

WCRIBMA
THE WORKERS' COMPENSATION RATING
AND INSPECTION BUREAU OF MASSACHUSETTS

December 20, 2021

The Honorable Gary Anderson
Commissioner of Insurance
Massachusetts Division of Insurance
1000 Washington Street, Suite 810
Boston MA 02118-6200

Dear Commissioner Anderson:

In accordance with General Laws, Chapter 152, Sections 52 and 53A, as amended by St. 1985, c. 572, I submit, on behalf of all members and subscribers of The Workers' Compensation Rating and Inspection Bureau of Massachusetts (WCRIBMA), a General Revision of Workers' Compensation Insurance Rates and Rating Values.

With this letter, I am submitting the technical support for the analysis underlying the proposed statewide increase in average rates of 2.7%. Our Cost Containment filing is attached as Volume 3 of the filing.

We propose the manual rates to be effective 12:01 A.M., July 1, 2022, and to apply to each risk as of the first normal anniversary rating date following that effective date.

Sincerely,



Daniel R. Judson
President

COMMONWEALTH OF MASSACHUSETTS
DIVISION OF INSURANCE

Docket No. 21-

In re:

APPLICATION OF THE WORKERS'
COMPENSATION RATING AND INSPECTION
BUREAU OF MASSACHUSETTS FOR APPROVAL
OF A GENERAL RATE REVISION TO BE
EFFECTIVE ON AND AFTER JULY 1, 2022

PRE-FILED DIRECT TESTIMONY OF CAROLYN J. BERGH

The Workers' Compensation Rating and Inspection Bureau of Massachusetts ("WCRIBMA") submits the following direct testimony of Carolyn J. Bergh in support of its application for a general rate revision to be effective on and after July 1, 2022.

Q. Please state your full name.

A. Carolyn J. Bergh.

Q. Ms. Bergh, please describe your current employment and your educational and professional experience.

A. I am presently employed as Vice President and Actuary at the WCRIBMA. I hold a bachelor's degree in mathematics and statistics from the University of Connecticut, Storrs. I am a Fellow of the Casualty Actuarial Society and a member of the American Academy of Actuaries. I also hold the designation of a Chartered Property Casualty Underwriter (CPCU). Before joining the WCRIBMA in September 2018, I spent five years as an assistant vice president and actuary for The Hartford overseeing their workers' compensation line of business, where my responsibilities included rating and pricing, reserving, claims and

underwriting support. Prior to The Hartford, I was employed at the NCCI for ten years. Six and a half years as a Practice Leader and Senior Actuary, overseeing the Legislative Analysis area, Pool Reserving and Data Quality Team and three and a half years as a State Actuary / Project Leader for several states, including Virginia, Tennessee, Texas, Rhode Island and Iowa. My actuarial career began in 1987 at Aetna Property Casualty in Hartford where I worked on ratemaking for personal lines. Subsequently I have worked for several companies in both a ratemaking and reserving capacity: NCCI (9/89–10/91) Sr. Actuarial Analyst, Workers Compensation Class Ratemaking; Lancer Insurance Company (10/92-9/95) Commercial Auto and Personal Lines; Providence Washington Insurance Company (9/95-11/99) Commercial and Personal Lines; Bristol West Insurance Company (11/99-2/03) Non-Standard Auto. A copy of my curriculum vitae is attached to this testimony.

Q. What was your role in the preparation of the current WCRIBMA filing for a general rate revision?

A. I was ultimately responsible for preparation of the entire filing. I worked closely with the WCRIBMA's actuarial staff and our outside consulting experts in preparing the filing. I am testifying in support of the reasonableness of the WCRIBMA's overall rate indication and sponsor Sections I (Rate Recommendation), II (Loss Development), III (Premium), IV (Benefit Change Adjustments), V (Trend), VI (Expenses) and XIV (Cost Containment). I also oversaw preparation of Volume 2 of the filing, which included consulting with and providing input to my colleague, Anthony Salido, regarding the data and methodology used in that volume. I also provided input into assumptions related to Volume 1, Section VII (Profit), which was prepared by the WCRIBMA's staff and peer reviewed by our outside consulting

expert George Zanjani. I worked with the WCRIBMA's outside consulting experts regarding their peer review and input on the other portions of the filing.

Q. Have you explained the basis of your derivation of each of the ratemaking factors that you are sponsoring in the text and accompanying exhibits found in the WCRIBMA's filing?

A. Yes.

Q. Are the data, calculations and narrative statements in the sections you are sponsoring complete and accurate?

A. To the best of my knowledge, information and belief, the data and calculations in the sections of the filing I am sponsoring are complete and accurate, and the narrative statements offered in support of these sections are also accurate and correct.

Q. Ms. Bergh, what general rate level change is the WCRIBMA recommending this year?

A. As shown in Section I of the filing, the WCRIBMA is recommending an increase in average rates of 2.7% for workers' compensation, effective July 1, 2022.

Q. Are you familiar with the statutory standard that must be applied by the Commissioner in reviewing the rates proposed in the WCRIBMA's current filing – that they “are not excessive, inadequate or unfairly discriminatory” and that they “fall within a range of reasonableness”?

A. Yes.

Q. Do you have an opinion as to whether the rates proposed in the WCRIBMA's current filing satisfy the statutory standard?

A. Yes.

Q. What is your opinion?

A. It is my professional opinion that the rates proposed in the WCRIBMA's current filing are not excessive, inadequate or unfairly discriminatory for the classifications to which they apply, and that they fall within a range of reasonableness. Accordingly, I recommend that the Commissioner approve the WCRIBMA's filing.

Q. What was your role in the preparation of the cost containment section of the current WCRIBMA filing?

A. I oversaw the preparation of the cost containment section of the filing. I worked closely with WCRIBMA staff in reviewing the cost containment surveys for the participating companies and in the contacting of those companies about any outstanding questions the WCRIBMA had regarding the survey responses.

In addition to overseeing the compilation of these ten survey responses, I also peer reviewed the input of the updated data and information from the Insurance Fraud Bureau of Massachusetts. That information can be found in the cost containment filing. To the best of my knowledge, the information and exhibits in this section of the filing are complete and accurate.

Q. Are you familiar with the statutory provisions that require the WCRIBMA to make a cost containment filing?

A. Yes. It is my understanding that the legislature has mandated that the Commissioner make a finding, based on the information WCRIBMA submits in its filing, as to whether insurers employ acceptable "cost control programs and techniques ... which have had or are expected to have a substantial impact on fraudulent claim costs, unnecessary health care

costs, and any other unreasonable costs and expenses, as well as the collection of appropriate premium charges owed” to the insurers the WCRIBMA represents.

Q. Does this filing provide the information the Commissioner would need to make a finding that the industry’s cost control programs and techniques satisfy the statutory standard?

A. Yes.

Q. Do you have an opinion on what his finding should be this year?

A. Yes.

Q. What is your opinion?

A. In my professional opinion, the information the WCRIBMA has submitted this year should lead the Commissioner to make the finding that there are acceptable cost control programs and techniques’ presently in place which satisfy the statutory requirements.

Signed this 10th day of December 2021 under the pains and penalties of perjury.



Carolyn J. Bergh, FCAS, MAAA, CPCU

PROFESSIONAL EXPERIENCE:

WORKERS' COMPENSATION RATING & INSPECTION BUREAU OF MA, Boston, MA

9/18 – present **Vice President and Actuary**

Responsible for the management of the Actuarial and Data Operations departments.
Oversee the collection of data and manage the preparation of workers' compensation rate filings for the Commonwealth of Massachusetts.

THE HARTFORD, Hartford, CT

10/12 – 5/18 **Assistant Vice President & Actuary, Workers Compensation Line of Business**

Ensured the profitability and rate adequacy of \$2.8B book of business
Worked closely with product, underwriting, claims, reserving, finance, data scientist and field office
Oversaw the functional areas of rating, pricing and planning
Indications, filings, trends monitoring, planning, predictive modeling implementation and monitoring
Pricing - Responsible for monitoring the regulatory environment and tracking marketplace activity including preparation of competitor analyses, rate-setting, and pricing proposals
Industry influence and participation - Actuarial Committee (MA, PA, CA and NCCI)

2003 – 2012 ***NATIONAL COUNCIL ON COMPENSATION INSURANCE, Boca Raton, FL***

2006 – 2012 **Practice Leader & Senior Actuary**

Legislative Analysis - Oversaw the pricing of legislative proposals and enactments
Provided support to legislators and insurance industry by analyzing benefit proposals, conducting research and participate in educational forums on cost drivers
Residual Market Pool Reserving
Data Quality

2003 – 2006 **Director and Actuary**

Oversaw the preparation of rate filings in several states
Expert witness testimony and educational forums
Team leader of legislative analysis oversaw pricing proposals and enacted legislation and research on benefit structure and post reform analysis

BRISTOL WEST INSURANCE COMPANY, Davie, FL

1999-2003 **Actuary and Manager** (Non-Standard Auto)

Assisted in building Actuarial and Product Management Department
Quarterly Reserving - presented reserves and claims' trends to Sr. Management and BOD
Preparation of Actuarial Reports and Opinions
Liaison with external auditors, Department of Insurance personnel and Reinsurers
Claims metrics development and monitoring
Mergers and Acquisition activity

PROVIDENCE WASHINGTON INSURANCE COMPANY, Providence, RI

1995-1999 **Actuary and Product Manager**

Pricing / Reserving: Commercial and Personal Lines
Rate revisions, filings, product development, profitability studies
Quarterly reserving, year-end financial reporting, risk based capital analysis
Niche marketing analysis and program development

LANCER INSURANCE COMPANY, Long Beach, NY

1992-1995 **Actuary: Pricing / Reserving: Transportation Specialist and Personal Lines**

NATIONAL COUNCIL ON COMPENSATION INSURANCE, Boca Raton, FL

1989-1991 **Sr. Actuarial Analyst: Class Ratemaking, Countrywide Exhibits and Documentation**

AETNA PROPERTY CASUALTY, Hartford, CT

1987-1989 **Actuarial Analyst: Homeowners Pricing / Commercial Lines Reserving**

Education:

University of Connecticut 1987
Actuarial Science: Math & Statistics
B.S. Actuarial Science, Cum Laude

Storrs, Connecticut

Professional Designations and Activities

Fellow of Casualty Actuarial Society (FCAS): 2006
Member of the Academy of Actuaries (MAAA): 2018
Chartered Property Casualty Underwriter (CPCU): 2020

CAS Examination Committee: (2006-2015)

EXPERT TESTIMONY:

Helena, Montana, February 2009
BOD MT State Fund – Medical Fee Schedule

Nashville, Tennessee, October 2007
Workers Compensation Insurance Loss Cost Hearing

Nashville, Tennessee, April 2007
Workers Compensation Insurance Loss Cost Hearing – Medical Fee Schedule - Law Only

Providence, Rhode Island, January 2007
Workers Compensation Insurance Loss Cost Hearing

Nashville, Tennessee, October 2006
Workers Compensation Insurance Loss Cost Hearing

Providence, Rhode Island, December 2005
Workers Compensation Insurance Loss Cost Hearing

Nashville, Tennessee, September 2005
Workers Compensation Insurance Loss Cost Hearing

Nashville, Tennessee, April 2005
Workers Compensation Insurance Loss Cost Hearing – Medical Fee Schedule - Law Only

Nashville, Tennessee, February 2005
Workers Compensation Insurance Loss Cost Hearing

Nashville, Tennessee, November 2004
Workers Compensation Insurance Loss Cost Hearing

Nashville, Tennessee, July 2004
Workers Compensation Insurance Loss Cost Hearing – Law Only

Nashville, Tennessee, February 2004
Joint Committee on Workers Compensation

Nashville, Tennessee, February 2004
Senate, Commerce, Labor and Agriculture Committee

PUBLIC PRESENTATIONS:

CAS Spring Meeting, June 2008
WC Second Injury Fund Eliminations

Data Reporting Workshop, Jan 2008
NCCI New Medical Call

Annual Issues Symposium, May 2007
Performance of Payroll as the Exposure Base for WC

STATE ADVISORY FORUMS:

Nashville, Tennessee, September 2006

Austin, Texas, November 2005

Nashville, Tennessee, September 2005

Providence, Rhode Island, September 2005

Nashville, Tennessee, September 2004

Austin, Texas, November 2004

Austin, Texas, November 2003

Nashville, Tennessee, September 2003

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PRE-FILED DIRECT TESTIMONY OF ANTHONY SALIDO

The Workers' Compensation Rating and Inspection Bureau of Massachusetts ("WCRIBMA") submits the following direct testimony of Anthony Salido in support of Sections VIII, IX, X, XI, XII and XIII of its filing for a general rate revision to be effective on and after July 1, 2022.

Q. Please state your full name.

A. Anthony Salido.

Q. Mr. Salido, please describe your current employment and your educational and professional experience.

A. I am presently employed as Assistant Vice President, Data Operations and Actuary at the WCRIBMA, 101 Arch Street, Boston, Massachusetts. My educational background includes a Bachelors degree in Mathematics and Economics from Boston College. I joined the WCRIBMA in June 1998. I am a Fellow of the Casualty Actuarial Society. A copy of my resume is attached to this testimony.

Q. What was your role in the preparation of the current WCRIBMA filing?

A. I was responsible for the preparation of Volume II of the filing. I had principal responsibility for the preparation of the following sections of the filing: Sections VIII (F-Class), IX (Classification), X (Experience Rating), XI (Miscellaneous Rating Values), XII (Retrospective Rating), and Section XIII (Data). These sections were also peer reviewed by my colleague, Carolyn Bergh, Vice President & Actuary, WCRIBMA, who oversaw preparation of the filing as a whole and consulted with and provided input to me regarding the data and methodology used in these sections of the filing.

Q. Have you explained the basis of your derivation of each of the ratemaking factors in the text and accompanying exhibits found in Sections VIII (F-Class), IX (Classification), X (Experience Rating), XI (Miscellaneous Rating Values), and XII (Retrospective Rating)?

A. Yes.

Q. Are the data, calculations and narrative statements in the sections you are sponsoring complete and accurate?

A. To the best of my knowledge, information and belief, the data and calculations underlying Sections VIII (F-Class), IX (Classification), X (Experience Rating), XI (Miscellaneous Rating Values), and XII (Retrospective Rating) are complete and accurate, and the narrative statements are also accurate and correct.

Signed this 10th day of December, 2021 under the pains and penalties of perjury.



Anthony Salido, FCAS, MAAA

Anthony D. Salido, FCAS, MAAA
Workers' Compensation Rating and Inspection Bureau of MA
101 Arch St. 5th Floor
Boston, MA 02110

Work experience

**The Workers' Compensation Rating and Inspection Bureau of MA
Boston, MA**

06/1998 - Present

Senior Actuarial Analyst 01/2004-08/2010

Data Operations Director / Actuary 09/2010–11/2018

Assistant Vice President, Data Operations and Actuary 12/2018–Present

- Directs the collection, editing, and correction of all Unit Statistical, Policy and Aggregate Financial Call data submitted to the WCRIBMA by its member carriers.
- Responsible for the preparation of various sections contained in the WCRIBMA's rate filings, including loss development, premiums, benefit level adjustments, trend, expenses, experience rating, retrospective rating, class rates, F-Class rates, and miscellaneous rating.
- Maintains the data structures and associated metadata for the Actuarial Department's Financial Call and Unit Stat plan databases.
- Responsible for the maintenance of the nightly batch process that populates the Actuarial Department's databases, runs the Actuarial Department's data edits, and creates content for the WCRIBMA's intranet and web site.
- Formalized and directed the process employed by the WCRIBMA for the data reconciliations mandated by the Massachusetts Workers Compensation Statistical Plan. Worked with other WCRIBMA departments and data reporters to explain and/or correct anomalies identified by the reconciliation process.
- Developed and maintains Actuarial Department's intranet site which includes a history of Massachusetts workers' compensation rate filing activity, reconciliation reports, edit reports, and other content to support the WCRIBMA's rate filing efforts.
- Prepares Circular Letters and Special Bulletins.
- Responds to information requests from members, regulators, etc.

Education

F.C.A.S. 2010, M.A.A.A. 2008

Boston College, Chestnut Hill MA

B.A. in Mathematics and Economics 1998

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PRE-FILED DIRECT TESTIMONY OF SHARON TENNYSON

The Workers' Compensation Rating and Inspection Bureau of Massachusetts ("WCRIBMA") submits the following direct testimony of Sharon Tennyson in support of its application for a general rate revision to be effective on and after July 1, 2022.

Q. Please state your full name.

A. Sharon Tennyson.

Q. What are your professional qualifications?

A. I am an economist and Professor of Public Policy and Department of Economics at Cornell University. Before moving to Cornell, I was on the faculty of the Department of Insurance and Risk Management at the Wharton School of the University of Pennsylvania. I have over 25 years' experience in research related to insurance markets. I serve as a Senior Associate Editor of the *Journal of Risk and Insurance* and on the Editorial Board of the *Journal of Insurance Regulation*. I am a former president of the Risk Theory Society. My particular area of expertise is in the industrial organization and regulation of insurance markets, and I have published extensively on these topics. My curriculum vitae is attached to this testimony.

Q. What was your role in the preparation of the current WCRIBMA filing for a general rate revision?

A. I was retained by Anderson & Kreiger LLP, counsel for the WCRIBMA, to provide an analysis based on well-accepted economic theory that uses available insurance market data to determine whether the commission allowance recommended by the WCRIBMA is reasonable and reflects the actual cost to agents or brokers of the services they provide. I completed such an analysis for the WCRIBMA and it is summarized in my report, reproduced in Section XIV of the WCRIBMA's rate filing. To the best of my knowledge, information and belief, the data and calculations underlying my report are complete and accurate, and the narrative statements offered in my report are also accurate and correct, and continue to reflect the competitive situation of the workers compensation market in Massachusetts in 2021.

Q. Professor Tennyson, what conclusions did you reach as a result of your analysis?

A. It is my professional opinion that the commission allowance recommended by the WCRIBMA is reasonable and reflects the actual cost to agents and brokers of the services they provide as producers of workers' compensation insurance policies in Massachusetts.

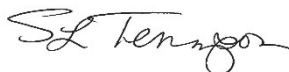
Q. Have you explained in your report how you came to these conclusions?

A. Yes.

Q. Does your report contain all the data that you relied upon in reaching these conclusions?

A. Yes.

Signed this 8th day of December 2021 under the pains and penalties of perjury.



Sharon Tennyson

SHARON TENNYSON, Ph.D.

Jeb E. Brooks School of Public Policy and
Department of Economics
Cornell University

2214 MVR Hall, Ithaca, NY

Email: sharon.tennyson@cornell.edu

Website: <http://www.human.cornell.edu/bio.cfm?netid=st96>

AREAS OF INTEREST

Insurance Law and Economics, Consumer Policy, Regulatory Economics, Household Finance

EDUCATION

Ph.D., Economics, Northwestern University; Fields: Industrial Organization, Public Economics
B.A., Economics, University of California at Los Angeles

PRIMARY ACADEMIC APPOINTMENTS

- 2021- *Professor*, Jeb. E. Brooks School of Public Policy and Department of Economics, Cornell University
2013-2021 *Professor*, Department of Policy Analysis and Management, Cornell University
1998-2012 *Associate Professor*, Department of Policy Analysis and Management, Cornell University
1990-1998 *Assistant Professor*, Department of Insurance and Risk Management, University of Pennsylvania

SECONDARY APPOINTMENTS

- 2020- Member, Advisory Board, Cornell Program on Infrastructure Policy
2019-2020 Member, Research Working Group on Rural Revitalization and Resiliency in Upstate New York, Polson Institute, Cornell
2018- Faculty Fellow, Atkinson Center for a Sustainable Future, Cornell
2017-2020 Coordinator, Faculty Working Group on Disaster Resilience, Mario Einaudi Center for International Studies, Cornell
2017-2020 Director of Graduate Studies, Graduate Field of Public Affairs, Cornell
2017-2018 Advisory Board member, Mario Einaudi Center for International Studies, Cornell
2014-2017 Director, Cornell Institute for Public Affairs
2014- Faculty Affiliate, Cornell Institute for Behavioral and Household Finance
2013-2018 Core Faculty member, Cornell Institute for Public Affairs
2012 - Faculty Affiliate, Bronfenbrenner Center for Translational Research, Cornell
2008 - Senior Research Fellow, Networks Financial Institute, Scott College of Business
2003-2008 Faculty Fellow, Program on Pharmaceutical Policy Issues, Department of Policy Analysis and Management, Cornell
2003-2004 Project Coordinator, Program on Pharmaceutical Policy Issues, Department of Policy Analysis and Management, Cornell
2002-2003 Director of Undergraduate Studies, Department of Policy Analysis and Management, Cornell
1996-1998 Senior Research Fellow, Financial Institutions Center, Wharton School

EXTERNAL LEADERSHIP POSITIONS

- 2020- Executive Committee member, International Academy of Financial Consumers
 2019- Editor, *International Review of Financial Consumers* (Advisor, 2016-2019)
 2018- Senior Editor, *Journal of Risk and Insurance* (Associate Editor, 2004-2017)
 2018- Editorial Board member, *Journal of Consumer Affairs*
 2011-2017 Editor, *Journal of Consumer Affairs*
 2011-2018 International Board of Advisors, SKKU Graduate School of Insurance, SKKU School of Business, Seoul, Korea
 2005- Editorial Review Board member, *Journal of Insurance Regulation*
 2003-2004 President, Risk Theory Society (Officer 2002-2005)

VISITING APPOINTMENTS

- June 2016 GenRe Distinguished Visitor, University of Cologne, Germany
 July 2011 Munich Risk and Insurance Center, Ludwig Maximilians-Universität, Germany
 Feb 2011 Center for Insurance Research, Florida State University
 April 2000 Department of Insurance and Risk Management, University of Pennsylvania
 1999 Centre for Market and Public Organisation (CMPO), University of Bristol, U.K.

RECENT HONORS AND AWARDS

- 2020 Fulbright U.S. Scholar (Global Fellowship), The Fulbright Program, US Department of State (for studies in Germany and Jamaica 2021-2023)
 2019 Graduate KON/HEAA Advising Award, College of Human Ecology, Cornell University
 2019 Delegate (Cornell University), UN Climate Change Conference (COP25), Madrid
 2019 Keynote Speaker, International Academy of Financial Consumers 6th annual Global Forum on Financial Consumers, Yogyakarta, Indonesia; “Linking Academic Research with Public Policy”
 2018 Social Science Fellowship, Atkinson Center for a Sustainable Future, Cornell (awarded for spring 2019)
 2017 Invited Panelist, 7th Insurance Law Forum, Brazilian Institute of Insurance Law (IBDS), Sao Paulo, Brazil; “Insurance and Regulatory Capture”
 2016 Winner, 2015 Best Article, *Risk Management and Insurance Review*; “Product Ratings as a Market Reaction to Deregulation: Evidence from the German Insurance Market” (with Stephanie Meyr)
 2014 Winner, 2013 Spencer L. Kimball Writing Award, *Journal of Insurance Regulation* Best Article award; “The Effects of Regulatory Reforms in the South Carolina Auto Insurance Market” (with Robert Klein and Martin F. Grace)
 2013 Keynote Speaker, 13th Annual Regulatory Affairs Symposium, Insurance Bureau of Canada, Toronto; “Ontario Auto Insurance: Great Expectations”
 2012 Winner, 2011 Casualty Actuarial Society Award for Best Article published by the American Risk and Insurance Association; “The Impact of Rate Regulation on Claims: Evidence from Massachusetts Automobile Insurance” (with Richard Derrig)
 2012 Winner, 2011 Best Feature Article, *Risk Management and Insurance Review*; “The Impact of Rate Regulation on Claims: Evidence from Massachusetts Automobile Insurance” (with Richard Derrig)

- 2011 Winner, 2010 Best Article, *Geneva Risk and Insurance Review*; “Incentive Effects of Community Rating in Insurance Markets: Evidence from Massachusetts Automobile Insurance”
- 2011 Keynote Speaker, American Council on Consumer Interests; “Perspectives on Consumer Protection Regulation”
- 2010 Winner, 2009 Best Feature Article, *Risk Management and Insurance Review*; “Do State Cost Control Policies Reduce Medicaid Prescription Drug Spending?” (with Kosali I. Simon and Julie Hudman)
- 2010 Keynote Speaker, Louisiana Conference on Insurance Fraud and Vehicle Theft; “The Many Faces of Fraud: Moral, Social and Economic Catalysts”
- 2010 Keynote Speaker, China International Conference on Insurance and Risk Management, Xi Ning China; “Issues and Challenges in Consumer Protection Regulation”

CURRENT WORKING PAPERS

“Price Subsidies and the Demand for Automobile Insurance”, with BoHeng Su, in revision for *The North American Actuarial Journal*.

“The Airline Passenger Protection Rule: Airline Responses for On-Time Performance”, with Sra Chuenchoksan and Andrew M. McClintock, in revision for *Journal of Regulatory Economics*.

“Is Risk-Taking in our Nature? Genetics and Personality in Financial Decision-Making,” with Vickie Bajtelsmit and Lisa L. Posey, under review.

“School-based Healthcare and Rural Community Health,” with John Sipple, Peter Fiduccia, Wendy Brunner, Elizabeth Lembo and Chris Kjolhede, under review.

“The Effects of State Legal Environments on Automobile Insurance Costs and Compensation: Evidence from the *Royal Globe* Doctrine,” in preparation for submission.

REFEREED JOURNAL ARTICLES

“My Wife is my Insurance Policy: Household Bargaining and the Purchase of Long Term Care Insurance,” with Hae Kyung Yang and Frances Woolley, *Research on Aging*, forthcoming.

“EU Intermediary Regulation and its Impact on Insurance Agent Quality: Evidence from Germany,” with Christoph Lex, *International Review of Law and Economics*, 68 December 2021: 106021.

“Credible or Biased? An Analysis of Insurance Product Ratings,” with Stephanie Müller and Patricia Born, *International Review of Financial Consumers*, 5 (1) April 2020: 25-39.

“Effects of Informational Nudges on Consumer Debt Repayment Behaviors,” with Lauren Jones and Caezilia Loibl, *Journal of Economic Psychology* 51 December 2015: 16-33.

“Directors’ and Officers’ Liability Insurance, Corporate Risk and Risk Taking: New Panel Data Evidence on the Role of Directors’ and Officers’ Liability Insurance,” with M. Martin Boyer, *Journal of Risk and Insurance* 82(4) December 2015: 753-791.

“Ontario Auto Insurance Reform: A Game of “Whack-A-Mole,” with Mary Kelly and Anne E. Kleffner, *Assurances* 82(4) December 2015: 43-74.

“Product Ratings as a Market Reaction to Deregulation: Evidence from the German Insurance Market”, with Stephanie Meyr, *Risk Management & Insurance Review* 18(1) Spring 2015: 77- 100.
Winner, 2015 American Risk and Insurance Association Award for Best Article published in *RMIR*

“The Influence of FDA Advisory Information and Black Box Warnings on Individual Use of Prescription Antidepressants,” with Kristy Parkinson, Joseph Price and Kosali Simon, *Review of Economics of the Household* 12(4) December 2014: 771-790.

“The Development and Regulation of China’s Insurance Market: History and Perspectives,” with Bingzheng Chen, Maoqi Wang and Haizhen Zhou, *Risk Management & Insurance Review* 17(2) Fall 2014: 241-263.

“The Role of Life Experience in Long Term Care Insurance Decisions,” with HaeKyung Yang, *Journal of Economic Psychology* 42 June 2014: 175-188.

“Does the Threat of Insurer Liability for “Bad Faith” Affect Insurance Settlements?” with Danial P. Asmat, *Journal of Risk and Insurance* 81(1) March 2014: 1-23.

“The Effects of Regulatory Reforms in the South Carolina Auto Insurance Market,” with Robert W. Klein and Martin Grace, *Journal of Insurance Regulation* 32 2013: 1-30.
Winner, 2013 Spencer L. Kimball Writing Award, *Journal of Insurance Regulation*
Best Article award

“The Effect of Prescription Drug Withdrawals on the Use of Competitor Drugs: The Case of Vioxx,” with J. Michael Collins and Kosali Simon, *Journal of Economic Behavior and Organization* 86(1) February 2013: 148-168.

“Determination of the Dates of Passage of the Married Women’s Property Acts and Earnings Acts,” with R. Richard Geddes, *Research in Economic History* Vol. 29 2013: 145-189.

“The Effects of Expanding Property Rights on Women’s Economic Activity,” with R. Richard Geddes and Dean Lueck, *Journal of Law and Economics* 55(4) November 2012: 839-867.

“Consumers’ Insurance Literacy: Evidence from Survey Data,” *Financial Services Review* 20(3) Fall 2011: 165-179.

“The Impact of Rate Regulation on Claims: Evidence from Massachusetts Automobile Insurance,” with Richard A. Derrig, *Risk Management & Insurance Review* 14(2) Fall 2011: 173-200.
Winner, 2011 American Risk and Insurance Association Award for Best Feature Article published in *RMIR*, and the 2011 Casualty Actuarial Society Award for Best Article Published by the American Risk and Insurance Association

“The Effects of Regulated Premium Subsidies on Insurance Costs: An Empirical Analysis of Automobile Insurance,” with Laureen Regan and Mary A. Weiss, *Journal of Risk and Insurance* 77(3) September 2010: 597-624.

“Incentive Effects of Community Rating in Insurance Markets: Evidence from Massachusetts Automobile Insurance,” *Geneva Risk and Insurance Review* 35(1) June 2010: 19-46.

Winner, 2010 European Group of Risk and Insurance Economists Award for Best Article published in *GRIR*

“The Law and Economics of First Party Insurance Bad Faith Liability,” with William J. Warfel, *Connecticut Insurance Law Journal* 16(1) 2009-2010: 203-242.

“State Prescription Drug Policies, Cost Barriers and the Use of Acute Care Services by Medicaid Beneficiaries,” with Hae Kyung Yang, *Journal of Consumer Affairs* 43(1) Spring 2009: 4-25.

“Do State Cost Control Policies Reduce Medicaid Prescription Drug Spending?” with Kosali I. Simon and Julie Hudman, *Risk Management & Insurance Review* 12(1) Winter 2009: 37-64.

Winner, 2009 American Risk and Insurance Association (ARIA) Award for Best Feature Article, *RMIR*

“The Emergence and Potential Consequences of First Party Insurance Bad Faith Liability,” with William J. Warfel, *Journal of Insurance Regulation* 28(2) Winter 2008: 3-20.

“The Relationship between Auto Insurance Rate Regulation and Insured Loss Costs: An Empirical Analysis,” with Laureen Regan and Mary A. Weiss, *Journal of Insurance Regulation* 27(1) Fall 2008: 23-46.

“Insurance Fraud and Optimal Claims Settlement Strategies,” with Keith J. Crocker, *Journal of Law and Economics* 45(2) October 2002: 469-508.

“Claims Auditing in Automobile Insurance: Fraud Detection and Deterrence Objectives,” with Pau Salsas-Forn, *Journal of Risk and Insurance* 69(3) September 2002: 289-308.

“Insurance Experience and Consumers’ Attitudes toward Insurance Fraud,” *Journal of Insurance Regulation* 21(2) Winter 2002: 35-56.

“State Curriculum Mandates and Student Knowledge of Personal Finance,” with Chau Nguyen, *Journal of Consumer Affairs* 25(2) Winter 2001: 241-262.

“Regulation, Political Influence and the Price of Automobile Insurance,” with J. David Cummins and Richard D. Phillips, *Journal of Insurance Regulation* 20(1) Fall 2001: 9-50.

“Efficiency, Scale Economies and Consolidation in the U.S. Life Insurance Industry,” with J. David Cummins and Mary A. Weiss, *Journal of Banking and Finance* 23(2-4) February 1999: 325-357.

“Capital Shocks and Merger Activity in the Property-Liability Insurance Industry,” with Sandra L. Chamberlain, *Journal of Risk and Insurance* 65(4) December 1998: 563-595.

“The Coexistence of Distribution Systems under Price Search: Theory and some Evidence from Insurance,” with Lisa L. Posey, *Journal of Economic Behavior and Organization* 35(1) January 1998: 95-115.

“The Impact of Rate Regulation on State Automobile Insurance Markets,” *Journal of Insurance Regulation* 15(4) Summer 1997: 502-523.

“Economic Institutions and Individual Ethics: A Study of Consumer Attitudes Toward Insurance Fraud,” *Journal of Economic Behavior and Organization* 30(2) February 1997: 247-266.

“Agent Discretion and the Choice of Insurance Marketing System,” with Lauren Regan, *Journal of Law and Economics* 39(2) October 1996: 637-666.

“Moral Hazard in Insurance Claiming: Evidence from Automobile Insurance,” with J. David Cummins, *Journal of Risk and Uncertainty* 12(1) January 1996: 29-50.

“Regulatory Lag in Automobile Insurance,” *Journal of Risk and Insurance* 60(1) March 1993: 36-58.

“Reinsurance and the Liability Insurance Crisis,” with Lawrence A. Berger and J. David Cummins, *Journal of Risk and Uncertainty* 5(3) July 1992: 253-272.

“Labor Market Discrimination, Imperfect Information and Self-Employment,” with Stephen Coate, *Oxford Economic Papers* 44(2) April 1992: 272-288.

“Controlling Automobile Insurance Costs,” with J. David Cummins, *Journal of Economic Perspectives* 6(2) Spring 1992: 95-115.

BOOK CHAPTERS

“Insurer Liability and Claim Settlement Failures: Evidence from the United States,” Chapter 19 in *Contemporary Insurance Law*, 20th Anniversary Commemorative Volume of the Brazilian Institute of Insurance Law (IBDS), Ernesto Tzirulnik, Anamaria Blanco, Carolina Cavalcanti and Vitor Boaventura Xavier, eds. Roncarati Publishers, Sao Paulo, 2021.

“The Law and Economics of Insurance Bad Faith Liability,” with Danial Asmat, Chapter 12 in *Research Handbook of the Economics of Insurance Law*, Daniel Schwartz and Peter Siegelman, eds. Edward Elgar Publishers, 2015.

“Insurance Distribution,” with James I. Hilliard and Lauren Regan, chapter 23 in *Handbook of Insurance* 2nd edition, Georges Dionne, editor. Springer, 2013.

“Challenges and Approaches to Consumer Protection in the Insurance Industry,” in *The Fundamentals of Future Insurance Regulation and Supervision: A Global Perspective*, Patrick M. Liedtke and Jan Monkiewicz, editors. Palgrave MacMillan, 2011.

“Automobile Insurance Regulation: The Massachusetts Experience,” with Lauren Regan and Mary A. Weiss, in J. David Cummins, ed., *Deregulating Property-Liability Insurance: Restoring*

Competition and Increasing Market Efficiency. Washington, DC: American Enterprise Institute-Brookings Institution Joint Center for Regulatory Studies, 2002: 25-80.

“Insurance Distribution Systems,” with Laureen Regan, in Georges Dionne, ed., *Handbook of Insurance*, Kluwer Academic Publishers, 2000: 709-745.

“Costly State Falsification or Verification? Theory and Evidence from Bodily Injury Liability Claims,” with Keith J. Crocker, in Georges Dionne and Claire Laberge-Nadeau, eds., *Automobile Insurance: Road Safety, New Drivers, Risks, Insurance Fraud and Regulation*, Kluwer Academic Publishers, 1999: 120-130.

“Rate Regulation and the Industrial Organization of Automobile Insurance,” with Susan J. Suponic, in David Bradford, ed., *The Economics of Property-Casualty Insurance*, University of Chicago Press, 1998: 113-138.

“Moral Hazard, Adverse Selection and Community Monitored Insurance Programs,” with Neil A. Doherty, in Robert Klein, ed., *Alternative Approaches to Insurance Regulation*, National Association of Insurance Commissioners, 1998: 97-110.

PUBLISHED ESSAYS AND POLICY BRIEFS

Insurance and Regulatory Capture, invited article for the Proceedings of the 7th Insurance Law Forum, Brazilian Institute for Insurance Law (IBDS), Brazil. 2018.

“Can Regulations Improve Financial Information and Advice?” invited article, *International Review of Financial Consumers* 1(1) Oct 2016: 1-8.

How Risk and Insurance Experts View the Effectiveness of Prior Approval and Market-Oriented Rate Regulatory Policies in Auto Insurance, Insurance Research Council, August 2013.

Does Ontario Need a New Auto Insurance System? with Mary Kelly and Anne Kleffner, Insurance Bureau of Canada policy brief, September 2012.

Long Term Effects of Rate Regulatory Reforms in Automobile Insurance Markets, Insurance Research Council, March 2012.

Consumers’ Insurance Literacy, Policy Brief 2011-PB-06 Networks Financial Institute July 2011.

“Consumer Protection in Insurance Markets,” invited article, *Journal of Financial Consumers* 1(1) June 2011: 1-10.

Rethinking Consumer Protection Regulation in Insurance Markets, Policy Brief 2010-PB-07 Networks Financial Institute September 2010.

Analyzing the Role for a Consumer Financial Protection Agency, Policy Brief 2009-PB-13 Networks Financial Institute December 2009.

“Moral, Social and Economic Dimensions of Insurance Claims Fraud,” *Social Research: An International Quarterly* 75(4) Winter 2008: 1181-1204.

State Regulation and Consumer Protection in the Insurance Industry, Policy Brief 2008-PB-03 Networks Financial Institute February 2008. Reprinted in *Consumer Protection: Diverging Perspectives*, G. Radhika, ed., Hyderabad: Icfai University Press, 2008-09

First-Party Insurance Bad Faith Liability: Law, Theory, and Economic Consequences, with William J. Warfel, National Association of Mutual Insurance Companies Issue Brief 2008.

Efficiency Consequences of Insurance Rate Regulation, Policy Brief 2007-PB-03 Networks Financial Institute. Reprinted in *The Icfai University Journal of Insurance Law* 6(3) 2008: 41-54.

OTHER NON-REFEREED PUBLICATIONS

“Can health insurance companies charge the unvaccinated higher premiums? What about life insurers? 5 questions answered”, with Kosali I. Simon, *The Conversation*, August 18, 2021. <https://theconversation.com/can-health-insurance-companies-charge-the-unvaccinated-higher-premiums-what-about-life-insurers-5-questions-answered-165959>

“Insurer Anti-Fraud Programs: Contracts and Detection versus Norms and Prevention,” *Journal of Financial Transformation*, Spring 2011.

“Bad Faith Lawsuits: Raise Standard of Proof”, with William J. Warfel, *Fraud Focus* (newsletter published by The Coalition Against Insurance Fraud), Winter 2009.

“Bad-Faith Liability for Unfair Claims Settlement Practices in First-Party Insurance,” with William J. Warfel, *Pravartak: Journal of Insurance and Risk Management*, May 2009.

“Financial Literacy: A Public Policy Issue -- The Effect of Curriculum Mandates on Student Financial Knowledge,” with Chau Nguyen and B.J. Bristow, *Proceedings of the 2000 Annual Conference of the Association for Financial Planning and Counseling*, November 2000.

“Curriculum Mandates: A Policy to Increase Financial Literacy?” with B.J. Bristow and Chau Nguyen, *Jumpstart Coalition Newsletter*, October 2000.

“Government Regulation of Insurer Sales Practice,” *Market and Public Organisation*, University of Bristol, Issue 2, December 1999: 7-10.

Book Review of “The Liability Maze: The Impact of Liability Law on Safety and Innovation” by Peter Huber and Robert Litan, eds., published in *Journal of Policy Analysis and Management*, V11, No.4 (Fall 1992): 728-731

“The Effect of Rate Regulation on Underwriting Cycles,” *CPCU Journal* 44(1) Mar 1991:33-45.

UNPUBLISHED PAPERS

“Enhancing the Impact of Rural School-Based Health Centers via Parenting Education,” with

Kimberly A. Kopko, 2020.

"Empirical Analysis of Expanding Insurers' Duty to Settle: Evidence from the Royal Globe Doctrine," with Brian Richman, *Available at SSRN 2994586*, 2017.

"Tort Liability and Settlement Failure: Evidence on Litigated Auto Insurance Claims", with Danial P. Asmat. *Available at SSRN 2816697*, 2016.

"State Regulations, Uninsured Driving and the Cost of Automobile Insurance," with Mary A. Weiss, 2011.

"Trends in State Medicaid Prescription Drug Policies 1990-2004: What are the main policies the states are using?" with Kosali Simon and Julie Hudman, 2005.

"Medicaid Crowd-out Of Private Insurance: The Case of Long Term Care," with Hyojin Kang and Alan Mathios, 2004.

CONFERENCE PARTICIPATION

Organizational Activities:

- 2020, 2021 Organizing committee member, Global Forum on Financial Consumers
- 2018-2020 Session organizer and moderator, American Risk and Insurance Association session at the American Economic Association meetings (January 2019, January 2020, January 2021)
- 2015 Local organizer (host institution), Risk Theory Society
- 2013 Organizer, Editors' Roundtable, ACCI annual meeting
- 2012 Plenary session co-organizer and moderator, panel on Consumer Protection Regulation, Asia-Pacific Risk and Insurance Association annual meeting
- 2009 Co-organizer, NAIC-Temple Symposium on Insurance Solvency Regulation
- 2008 Session organizer, American Economic Association meeting
- 2002 Program Chair, Risk Theory Society Seminar
- 1999 Session organizer, CSWEP session, Western Economic Association meeting

Research Presentations:

- 2019 Global Forum on Financial Consumers; IAFICO Fifth Annual Congress, Indonesia (plenary session presenter)
UN Climate Change Conference (COP25), Madrid, panel presentation at the EU Pavilion (presenter)
- 2018 Bronfenbrenner Center for Translational Research, Talk at Twelve (panelist)
- 2017 7th Insurance Law Forum, IBDS, Sao Paulo, Brazil (presenter)
- 2016 7th CEAR/MRIC Behavioral Insurance Workshop, Munich (discussant)
- 2015 Global Forum on Financial Consumers; IAFICO First Annual Congress, Jeju Korea (plenary session presenter)
World Risk and Insurance Economics Congress (discussant), Munich
Public Choice Society annual meeting (presenter and discussant)
- 2014 Public Choice Society annual meeting (presenter and discussant)
- 2013 Casualty Actuarial Society national meeting (presenter), Vancouver, BC
American Risk and Insurance Association meeting (discussant)

- 2012 National Insurance Council of Canada annual meeting (panelist), Quebec City
Risk Theory Society seminar (presenter)
American Council on Consumer Interests meeting (presenter)
Webinar, National Association of Mutual Insurance Companies (presenter)
Asia-Pacific Risk and Insurance Association meeting (presenter)
- 2011 Allied Social Science Association meeting, session sponsored by American Risk
and Insurance Association (presenter)
American Risk and Insurance Association meeting (presenter)
- 2010 World Risk and Insurance Economics Congress, Singapore (presenter and
discussant)
Conference on Insurance Regulatory Reform Issues: A Regional Perspective,
Networks Financial Institute, Indianapolis (panelist)
C.D. Howe Institute Conference on Price Regulation and Social Welfare: The Case of
Automobile Insurance in Canada, Toronto (discussant)
- 2009 National Association of Mutual Insurance Companies Public Policy Summit
- 2008 American Society of Health Economists meeting (presenter)
American Economic Association meeting (presenter)
Searle Center Conference on Insurance Markets and Regulation, Northwestern
University (presenter)
American Risk and Insurance Association meeting, (presenter and discussant)
Insurance Bureau of Canada Regulatory Affairs Symposium, Toronto (presenter)
Fifth Insurance Reform Summit, Networks Financial Institute, Washington, D.C.
Conference on Empirical Legal Studies (discussant)
- 2007 American Risk and Insurance Association meeting (presenter and discussant)
Casualty Actuary Society Northeast Regional Meeting (presenter)
Fourth Insurance Reform Summit, Networks Financial Institute, Washington, D.C.
(presenter)
- 2006 International Society for New Institutional Economics meeting (presenter)
American Risk and Insurance Association meeting (discussant)
- 2002 Casualty Actuarial Society national meeting (presenter)
Insurance Research Council/Massachusetts Automobile Insurers' Bureau
Conference on Insurance Fraud (presenter)
- 2001 American Enterprise Institute-Brookings Joint Center for Regulatory Studies
Conference on Property-Liability Insurance Price Deregulation (presenter)
American Council on Consumer Interests meeting (presenter)
Risk Theory Society Seminar (presenter)
Casualty Actuarial Society national meeting (presenter)
- 2000 Seminar of the European Group of Risk and Insurance Economists (presenter,
discussant)
Insurance: Mathematics and Economics meeting (presenter)
- 1998 Economic Policy Institute Conference on Automobile Insurance (discussant)
- 1997 Fifth International Conference on Insurance Solvency and Finance (presenter)
International Conference on Automobile Insurance, University of Montreal (presenter)
- 1996 American Risk and Insurance Association meeting (presenter)
- 1995 American Risk and Insurance Association meeting (presenter)
- 1994 American Risk and Insurance Association meeting (presenter)

- Econometric Society North American Summer Meeting (presenter)
 Franco-American Economics Seminar (presenter)
 National Bureau of Economic Research Conferences on Property-Casualty
 Insurance (presenter)
 1993 American Economic Association meeting (presenter)
 1992 American Risk and Insurance Association meeting (presenter)
 Risk Theory Society Seminar (presenter)
 1991 American Risk and Insurance Association meeting (presenter)

Educational Presentations:

- 2018 Sungkyunkwan University, Seoul Korea, Guest Lecturer on Disaster Risk Financing
 2016 Cornell Cooperative Extension, Parenting Education In-Service, Panelist;
 "Enhancing Community Impacts of School-Based Health Clinics in Rural New
 York via Parenting Education: A Pilot Study"
 2015 Sungkyunkwan University, Seoul Korea, Guest Lecturer on Consumer Protection
 Economics
 2015 Huebner Foundation Faculty-PhD Seminar, Faculty Panelist, Munich, August
 2012 Cornell Cooperative Extension, Family and Economic Resource Management In-
 Service, Panelist; "Improving Consumers' Use of Credit Cards: The Role of Policy"
 2012 Casualty Actuarial Society Northeast Regional meeting (CANE), General Session
 Speaker; "Lessons for Actuaries from Behavioral Economics" (with James Guszca)
 2012 Bad Faith and Beyond Conference, Rutgers-Camden Law School, Panelist;
 "Empirical Perspectives on Bad Faith Liability"
 2012 American Council of Consumer Interests Webinar for Emerging Academics;
 "Publishing: Perspectives of an Editor"
 2011 General Session Speaker, Casualty Actuarial Society InFocus Seminar; "Lessons
 for Insurance Actuaries from Behavioral Economics" (with James Guszca)
 2010 Cornell University, Johnson Graduate School of Management, Faculty Panel
 "Financial Protections in the U.S. and Globally" (Andrew Ross Sorkin visit)
 2010 Singapore College of Insurance, Distinguished Visiting Professor Lecture;
 "Understanding Consumer Behavior in Insurance Transactions"
 2010 Cornell Human Ecology Alumni Association, annual meeting; "Financial
 Regulatory Reforms"
 2010 National Conference of Insurance Legislators, Institute for Insurance Policy; "The
 Cost of Claims Fraud: Who Ultimately Pays?"
 2008 National Association of Mutual Insurance Companies, annual meeting;
 "Consequences of First-Party Insurance Bad Faith Liability"
 2001 Cooperative Extension Conference (ACCEE); "Life is a Risky Business: Making
 Insurance Choices Wisely"
 2000 Cornell Cooperative Extension Inservice; "Improving Insurance Knowledge of New
 York State Consumers"
 1996 Minnesota Independent Insurance Agents Association; "The Future of Insurance
 Marketing Systems"

Other Conference Participation:

Research Forum co-moderator, World Risk and Insurance Economics Conference, 2020; Session
 chair, Global Forum on Financial Consumers, 2021, 2019, 2015; Moderator, Plenary Session of Best
 Paper Finalists, ACCI annual meeting, 2016, 2015, 2014; Session chair, Public Choice Society,

2014; Faculty participant, Insurance Economics Colloquium, Wildbad Kreuth Germany, 2013; Panelist, Editors' Round Table, Marketing and Public Policy, 2013; Moderator, CAS Spring Meeting General Session, 2013; Panelist, Progrés International Insurance Seminar of the Geneva Association, Geneva Switzerland, Panel on Consumer Protection Regulation, 2012; Panelist, University of Wisconsin Center for Financial Security, Financial Literacy Workshop, 2011; Cornell Cooperative Extension FERM Project Working Team lunch, faculty speaker, 2011; Invited participant, Enterprise Risk Management Institute International (ERM-II), Symposium on Systemic Risk in the Insurance Industry, 2010; Resident academic, annual CEO Conference of Canadian property-casualty insurance companies 2007; Session moderator, American Risk and Insurance Association meetings 2000, 2004, 2006, 2007, 2008, 2015 (WRIEC); Session moderator, ACCI 2001, 2012, 2013

PUBLIC POLICY CONSULTING

2018 Consultant, Insurance Research Council, research on no-fault automobile insurance in Florida (no report)

2016 Expert witness, Massachusetts Division of Insurance hearings on workers compensation rates (consultant to Workers Compensation Rating and Inspection Bureau of Massachusetts)

2013 White Paper: *Commission Allowances in Workers' Compensation Rates* (consultant to Workers Compensation Rating and Inspection Bureau of Massachusetts)

2012 White Paper: *Reforming Ontario's Auto Insurance System: Research and Recommendations*, with Mary Kelly and Anne Kleffner (consultant to Insurance Bureau of Canada)

2011 Expert witness, Michigan Senate hearings on No-fault Insurance; White paper: *Excess Costs in Michigan Auto Insurance: Causes and Implications for Reform* (consultant to several insurance companies)

2011 White paper: *Long Term Consequences of Auto Insurance Rate Deregulation*; (consultant to Insurance Research Council)

2008 Expert witness, Massachusetts Special Commission on Auto Body Rates (consultant to the Massachusetts Insurance Federation)

2008 White Paper: *First-Party Insurance Bad Faith Liability: Law, Theory, and Economic Consequences*, with William J. Warfel (consultant to National Association of Mutual Insurance Companies)

2007 Expert witness, Massachusetts Automobile Insurance Competition hearing; White paper: *Evaluating Competition in Automobile Insurance Markets* (consultant to The Fairness for Good Drivers Coalition)

2007 White paper: *Unintended Consequences of Insurance Price Suppression* (consultant to Insurance Bureau of Canada)

2006 Expert witness, Alberta Automobile Insurance hearing (consultant to the Insurance Bureau of Canada)

1995 Expert witness, Maryland State Governor's Commission on Reforming Baltimore City Automobile Insurance

GRANT FUNDING

2020-2023 Principal Investigator (in collaboration with Kim Kopko), *USDA National Institute of Food and Agriculture Smith-Lever Grant*, "Exploring School-Extension Partnerships with a Focus on Parenting Education"

- 2020-2023 Co-Principal Investigator (Principal Investigator John Sipple), *Hatch Grant, USDA*, “Enhancing the Impact of School-Based Health Clinics in Rural New York State”
- 2020-2023 Co-Principal Investigator (Principal Investigator John Zinda), *CSREES Research-Extension Integration Grant*, “Flood Risk in Context: Insurance and Risk Response in Flood-Prone Communities”
- 2019-2020 Principal Investigator (in collaboration with Nancy Wells, Laurie Miller and Maria-Jose Sanchez), *Engaged Cornell Curriculum Planning Grant*, “Agricultural Sustainability and Community Resilience through School Programs in Rural Chile”
- 2016-2019 Principal Investigator (in collaboration with John Sipple and Kim Kopko) *CSREES Research-Extension Integration Grant*, “Enhancing the Community Impact of School-Based Health Centers in Building a Culture of Health in Rural New York”
- 2014-2015 Principal Investigator, *Cornell Institute for Social Science Director’s Discretionary Grant*, “Supplemental Funding for RTS Conference”
- 2011-2012 Principal Investigator, *Cornell Institute for Social Science Small Grant*, “Credit Card Reforms: Helping or Hurting Consumers?”
- 2006-2008 Principal Investigator, *Program on Consumers, Pharmaceutical Policy and Health Grant*, “Drug Choice, Negative Information and Consumer Behavior” 2003-
- 2007 Co-Principal Investigator (with Kosali Simon), *Program on Consumers, Pharmaceutical Policy and Health Grant*, “State Regulation of Medicaid Pharmacy Benefits”
- 2003-2005 Initiative Team Member (with PAM Dept. colleagues), *Merck Company Foundation Program on Pharmaceutical Policy Issues Grant*, “Program on Consumers, Pharmaceutical Policy and Health”, John Rizzo, Principal Investigator
- 2000-2003 Principal Investigator, *College of Human Ecology Grant*, Cornell University: “Regulatory Issues in Insurance Markets”
- 1999-2001 Principal Investigator (collaborative research with B.J. Bristow), *CSREES Research-Extension Integration Grant*: “Insurance Choices: Knowledge, Confidence and Competence of New York State Consumers”
- 1998-2003 Principal Investigator, *Hatch Grant, USDA*: “Issues in the Regulation of Insurance Marketing and Distribution”
- 1995-1997 Principal Investigator (collaborative research with Keith J. Crocker), *National Science Foundation, Economics Division Grant #SBR95-07768*: “Contracting with Costly State Falsification: Theory and Empirical Results from Automobile Insurance”
- 1995-1996 Principal Investigator, *National Association of Insurance Commissioners Journal of Insurance Regulation Grant*: “The Effects of Rate Regulation on the Structure of Automobile Insurance Markets”
- 1994-1995 Principal Investigator, *University of Pennsylvania Research Foundation Grant*: “Regulation and Industrial Organization in Structurally Competitive Industries: The Case of Automobile Insurance”
- 1994-1995 Principal Investigator, *University of Pennsylvania Research Foundation Grant*: “Social Norms in Economic Settings: Consumer Attitudes Toward Insurance Fraud”
- 1993-1995 Co-Principal Investigator (collaborative research with J.D. Cummins), *Financial Institutions Center Grant*, The Wharton School: “The Management and Control of Fraud in Insurance Firms”
- 1993-1994 Co-Principal Investigator (collaborative research with S. Chamberlain), *Fishman-*

- Davidson Center Grant, The Wharton School: “The Risk and Efficiency Effects of Insurance Company Mergers”*
- 1992-1993 Principal Investigator, *University of Pennsylvania Research Foundation Grant: “The Tort System and Insurance ‘Lotteries’”*
- 1989-1990 Principal Investigator, *Society of CPCU Grant: “The Effects of Rate Regulation on Underwriting Cycles”*
- 1988-1989 Doctoral Dissertation Fellowship, *State Farm Companies Foundation: “Supply Dynamics and Underwriting Cycles in Property Liability Insurance”*
- 1987-1988 Graduate Research Fellowship, *Center for Urban Affairs and Public Policy, Northwestern University*

PH.D. COMMITTEES

- 2018 Peter Wissoker (CRP)
- 2017 Liyuan Cui (Economics)
- 2015 Sra Chuenchoksan (Economics)
- 2014 Lauren E. Jones (PAM) (chair)
- 2014 José Balmori di la Miyar (PAM) (chair)
- 2008 J. Michael Collins (PAM) (chair)
- 2007 Sara Hoda (PAM)
- 2007 Hae Kyung Yang (PAM)
- 2007 Ajay Aseem Palvia (Economics)
- 2005 Sonja Afroz (Economics)
- 2003 Hyojin Kang (PAM)
- 1998 M. Martin Boyer (RMI) (chair)
- 1998 Susan J. Suponcic (Public Policy)
- 1997 David M. Russell (RMI)
- 1996 Jweeping Er (RMI)
- 1995 Sung Hun Seog (RMI)
- 1995 Tracy Shepard Allotey (RMI)
- 1994 Jeong D. Kim (Healthcare Systems)
- 1994 Richard A. Phillips (RMI)
- 1993 Laureen A. Regan (RMI)
- 1993 Anne E. Kleffner (RMI)
- 1993 David W. Sommer (RMI)
- 1992 Lisa L. Posey (RMI)

MASTERS’ THESIS COMMITTEES CHAIRED

- 2021 Yeni Mulyono, CIPA (thesis)
- 2019 Jeanine Foote, CIPA (thesis)
- 2019 Maryam Pakneshan, CIPA (thesis)
- 2019 Yongjoo Lee, CIPA (professional report)
- 2018 Roberto Galvan, CIPA (thesis)
- 2016 Akiko Toya, CIPA (professional report)
- 2015 Xiaodi Li, CIPA (thesis)
- 2015 Rafael Morales, CIPA (thesis)
- 2013 Samir Kiuhan, CIPA (thesis)

2013 Cheng Chen, CIPA (professional report)
 2011 Andrew McClintock, PAM (thesis)
 2011 Scott Talaga, CIPA (thesis)

Mentor, Maria Jose Sanchez Arrieta, post-Fulbright research study, 2015-2016
 Mentor, Cristoph Lex, visiting Ph.D. student, Ludwig Maximillion University, Spring 2013
 Mentor, Maoqi Wang, visiting Ph.D. student, Tsinghua University, Fall 2011

PROFESSIONAL SERVICE

Service to Government and Industry:

Member, Consumer Financial Education Committee, The Actuarial Foundation, 2012-2013;
 Member, Board of Trustees, Elizabeth Ann Clune Montessori School of Ithaca, 2004-2007;
 Economic Reviewer, Institute for Defense Analysis, 2003-2006; Board of Directors, Ithaca
 Community Childcare Center, 2000-2004 (Vice President, 2002-2003; Secretary 2001-2002);
 Advisor, Consumer Information Task Force Coalition Against Insurance Fraud, 1996-1997

Service to American Risk and Insurance Association:

ASSA Session Coordinator 2018, 2019, 2020; Program Committee 1993, 1996, 1997, 2000, 2006,
 2007, 2008, 2010, 2013, 2014, 2015, 2016, 2017, 2018; Nominations Committee 1996, 2015; Best JRI
 Feature Article Awards Committee 1995, 1996, 1998, 2006, 2007, 2008, 2012, 2014; Best RMIR
 Feature Article Awards Committee 2013, 2014, 2017; Best RMIR Perspectives Article Awards
 Committee 2010 (Chair), 2011; Book Awards Committee, 1992, 1999 (Chair), 2003, 2004

Ad Hoc Reviewing:

Journal of Risk and Insurance (assistant editor award, 1996 and 1997), North American Actuarial
 Journal, Journal of Economic Psychology, Journal of Economic History, Criminology, Journal of
 Financial Stability, Journal of Public Policy and Marketing, Natural Hazards, Review of Economics of
 the Household, Risk Management and Insurance Review, Geneva Risk and Insurance Review,
 Management Science, Asia-Pacific Journal of Risk and Insurance, Journal of Consumer Affairs,
 Journal of Policy Analysis and Management, Astin Bulletin, Journal of Law Economics and
 Organization, Journal of Banking and Finance, Journal of Political Economy, American Economic
 Review, Journal of Law and Economics, Journal of Business Ethics, National Science Foundation,
 Geneva Papers on Risk and Insurance: Issues and Practice, Journal of Legal Studies, Journal of
 Insurance Regulation, European Economic Review, Journal of Consumer Policy, International Review
 of Economics and Finance, Industrial and Labor Relations Review, Journal of Insurance Issues,
 Economic Journal, Journal of Financial Intermediation, Journal of Risk and Uncertainty, Review of
 Industrial Organization, MIT Press, Elsevier Press, Social Sciences and Humanities Research Council
 of Canada

CORNELL UNIVERSITY SERVICE

College and University Committees:

Faculty Advisory Committee on Tenure Appeals, 2021-2025; Atkinson Center Postdoctoral
 Fellowship Review Committee, 2020, 2021; Truman Scholarship Review Committee, 2018, 2019;
 Atkinson Center Academic Venture Fund Review Committee, 2019, 2021; CHE Grievance
 Committee, 2015-2020; Faculty Senate Committee on Program Review, 2013- 2016; Faculty Senate
 Committee on Academic Freedom and Professional Status of the Faculty, 2012-2015; External

Member, AEM Hiring Committee for Nonprofit Management, 2014; Mann Library Committee, 2005-2009 (chair 2008-2009); University Benefits Committee, 2002-2006; Grant Review Team, Hatfield Fund for the Enhancement of Economics Education, 2002-2005; CHE Nominations Committee, 2001-2004, 2010-2017; CHE Educational Policies Committee, 2002-2003; Review Team, Pre-proposals for Cornell Cooperative Extension Learning Centers, 2001

Department Committees:

Liaison to Mann Library, 2005-2014; Executive Committee, 2002-2003; Undergraduate Committee, 1998-2003 (Chair, 2002-2003); Sloan MHA Program Committee, 1998-2001; Faculty Search Committee, 1998-2002, 2002-2004 (Chair), 2005-2006, 2006-2007 (co-Chair), 2008-2009, 2009-2010, 2010-2011, 2012-2013, 2014-2015 (co-Chair); Search Committee for Sloan Program Associate Director, 1999-2000 (Chair); Graduate Field Committee, 2000-2002

CORNELL GRADUATE FIELD MEMBERSHIP

Public Affairs; Policy Analysis and Management; Economics; Risk Analysis, Communication and Policy

COURSES TAUGHT

Cornell: Economics of Consumer Policy, Risk Management and Policy (MPA), Microeconomics for Management and Policy (MHA), Intermediate Policy Analysis, Regulating Financial Institutions, Honors Thesis Seminar, Economics of Consumer Law and Protection, Economics of the Public Sector, Consumers, Information and Regulatory Policy (PhD), Seminar on Pharmaceutical Policy Issues (MHA)

Wharton: Principles of Risk and Insurance, Risk Management, Risk Management and Treatment (MBA), Industrial Organization of Insurance Markets (PhD)

**COMMONWEALTH OF MASSACHUSETTS
DIVISION OF INSURANCE**

Docket No. 21-

In re:

**APPLICATION OF THE WORKERS'
COMPENSATION RATING AND INSPECTION
BUREAU OF MASSACHUSETTS FOR APPROVAL
OF A GENERAL RATE REVISION TO BE
EFFECTIVE ON AND AFTER July 1, 2022**

PRE-FILED DIRECT TESTIMONY OF GEORGE ZANJANI

The Workers' Compensation Rating and Inspection Bureau of Massachusetts ("WCRIBMA") submits the following direct testimony of George Zanjani in support of its application for a general rate revision to be effective on and after July 1, 2022.

Q. Please state your full name.

A. George Zanjani.

Q. What are your professional qualifications?

A. I am Professor of Finance and the holder of the Frank Park Samford Chair of Insurance at the University of Alabama. A complete curriculum vitae is attached to this testimony as Exhibit 1. To summarize, my undergraduate studies were at Stanford University from 1987-1990, where I earned an A.B./B.S in Economics and Biology. I joined the commercial lines actuarial department of Fireman's Fund Insurance Companies in 1990 as an Assistant Actuarial Analyst. Upon leaving in 1994, I was a Senior Actuarial Analyst, an Associate of the Casualty Actuarial Society, and the head of the company's Workers' Compensation actuarial unit. I did my graduate studies in Economics at the University of Chicago, earning a Ph.D. in 2000. I joined the Research Department of the Federal Reserve

Bank of New York in the Capital Markets Function as a Research Economist in 2000, leaving as a Senior Economist in 2008. I joined the Robinson College of Business of Georgia State University in 2008 as an Associate Professor of Risk Management and Insurance and was the inaugural holder of the AAMGA Distinguished Chair in Risk Management and Insurance in 2011. I started my current position in 2017. Over the past five years I have also served as an expert witness on underwriting profit provisions in various rate hearings.

Q. What was your role in the preparation of the current WCRIBMA filing for a general rate revision?

A. I reviewed the calculations, inputs, narrative, and model used in Section VII of the WCRIBMA's filing. Specifically, I reviewed the inputs to and estimation of the cost of capital and the portfolio rate of return, as well as the application of the discounted cash flow models to derive the proposed underwriting profit provision. I have relied on the WCRIBMA for estimates of underwriting cash flow patterns (for losses, expenses and premiums) and taken as given the actuarial projections of losses and expenses underlying the discounted cash flow models. Based on the information available to me, I believe that the data and calculations underlying Section VII of the filing to be complete and accurate, and the narrative statements offered in support of Section VII are also accurate and correct.

Q. Are you familiar with the underwriting profit provision used by the WCRIBMA in calculating the proposed rates?

A. Yes.

Q. Are you familiar with the statutory standard that must be applied by the Massachusetts Commissioner of Insurance in reviewing the rates proposed in the

WCRIBMA's current filing – that they “are not excessive, inadequate or unfairly discriminatory” and that they “fall within a range of reasonableness”?

A. Yes.

Q. Do you have an opinion as to whether the rates proposed in the WCRIBMA's current filing satisfy the statutory standard?

A. Yes.

Q. What is your opinion?

A. It is my opinion that---assuming 1) the actuarial projections of losses, expenses and premiums in the filing are reasonable and 2) that the cash flow patterns used in the models are reasonable---then the proposed rates satisfy the statutory standard. My conclusion follows from two main observations. First, the discounted cash flow models used to calculate the underwriting profit provision are correctly constructed to produce a provision that yields a fair return to invested capital. Second, the critical discretionary inputs to the models---specifically the weighted average cost of capital (WACC), the portfolio rate of return, and the leverage ratio---are reasonable and well-suited to the Massachusetts workers' compensation market.

Details of the models and the derivation of the inputs are provided in Section VII of the filing. Below, I offer additional perspective on the reasonableness of the critical discretionary inputs to the model.

Portfolio Rate of Return and Leverage Ratio

The WCRIBMA bases the portfolio allocations and leverage assumptions on data from the groups writing workers' compensation in Massachusetts. Specifically, the portfolio weights and the leverage ratio used in the models are premium-weighted averages of the figures

from the insurance groups operating in Massachusetts, with the premium weights being Massachusetts workers' compensation DPW. In my opinion, this approach gives figures more relevant and closely matched to the Massachusetts workers' compensation market than figures based on national industry composites.

To elaborate, the asset portfolio for the total industry reflects the heavy equity allocations of certain personal lines carriers and other companies that do not underwrite workers' compensation insurance. Similarly, reserve-to-surplus ratios vary considerably across lines of insurance, with long-tailed lines having higher ratios due to the additional loss reserves on the balance sheet. Both of these examples argue for a more tailored approach for finding the asset portfolio and leverage relevant for the workers' compensation line. Basing the assumptions on composites of segments of the industry, such as A.M. Best's Commercial Casualty Composite, is a step in the right direction, however, such composites may include data from companies focusing in other casualty lines and are also not tailored to Massachusetts specifically. By using averages based on groups serving the Massachusetts workers' compensation market, I believe the WCRIBMA is tailoring its assumptions as closely as possible to the ratemaking task at hand.

Cost of Capital

As described in the text of Section VII, the WCRIBMA considers two models to estimate the cost of equity---a CAPM-based approach and a Discounted Cash Flow Model. As with the asset portfolio and leverage calculations, the critical inputs for the cost of equity calculation are based as closely as possible on the Massachusetts workers' compensation market. Specifically, all publicly traded holding companies engaged in underwriting workers' compensation insurance in Massachusetts are sampled, with the average cost of equity

being based on a weighted average using Massachusetts workers' compensation DPW. The output is then averaged and combined with an estimated cost of debt to produce a WACC of 7.14%.

The methods used by the WCRIBMA are widely accepted means of estimating the cost of capital. However, all methods of estimation have various inputs and implementation choices that can affect the results. To get a sense of where the WCRIBMA estimate falls in relation to others, I gathered alternative recent estimates of the WACC for the property-casualty insurance industry from publicly available sources in the following table:

Method	Source	Date	WACC Estimate
CAPM	Duff & Phelps	9/30/21	6.0%
CAPM + Size Premium	Duff & Phelps	9/30/21	6.2%
CAPM Build-Up	Duff & Phelps	9/30/21	7.2%
Fama-French 5-Factor	Duff & Phelps	9/30/21	5.8%
Discounted Cash Flow (1-stage)	Duff & Phelps	9/30/21	N/A
Discounted Cash Flow (3-stage)	Duff & Phelps	9/30/21	7.9%
CAPM	Damodaran Online	1/4/21*	3.93%

- The Damodaran estimate features an updated (as of 12/2/21) Treasury yield.

The figures are sourced from the industry composite for the latest available quarterly update of the *Valuation Handbook – U.S. Industry Cost of Capital* by Duff & Phelps and the latest available annual update of the costs of capital by industry sector released by Aswath Damodaran, a valuation expert at New York University (*available at*

<http://pages.stern.nyu.edu/~adamodar/>). As can be seen from the table, the WCRIBMA figure of 7.14%---despite being a blend of the output of CAPM and Discounted Cash Flow methodologies---falls within the span of estimates above and thus appears reasonable in the context of other available estimates for the industry. It should be noted, however, that the WCRIBMA estimate is tailored specifically to the Massachusetts workers' compensation market, so it could be higher or lower, at any given time, than estimates for the broader industry. In addition, as I will detail below, all of these cost of capital estimates are based on publicly traded companies and thus should be adjusted for the presence of the private companies that comprise a significant share of the Massachusetts market.

Q. Do you have anything to add to the text of Section VII of the filing at this time?

A. Yes, while I have concluded that the filed rates are reasonable and not excessive, there are two additional points worth mentioning.

First, the cost of capital analysis of WCRIBMA is based entirely on publicly traded stock firms, which have the easiest access to financing and thus the lowest costs of capital. However, I estimate that---based on 2020 direct premiums written---only 63% of the workers' compensation market in Massachusetts is underwritten by firms associated with publicly traded holding companies. Firms associated with private, often mutual, ownership underwrite the remaining 37%. This segment is well-known to have more difficulty in accessing financing, with the problem for mutuals being especially acute.

Q. How much of a difference does this make?

A. Research dating back at least as far as the 1960's has demonstrated that private equity trades at a substantial discount to public equity. The discount is thought to derive from a variety of factors, including the illiquid nature of private equity stakes (also known

as a “lack of marketability”) as well as information, monitoring, and control issues. The discount translates into a higher cost of equity. For example, if a public firm’s cost of equity is estimated at 10% and the equity of a comparable private firm is selling at a 20% discount to that of the public firm, the private firm’s cost of equity would be estimated as:

$$12.5\% = 10\% / (1 - 20\%)$$

The discount is difficult to estimate. The attached Exhibit 2 to my testimony summarizes some of the academic research on the private firm discount. Studies have taken a variety of approaches to measurement. “IPO” studies compare the prices of pre-IPO share transactions in a private company with post-IPO share prices after the company is public. “Acquisition” studies compare the valuations of acquired private companies versus the valuations of acquired public companies. “Restricted stock” and “private placement” studies compare the prices of restricted stock issued by public companies with the prices of their traded shares.

All the approaches have their flaws. IPO studies, for example, may have a bias toward overstating the discount because of the differences in timing of transactions. Restricted stock and private placement studies tend to understate the discount: Since they confine their attention to public companies, they do not account for factors other than the discount for lack of marketability (DLOM), and, moreover, the actual restrictions on marketability for private placements have been loosened significantly over the years by the Securities and Exchange Commission.

On balance, however, the studies point to a substantial discount. To get a sense of the import, I use a discount of 25%, which is slightly below the average of the averages of the three groups in Exhibit 2 (when taking the midpoint of the ranges for the studies

with ranges of estimates). Accounting for a 25% valuation discount on 37% of the market would raise the WACC estimates presented earlier as follows:

Method	Source	Date	Adjusted WACC Estimate
CAPM	Duff & Phelps	9/30/21	6.7%
CAPM + Size Premium	Duff & Phelps	9/30/21	7.0%
CAPM Build-Up	Duff & Phelps	9/30/21	8.0%
Fama-French 5-Factor	Duff & Phelps	9/30/21	6.4%
Discounted Cash Flow (1-stage)	Duff & Phelps	9/30/21	N/A
Discounted Cash Flow (3-stage)	Duff & Phelps	9/30/21	8.8%
CAPM	Damodaran Online	1/4/21	4.4%

This exercise underscores the conclusion that the WCRIBMA's WACC estimate of 7.14% is reasonable and far from aggressive when viewed in the context of estimates for the overall industry. Moreover, although the cost of capital input used in the filing does not contemplate any higher cost of capital endured by private firms, doing so would obviously produce a higher underwriting profit provision and higher rates.

Q. What is the second additional point you would like to make?

A. Consistent with the Commissioner's Decision on 2003 Rates, there is no consideration of policyholder dividends in the course of deriving the underwriting profit provision. While the interpretation of policyholder dividends may vary from company to company, at least in the case of stock companies the dividends represent cash payments

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that, like other expense items, reduce the profit of the firm. Accounting for such reasonably expected dividend payments connected with risk transfer would evidently reduce the projected rate of return on capital. Consideration of policyholder dividends would obviously produce a higher underwriting profit provision and higher rates.

Signed this 9th day of December 2021 under the pains and penalties of perjury.

George Zanjani Digitally signed by George
Zanjani
Date: 2021.12.09 11:04:00 -05'00'

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Education

Ph.D., Economics, University of Chicago, 2000
ACAS, Casualty Actuarial Society, 1994
A.B./B.S., Economics and Biology, Stanford University, 1990

Work Experience

University of Alabama (Tuscaloosa, Alabama)

Professor of Finance and Frank Park Samford Chair of Insurance, 2017-

Georgia State University (Atlanta, Georgia)

AAMGA Distinguished Chair in Risk Management & Insurance, 2011-2017
Associate Professor, 2008-2017

Nanyang Technological University (Singapore)

Visiting Senior Research Fellow, 2011-12, 2013-2014

Federal Reserve Bank of New York (New York, New York)

Senior Economist, 2006-2008
Economist, 2000-2006

Fireman's Fund Insurance Companies (Novato, California)

Senior Actuarial Analyst, 1993-94
Actuarial Analyst, 1991-1993
Assistant Actuarial Analyst, 1990-1991

Publications: Refereed Scholarly

"Economic Capital and RAROC in a Dynamic Model," (with Daniel Bauer), *Journal of Banking and Finance*, 125: Article 106071, (2021) [Winner of Casualty Actuarial Society Hachemeister Prize, 2015]

"Capital Allocation Techniques: Review and Comparison," (with Daniel Bauer and Qiheng Guo), *Variance*, 14(2), (2021)

- “Dynamic Capital Allocation with Irreversible Investments,” (with Daniel Bauer, Shinichi Kamiya, and Xiaohu Ping), *Insurance: Mathematics and Economics* 85: 138-52, (2019)
- “What Drives Tort Reform Legislation? Economics and Politics of the State Decisions to Restrict Liability Torts,” (with Yiling Deng), *Journal of Risk & Insurance* 85: 959-991, (2018)
- “Egalitarian Equivalent Capital Allocation,” (with Shinichi Kamiya), *North American Actuarial Journal* 21: 382-96, (2017)
- “The Marginal Cost of Risk, Risk Measures, and Capital Allocation,” (with Daniel Bauer), *Management Science* 62: 1431-1457 (2016)
- “Economic Analysis of Risk and Uncertainty Induced by Health Shocks: A Review and Extension,” (with Tomas J. Philipson), in *Handbook of the Economics of Risk and Uncertainty*, Volume 1, Mark J. Machina and W. Kip Viscusi (eds.), North Holland: Elsevier (2014)
- “Capital Allocation and Its Discontents,” (with Daniel Bauer), in *Handbook of Insurance* (2nd edition), Georges Dionne (ed.), New York: Springer (2013)
- “Financial Pricing of Insurance,” (with Daniel Bauer and Richard D. Phillips), in *Handbook of Insurance* (2nd edition), Georges Dionne (ed.), New York: Springer (2013)
- “Insurance Risk, Risk Measures, and Capital Allocation: Navigating a Copernican Shift,” (with Michael R. Powers), *Annual Review of Financial Economics* 5: 201-223 (2013)
- “Catastrophe Bonds, Reinsurance, and the Optimal Collateralization of Risk Transfer,” (with Darius Lakdawalla), *Journal of Risk & Insurance* 79, pp. 449-76 (2012)
- “An Economic Approach to Capital Allocation,” *Journal of Risk and Insurance* 77, pp. 523-549 (2010) [Winner of Casualty Actuarial Society ARIA Award, 2010]
- “Federal Financial Exposure to Catastrophic Risk,” (with J. David Cummins and Michael Suher), in *Measuring and Managing Federal Financial Risk*, Deborah Lucas (ed.), Chicago: University of Chicago Press (2010)
- “Public versus Private Underwriting of Catastrophe Risk: Lessons from the California Earthquake Authority,” in *Risking House and Home: Disasters, Cities, Public Policy*, John M. Quigley and Larry A. Rosenthal (eds.), Berkeley: Berkeley Public Policy Press (2008)
- “Regulation, Capital, and the Evolution of Organizational Form in U.S. Life Insurance,” *American Economic Review* 97, pp. 973-983 (2007)

“Insurance, Self Protection, and the Economics of Terrorism,” (with Darius Lakdawalla), *Journal of Public Economics* 89, pp. 1891-1905 (2005)

“Terrorism Insurance Policy and the Public Good,” (with Darius Lakdawalla), *St. John's Journal of Legal Commentary* 18, pp. 463-469 (2004)

“The Production and Regulation of Health Insurance: Limiting Opportunism in Proprietary and Non-Proprietary Organizations,” (with Tomas Philipson) in *Individual Decisions for Health*, Bjorn Lindgren (ed.), pp. 194-206, Routledge International Studies in Health Economics, Routledge: London (2003)

“Pricing and Capital Allocation in Catastrophe Insurance,” *Journal of Financial Economics* 65, pp. 283-305 (2002) [reprinted in *Insurance and Risk Management Volume I: Economics of Insurance Markets*, Gregory Niehaus (ed.), Northampton: Edward Elgar Publishing, (2008)]

Publications: Professional/Practitioner

Book review of “Moral Hazard in Health Insurance,” *Journal of Economic Literature* 53, pp. 682-3 (2015)

“Microinsurance Lessons from History,” (with Rick Koven), *Microinsurance Learning and Knowledge (MILK)* (2013)

“Institutional Investors and Asset Allocations: Accounting and Regulation of Private Defined Benefit Pension Plans and Other Institutional Investors in the United States, Mexico, and Australia,” (with John Broadbent, Michael Palumbo, and Julio Santaella), *CGFS Publication No. 27, Working Group on Institutional Investors, Global Savings, and Asset Allocation* (2006)

“An Overview of Political Risk Insurance” (with Kausar Hamdani and Elise Liebers), *CGFS Publication No. 22, Working Group on Foreign Direct Investment in the Financial Sector of Emerging Market Economies* (2005)

Work in Progress

“Life Insurance and Annuity Pricing During the Financial Crisis, Revisited,” (with Daniel Bauer, Lars Powell, and Boheng Su), working paper, 2020.

“Market Discipline and Guaranty Funds in Life Insurance,” (with Martin Grace, Shinichi Kamiya, and Robert W. Klein), working paper, 2019

“The Effect of Government Guarantees on Market Discipline in the Property-Casualty Insurance Industry,” (with Yiling Deng and Ty Leverty), working paper, 2019

- “An Integrated Approach to Measuring Asset and Liability Risks in Financial Institutions,” (with Daniel Bauer), working paper, 2019
- “Optimal Insurance Contracts with Insurer Background Risk,” (with Xiaohu Ping), working paper, 2015
- “The Effect of Banking Crises: Evidence from Non-Life Insurance Consumption,” (with Shinichi Kamiya and Jackie Li), working paper, 2015
- “Bankruptcy in the Core and Periphery of Financial Groups: The Case of the Property-Casualty Insurance Industry” working paper, 2010
- “The Rise and Fall of the Fraternal Life Insurer: Law and Organizational Form in U.S. Life Insurance, 1870-1920,” working paper, (*revise and resubmit, Journal of Law & Economics*), 2007
- “Organizational Form and the Underwriting Cycle: Theory with Evidence from the Pennsylvania Fire Insurance Market, 1873-1909,” working paper, 2004
- “Consumption versus Production of Insurance,” (with Tomas Philipson), *NBER Working Paper #6225*, 1997

External Research Projects and Consulting

- 2021 Expert Witness, Workers’ Compensation Rate Filings, North Carolina
- 2021 Expert Witness, Mobile Homeowners Rate Filings, North Carolina
- 2020 Expert Witness, Homeowners Rate Filings, North Carolina
- 2020 Expert Witness, Dwelling Rate Filings, North Carolina
- 2020 Expert Witness, Workers’ Compensation Rate Filing, North Carolina
- 2019 NCCI Review of Cost of Capital Methodology
- 2019 Expert Witness, Workers’ Compensation Rate Filing, Massachusetts
- 2019 Expert Witness, Flood Rate Filing, North Carolina
- 2019 Expert Witness, Workers’ Compensation Rate Filing, North Carolina
- 2019 Expert Witness, Dwelling Rate Filings, North Carolina
- 2019 Expert Witness, Automobile Rate Filing, North Carolina
- 2019 Expert Witness, Mobile Homeowners Rate Filings, North Carolina
- 2018 NCCI Review of TCJA
- 2017 Expert Witness, Workers’ Compensation Rate Hearing, Florida
- 2016 Expert Witness, Assigned Risk Workers’ Compensation Rate Hearing, Virginia
- 2015 Expert Witness, Workers’ Compensation Rate Hearing, Florida
- 2015 NCCI Revision of Underwriting Profit and Contingency Internal Rate of Return Model
- 2015 An Extension of the Project on the Costs of Holding Capital, sponsored by the CAS
- 2013 Microinsurance Centre Lessons from History Project
- 2012 Allocation of the Costs of Holding Capital, sponsored by the CAS,
- 2011 CRO Risk Index Project, co-sponsored by SOA and Bloomberg, co-founder
- 2009 “The Financial Crisis and Lessons for Insurers,” \$50,000 SOA grant, role: report co-author

Papers Presented at Professional Meetings

- 2020 “Life Insurance and Annuity Pricing During the Financial Crisis, Revisited” WRIEC, virtual meeting
- 2019 “An Integrated Approach to Measuring Asset and Liability Risks in Financial Institutions,” EGRIE Annual Meeting, Rome, Italy
- 2019 “An Integrated Approach to Measuring Asset and Liability Risks in Financial Institutions,” ARIA Annual Meeting, San Francisco, CA
- 2019 “An Integrated Approach to Measuring Asset and Liability Risks in Financial Institutions,” RTS Annual Seminar, Tuscaloosa, AL
- 2017 “The Effect of Government Guarantees on Market Discipline in the Property-Casualty Insurance Industry,” NBER Insurance Project Workshop, Boston, MA
- 2015 “The Marginal Cost of Risk in a Multi-Period Model,” NBER Insurance Project Workshop, Stanford, CA
- 2015 “The Marginal Cost of Risk in a Multi-Period Model,” CAS Annual Meeting, Philadelphia, PA
- 2015 “Dynamic Capital Allocation,” IME Annual Conference, Liverpool UK
- 2015 “What Drives Tort Reform Legislation? Economics and Politics of the State Decisions to Restrict Liability Torts,” ASSA Annual Meeting, Boston, MA
- 2014 “The Marginal Cost of Risk in a Multi-Period Model,” CAS Centennial, New York, NY
- 2014 “Market Discipline and Guaranty Funds in Life Insurance,” EGRIE Annual Seminar, St. Gallen, CH
- 2014 “Dynamic Capital Allocation with Irreversible Investments,” EGRIE Annual Seminar, St. Gallen, CH
- 2014 “What Drives Tort Reform Legislation? Economics and Politics of the State Decisions to Restrict Liability Torts,” ARIA Annual Meeting, Seattle, WA
- 2014 “The Marginal Cost of Risk in a Multi-Period Model,” ARIA Annual Meeting, Seattle, WA
- 2014 “Market Discipline and Guaranty Funds in Life Insurance,” ARIA Annual Meeting, Seattle, WA
- 2014 “The Marginal Cost of Risk in a Multi-Period Model,” IME Conference, Shanghai, CN
- 2014 “The Effect of Banking Crises: Evidence from Non-Life Insurance Consumption,” Risk Theory Seminar, Munich, Germany
- 2013 “The Effect of Banking Crises: Evidence from Non-Life Insurance Consumption,” ASSA Annual Meeting, Philadelphia, PA
- 2013 “Optimal Insurance Contracts with Insurer Background Risk,” EGRIE Annual Meeting, Paris, FR
- 2013 “The Effect of Banking Crises: Evidence from Non-Life Insurance Consumption,” ARIA Annual Meeting, Washington D.C.
- 2013 “The Marginal Cost of Risk, Risk Measures, and Capital Allocation,” IRFRC Catastrophe Risk Conference, Singapore
- 2013 “Optimal Insurance Contracts with Insurer Background Risk,” ARIA Annual Meeting, Washington D.C.
- 2013 “The Marginal Cost of Risk, Risk Measures, and Capital Allocation,” CEAR/ETH Indices of Risk and New Risk Measures Conference, Zurich, CH
- 2012 “The Marginal Cost of Risk, Risk Measures, and Capital Allocation,” CAS Spring Meeting, Phoenix, AZ
- 2012 “The Marginal Cost of Risk, Risk Measures, and Capital Allocation,” Symposium: Risk and Catastrophic Events, State College, PA
- 2012 “The Marginal Cost of Risk, Risk Measures, and Capital Allocation,” ASSA Annual Meeting, Chicago, IL
- 2011 “The Marginal Cost of Risk, Risk Measures, and Capital Allocation,” NBER Insurance Project Workshop, Cambridge, MA
- 2010 “Bankruptcy in the Core and Periphery of Financial Groups: The Case of the Property-Casualty Insurance Industry,” ASSA Annual Meeting, Atlanta, GA
- 2009 “Bankruptcy in the Core and Periphery of Financial Groups: The Case of the Property-Casualty Insurance Industry,” Risk Management and Corporate Governance Conference, Loyola University of Chicago
- 2009 “Bankruptcy in the Core and Periphery of Financial Groups: The Case of the Property-Casualty Insurance Industry,” ARIA Annual Meeting, Providence, RI
- 2008 “An Economic Approach to Capital Allocation,” Risk Theory Society, Annual Meeting, Fort Collins, CO
- 2007 “Federal Financial Exposure to Catastrophic Risk,” ARIA Annual Meeting, Quebec City, CA
- 2007 “Catastrophe Bonds, Reinsurance, and the Optimal Collateralization of Risk Transfer,” EFMA Annual Meeting, Vienna, AT
- 2007 “Catastrophe Bonds, Reinsurance, and the Optimal Collateralization of Risk Transfer,” 5th Infinity Conference on International Financial Integration, Dublin, IE

- 2007 “Federal Financial Exposure to Catastrophic Risk,” NBER Conference on Measuring and Managing Federal Financial Risk, Evanston, IL
- 2006 Insuring Catastrophic Losses: The Status of TRIA and Proposed Natural Disaster Backstops, Wash., D.C.
- 2006 “Catastrophe Bonds, Reinsurance, and the Optimal Collateralization of Risk Transfer,” Risk Theory Society, Annual Meeting, Richmond, VA
- 2006 “Public versus Private Underwriting of Catastrophe Risk: Lessons from the California Earthquake Authority,” Berkeley Symposium on Real Estate, Catastrophic Risk, and Public Policy
- 2006 “Catastrophe Bonds, Reinsurance, and the Optimal Collateralization of Risk Transfer,” NBER Insurance Project Workshop, Cambridge, MA
- 2005 “Regulation, Capital, and the Evolution of Organizational Form in U.S. Life Insurance,” NBER Insurance Project Workshop, Cambridge, MA
- 2004 “The Rise and Fall of the Fraternal Life Insurer: Law and Organizational Form in U.S. Life Insurance,” NBER Insurance Project Workshop, Cambridge, MA
- 2004 “Regulation, Capital, and the Evolution of Organizational Form in U.S. Life Insurance,” American Finance Association, Annual Meeting, San Diego, CA
- 2003 “Insurance, Self-Protection, and the Economics of Terrorism,” Risk Theory Society, Annual Meeting, Atlanta, GA
- 2003 “Terrorism Insurance Policy and the Public Good,” St. John’s Journal of Legal Commentary 10th Annual Legal Symposium: Terrorism and its Impact on Insurance: Legislative Responses and Coverage Issues, Queens, NY
- 2003 “Insurance, Self-Protection, and the Economics of Terrorism,” NBER Insurance Project Workshop, Cambridge, MA
- 2002 “Pricing and Capital Allocation in Catastrophe Insurance,” CAS Risk and Capital Management Seminar, Toronto, CA
- 2002 “Market Discipline and Government Guarantees in U.S. Life Insurance,” Risk Theory Society, Annual Meeting, Urbana-Champaign, IL
- 2001 “Pricing and Capital Allocation in Catastrophe Insurance,” Risk Theory Society, Annual Meeting, Montreal

Other Conferences Talks and Panel Participation

- 2018 Surplus Lines Automation Conference, Florida
- 2017 International Conference on Business Sciences, Cairo University, Egypt
- 2016 IIF Insurance Colloquium, Basel, Switzerland
- 2016 Surplus Lines Association of California, California (keynote)
- 2014 Surplus Lines Automation Conference, Florida
- 2011 PRMIA Annual Risk Leadership Conference, Atlanta, GA
- 2011 7th International Microinsurance Conference, Rio de Janeiro, Brazil
- 2010 Property Loss Research Bureau Eastern Adjusters Conference, Atlanta, GA (keynote)
- 2008 NCOIL Annual Meeting, Duck Key, FL
- 2007 Capital Markets Symposium on Securitizing Insurance Risk, New York, NY
- 2006 Insuring Catastrophic Losses: The Status of TRIA and Proposed Natural Disaster Backstops, Wash., D.C.
- 2006 Catastrophe Bonds and Insurance Linked Securities Summit, New York, NY
- 2005 12th Annual International Conference Promoting Business Ethics, New York, NY

Service Activities in Academic and Professional Organizations

- American Risk & Insurance Association President (2012-13)
- Risk Theory Society President (2011-2012)
- American Risk & Insurance Association Board Member (2007-2014)
- International Research Advisory Board, Risk and Insurance Research Center, NCCU, Taiwan
- Editorial Board, *Journal of Insurance Issues* (2012-2014)
- Senior Editor, *Journal of Risk and Insurance* (2019-)

Huebner Colloquium Panelist (2016-2019)

External Committees

American Risk & Insurance Association Program Committee, various years; ARIA Nominations Committee, 2015, 2016, 2018; Kulp-Wright Book Award Committee, 2005

Discussant: *WRIEC 2020; EGRIE Annual Meeting, Rome, 2019; ARIA Annual Meeting, San Francisco, 2019; ARIA Annual Meeting, Chicago, 2018; ARIA Annual Meeting, Boston, 2016; SIFR Insurance Conference, Stockholm, 2015; EGRIE Annual Seminar, St. Gallen, 2014; ARIA Annual Meeting, Seattle, 2014; ARIA Annual Meeting, San Diego, 2011; CEAR Workshop on Insurance for the Poor, Atlanta, 2010; CEAR Workshop on Risk Perception and Subjective Beliefs, Atlanta, 2010; Midwest Finance Association Annual Meeting, Chicago, 2009; 5th Infiniti Conference, Dublin, 2007; EFMA Annual Meeting, Vienna, 2007; AEA Annual Meeting, San Diego, 2004*

Session Chair: *ARIA Annual Meeting, Chicago, 2018, ARC, Atlanta, 2017; IME, Atlanta, 2017; ARIA Annual Meeting, San Diego, 2011; Midwest Finance Association Annual Meeting, Chicago, 2009; ARIA Annual Meeting, Quebec City, 2007; EFMA Annual Meeting, Vienna, 2007;*

Referee for *Asia-Pacific Journal of Risk and Insurance, Astin Bulletin, Australian Social Monitor, Contemporary Economic Policy, Current Issues in Economics and Finance, Defense and Peace Economics, European Economic Review, Financial Review, Geneva Papers: Issues and Practice, Geneva Risk and Insurance Review, Health Affairs, Insurance: Mathematics and Economics, Journal of Banking and Finance, Journal of Business, Journal of Finance, Journal of Financial Intermediation, Journal of Financial Services Research, Journal of Law and Economics, Journal of Money, Credit, and Banking, Journal of Political Economy, Journal of Risk and Insurance, Management Science, North American Actuarial Journal, Proceedings of the National Academy of Sciences, Review of Financial Studies, Risk Management and Insurance Review, Scandinavian Actuarial Journal, and Science.*

Working Group Participation

Committee on the Global Financial System, Working Group on Institutional Investors, Global Savings, and Asset Allocation (2006); Presidential Working Group on Financial Markets, Working Group on Terrorism Insurance (2006)

Continuing Education Activities

- | | |
|-----------|--|
| 2004-2007 | Central Banking Seminar, Federal Reserve Bank of New York, Topics: Introduction to U.S. Financial Markets; Introduction to Non-bank Financial Institutions |
| 2009 | Texas Farm Bureau Program, Georgia State University, Topic: Securitization, the Insurance Industry, and the Panic of 2007 |
| 2009-2012 | Horst K. Jannott Visiting Fellows Program, Georgia State University, Topics: Securitization, the Insurance Industry, and the Panic of 2007; Introduction to Statistics |

Sample of Findings on the Private Company Discount

Study	Years	Discount	Type
Emory (1994)	1992-1993	45%	IPO
Willamette Management Associates (various)	1975-1997	29% to 60%	IPO
Garland and Reilly (2004)	1998-2002	35%	IPO
Larcker et al. (2018)	2017	39% to 47%	IPO
Koeplin et al. (2000)	1984-1998	20% to 30%	Acquisitions
Block (2007)	1999-2006	20% to 25%	Acquisitions
Officer (2007)	1979-2003	15% to 30%	Acquisitions
Paglia and Harjoto (2010)	1993-2008	65% to 70%	Acquisitions
Jaffe et al. (2018)	1985-2014	0%	Acquisitions
Lohrey (2020)	2005-2015	48% to 62%	Acquisitions
Silber (1991)	1981-1988	34%	Restricted Stock
Johnson (1999)	1991-1995	20%	Restricted Stock
Bajaj et al. (2001)	1990-1995	7%	Private placements
Comment (2012)	2004-2010	5% to 6%	Private placements
Finnerty (2013)	1991-1997	21%	Private placements
Finnerty (2013)	1997-2007	15%	Private placements
Chen et al. (2015)	1999-2012	10%	Private placements

William L. Silber (1991), "Discounts on Restricted Stock: The Impact of Illiquidity on Stock Prices," *Financial Analyst Journal*, July-August 1991, 60-64.

John D. Emory, "The Value of Marketability as Illustrated in Initial Public Offerings of Common Stock-February 1992 through July 1993," *Business Valuation Review*, March 1994, 3-7.

BA Johnson (1999), "Quantitative Support for Discounts for Lack of Marketability" *Business Valuation Review* 16, 152-55.

John Koeplin, Atulya Sarin, Alan C. Shapiro (2000), "The Private Company Discount," *Journal of Applied Corporate Finance* 12, 94-101.

Mukesh Bajaj, David J. Denis, Stephen P Ferris, and Atulya Sarin (2001), "Firm Value and Marketability Discounts," *Journal of Corporation Law* 27, 89-115.

Garland, P.J., and Reilly, A.L. (2004), "Update on the Willamette Management Associates Pre-IPO Discount for Lack of Marketability Study for the Period 1998-2002," *Willamette Management Associates Insights*, Spring 2004, 38-44.

Block, S. (2007), "The Liquidity Discount in Valuing Privately Owned Companies," *Journal of Applied Finance* 17(2), 33-40.

Officer, M.S. (2007), "The Price of Corporate Liquidity: Acquisition Discounts for Unlisted Targets," *Journal of Financial Economics* 83(3), 571-598.

John K. Paglia and Maretno Harjoto (2010), "The Discount for Lack of Marketability in Private Companies: A Multiples Approach," *Journal of Business Valuation and Economic Loss Analysis* 5(1), Article 5.

Robert Comment (2012), "Revisiting the Illiquidity Discount: A New (and Skeptical) Restricted Stock Study," *Journal of Applied Corporate Finance* 24, 80-91.

John D. Finnerty (2013), "The Impact of Stock Transfer Restrictions on the Private Placement Discount," *Financial Management* 42, 575-609.

Chen, Linda H., Edward A. Dyl, George J. Jiang, and Januj A. Juneja (2015), "Risk, Illiquidity, or Marketability: What Matters for the Discounts on Private Placements?" *Journal of Banking and Finance* 57, 41-50.

Jeffrey F. Jaffe, Jan Jindra, David J. Pedersen, and Torben Voetmann (2018), "Do Unlisted Targets Sell at Discounts?" *Journal of Financial and Quantitative Analysis*, forthcoming.

David F. Larcker, Brian Tayan, and Edward Watts (2018), "Cashing it In: Private Company Exchanges and Employee Sales Prior to IPO," *Stanford Closer Look Series*, CGRP-73

Peter L. Lohrey (2020), "The Dodd-Frank Act and the Private Company Discount: An Empirical Investigation," *Journal of Forensic Accounting Research* 5(1), 298-318.

* The Willamette research studies were unpublished but reported in *Business Valuation Discounts and Premiums*, Chapter 5, by Shannon Pratt (New York: John Wiley & Sons, Inc., p. 85).

MASSACHUSETTS WORKERS' COMPENSATION

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Introduction

On behalf of our more than three hundred member carriers, the Workers' Compensation Rating and Inspection Bureau of Massachusetts ("WCRIBMA") recommends that average rates for workers' compensation insurance be increased by 2.7% for policies effective on and after July 1, 2022.

Filing Summary

This filing is divided into three parts (Volumes). Volume 1 is the main rate level filing, with explanatory text and actuarial exhibits underlying the calculation of the average rate indication. Volume II contains the rate level indication for F-Classes, revised Experience and Retrospective Rating Plan parameters, miscellaneous rating values, and classification rate displays. Volume III addresses cost containment. The pre-filed testimony of two WCRIBMA actuaries supporting this filing, Carolyn Bergh and Anthony Salido, and the WCRIBMA's outside expert witnesses, Dr. George Zanjani of the University of Alabama, and Dr. Sharon Tennyson of Cornell University, is included with the filing.

This filing presents the required testimony, data, and calculations supporting the WCRIBMA's recommended rate revisions. The rates the WCRIBMA recommends are neither excessive nor inadequate; they are not unfairly discriminatory; and they fall within a range of reasonableness. The Commissioner should, therefore, approve the WCRIBMA's filing.

In this introduction, the WCRIBMA presents a summary of the principal ratemaking issues and methods considered in the filing. Consistent with past practice, the WCRIBMA uses a loss ratio methodology to derive two separate rate indications that are then averaged to produce the final recommendation. This year, the WCRIBMA derived one indication from policy year 2017 data and the other from policy year 2018 data.¹ Policy year 2017 data consist of premium and loss experience generated by policies written during 2017. Policy year 2018 data consist of premium and loss experience generated by policies written during 2018.

Using a standard loss ratio method, the WCRIBMA calculates a permissible loss, loss adjustment expense (“LAE”) and fixed expense ratio (“Target Cost Ratio”) and compares it to an adjusted loss, LAE and fixed expense ratio reflecting the past experience that supports this filing (“Actual Cost Ratio”). The WCRIBMA adjusts Aggregate Financial premium and loss data from the experience period so that the data reflect as accurately as possible the conditions that are expected to prevail during the period when the rates are expected to be in effect, here 7/1/22-6/30/23. The recommended rate change is designed to bring the Actual Cost Ratio into alignment with the Target Cost Ratio.

It is important to understand that the ratemaking methodology used in this filing is not a series of unrelated calculations, but rather an integrated series of adjustments to the reported experience that taken together yield a reasonable rate level. Each of these adjustments is summarized below and further detailed in the body of the filing.

¹ Policy year data is used by NCCI for determining indicated loss cost (or rate) changes in all 37 states and the District of Columbia where NCCI files loss costs (or rates).

2017-2018 Policy Year Data

The Rate Filing utilizes data from policy years 2017 and 2018, evaluated as of December 31, 2019, rather than the latest available policy years 2018 and 2019 evaluated as of 12/31/2020, to eliminate the distortive impact that COVID-19 and the accompanying local, state and federal mandates (e.g., stay-at-home orders² and suspension of non-essential medical services³), as well as federal relief (e.g., Paycheck Protection Program) has on 2018 and 2019 data, during calendar year 2020. For example, due to the ban on non-essential medical services for much of 2020, and the reluctance to seek out medical services to avoid exposure to hospital or clinical settings, the medical loss experience appears to be understated in calendar year 2020. In addition, mandatory shut downs and stay at home orders resulted in lower non-COVID claims (both lost time⁴ and medical only) and the associated indemnity losses than would otherwise be expected. Further, during the period from March 2020 to April 2020, the unemployment rate rose from 2.7% to 16.4%, but as of October 2021 returned to 5.3%⁵.

It would be inconsistent with the prospective nature of rate making for the WCRIBMA to utilize data so heavily distorted by COVID-19–related anomalies to set

² 3/23/2020: Governor Charlie Baker Orders All Non-Essential Businesses To Cease In Person Operation, Directs the Department of Public Health to Issue Stay at Home Advisory For Two Weeks; 3/31/2020: Baker-Polito Administration Extends Non-Essential Business Closures (until May 4); 4/28/2020: Baker-Polito Administration Extends Non-Essential Business Closures to May 18th; 5/15/2020: Baker-Polito Administration & Employer Community Announce Continuation of Work From Home Policies

³ 3/15/2020: Baker-Polito Administration Announces Emergency Actions to Address COVID-19; includes Hospitals must cancel non-essential elective procedures

⁴ WCRI: The Early Impact of COVID-19 on Workers' Compensation Claim Composition, January 2021, Figure 5a: Comparing Changes in the Number of Non-COVID-19 Clams and Employment from 2019Q2 to 2020Q2.

⁵ Department of Unemployment Assistance (DUA) Labor Force and Unemployment Data,

adequate and reasonable rates for the policy year beginning in July 2022. While the WCRIBMA understands the effects of COVID-19 will continue to be felt in the coming years, the current unemployment rates, the renewed availability of medical and other services, vaccines, therapeutics and the waning availability of federal payroll relief, all suggests that use of pre COVID-19 data is more predictive of the likely post July 2022 environment.

Losses

Losses require three separate adjustments to rate period levels. The first, described in Section II of the filing, is loss development. Since the claims associated with policy year 2017 and policy year 2018 losses have not yet all been settled, the WCRIBMA looks at past settlement patterns to estimate ultimate values.

Workers' compensation payments may reflect claims for either (or both) indemnity (wage loss and survivor benefits) and medical benefits, and these are developed separately. The WCRIBMA calculates two different estimates of ultimate medical and indemnity losses, the first based on the development of paid losses, and the second based on the development of the sum of paid losses and case reserves. These are averaged when the WCRIBMA calculates the experience period loss ratios.

Next, losses are adjusted to reflect benefit level changes. Separate adjustments are calculated to bring indemnity and medical losses for policy years 2017 and 2018 to the July 1, 2022 benefit level, and additional adjustments to bring losses from the July 1, 2022 benefit level to the projected benefit level for the period the rates will be in effect.

These calculations are displayed in Section IV of the filing. These adjustments are made to reflect the impact of the changes in Statewide Average Weekly Wage (SAWW)⁶ made every October 1st by the Commonwealth's Division of Unemployment Assistance. Historically, the SAWW in Massachusetts has increased steadily. However, due to the distortive impact that COVID-19 and the accompanying local, state and federal mandates (e.g., stay-at-home orders, economic shutdowns and federal relief (e.g., Paycheck Protection Program), the latest SAWW, effective 10/1/2021 of \$1,694.24, is 14% ($1,694.24/1,487.78$) higher than the prior year. This is due to the disproportionate impact that the shutdowns had on lower wage industries. In an effort to estimate the prospective benefit levels, when rates would be in effect, the latest value of SAWW is not used to project values of the SAWW, instead the SAWW effective 10/1/2020⁷ is used as the base year and utilizes a SAWW trend factor of 3.6% as shown in Section IV - D, Exhibit 3. As in prior years, the WCRIBMA estimates the wage-based benefit effects with a simulation model.⁸

Finally, losses are adjusted for trend to account for expected changes in loss costs from the experience period to the time the recommended rates will be in effect. Regression techniques are used to analyze separately the distinct underlying components of observed loss trends: changes in claim frequency, claim severity and

⁶ As of 10/1/2021, Department of Unemployment Assistance (DUA) promulgated the State Average Weekly Wage (SAWW) of \$1,694.24 from the prior (10/1/2020) SAWW of \$1,487.78.

⁷ The WCRIBMA has estimated that the 10/1/2020 SAWW reflects data underlying the period from 4/1/2019 to 3/31/2020 and remains largely unaffected by COVID-19 anomalies.

⁸ WCRIBMA simulation model is based on NCCI's previously utilized automatics model.

wages (used as a proxy for exposure because payroll is the predominant exposure base).

Details of the loss trend calculations are found in Section V.

Premiums

For most workers' compensation policies, the final premium is not known until after the policy expires. Insurers base initial premiums on estimated payroll, subject to a post-expiration audit. As a result, policy year premium is developed using a technique much like loss development. The WCRIBMA also adjusts reported premiums to current rate level. These adjustments are found in Section III.

Expenses

Section VI contains the calculations underlying the expense provisions in the rates. As in past years, these calculations are based on the methods specified by the Commissioner in the 1987 Rate Decision. Expenses are divided into fixed and variable categories. Variable expenses are proportional to either premium (premium taxes, commissions, and other acquisition expenses) or losses (loss adjustment expenses). Fixed expenses are divided into expense categories (salaries, postage, utilities, etc.). As in the last filing, the WCRIBMA uses a composite external index to estimate expense trends. The WCRIBMA also continues to include a provision to reflect the estimated net cost to insurers for the purchase of reinsurance.

Underwriting Profit

Discounted cash flow models are used to estimate the underwriting profit provision in Section VII. WCRIBMA uses the internal rate of return (“IRR”) model and the insurer capital cost (“ICC”) model. The IRR model is widely used in insurance ratemaking⁹ and was approved by the Commissioner for use in workers’ compensation ratemaking in Massachusetts in 2003. The ICC model is mathematically equivalent to the IRR model, and is used to quantify the capital costs in dollar terms.¹⁰

To implement the IRR and ICC models, the WCRIBMA first determines the various inputs needed by the models, such as the cost of capital (or target rate of return), the expected return on insurers’ invested assets, the leverage ratio, and the cash flows associated with underwriting. Using the IRR and ICC models and their associated inputs, the WCRIBMA derives the premium level required to achieve the target return on capital.

⁹ Actuarial Standard of Practice No. 30 (ASOP #30) - Treatment of Profit and Contingency Provisions and the Cost of Capital in Property/Casualty Insurance Ratemaking, published by the Actuarial Standards Board, lists three examples of models that may be used to directly develop an underwriting profit provision, including the Net Present Value (NPV) Model. ASOP #30 states that the “internal rate of return (IRR) model, a specific application of the general NPV model, uses an iteration technique to calculate the rate(s) of return that will set the net present value of a risk transfer’s cash inflows and outflows equal to zero.”

¹⁰ The list of models that may be used to directly develop an underwriting profit provision which are described in ASOP #30 also includes the total financial needs model. “Total financial needs models are used to develop the underwriting profit provision such that the sum of underwriting profit, miscellaneous (non-investment) income, investment income from insurance operations, and investment income on capital, after income taxes, will equal the cost of capital. Each of these components is explicitly quantified.” The ICC model is an example of a total financial needs model.

Longshore and Harbor Workers' Compensation

Section VIII describes the derivation of rate recommendations for risks that have exposure to the benefits and risks that apply under the United States Longshore and Harbor Workers' Compensation Act, also known as the "F-Classes".

Classifications and Rating Plan Parameters

Section IX describes how the overall rate change is distributed among the more than four hundred classifications for which workers' compensation policies are written in Massachusetts. Section X presents D-Ratio and expected loss rate calculations for use in experience rating. Section XI details the derivation of miscellaneous rating values, including credit factors for both the Massachusetts Benefits Deductible Program and the Massachusetts Benefits Claim and Aggregate Deductible Program. Section XII contains the calculation of various retrospective rating parameters, including hazard group relativities and excess loss factors.

Data

Section XIII describes the process the WCRIBMA uses to validate and edit the data used in its rate filings. Section XIII also provides details about certain adjustments to the reported data, including the exclusion of certain data, deemed necessary this year for purposes of this rate filing.

Cost Containment

The WCRIBMA's cost containment filing once again includes the responses of ten representative carriers to a survey of cost containment practices. In 2013, the WCRIBMA revised its survey instrument to provide an expanded array of information.¹¹ The WCRIBMA recommends that, as in the past, the Commissioner accept this filing as evidence of the industry's compliance with its statutory cost containment obligations.

¹¹ In the 2012 Rate Decision, the Commissioner stated that the scope of the WCRIBMA's 2012 Cost Containment Survey "focuses on loss costs and premium collection and does not address other expenses that workers' compensation insurers incur, such as general expenses, overhead, and commissions." In response, the current survey has a broader scope and addresses general expenses, such as salaries, travel, advertising, and rent. The current survey also addresses commissions. In addition, this year's survey includes carriers' response to COVID-19 on their operations.

I 000010

Section I - Rate Recommendation
Subsection A - Introduction
7/1/2022

Section I - A
Exhibit 1

RATE INDICATION SUMMARY

Statewide Rate Change Summary		
<i>Indication Effective Date: 7/1/2022</i>		
(1)	Indicated Rate Change Based on Policy Year 2017 Data (Section I-B, Exhibit 1)	3.4%
(2)	Indicated Rate Change Based on Policy Year 2018 Data (Section I-B, Exhibit 1)	2.0%
(3)	Average Indicated Rate Change = [(1) + (2)] / 2.0	2.7%

Expense Constants			
	Current	Recommended	
(4)	For Risks developing at least \$1,000 in Standard Premium (Section VI-D, Exhibit 1)	\$338	\$338
(5)	For Risks developing at least \$200 and less than \$1,000 in Standard Premium (Section VI-D, Exhibit 1)	\$250	\$250
(6)	For Risks developing less than \$200 in Standard Premium (Section VI-D, Exhibit 1)	\$159	\$159
(7)	Per Capita Risks (for each exposure, up to a maximum of 4)	\$64	\$64

I 000011

Section I - Rate Recommendation
 Subsection B - Calculation of Indicated Rate Change
 7/1/2022

Section I - B
 Exhibit 1

	Policy Year <u>2017</u>	Policy Year <u>2018</u>
(1) Standard Earned Premium plus Adjusted ARAP Premium (Section I-D, Exhibit 2)	1,272,315,507	1,236,067,013
(2) Composite Adjustment Factor (Section I-D, Exhibit 2)	1.044	1.039
(3) Adjusted Standard Earned Premium plus Adjusted ARAP = [(1) x (2)]	1,328,098,053	1,283,738,372
(4) Cumulative Premium Development Factor to Ultimate (Section I-D, Exhibit 2)	0.999	1.012
(5) Rate On-Level Factor (Section I-D, Exhibit 2)	0.812	0.864
(6) Factor to Remove Expense Constant (Section I-D, Exhibit 2)	0.962	0.962
(7) Adjusted On-Level Standard Earned Premium plus Adjusted ARAP at Ultimate = [(3) x (4) x (5) x (6)]	1,036,705,347	1,078,616,826
(8) Annual Wage Trend (Section I-D, Exhibit 4)	0.036	0.036
(9) Wage Trend Factor to 7/1/2023 (based on Section I-D, Exhibit 4)	1.212	1.171
(10) Standard Earned Premium plus ARAP Projected to Prospective Effective Period = [(7) x (9)]	1,256,693,537	1,262,531,342
(11) Average On-Level Incurred Losses Projected to Prospective Effective Period (Section I-C Exhibit I, Page 1 Item (30), Page 2 Item (30))	764,778,679	758,035,285
(12) Loss Ratio Projected to Prospective Effective Period = [(11) / (10)]	0.609	0.600
(13) Factor to Remove the Large Deductible Contribution to the Residual Market Subsidy (Section I-E)	1.000	1.000
(14) Loss Adjustment Expense Factor (Section I-D, Exhibit 5)	1.187	1.187
(15) Fixed Expense Ratio (Section VI-B, Exhibit 1)	0.059	0.058
(16) Indicated Policy Year Loss, LAE, and Fixed Expense Ratio = { [(12) x (14)] + (15) } x (13)	0.781	0.771
(17) Commission and Other Acquisition Expense Ratio (Section I-D, Exhibit 5)	0.127	0.127
(18) Premium Tax Ratio (Section I-D, Exhibit 5)	0.022	0.022
(19) Premium Discount Ratio (Section I-D, Exhibit 5)	0.055	0.055
(20) Variable Expense Ratio = [(17) + (18) + (19)]	0.203	0.203
(21) Underwriting Profit Provision (Section VII-A)	0.041	0.041
(22) Permissible Loss, LAE, and Fixed Expense Ratio = [1.0 - (20) - (21)]	0.755	0.755
(23) Indicated Rate Change = [(16) / (22)] - 1.0	3.4%	2.0%
(24) Overall Indicated Rate Change = [(23) PY2017 + (23) PY2018] / 2.0		2.7%

I 000012

Section I - Rate Recommendation
 Subsection C - Indicated Rate Change Detail
 7/1/2022

Section I - C
 Exhibit 1
 Page 1

Premium and Incurred Losses Projected to the Prospective Effective Period
 Policy Year 2017

Premium

(1)	Adjusted On-Level Standard Earned Premium plus Adjusted ARAP at Ultimate (Section I -D, Exhibit 2)	1,036,705,347
(2)	Annual Wage Trend (Section I-D, Exhibit 4)	0.036
(3)	Wage Trend Factor to Prospective Effective Period (7/1/2023)	1.212
(4)	Standard Earned Premium plus ARAP Projected to Prospective Effective Period = [(1) x (3)]	1,256,693,537

Indemnity Losses

		<u>Paid</u>	<u>Paid + Case</u>
(5)	Indemnity Losses at Latest Month - Industry Total (Section I-D, Exhibit 1)	265,134,215	373,977,130
(6)	Indemnity Loss Development Factor to 252 Months (Section I-D, Exhibit 1)	1.689	1.239
(7)	Tail Factor 252 Months to Ultimate (Section I-D, Exhibit 1)	1.036	1.016
(8)	Factor to Adjust for Escalated Benefits (Section I-D, Exhibit 1)	1.037	1.007
(9)	Estimated Ultimate Indemnity Loss = [(5) x (6) x (7) x (8)]	481,201,829	474,114,588
(10)	Annual Indemnity Loss Trend (Section I-D, Exhibit 4)	0.005	0.005
(11)	Indemnity Loss Trend Factor to 7/1/2023	1.029	1.029
(12)	Estimated Indemnity Losses Trended = [(9) x (11)]	495,232,621	487,938,732
(13)	Estimated Benefit Change Factor Prior to 1/1/2022 (Section I-D, Exhibit 3)	1.072	1.072
(14)	On Level Losses = [(12) x (13)]	531,078,070	523,256,242
(15)	Estimated Benefit Change Factor Subsequent to 1/1/2022 (Section I-D, Exhibit 3)	0.988	0.988
(16)	On-Level Incurred Losses Projected to Prospective Effective Period = [(14) x (15)]	524,500,312	516,775,362

Medical Losses

(17)	Medical Losses at Latest Month - Industry Total (Section I-D, Exhibit 1)	172,563,579	232,214,913
(18)	Medical Loss Development Factor to 252 Months (Section I-D, Exhibit 1)	1.293	0.988
(19)	Tail Factor 252 Months to Ultimate (Section I-D, Exhibit 1)	1.077	1.017
(20)	Factor to Adjust for Escalated Benefits (1.000 for Medical Losses)	1.000	1.000
(21)	Estimated Ultimate Medical Loss = [(17) x (18) x (19) x (20)]	240,341,463	233,314,817
(22)	Annual Medical Loss Trend (Section I-D, Exhibit 4)	0.006	0.006
(23)	Medical Loss Trend Factor to 7/1/2023	1.031	1.031
(24)	Estimated Medical Losses Trended = [(21) x (23)]	247,762,648	240,519,036
(25)	Estimated Benefit Change Factor Prior to 1/1/2022 (Section I-D, Exhibit 3)	1.000	1.000
(26)	On Level Losses = [(24) x (25)]	247,762,648	240,519,036
(27)	Estimated Benefit Change Factor Subsequent to 1/1/2022 (Section I-D, Exhibit 3)	1.000	1.000
(28)	On-Level Incurred Losses Projected to Prospective Effective Period = [(26) x (27)]	247,762,648	240,519,036

Total Combined Medical and Indemnity Losses

(29)	Total Estimated Ultimate Losses Trended and On Level = [(16) + (28)]	772,262,960	757,294,398
(30)	Average On-Level Incurred Losses Projected to Prospective Effective Period	764,778,679	

I 000013

Section I - Rate Recommendation
 Subsection C - Indicated Rate Change Detail
 7/1/2022

Section I - C
 Exhibit 1
 Page 2

Premium and Incurred Losses Projected to the Prospective Effective Period Policy Year 2018

Premium

(1)	Adjusted On-Level Standard Earned Premium plus Adjusted ARAP at Ultimate (Section I-D, Exhibit 2)	1,078,616,826
(2)	Annual Wage Trend (Section I-D, Exhibit 4)	0.036
(3)	Wage Trend Factor to Prospective Effective Period (7/1/2023)	1.171
(4)	Standard Earned Premium plus ARAP Projected to Prospective Effective Period = [(1) x (3)]	1,262,531,342

Indemnity Losses

		<u>Paid</u>	<u>Paid + Case</u>
(5)	Indemnity Losses at Latest Month - Industry Total (Section I-D, Exhibit 1)	144,804,518	256,002,748
(6)	Indemnity Loss Development Factor to 252 Months (Section I-D, Exhibit 1)	3.189	1.760
(7)	Tail Factor 252 Months to Ultimate (Section I-D, Exhibit 1)	1.036	1.016
(8)	Factor to Adjust for Escalated Benefits (Section I-D, Exhibit 1)	1.037	1.007
(9)	Estimated Ultimate Indemnity Loss = [(5) x (6) x (7) x (8)]	496,150,009	461,249,634
(10)	Annual Indemnity Loss Trend (Section I-D, Exhibit 4)	0.005	0.005
(11)	Indemnity Loss Trend Factor to 7/1/2023	1.024	1.024
(12)	Estimated Indemnity Losses Trended = [(9) x (11)]	507,954,677	472,223,933
(13)	Estimated Benefit Change Factor Prior to 1/1/2022 (Section I-D, Exhibit 3)	1.062	1.062
(14)	On Level Losses = [(12) x (13)]	539,415,361	501,471,598
(15)	Estimated Benefit Change Factor Subsequent to 1/1/2022 (Section I-D, Exhibit 3)	0.988	0.988
(16)	On-Level Incurred Losses Projected to Prospective Effective Period = [(14) x (15)]	532,734,340	495,260,535

Medical Losses

(17)	Medical Losses at Latest Month - Industry Total (Section I-D, Exhibit 1)	138,169,849	214,948,316
(18)	Medical Loss Development Factor to 252 Months (Section I-D, Exhibit 1)	1.656	1.050
(19)	Tail Factor 252 Months to Ultimate (Section I-D, Exhibit 1)	1.077	1.017
(20)	Factor to Adjust for Escalated Benefits (1.000 for Medical Losses)	1.000	1.000
(21)	Estimated Ultimate Medical Loss = [(17) x (18) x (19) x (20)]	246,528,033	229,554,165
(22)	Annual Medical Loss Trend (Section I-D, Exhibit 4)	0.006	0.006
(23)	Medical Loss Trend Factor to 7/1/2023	1.025	1.025
(24)	Estimated Medical Losses Trended = [(21) x (23)]	252,738,585	235,337,110
(25)	Estimated Benefit Change Factor Prior to 1/1/2022 (Section I-D, Exhibit 3)	1.000	1.000
(26)	On Level Losses = [(24) x (25)]	252,738,585	235,337,110
(27)	Estimated Benefit Change Factor Subsequent to 1/1/2022 (Section I-D, Exhibit 3)	1.000	1.000
(28)	On-Level Incurred Losses Projected to Prospective Effective Period = [(26) x (27)]	252,738,585	235,337,110

Total Combined Medical and Indemnity Losses

(29)	Total Estimated Ultimate Losses Trended and On Level = [(16) + (28)]	785,472,925	730,597,645
(30)	Average On-Level Incurred Losses Projected to Prospective Effective Period	758,035,285	

I 000014

Section I - Rate Recommendation
 Subsection D - Loss Development Summary
 7/1/2022

Section I - D
 Exhibit 1

Summary of Estimated Ultimate Losses

Paid Loss Development Method

Policy Year (1)	Benefit Type (2)	Paid Losses at 12/31/19 (3)	Cumulative Factors from Latest Month to 252 Months (4)	Losses Developed to 252 Months (5)	Tail Factor from 252 Months to Ultimate (6)	Factor to Adjust for Escalated Benefits (7)	Estimated Ultimate Losses (8)
2017	Indemnity	265,134,215	1.689	447,893,527	1.036	1.037	481,201,829
2017	Medical	172,563,579	1.293	223,100,576	1.077	1.000	240,341,463
2017	Total	437,697,794		670,994,103			721,543,291
2018	Indemnity	144,804,518	3.189	461,807,010	1.036	1.037	496,150,009
2018	Medical	138,169,849	1.656	228,843,353	1.077	1.000	246,528,033
2018	Total	282,974,367		690,650,363			742,678,042

Paid Plus Case Loss Development Method

Policy Year (9)	Benefit Type (10)	Paid Plus Case Losses at 12/31/19 (11)	Cumulative Factors from Latest Month to 252 Months (12)	Losses Developed to 252 Months (13)	Tail Factor from 252 Months to Ultimate (14)	Factor to Adjust for Escalated Benefits (15)	Estimated Ultimate Losses (16)
2017	Indemnity	373,977,130	1.239	463,197,172	1.016	1.007	474,114,588
2017	Medical	232,214,913	0.988	229,499,290	1.017	1.000	233,314,817
2017	Total	606,192,043		692,696,463			707,429,405
2018	Indemnity	256,002,748	1.760	450,628,459	1.016	1.007	461,249,634
2018	Medical	214,948,316	1.050	225,800,138	1.017	1.000	229,554,165
2018	Total	470,951,064		676,428,597			690,803,799

Notes:

- (3), (11): Aggregate Financial Data.
- (4), (12): Section II - B, Exhibit 1.
- (5) = (3) x (4)
- (6): Section II - C, Exhibit 1, Page 1.
- (7): Section II - D, Exhibit 1, Page 1.
- (8) = (5) x (6) x (7)
- (13) = (11) x (12)
- (14): Section II - C, Exhibit 2, Page 1.
- (15): Section II - D, Exhibit 2, Page 1.
- (16) = (13) x (14) x (15)

I 000015

Section I - Rate Recommendation
 Subsection D - Premium Summary
 7/1/2022

Section I - D
 Exhibit 2

Policy Year Aggregate Financial Data
 Calculation of Standard Premium plus Adjusted ARAP Premium Development Factors
 Industrywide

Summary Exhibit

	Policy Year as of 12/31/2019	
	2017	2018
(1) Standard Earned Premium plus Adjusted ARAP Premium	1,272,315,507	1,236,067,013
(2) Adjustment for Experience and Merit Rating, ARAP, and Construction Credit Off-balance	1.041	1.038
(3) Adjustment Factor to Remove the Impact of Loading for Recoupment of Insolvency Fund Assessments	1.002	1.000
(4) Composite Adjustment Factor = (2) x (3)	1.044	1.039
(5) Adjusted Standard Earned Premium plus ARAP = (1) x (4)	1,328,098,053	1,283,738,372
(6) Cumulative Premium Development Factor to Ultimate (see Section III-A, Exhibit 1, Page 2)	0.999	1.012
(7) Rate On-Level Factor	0.812	0.864
(8) Factor to Remove Expense Constant	0.962	0.962
(9) Adjusted On-Level Standard Earned Premium plus Adjusted ARAP at Ultimate = (5) x (6) x (7) x (8)	1,036,705,347	1,078,616,826

Notes:

- (1): Section III-B, Exhibit 2
- (2): Section III-B, Exhibit 1
- (3): Section III-C, Exhibit 1
- (6): Premiums are deemed to be fully developed at 252 months.
- (7): Section III-D, Exhibit 1
- (8): Section VI-F, Exhibit 2.

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Section I - Rate Recommendation
 Subsection D - Benefit Change Adjustments Summary
 7/1/2022

Section I - D
 Exhibit 3

Benefit Level Adjustment Factors

All Injury Types

Time Period		Indemnity					Medical	Total
Beginning Period	Ending Period	Death	Permanent Total	Permanent Partial	Temporary Total	All Injury Types	All Injury Types	All Injury Types
1/1/2022	Prosp. Eff. Period					0.988	1.000	
PY 2017	1/1/2022					1.072	1.000	
PY 2018	1/1/2022					1.062	1.000	
PY 2004	Prosp. Eff. Period	1.105	1.126	1.218	1.075	1.167	1.036	
PY 2005	Prosp. Eff. Period	1.099	1.117	1.201	1.070	1.155	1.032	
PY 2006	Prosp. Eff. Period	1.094	1.109	1.184	1.066	1.143	1.032	
PY 2007	Prosp. Eff. Period	1.088	1.100	1.167	1.061	1.130	1.032	
PY 2008	Prosp. Eff. Period	1.081	1.091	1.151	1.056	1.118	1.024	
PY 2009	Prosp. Eff. Period	1.079	1.088	1.145	1.054	1.113	1.002	
PY 2010	Prosp. Eff. Period	1.080	1.088	1.146	1.055	1.114	1.000	
PY 2011	Prosp. Eff. Period	1.076	1.083	1.136	1.053	1.107	1.000	
PY 2012	Prosp. Eff. Period	1.071	1.076	1.124	1.049	1.097	1.000	
PY 2013	Prosp. Eff. Period	1.069	1.073	1.118	1.047	1.093	1.000	
PY 2014	Prosp. Eff. Period	1.063	1.069	1.111	1.045	1.087	1.000	
PY 2015	Prosp. Eff. Period	1.051	1.063	1.100	1.041	1.078	1.000	
PY 2016	Prosp. Eff. Period	1.045	1.056	1.088	1.037	1.069	1.000	
PY 2017	Prosp. Eff. Period	1.039	1.048	1.076	1.032	1.059	1.000	
PY 2018	Prosp. Eff. Period	1.032	1.039	1.063	1.026	1.049	1.000	
PY 2016	CPY 2018_07	1.017	1.020	1.031	1.014		1.000	
PY 2017	CPY 2019_07	1.018	1.021	1.032	1.014		1.000	
PY 2018	CPY 2020_07	1.023	1.028	1.044	1.019		1.000	
CPY 2018_07	Prosp. Eff. Period							1.029
CPY 2019_07	Prosp. Eff. Period							1.022
CPY 2020_07	Prosp. Eff. Period							1.010
CPY 2008_09	Prosp. Eff. Period							1.075
Prior Eff. Period (using benefit level projections from prior filing)	Prosp. Eff. Period					1.024	1.000	1.016

Notes:

From Section IV-A, Exhibit 1.

1/1/2022 refers to a point in time. All other time periods refer to Policy Years.

Example: PY 2010 to Prosp. Eff. Period for Permanent Partial = 1.146 = 1.228 / 1.072

where 1.228 is the Index Factor for Prosp. Eff. Period and 1.072 is the Index Factor for PY 2010 for Indemnity Permanent Partial, from Exhibit 2.

Paid Trend Summary

	Indemnity				Medical								SAWW		
	Severity		Frequency		Lost-Time Medical				Medical Only				Trend	Credibility	
	Trend	Credibility	Trend	Credibility	Trend	Credibility	Trend	Credibility	Trend	Credibility	Trend	Credibility			
(1) Massachusetts Trend															
5 Year	1.1%	83.0%	-1.2%	53.5%	1.1%	47.5%	-1.2%	53.5%	2.8%	100.0%	-2.3%	38.9%	3.6%	100.0%	
6 Year	1.9%	71.8%	-1.4%	76.7%	2.3%	49.1%	-1.4%	76.7%	2.2%	100.0%	-2.9%	44.1%	3.4%	100.0%	
7 Year	2.0%	94.8%	-1.5%	100.0%	2.3%	65.2%	-1.5%	100.0%	2.0%	100.0%	-3.3%	52.1%	3.4%	100.0%	
8 Year	2.0%	100.0%	-1.6%	100.0%	2.2%	79.5%	-1.6%	100.0%	2.2%	100.0%	-3.7%	47.0%	3.3%	100.0%	
9 Year	2.3%	100.0%	-1.8%	100.0%	2.3%	93.0%	-1.8%	100.0%	2.2%	100.0%	-4.1%	47.2%	3.1%	100.0%	
10 Year	2.1%	100.0%	-1.6%	85.2%	2.0%	89.8%	-1.6%	85.2%	2.1%	100.0%	-4.0%	52.8%	3.0%	100.0%	
(2) Selected Trend	2.0%		-1.5%		2.3%		-1.5%		2.8%		-4.0%		3.6%		
(3) 15 Year Massachusetts Complement of Credibility	2.3%		-1.7%		2.1%		-1.7%		2.0%		-4.1%		2.7%		
(4) Credibility Weighted Trend	2.0%		-1.5%		2.3%		-1.5%		2.8%		-4.0%		3.6%		

	Lost-Time Medical	Medical Only
(5) Medical Loss Trend	0.8%	-1.4%
(6) Fraction of Total Medical	88.0%	12.0%
(7) Total Medical Loss Trend	0.6%	

	Indemnity	Medical
(8) Total Loss Trend	0.5%	0.6%
(9) SAWW Trend	3.6%	3.6%
(10) Total Net Trend	-2.9%	-2.9%

Notes:

- (1), (3): Section V, Exhibit 2 Severity; Exhibit 3 Frequency and SAWW.
- (2): Selection based on the fit with the highest credibility and least number of years.
- (4) = Credibility Weighted Selected Trend
- (5) = $[(1.0 + \text{Credibility Weighted Severity Trend}) \times (1.0 + \text{Credibility Weighted Frequency Trend})] - 1.0$
- (6) Medical Only = Medical Only Fraction of Total Medical from Section IV-E, Exhibit 2
 Lost Time Medical = $1.0 - \text{Medical Only}$
- (7) = Weighted Average of (5) using (6) as weights
- (8): Indemnity = $(1.0 + \text{Credibility Weighted Severity Trend}) \times (1.0 + \text{Credibility Weighted Frequency Trend}) - 1.0$
 Medical = Row (7)
- (9): (4) for SAWW.
- (10) = $\{ [1.0 + (8)] / [1.0 + (9)] \} - 1.0$

I 000017

I 000018

Section I - Rate Recommendation
Subsection D - Expenses Summary
7/1/2022

Section I - D
Exhibit 5

Summary of Expense Ratios

(1)	Commission and Other Acquisition Expense Ratio	12.7%
(2)	Average Premium Discount as a % of Standard Premium + ARAP	5.5%
(3)	Premium Tax Ratio = 2.28% x [1.0 - (2)]	2.2%
(4)	Variable Expense Ratio = (1) + (2) + (3)	20.3%
(5)	Fixed Expense Ratio	5.8%
(6)	Total Loss Adjustment Expense Ratio (LAE / Loss)	18.7%

Notes:

(1): Section VI-G, Exhibit 1.

(2): Section VI-E, Exhibit 1.

(3): 2.28% from Section VI-B, Exhibit 3.

(5): Section VI-B, Exhibit 1.

(6): Section VI-H, Exhibit 1.

Derivation of Large Deductible Factor Applied to Remove the Benefit of the Residual Market Subsidy Paid by Large Deductible Insureds

The WCRIBMA makes rates based on the experience of both residual markets risks and voluntary market risks, excluding risks subject to large deductibles. Large deductible policies subsidize the residual market.¹ Consequently, for the purposes of the rate filing, the WCRIBMA must estimate the residual market subsidy attributable to large deductible policies, and then make an offset for this subsidy in the calculation of the indicated average rate change.

Derivation of Factor:

Definitions

W_{vol}	- Proportion of Voluntary Non-Large Deductible Exposure to the sum of Voluntary Non-Large Deductible Exposure plus Residual Market Exposure
W_{rm}	- $1 - W_{vol}$ - Proportion of Residual Market Exposure to the sum of Voluntary Non-Large Deductible Exposure plus Residual Market Exposure
Q_{vol}	- Average Voluntary Market Rate equivalent
Q_{rm}	- Average Residual Market Rate equivalent
Q_{oa-0}	- Average Rate equivalent for Voluntary and Residual Market in total assuming no subsidy paid for by large deductibles.
Q_{oa-1}	- Average Rate equivalent for Voluntary and Residual Market in total assuming a subsidy paid for by large deductibles
u	- Ratio of Non-Large Deductible Voluntary Assessable Premium to the Total Voluntary Assessable Premium

¹ The voluntary market subsidizes the residual market. The subsidy associated with non-large deductible voluntary policies is implicitly reflected in the rate indication, since the average indicated rate change is calculated exclusive of large deductibles.

I 000020

Section I – Rate Recommendation
Subsection E – Reflecting the Impact of Large Deductibles
7/1/2022

Section I-E
Page 2

$$d = Q_{rm} / Q_{vol}$$

First, assume no residual market subsidy paid by anyone other than W_{vol} :

$$(1) W_{vol}Q_{vol} + W_{rm}Q_{rm} = Q_{oa-0}$$

This is a weighted average of the voluntary rate and the residual market rate. Now assume that large deductibles subsidize the residual market. The residual market subsidy would be:

$$(2) \text{Residual Market Subsidy} = w_{rm} (Q_{rm} - Q_{oa-0})$$

The large deductible share of the residual market subsidy would be:

$$(3) (1 - u) w_{rm} (Q_{rm} - Q_{oa-1})$$

The formula for the overall rate that reflects the subsidy paid by the large deductibles would be:

$$(4) W_{vol}Q_{vol} + W_{rm}Q_{rm} - (1 - u) w_{rm} (Q_{rm} - Q_{oa-1}) = Q_{oa-1}$$

Therefore Q_{oa-1} :

$$(5) Q_{oa-1} = W_{vol}Q_{vol} - (1 - u) w_{rm} (Q_{rm} - Q_{oa-1}) + W_{rm}Q_{rm}$$

$$(6) Q_{oa-1} / Q_{oa-0} = [W_{vol}Q_{vol} - (1 - u) w_{rm} (Q_{rm} - Q_{oa-1}) + W_{rm}Q_{rm}] / [W_{vol}Q_{vol} + W_{rm}Q_{rm}]$$

If we assume that the average rate equivalent for the total market is 1.00, such that:

$$(7) W_{vol}Q_{vol} + W_{rm}Q_{rm} = Q_{oa-0} = 1.00,$$

Then the factor Q_{oa-1} / Q_{oa-0} reduces to Q_{oa-1} . Also solving (7) for Q_{vol} and Q_{rm} and introducing the variable d , results in the following:

$$(8) d = Q_{rm} / Q_{vol}$$

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Section I – Rate Recommendation
Subsection E – Reflecting the Impact of Large Deductibles
7/1/2022

Section I-E
Page 3

$$(9) Q_{vol}(w_{vol} + w_{rm}d) = 1.00$$

$$(10) Q_{vol} = 1 / (w_{vol} + w_{rm}d)$$

Similarly:

$$(11) Q_{rm} = d / (w_{vol} + w_{rm}d)$$

Given (5) and (7):

(12) $Q_{oa-1} = 1.0 - (1 - u) w_{rm} (Q_{rm} - Q_{oa-1})$, producing the following adjustment factor:

$$(13) \text{ Adjustment Factor} = Q_{oa-1} = [1.0 - w_{rm}Q_{rm}(1 - u)] / [1.0 - w_{rm}(1 - u)]$$

Calculation of the “d”

“d” is defined as: $d = Q_{rm} / Q_{vol}$

Define Q_{vol} and Q_{rm} as follows, based on the WCRIBMA’s formula for a rate:

$$(14) Q_{vol} = (L_{vol} + F) / (1 - V_{vol} - P)$$

$$(15) Q_{rm} = (L_{rm} + F) / (1 - V_{rm} - P)$$

$$(16) w_{vol}L_{vol} + w_{rm}L_{rm} = L_f$$

where

L_{vol}	- Voluntary Loss & LAE Ratio to the sum of Standard Premium plus ARAP
L_{rm}	- Residual Market Loss & LAE Ratio to the sum of Standard Premium plus ARAP
L_f	- Voluntary plus Residual Market Loss & LAE Ratio to the sum of Standard Premium plus ARAP
F	- Fixed Expense Ratio relative to the sum of Standard Premium plus ARAP
V_{vol}	- Voluntary Variable Expenses Ratio

I 000022

Section I – Rate Recommendation
Subsection E – Reflecting the Impact of Large Deductibles
7/1/2022

Section I-E
Page 4

V_{rm} - Residual Market Variable Expenses Ratio

P - Profit provision relative to the sum of Standard Premium plus ARAP

w_{vol} - Proportion of Voluntary Non-Large Deductible Exposure to the sum of Voluntary Non-Large Deductible Exposure plus Residual Market Exposure

w_{rm} - $1 - w_{vol}$

r - L_{rm} / L_{vol}

$$(17) w_{vol}L_{vol} + w_{rm}rL_{vol} = L_f$$

$$(18) L_{vol} = L_f / (w_{vol} + w_{rm}r)$$

$$(19) w_{vol}L_{rm} / r + w_{rm}L_{rm} = L_f$$

$$(20) L_{rm} = L_f r / (w_{vol} + w_{rm}r)$$

Consequently, if a loss ratio differential, r , is selected, the values of L_{vol} and L_{rm} can be derived.

Taking formulas (14) and (15) we can derive a formula for d :

$$(21) d = Q_{rm} / Q_{vol} = [(L_{rm} + F) / (1 - V_{rm} - P)] / [(L_{vol} + F) / (1 - V_{vol} - P)]$$

$$(22) d = Q_{rm} / Q_{vol} = [(L_{rm} + F) / (L_{vol} + F)] \times [(1 - V_{vol} - P) / (1 - V_{rm} - P)]$$

We can solve the first term given a loss ratio differential and formulas (18) and (20). This leaves the second term.

The V_{vol} and V_{rm} can be thought of as the following:

$$(23) V_{vol} = C_{vol} + A + T + D_{vol}$$

$$(24) V_{rm} = C_{rm} + A + T$$

where C_{vol} - Commission Ratio relative to the sum of Standard

I 000023

Premium plus ARAP for the Voluntary Market

- C_{rm} - Commission Ratio relative to the sum of Standard Premium plus ARAP for the Residual Market
- A - Other Acquisition Expense Ratio relative to the sum of Standard Premium plus ARAP
- T - Premium Tax Ratio relative to the sum of Standard Premium plus ARAP
- D_{vol} - Premium Discount relative to the sum of Standard Premium plus ARAP for the voluntary market

Then the second term in (22) becomes:

$$(25) [1 - (C_{vol} + A + T + D_{vol})] / [1 - (C_{rm} + A + T)]$$

and the remaining unknowns are C_{vol} and C_{rm} .

$$(26) w_{vol}C_{vol} + w_{rm}C_{rm} = C_f$$

Introducing a new variable k , the commission ratio differential between the Residual Market and the Voluntary Market, such that:

$$(27) k = C_{rm} / C_{vol},$$

Then equations can be derived for C_{vol} and C_{rm} as follows:

$$(28) C_{vol} = C_f / (w_{vol} + w_{rm}k)$$

$$(29) C_{rm} = C_f k / (w_{vol} + w_{rm}k)$$

“ k ” is the estimated commission differential. Given we have C_f as a known and we can solve for C_{vol} and C_{rm} , we now have all the variables needed to solve equation (13).

The detailed calculations for solving equation (13), the Factor to Remove the Large Deductible Contribution to the Residual Market Subsidy, are located in Section I-E, Exhibit 1, Page 1. As demonstrated in that section, the resulting adjustment factor is **1.000**.

I 000024

Section I - Rate Recommendation
 Subsection E - Reflecting the Impact of Large Deductibles
 7/1/2022

Section I - E
 Exhibit 1
 Page 1

Factor to Remove the Large Deductible Contribution to the Residual Market Subsidy

	Total Market	Residual Market ("rm")	Voluntary Market ("vol")
(1) Permissible Loss, LAE, and Fixed Expense Ratio	75.5%		
(2) Fixed Expense Ratio	5.8%		
(3) Permissible Loss and LAE Ratio = [(1) - (2)]	69.7%		
(4) Loss Ratio Differential, r	1.203		
(5) Market Weight - w_x		21%	79%
(6) Implied Permissible Loss and LAE Ratio		0.804	0.668
(7) Implied Permissible Loss, LAE, and Fixed Expense Ratio		0.862	0.727
(8) Implied Permissible Loss, LAE, and Fixed Expense Ratio Differential	1.187		
(9) Variable Expense Ratio	20.3%	9.9%	23.1%
(10) Underwriting Profit Provision	4.13%		
(11) Implied Rate Factor Equivalent		1.003	0.999
(12) Implied Rate Differential, d	1.004		
(13) Residual Market Rate equivalent, Q_{rm}	1.003		
(14) Proportion of Total Voluntary Assessable Premium Not from Large Deductibles, u	0.740		
(15) Factor to Remove the Large Deductible Contribution to the Residual Market Subsidy	1.000		

Notes

(1): from Section VI-A, Exhibit 1 and Section VII-A, Exhibit 1

(2): Section VI-B, Exhibit 1, average of column (18).

(4): Loss Ratio Differential from Page 2, assumes LAE as % of loss is the same for Residual and Voluntary Market.

(5): Residual Market weight, w_{rm} , from Section I-E, Exhibit 2, Voluntary Market weight, $w_{vol} = 1.0 - w_{rm}$

(6): Voluntary Market Implied Permissible Loss and LAE Ratio = (3) / [(5 w_{rm}) x (4) + (5 w_{vol})]

Residual Market Permissible Implied Loss and LAE Ratio = (4) x (6) $_{vol}$

(7) = (2) + (6)

(8) = (7) $_{rm}$ / (7) $_{vol}$

(9): Section VI-A, Exhibit 1, Total Market; Residual Market commission calculated based on the Residual Market - Pool Procedures - Producer Fee Schedule.

Premium discounts were discontinued in the Residual Market effective 1/1/1991.

(10): Section VII-A, Exhibit 1.

(11) = (7) / [1.0 - (9) - (10)]

(12) = (11) $_{rm}$ / (11) $_{vol}$

(13) = d / [$w_{vol} + (w_{rm} \times d)$]

(14): Exhibit 2.

(15) = [1.0 - $w_{rm} \times Q_{rm} \times (1.0 - u)$] / [1.0 - $w_{rm} \times (1.0 - u)$]

Calculation of Residual Market to Voluntary Loss Ratio Differential
 (\$ amounts in millions)

Policy Year	Total Market			Residual Market			Voluntary Market			Loss Ratio Differential LR _{rm} / LR _{vol} = (7) / (10)
	Standard Earned Premium plus ARAP	Paid Losses and Case Reserves	Paid + Case Loss Ratio = (3) / (2)	Standard Earned Premium Plus ARAP	Paid Losses and Case Reserves	Paid + Case Loss Ratio = (6) / (5)	Standard Earned Premium Plus ARAP	Paid Losses and Case Reserves	Paid + Case Loss Ratio = (9) / (8)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
2012	967	583	60.3%	176	129	73.3%	791	454	57.4%	1.276
2013	1,019	575	56.4%	209	123	58.8%	810	452	55.8%	1.053
2014	1,077	666	61.8%	242	163	67.2%	835	503	60.2%	1.116
2015	1,150	645	56.1%	262	160	60.8%	888	485	54.7%	1.113
2016	1,198	625	52.2%	267	167	62.4%	931	459	49.3%	1.266
2017	1,270	606	47.7%	273	150	55.0%	997	456	45.8%	1.203
2018	1,233	471	38.2%	259	118	45.6%	974	353	36.2%	1.260
(12) Average Last 2 Years				266	134	50.5%	985	404	41.0%	1.229
(13) Average All Years				241	144	59.8%	889	452	50.8%	1.177
(14) Selected Loss Ratio Differential										1.203

Notes:
 Data as of 12/31/2019 from Aggregate Financial Database, excluding large deductible policies.

1000025

Residual Market Weight "w_{rm}"
 Proportion of Voluntary Assessable Premium Not from Large Deductibles "u"
 (\$ amounts in millions)

Calendar Year	Voluntary Assessable Premium Basis Used to Determine Shares of the Residual Market	Take-Out Program Written Premium	Take-Out Credits	Residual Market Direct Written Premium	Large Deductible Standard + ARAP Written Premium	Voluntary Non-Large Deductible Not in Take-Out Program Written Premium = (2) - (3) - (6) + (4)	Residual Market Weight "w _{rm} " = (5) / [(3) + (5) + (7)]	"u" -- Proportion of Assessable Premium Not from Large Deductibles = (7) / [(7) + (6)]
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
2018	1170	50	46	266	287	879	0.222	0.754
2019	1231	61	55	242	334	891	0.203	0.727
Selected	1200	55	51	254	311	885	0.213	0.740

Note:

Refers to the prospective effective period from 7/1/2022 through 7/1/2023.

(2),(3),(4),(5),(6): Massachusetts Workers' Compensation Assigned Risk Pool Special Bulletin No. SB-11-19 for Calendar Year 2018 and Special Bulletin No. SB-11-20 for Calendar Year 2019.

(2),(3),(4),(5),(6),(7): Selected based on two-year average of Calendar Year 2018 and 2019.

LOSS DEVELOPMENT

As explained in the 2003 Rate Decision, “[t]he ultimate value of losses cannot be determined from reported losses alone, because losses are not always reported immediately and loss values change over time as payments are made and reserves adjusted.” 2003 Rate Decision, page 5. Loss development thus requires an actuarial method of estimating the ultimate settlement value of losses based on “reported losses”¹ and historical patterns of development, i.e. the change in the observed value of a loss between valuation dates. Loss development factors are mathematically derived by analyzing the development of losses from initial reporting and reserving to the ultimate value at the time of the final settlement. The assumption is that losses develop in a consistent pattern over time so that historical experience can be used to predict future development.²Reported losses are developed to their estimated “ultimate” level based on historical loss development patterns. The pattern of change in reported losses over time is observed at regular intervals and converted into age-to-age link ratios, each of which reflects the ratio of the loss valued as of time (T+1) to the loss valued as of time T. When applied successively, age-to-age link ratios yield cumulative loss development factors. Cumulative loss development factors are then applied to current reported losses to estimate what the ultimate value of losses will be when all associated claims are settled.

¹ The term “reported losses” refers to either paid losses or paid losses plus case reserves.

² As explained in Section I, reviewing historical losses which were heavily distorted by COVID-19 to predict future development is problematic for several reasons. While the WCRIBMA understands the effects of COVID-19 will continue to be felt in the coming years, the current unemployment rates, the renewed availability of medical and other services, vaccines, therapeutics and the waning availability of federal payroll relief, all suggest that use of pre COVID-19 data (from Policy Years 2017 and 2018) is more predictive of the likely post July 2022 environment than the Policy Year 2018 and 2019 data.

II 000002

In this section of the Filing, reported losses for policy years 2017 and 2018 are developed to their estimated ultimate levels for the industry. Consistent with the Casualty Actuarial Society Statement of Principles Regarding Property and Casualty Insurance Ratemaking, the WCRIBMA has examined the results of more than one method of estimating ultimate losses in an effort to derive a reasonable estimate of losses. The selected estimate of ultimate losses is the average of the estimates derived by developing paid losses and by developing the sum of paid losses and case reserves. The paid loss data used in this filing are the actual inception-to-date paid losses net of subrogation and second injury fund recoveries. The case reserve data used in this filing are the claim-specific amounts held as reserves for anticipated future claims payments.

The 2017 policy year and 2018 policy year ultimate loss estimates used in the rate indication are calculated by multiplying the reported losses by the applicable loss development factor to ultimate, which is the product of all age-to-age development factors (including the tail factor discussed below) from a given month (“age”) of development forward to the point at which we expect no further development.

One of the goals when using historical data as the basis for the ultimate loss predictions is to balance stability with responsiveness. Stability is a desirable quality to avoid large fluctuations that are not representative of future anticipated losses. The more years that are considered, the more stable the result is likely to be. We must, however, also consider responsiveness: we only want to include data that we believe represent current and ongoing conditions. This, in turn, weighs in favor of using the most recent reliable data available.

II 000003

Due to the stability in the Massachusetts benefit delivery system and claim adjudication process,³ the WCRIBMA continues to select age-to-age development factors for the paid losses as the unweighted averages of the latest two indicated age-to-age link ratios. However, due to greater volatility in the paid plus case development, selected age-to-age development factors are the unweighted averages of the latest five years. One of the reasons for additional volatility in paid plus case results from the presence or absence of large losses in a given year.⁴ In order to better represent the occurrence of these events, a five year average is selected.

As in past filings, medical and indemnity losses are developed separately because of their differing development patterns. The use of separate medical and indemnity loss development factors avoids potential distortions that could arise from changes in the relative proportions of medical and indemnity losses over time. In this filing, we are developing losses for the entire industry. Section II-A, Exhibit 1 summarizes the results. The underlying details of the methodology are displayed in Section II-B.

Consistent with past filings, the historical experience of companies that have stopped writing new business in Massachusetts and that did not report policy experience valued as of the end of the latest calendar year has been excluded from our financial aggregate database in order to avoid distortions to the rate indication. In addition, this filing excludes Aggregate Financial Losses associated with the catastrophic events of

³ Workers' Compensation Research Institute CompScope™ (Benchmarks for Massachusetts, 16th Edition and Medical Benchmarks for Massachusetts, 20th Edition)

⁴ Large losses are being defined as lost-time claims where indemnity plus medical losses are greater than or equal to ten million dollars.

II 000004

September 11, 2001⁵ and loss data from a single claim with a calendar year change in excess of ten million dollars due to a subrogation recovery.⁶

The WCRIBMA uses historical data and the resultant loss development factors to develop the policy year paid and the paid plus case losses to 252 months. An industry based "tail factor" accounts for development beyond 252 months to ultimate (the point at which there is no further payment activity).

The indicated ultimate indemnity tail factor is then adjusted for escalation. We make this adjustment for escalated benefits because some of the losses in the loss development triangle do not reflect the change in the law that introduced inflation-based increases in indemnity benefits or lost wages. See St. 1986, c. 572. The development pattern of indemnity losses that are subject to escalation will differ from that of indemnity losses not subject to escalation (unless escalation is zero). See Section II-D for the details of the calculation.

⁵ Consistent with past practice since the 2003 filing.

⁶ Consistent with unit statistical data reporting requirements, carriers are required to submit corrections for first through fifth reports.

TAIL FACTORS

Workers' compensation carriers in Massachusetts report aggregated financial policy year loss experience to the WCRIBMA at year-end valuation points for twenty-one consecutive years (252 months). As a result, the WCRIBMA can develop losses to 252 months using the age-to-age link ratios previously described. However, workers' compensation losses may continue to develop well beyond 252 months. For instance, a young person could suffer a severe work-related injury and collect workers' compensation benefits for the balance of his/her lifetime, in some cases forty years or more. The "tail factor" accounts for such instances by considering loss development from 252 months of development to ultimate.

Beyond 252 months of development, policy year loss experience is aggregated for statistical reporting purposes and reported in total as a single value. This loss experience is summarized and reported each year as an aggregate number "prior to" a given policy year. This experience does not lend itself to the calculation and application of age-to-age link ratios. However, this data can be used to develop a tail factor, which is essentially a loss development factor to ultimate intended to account for all remaining loss development beyond a given point. In this filing, we derive tail factor estimates for loss development from 252 months of development to ultimate.

This filing uses the same method to develop the tail factor employed by the Commissioner in the 2003 Rate Decision and by the WCRIBMA in all subsequent rate filings. The WCRIBMA's estimation of tail factors involves calculating the calendar year

change in losses for all policy years included in the most recent “prior to” line and comparing that result to the reported losses for the oldest policy year not included in the “prior to” line.

We calculate separate tail factors directly for medical and indemnity losses in order to reflect their differing development patterns. Medical losses tend to develop differently than do indemnity losses (Section II-B). Application of separate tail factors captures the different development patterns and prevents the estimate of ultimate losses from being distorted by shifts in the proportions of medical and indemnity losses over time. Separate tail factors are also estimated for paid and paid-plus-case reported losses.

As in previous filings, the selected tail factor is based on the average of five observations in order to reduce volatility. Each of the five years, in this filing, have a common report level of 252 months so that the calculated tail factor is consistent with the losses to which it is applied. We then calculate a tail factor to project losses from 252 months to ultimate values. The tail factor calculation is detailed on Exhibit 1, Page 1 and Exhibit 2, Page 1 of Section II-C.

Growth Factor Adjustment

Changes in the level of ultimate losses over time can distort the calculation of the tail factor. Without a growth factor adjustment, the tail factor would aggregate all years beyond 252 months and calculate the factor based on the assumption that policy years prior to 1999 had the same level of ultimate losses as policy year 1999 – this assumption is not true. Stated mathematically, if the ratios used to calculate the tail factor reflect

II 000007

losses in the numerator that relate to a different level of ultimate losses than do the losses used in the denominator,⁷ the tail factor will be distorted. This is not a problem for the age-to-age link ratios used through 252 months of development that only use the data for a given policy year in the calculation. However, the growth factor is intended to adjust for differences in the ultimate value of losses across policy years, thereby creating a more accurate estimate of development in the tail (see Section II-C, Exhibit 1, Page 2 and Page 3 and Exhibit 2, Page 2 and Page 3). In this filing, as in the 2020 Filing, we develop indemnity and medical growth factors separately; and calculate the growth factor for each individual policy year that contributes to the tail. This is consistent with the rationale for developing losses separately for indemnity and medical and will better capture any shifts in data between benefit types and policy years, creating a more accurate estimate of development in the tail. The growth factors continue to be derived for both paid (Section II-C, Exhibit 1, Pages 2 and 3) and paid plus case (Section II-C, Exhibit 2, Pages 2 and 3). Conceptually, the growth factor decomposes the calendar year development for policy years prior to 1999, into individual policy year components, and then adjusts based on each policy year's estimated contribution to the aggregate development. The data underlying the calculation of the growth factor are the historical policy year losses from the Aggregate Financial data, evaluated as of the latest common development point, 108 months.⁸

⁷ See Formula in Section II-C: [(Inception-to-date losses for PYs Prior to Policy Year 1999 at 12/31/[Y] - Inception-to-date losses for PYs Prior to Policy Year 1999 at 12/31/[Y] - 1 year)] / (Losses for policy year 1999 at 12/31/[Y]).

⁸ The Aggregate Financial data has been used in lieu of Annual Statement data to eliminate potential distortions in the growth factor calculation due to the Annual Statement's inclusion of large deductible experience in the workers' compensation line of business. Aggregate Financial data valued as of 108 months was used because data for policy years 1969 through 1977 were only reported through 108 months of development.

ADJUSTMENT FOR ESCALATED BENEFITS

This section calculates factors that reflect the impact of the introduction of escalation (inflation-indexed wage loss benefit increases) on loss development. This adjustment for differences in development patterns is necessary because some of WCRIBMA's loss data predate the change in law introducing escalation of indemnity benefits. These older, unescalated losses exhibit a development pattern that will differ from the expected development of indemnity losses that are subject to escalation.

The statutory escalation of benefits became effective on October 1, 1986, following the passage of St. 1986, c. 582. Data collected for policy year 1987 and later years reflect the impact of escalation. In this filing, age-to-age link ratios are derived from experience for policy years 1999 and later to develop losses to 252 months. Beyond 252 months of development, loss development factors, including age-to-age link ratios and tail factors, are derived from experience for policy years 1999 and prior. Reported losses for policy years prior to 1987 do not reflect the impact of escalation and therefore the portion of the tail factor that is based on data from these years must be adjusted.

The same simulation model has been used to quantify the adjustment for escalated benefits at the WCRIBMA since our 2003 rate filing. The simulation model assumes that permanent total claimants experience impaired mortality.

Exhibits 1 and 2, in Section II-D, estimate the differentials between the escalated and non-escalated development factors for both the paid and paid-plus-case loss development

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Section II - Loss Development
Subsection A - Summary
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Section II - A
Page 9

methods, respectively. The resulting factors are the basis for the selected escalation factor used in the estimation of ultimate losses.

ACCIDENT YEAR PAID LOSS DEVELOPMENT FACTORS**Used in Section VII - Profit**

Accident year loss flows are needed for purposes of estimating a profit provision in Section VII. Using the financial aggregate data evaluated as of December 31, 2019, the WCRIBMA has updated the medical and the indemnity accident year paid losses used to derive an accident year payment pattern. The combined loss flow is a weighted average of the medical and indemnity paid loss flows.

Medical Paid Loss Flow

As with the policy year loss development, we develop accident year losses to 252 months. We compute accident year medical paid loss development factors from the averages of the two latest link ratios. Losses developed to 252 months are multiplied by a medical paid loss tail factor. For purposes of modeling cash flows in Section VII, a policy year medical paid loss tail factor is used, in lieu of developing a separate accident year tail factor.

Indemnity Paid Loss Flow

The flow for indemnity paid losses has been derived from the financial aggregate data using a method identical to the method used for medical paid losses except that the indemnity paid losses have been adjusted for escalation of benefits.

II 000011

Section II - Loss Development
 Subsection A - Loss Development Summary
 7/1/2022

Section II - A
 Exhibit 1

Summary of Estimated Ultimate Losses Industry

Paid Loss Development Method

Policy Year (1)	Benefit Type (2)	Paid Losses at 12/31/19 (3)	Cumulative Factors from Latest Month to 252 Months (4)	Losses Developed to 252 Months (5)	Tail Factor from 252 Months to Ultimate (6)	Factor to Adjust for Escalated Benefits (7)	Estimated Ultimate Losses (8)
2017	Indemnity	265,134,215	1.689	447,893,527	1.036	1.037	481,201,829
2017	Medical	172,563,579	1.293	223,100,576	1.077	1.000	240,341,463
2017	Total	437,697,794		670,994,103			721,543,291
2018	Indemnity	144,804,518	3.189	461,807,010	1.036	1.037	496,150,009
2018	Medical	138,169,849	1.656	228,843,353	1.077	1.000	246,528,033
2018	Total	282,974,367		690,650,363			742,678,042

Paid Plus Case Loss Development Method

Policy Year (9)	Benefit Type (10)	Paid Plus Case Losses at 12/31/19 (11)	Cumulative Factors from Latest Month to 252 Months (12)	Losses Developed to 252 Months (13)	Tail Factor from 252 Months to Ultimate (14)	Factor to Adjust for Escalated Benefits (15)	Estimated Ultimate Losses (16)
2017	Indemnity	373,977,130	1.239	463,197,172	1.016	1.007	474,114,588
2017	Medical	232,214,913	0.988	229,499,290	1.017	1.000	233,314,817
2017	Total	606,192,043		692,696,463			707,429,405
2018	Indemnity	256,002,748	1.760	450,628,459	1.016	1.007	461,249,634
2018	Medical	214,948,316	1.050	225,800,138	1.017	1.000	229,554,165
2018	Total	470,951,064		676,428,597			690,803,799

Notes:

(3), (11): Aggregate Financial Data.

(4), (12): Section II - B, Exhibit 1.

(5) = (3) x (4)

(6): Section II - C, Exhibit 1, Page 1.

(7): Section II - D, Exhibit 1, Page 1.

(8) = (5) x (6) x (7)

(13) = (11) x (12)

(14): Section II - C, Exhibit 2, Page 1.

(15): Section II - D, Exhibit 2, Page 1.

(16) = (13) x (14) x (15)

Policy Year Aggregate Financial Data
 Summary of Loss Development Factors
 Industry

Loss Development Factors From																			
Months of Development	24-36	36-48	48-60	60-72	72-84	84-96	96-108	108-120	120-132	132-144	144-156	156-168	168-180	180-192	192-204	204-216	216-228	228-240	240-252
<u>(1) Indemnity Paid Losses</u>																			
2 Year Average	1.888	1.314	1.130	1.045	1.028	1.015	1.008	1.006	1.006	1.004	1.003	1.003	1.002	1.004	1.002	1.002	1.000	1.001	1.001
Cumulative Factor to 252	3.189	1.689	1.285	1.137	1.088	1.058	1.043	1.034	1.027	1.021	1.017	1.014	1.011	1.010	1.006	1.004	1.003	1.002	1.001
<u>(2) Medical Paid Losses</u>																			
2 Year Average	1.281	1.087	1.034	1.020	1.009	1.012	1.012	1.008	1.006	1.006	1.010	1.010	1.006	1.007	1.006	1.008	1.007	1.009	1.006
Cumulative Factor to 252	1.656	1.293	1.189	1.150	1.127	1.117	1.104	1.091	1.082	1.076	1.070	1.060	1.049	1.043	1.036	1.030	1.022	1.015	1.006
<u>(3) Indemnity Paid Plus Case Losses</u>																			
5 Year Average	1.421	1.128	1.058	1.017	1.004	1.000	0.998	1.004	1.001	1.002	1.003	1.002	1.000	1.001	1.001	1.000	1.000	1.001	1.001
Cumulative Factor to 252	1.760	1.239	1.098	1.037	1.020	1.016	1.016	1.017	1.013	1.012	1.010	1.006	1.005	1.004	1.003	1.002	1.002	1.002	1.001
<u>(4) Medical Paid Plus Case Losses</u>																			
5 Year Average	1.063	1.020	1.000	0.996	0.994	0.996	0.998	0.992	0.998	0.997	1.000	1.004	1.002	0.995	0.997	1.003	1.002	0.996	0.998
Cumulative Factor to 252	1.050	0.988	0.969	0.968	0.972	0.978	0.982	0.984	0.992	0.994	0.997	0.996	0.992	0.990	0.995	0.998	0.995	0.993	0.998

Notes:

- (1): Exhibit 2, Page 1.
- (2): Exhibit 2, Page 2.
- (3): Exhibit 3, Page 1.
- (4): Exhibit 3, Page 2.

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Section II - Loss Development
Subsection B - Policy Year Data
7/1/2022

Section II - B
Exhibit 2
Page 1

Policy Year Aggregate Financial Data
Calculation of Indemnity Paid Loss Development Factors
Industry

Policy Year	Losses (in 000's) Evaluated at Month		Loss Development Factor	Policy Year	Losses (in 000's) Evaluated at Month		Loss Development Factor
	24	36			144	156	
2013	119,582	224,775	1.880	2003	306,438	308,509	1.007
2014	129,875	245,269	1.896	2004	339,653	342,360	1.008
2015	134,978	251,451	1.863	2005	333,205	334,563	1.004
2016	133,963	254,308	1.898	2006	328,492	327,748	1.004
2017	140,625	264,007	1.877	2007	337,321	338,289	1.003
2 Yr Average			1.888	2 Yr Average			1.003
5 Yr Average			1.883	5 Yr Average			1.005
Selected Average			1.888	Selected Average			1.003
	36	48			156	168	
2012	209,638	280,862	1.340	2002	291,074	292,501	1.005
2013	224,775	294,625	1.311	2003	308,509	309,420	1.003
2014	246,269	333,986	1.356	2004	342,360	343,442	1.003
2015	251,451	334,318	1.330	2005	334,563	335,196	1.002
2016	254,308	330,448	1.299	2006	327,748	328,850	1.003
2 Yr Average			1.314	2 Yr Average			1.003
5 Yr Average			1.327	5 Yr Average			1.003
Selected Average			1.314	Selected Average			1.003
	48	60			168	180	
2011	285,922	326,090	1.140	2001	274,016	274,534	1.002
2012	280,862	324,037	1.154	2002	292,501	293,433	1.003
2013	294,625	335,498	1.139	2003	309,420	309,764	1.001
2014	333,986	380,253	1.139	2004	343,442	343,888	1.001
2015	334,318	375,187	1.122	2005	335,196	335,825	1.002
2 Yr Average			1.130	2 Yr Average			1.002
5 Yr Average			1.139	5 Yr Average			1.002
Selected Average			1.130	Selected Average			1.002
	60	72			180	192	
2010	302,715	322,599	1.066	2000	273,667	274,491	1.003
2011	326,090	343,211	1.053	2001	274,534	276,325	1.007
2012	324,037	345,608	1.067	2002	293,433	293,734	1.001
2013	335,498	350,903	1.046	2003	309,764	310,596	1.003
2014	380,253	396,979	1.044	2004	343,888	345,401	1.004
2 Yr Average			1.045	2 Yr Average			1.004
5 Yr Average			1.055	5 Yr Average			1.004
Selected Average			1.045	Selected Average			1.004
	72	84			192	204	
2009	298,600	305,222	1.022	1999	243,835	244,438	1.002
2010	322,599	331,226	1.027	2000	274,491	274,759	1.001
2011	343,211	350,566	1.021	2001	276,325	276,525	1.001
2012	345,608	355,530	1.029	2002	293,734	294,124	1.001
2013	350,903	360,538	1.027	2003	310,596	311,300	1.002
2 Yr Average			1.028	2 Yr Average			1.002
5 Yr Average			1.025	5 Yr Average			1.002
Selected Average			1.028	Selected Average			1.002
	84	96			204	216	
2008	316,385	320,672	1.014	1998	228,137	229,349	1.005
2009	305,222	309,808	1.015	1999	244,438	245,423	1.004
2010	331,226	334,920	1.011	2000	274,759	274,981	1.001
2011	350,566	355,991	1.015	2001	276,525	277,130	1.002
2012	355,530	360,739	1.015	2002	294,124	294,430	1.001
2 Yr Average			1.015	2 Yr Average			1.002
5 Yr Average			1.014	5 Yr Average			1.003
Selected Average			1.015	Selected Average			1.002
	96	108			216	228	
2007	327,440	331,889	1.014	1997	211,904	212,513	1.003
2008	320,672	322,552	1.006	1998	229,349	229,771	1.002
2009	309,808	312,417	1.008	1999	245,423	245,579	1.001
2010	334,920	336,434	1.005	2000	274,981	275,228	1.001
2011	355,991	360,329	1.012	2001	277,130	277,093	1.000
2 Yr Average			1.008	2 Yr Average			1.000
5 Yr Average			1.009	5 Yr Average			1.001
Selected Average			1.008	Selected Average			1.000
	108	120			228	240	
2006	321,289	322,697	1.004	1996	200,415	200,723	1.002
2007	331,889	334,211	1.007	1997	212,513	213,414	1.004
2008	322,552	324,463	1.006	1998	229,771	230,488	1.003
2009	312,417	314,258	1.006	1999	245,579	245,896	1.001
2010	336,434	338,720	1.007	2000	275,228	275,515	1.001
2 Yr Average			1.006	2 Yr Average			1.001
5 Yr Average			1.006	5 Yr Average			1.002
Selected Average			1.006	Selected Average			1.001
	120	132			240	252	
2005	330,346	331,809	1.004	1995	220,882	221,228	1.002
2006	322,697	325,557	1.009	1996	200,723	200,991	1.001
2007	334,211	335,491	1.004	1997	213,414	213,776	1.002
2008	324,463	327,323	1.009	1998	230,488	230,820	1.001
2009	314,258	315,188	1.003	1999	245,896	246,167	1.001
2 Yr Average			1.006	2 Yr Average			1.001
5 Yr Average			1.006	5 Yr Average			1.001
Selected Average			1.006	Selected Average			1.001
	132	144					
2004	336,905	339,653	1.008				
2005	331,809	333,205	1.004				
2006	325,557	326,492	1.003				
2007	335,491	337,321	1.005				
2008	327,323	328,069	1.002				
2 Yr Average			1.004				
5 Yr Average			1.005				
Selected Average			1.004				

Notes:
Losses from Aggregate Financial Data.

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Section II - Loss Development
Subsection B - Policy Year Data
7/1/2022

Section II - B
Exhibit 2
Page 2

Policy Year Aggregate Financial Data
Calculation of Medical Paid Loss Development Factors
Industry

Policy Year	Losses (in 000's) Evaluated at Month		Loss Development Factor	Policy Year	Losses (in 000's) Evaluated at Month		Loss Development Factor
<hr/>							
24 36							
2013	116,206	148,983	1.282	2003	158,812	158,159	1.009
2014	127,654	168,068	1.301	2004	171,969	173,307	1.008
2015	126,708	164,287	1.297	2005	169,612	170,892	1.008
2016	129,008	162,811	1.262	2006	173,287	175,831	1.015
2017	132,279	171,979	1.300	2007	173,277	174,073	1.005
2 Yr Average			1.281	2 Yr Average			1.010
5 Yr Average			1.288	5 Yr Average			1.009
Selected Average			1.281	Selected Average			1.010
<hr/>							
36 48							
2012	147,535	160,651	1.089	2002	146,298	147,646	1.009
2013	148,983	160,964	1.080	2003	158,159	159,469	1.008
2014	166,068	181,331	1.092	2004	173,307	174,579	1.007
2015	164,287	178,683	1.088	2005	170,892	171,903	1.006
2016	162,811	176,948	1.087	2006	175,831	178,471	1.015
2 Yr Average			1.087	2 Yr Average			1.010
5 Yr Average			1.087	5 Yr Average			1.009
Selected Average			1.087	Selected Average			1.010
<hr/>							
48 60							
2011	160,284	166,472	1.039	2001	129,213	130,369	1.009
2012	160,651	166,330	1.035	2002	147,646	148,914	1.009
2013	160,964	165,520	1.028	2003	159,469	160,489	1.006
2014	181,331	188,175	1.038	2004	174,579	175,346	1.004
2015	178,683	183,985	1.030	2005	171,903	173,142	1.007
2 Yr Average			1.034	2 Yr Average			1.006
5 Yr Average			1.034	5 Yr Average			1.007
Selected Average			1.034	Selected Average			1.006
<hr/>							
60 72							
2010	158,660	161,452	1.018	2000	123,295	124,225	1.008
2011	166,472	170,599	1.025	2001	130,369	131,344	1.007
2012	166,330	168,522	1.013	2002	148,914	150,213	1.009
2013	165,520	168,364	1.017	2003	160,489	161,604	1.007
2014	188,175	192,590	1.023	2004	175,346	176,458	1.006
2 Yr Average			1.020	2 Yr Average			1.007
5 Yr Average			1.019	5 Yr Average			1.007
Selected Average			1.020	Selected Average			1.007
<hr/>							
72 84							
2009	155,123	157,101	1.013	1999	115,888	117,423	1.013
2010	161,452	165,015	1.022	2000	124,225	125,582	1.011
2011	170,599	172,630	1.012	2001	131,344	132,400	1.008
2012	168,522	170,128	1.010	2002	150,213	151,253	1.007
2013	168,364	169,822	1.009	2003	161,604	162,471	1.005
2 Yr Average			1.009	2 Yr Average			1.006
5 Yr Average			1.013	5 Yr Average			1.009
Selected Average			1.009	Selected Average			1.006
<hr/>							
84 96							
2008	155,523	156,703	1.008	1998	111,689	112,472	1.007
2009	157,101	157,351	1.002	1999	117,423	118,491	1.009
2010	165,015	167,184	1.013	2000	125,582	126,934	1.011
2011	172,630	174,846	1.013	2001	132,400	133,289	1.007
2012	170,128	172,100	1.012	2002	151,253	152,569	1.009
2 Yr Average			1.012	2 Yr Average			1.008
5 Yr Average			1.009	5 Yr Average			1.008
Selected Average			1.012	Selected Average			1.008
<hr/>							
96 108							
2007	168,388	169,832	1.009	1997	99,715	100,106	1.004
2008	156,703	157,783	1.007	1998	112,472	113,660	1.011
2009	157,351	158,626	1.008	1999	118,491	119,496	1.008
2010	167,184	169,265	1.012	2000	126,934	127,907	1.008
2011	174,846	176,859	1.012	2001	133,289	134,122	1.006
2 Yr Average			1.012	2 Yr Average			1.007
5 Yr Average			1.010	5 Yr Average			1.007
Selected Average			1.012	Selected Average			1.007
<hr/>							
108 120							
2006	166,494	168,565	1.012	1996	97,376	98,311	1.010
2007	169,832	171,043	1.007	1997	100,106	100,450	1.003
2008	157,783	158,502	1.005	1998	113,660	114,473	1.007
2009	158,626	159,701	1.007	1999	119,496	120,376	1.007
2010	169,265	170,754	1.009	2000	127,907	129,276	1.011
2 Yr Average			1.008	2 Yr Average			1.009
5 Yr Average			1.008	5 Yr Average			1.008
Selected Average			1.008	Selected Average			1.009
<hr/>							
120 132							
2005	166,606	168,180	1.009	1995	99,550	100,585	1.010
2006	168,565	170,881	1.014	1996	98,311	98,873	1.006
2007	171,043	172,264	1.007	1997	100,450	100,941	1.005
2008	158,502	159,364	1.005	1998	114,473	115,025	1.005
2009	159,701	160,600	1.006	1999	120,376	121,227	1.007
2 Yr Average			1.006	2 Yr Average			1.006
5 Yr Average			1.008	5 Yr Average			1.007
Selected Average			1.006	Selected Average			1.006
<hr/>							
132 144							
2004	170,816	171,969	1.007				
2005	168,180	169,612	1.009				
2006	170,881	173,287	1.014				
2007	172,264	173,277	1.006				
2008	159,364	160,190	1.005				
2 Yr Average			1.006				
5 Yr Average			1.008				
Selected Average			1.006				

Notes:
Losses from Aggregate Financial Data.

II 000015

Section II - Loss Development
Subsection B - Policy Year Data
7/1/2022

Section II - B
Exhibit 3
Page 1

Policy Year Aggregate Financial Data Calculation of Indemnity Paid Plus Case Loss Development Factors Industry

Policy Year	Losses (in 000's) Evaluated at Month		Loss Development Factor	Policy Year	Losses (in 000's) Evaluated at Month		Loss Development Factor
	24	36			144	156	
2013	229,927	312,522	1.359	2003	312,502	314,104	1.005
2014	244,254	352,317	1.442	2004	347,575	349,670	1.006
2015	250,030	350,206	1.401	2005	339,106	340,492	1.004
2016	243,872	349,444	1.433	2006	331,967	332,165	1.001
2017	253,293	372,535	1.471	2007	341,789	342,240	1.001
2 Yr Average			1.452	2 Yr Average			1.001
5 Yr Average			1.421	5 Yr Average			1.003
Selected Average			1.421	Selected Average			1.003
	36	48			156	168	
2012	295,536	336,193	1.138	2002	297,768	299,173	1.005
2013	312,522	345,728	1.106	2003	314,104	314,258	1.000
2014	352,317	397,448	1.128	2004	349,670	350,152	1.001
2015	350,206	397,872	1.136	2005	340,492	341,112	1.002
2016	349,444	396,395	1.134	2006	332,165	332,015	1.000
2 Yr Average			1.135	2 Yr Average			1.001
5 Yr Average			1.128	5 Yr Average			1.002
Selected Average			1.128	Selected Average			1.002
	48	60			168	180	
2011	339,760	361,909	1.065	2001	279,210	279,350	1.001
2012	336,193	357,842	1.064	2002	299,173	298,899	0.999
2013	345,728	365,655	1.058	2003	314,258	314,324	1.000
2014	397,448	420,136	1.057	2004	350,152	350,667	1.001
2015	397,872	416,363	1.046	2005	341,112	341,419	1.001
2 Yr Average			1.052	2 Yr Average			1.001
5 Yr Average			1.058	5 Yr Average			1.000
Selected Average			1.058	Selected Average			1.000
	60	72			180	192	
2010	335,871	343,560	1.023	2000	278,226	278,420	1.001
2011	361,909	365,360	1.010	2001	279,350	278,959	0.999
2012	357,842	366,809	1.025	2002	298,899	299,211	1.001
2013	365,655	373,398	1.021	2003	314,324	315,309	1.003
2014	420,136	423,602	1.008	2004	350,667	351,954	1.004
2 Yr Average			1.015	2 Yr Average			1.003
5 Yr Average			1.017	5 Yr Average			1.001
Selected Average			1.017	Selected Average			1.001
	72	84			192	204	
2009	322,656	322,896	1.001	1999	248,309	249,052	1.003
2010	343,560	342,165	0.996	2000	278,420	278,545	1.000
2011	365,360	366,981	1.004	2001	278,959	279,221	1.001
2012	366,809	372,037	1.014	2002	299,211	299,630	1.001
2013	373,398	374,723	1.004	2003	315,309	315,184	1.000
2 Yr Average			1.009	2 Yr Average			1.001
5 Yr Average			1.004	5 Yr Average			1.001
Selected Average			1.004	Selected Average			1.001
	84	96			204	216	
2008	332,778	331,480	0.996	1998	233,493	233,601	1.000
2009	322,896	322,917	1.000	1999	249,052	248,509	0.998
2010	342,165	342,875	1.002	2000	278,545	278,688	1.001
2011	366,981	367,981	1.003	2001	279,221	279,379	1.001
2012	372,037	371,882	1.000	2002	299,630	299,790	1.001
2 Yr Average			1.001	2 Yr Average			1.001
5 Yr Average			1.000	5 Yr Average			1.000
Selected Average			1.000	Selected Average			1.000
	96	108			216	228	
2007	341,234	340,683	0.998	1997	216,382	216,259	0.999
2008	331,480	329,949	0.995	1998	233,601	234,231	1.003
2009	322,917	321,554	0.996	1999	248,509	248,612	1.000
2010	342,875	343,244	1.001	2000	278,688	278,789	1.000
2011	367,981	368,276	1.001	2001	279,379	279,165	0.999
2 Yr Average			1.001	2 Yr Average			1.000
5 Yr Average			0.998	5 Yr Average			1.000
Selected Average			0.998	Selected Average			1.000
	108	120			228	240	
2006	329,355	330,565	1.004	1996	204,614	204,512	1.000
2007	340,683	340,946	1.001	1997	216,259	216,957	1.003
2008	329,949	332,672	1.008	1998	234,231	234,174	1.000
2009	321,554	323,314	1.005	1999	248,612	248,569	1.000
2010	343,244	344,660	1.004	2000	278,789	279,040	1.001
2 Yr Average			1.005	2 Yr Average			1.000
5 Yr Average			1.004	5 Yr Average			1.001
Selected Average			1.004	Selected Average			1.001
	120	132			240	252	
2005	338,560	338,347	0.999	1995	225,327	225,777	1.002
2006	330,565	331,411	1.003	1996	204,512	204,468	1.000
2007	340,946	341,894	1.003	1997	216,957	217,139	1.001
2008	332,672	333,716	1.003	1998	234,174	234,469	1.001
2009	323,314	322,415	0.997	1999	248,569	248,701	1.001
2 Yr Average			1.000	2 Yr Average			1.001
5 Yr Average			1.001	5 Yr Average			1.001
Selected Average			1.001	Selected Average			1.001
	132	144					
2004	346,604	347,575	1.003				
2005	338,347	339,106	1.002				
2006	331,411	331,967	1.002				
2007	341,894	341,789	1.000				
2008	333,716	334,599	1.003				
2 Yr Average			1.001				
5 Yr Average			1.002				
Selected Average			1.002				

Notes:
Losses from Aggregate Financial Data.

II 000016

Policy Year Aggregate Financial Data
 Calculation of Medical Paid Plus Case Loss Development Factors
 Industry

Policy Year	Losses (in 000's) Evaluated at Month		Loss Development Factor	Policy Year	Losses (in 000's) Evaluated at Month		Loss Development Factor
	24	36			144	156	
2013	193,215	199,181	1.031	2003	178,457	177,741	0.996
2014	223,897	237,260	1.060	2004	197,933	197,064	0.996
2015	209,227	226,561	1.083	2005	191,363	193,653	1.012
2016	209,540	219,835	1.049	2006	199,385	200,679	1.006
2017	211,950	231,458	1.092	2007	190,676	188,994	0.991
2 Yr Average			1.071	2 Yr Average			0.999
5 Yr Average			1.063	5 Yr Average			1.000
Selected Average			1.063	Selected Average			1.000
2012	209,211	216,400	1.034	2002	170,110	171,879	1.010
2013	199,181	198,797	0.998	2003	177,741	178,074	1.002
2014	237,260	240,904	1.015	2004	197,064	197,030	1.000
2015	226,561	231,441	1.022	2005	193,653	193,665	1.000
2016	219,835	226,908	1.032	2006	200,679	202,244	1.008
2 Yr Average			1.027	2 Yr Average			1.004
5 Yr Average			1.020	5 Yr Average			1.004
Selected Average			1.020	Selected Average			1.004
2011	213,313	214,288	1.005	2001	154,076	154,819	1.005
2012	216,400	217,351	1.004	2002	171,879	172,501	1.004
2013	198,797	200,174	1.007	2003	178,074	178,995	1.005
2014	240,904	241,360	1.002	2004	197,030	197,700	1.003
2015	231,441	227,844	0.984	2005	193,665	192,758	0.995
2 Yr Average			0.993	2 Yr Average			0.999
5 Yr Average			1.000	5 Yr Average			1.002
Selected Average			1.000	Selected Average			1.002
2010	199,077	200,362	1.006	2000	156,555	152,726	0.976
2011	214,288	210,652	0.983	2001	154,819	154,446	0.998
2012	217,351	214,837	0.988	2002	172,501	172,067	0.997
2013	200,174	200,669	1.002	2003	178,995	180,265	1.007
2014	241,360	240,824	0.998	2004	197,700	197,344	0.998
2 Yr Average			1.000	2 Yr Average			1.003
5 Yr Average			0.996	5 Yr Average			0.995
Selected Average			0.996	Selected Average			0.995
2009	190,396	188,980	0.993	1999	138,740	140,097	1.010
2010	200,362	200,496	1.001	2000	152,726	152,404	0.998
2011	210,652	211,840	1.006	2001	154,446	154,215	0.999
2012	214,837	210,352	0.979	2002	172,067	171,959	0.999
2013	200,669	198,983	0.992	2003	180,265	176,404	0.979
2 Yr Average			0.985	2 Yr Average			0.989
5 Yr Average			0.994	5 Yr Average			0.997
Selected Average			0.994	Selected Average			0.997
2008	176,012	173,242	0.984	1998	139,630	138,967	0.995
2009	188,980	186,625	0.988	1999	140,097	143,081	1.021
2010	200,496	202,627	1.011	2000	152,404	151,880	0.997
2011	211,840	210,870	0.995	2001	154,215	154,467	1.002
2012	210,352	210,719	1.002	2002	171,959	171,672	0.998
2 Yr Average			0.999	2 Yr Average			1.000
5 Yr Average			0.996	5 Yr Average			1.003
Selected Average			0.996	Selected Average			1.003
2007	194,610	192,684	0.990	1997	109,699	110,085	1.004
2008	173,242	172,736	0.997	1998	138,967	139,668	1.005
2009	186,625	186,936	1.002	1999	143,081	143,436	1.002
2010	202,627	203,131	1.002	2000	151,880	152,345	1.003
2011	210,870	210,721	0.999	2001	154,467	153,773	0.996
2 Yr Average			1.001	2 Yr Average			0.999
5 Yr Average			0.998	5 Yr Average			1.002
Selected Average			0.998	Selected Average			1.002
2006	198,139	199,942	1.009	1996	109,718	110,352	1.006
2007	192,684	191,694	0.995	1997	110,085	109,539	0.995
2008	172,736	172,300	0.997	1998	139,668	136,328	0.976
2009	186,936	184,026	0.984	1999	143,436	143,919	1.003
2010	203,131	198,256	0.976	2000	152,345	152,003	0.998
2 Yr Average			0.980	2 Yr Average			1.001
5 Yr Average			0.992	5 Yr Average			0.996
Selected Average			0.992	Selected Average			0.996
2005	192,840	191,885	0.995	1995	109,341	109,936	1.005
2006	199,942	199,685	0.999	1996	110,352	109,642	0.994
2007	191,694	192,763	1.006	1997	109,539	109,618	1.001
2008	172,300	172,788	1.003	1998	136,328	136,218	0.999
2009	184,026	181,545	0.987	1999	143,919	142,501	0.990
2 Yr Average			0.995	2 Yr Average			0.995
5 Yr Average			0.998	5 Yr Average			0.998
Selected Average			0.998	Selected Average			0.998
2004	197,812	197,933	1.001				
2005	191,885	191,353	0.997				
2006	199,685	199,385	0.999				
2007	192,763	190,676	0.989				
2008	172,788	173,059	1.002				
2 Yr Average			0.995				
5 Yr Average			0.997				
Selected Average			0.997				

Notes:
 Losses from Aggregate Financial Data.

Paid Loss Tail Factors

Indemnity Paid 252nd Month to Ultimate Loss Tail Development Factor

(1) Policy Year	(2) Losses for Policy Year 252 mo	(3) Losses for All Prior Years		(5) 252 - Ult for PY	(6) Growth Factor	(7) Indicated 252 - Ult for PY
		Previous	Current			
1994	220,907,502		9,166,140,668			
1995	221,228,456	9,387,048,170	9,400,885,890	1.063	0.500	1.031
1996	200,990,876	9,622,114,346	9,635,623,554	1.067	0.480	1.032
1997	213,776,022	9,836,614,430	9,853,854,775	1.081	0.510	1.041
1998	230,819,822	10,067,630,797	10,082,109,894	1.063	0.570	1.036
1999	246,167,495	10,312,929,716	10,327,786,341	1.060	0.630	1.038
					5yr average	1.036

Medical Paid 252nd Month to Ultimate Loss Tail Development Factor

(8) Policy Year	(9) Losses for Policy Year 252 mo	(10) Losses for All Prior Years		(12) 252 - Ult for PY	(13) Growth Factor	(14) Indicated 252 - Ult for PY
		Previous	Current			
1994	110,818,128		2,840,665,024			
1995	100,585,212	2,951,483,152	2,962,341,528	1.108	0.730	1.079
1996	98,872,873	3,062,926,740	3,073,877,787	1.111	0.710	1.079
1997	100,940,783	3,172,750,660	3,183,985,887	1.111	0.750	1.083
1998	115,024,553	3,284,926,670	3,295,060,885	1.088	0.820	1.072
1999	121,227,075	3,410,085,438	3,420,407,239	1.085	0.860	1.073
					5yr average	1.077

Notes:

- (2), (3), (4): Indemnity Paid Losses from Aggregate Financial Data.
- (9), (10), (11): Medical Paid Losses from Aggregate Financial Data.
- (5) = $1.000 + ((4)-(3)) / (2)$
- (6): From Page 2
- (7) = $1.000 + [(5) - 1.000] \times (6)$
- (12) = $1.000 + ((11)-(10)) / (9)$
- (13): From Page 3
- (14) = $1.000 + [(12) - 1.000] \times (13)$

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Growth Factor Adjustment
 Indemnity Paid Losses

Policy Year (1)	Paid Losses (2)	Relative Development for Report Interval (3)					Dollar Development					On-Level Dollar Development						
							Prior to 1999	Prior to 1998	Prior to 1997 (4)	Prior to 1996	Prior to 1995	Prior to 1999	Prior to 1998	Prior to 1997 (5)	Prior to 1996	Prior to 1995		
1970	63,137,628																	
1971	62,891,597			0.010%	0.019%												18,885	39,813
1972	69,381,355			0.013%	0.020%	0.029%											37,771	59,720
1973	80,756,773		0.011%	0.025%	0.030%	0.039%											25,192	79,627
1974	85,055,307	0.012%	0.022%	0.038%	0.039%	0.048%	9,880	18,682	32,225	33,538	41,092	27,134	47,761	75,575	75,542		99,533	
1975	85,395,338	0.023%	0.033%	0.051%	0.049%	0.058%	19,840	28,134	43,138	42,090	49,508	54,267	71,641	100,767	94,427		119,440	
1976	102,015,770	0.035%	0.044%	0.063%	0.059%	0.068%	35,552	44,813	64,417	60,338	69,001	81,401	95,522	125,958	113,313		139,347	
1977	118,593,916	0.046%	0.055%	0.076%	0.069%	0.077%	55,106	65,120	89,863	81,834	91,673	108,535	119,402	151,150	132,198		159,254	
1978	166,564,835	0.058%	0.066%	0.088%	0.079%	0.087%	96,745	109,753	147,247	131,355	144,849	135,669	143,283	176,342	151,083		179,160	
1979	192,792,326	0.070%	0.077%	0.101%	0.089%	0.097%	134,374	148,207	194,781	171,044	186,285	162,802	167,163	201,533	169,969		199,067	
1980	212,043,084	0.081%	0.088%	0.114%	0.099%	0.106%	172,424	186,292	241,009	209,025	225,375	189,936	191,044	226,725	188,854		218,974	
1981	252,097,708	0.093%	0.099%	0.126%	0.108%	0.116%	234,279	249,168	318,372	273,361	292,307	217,070	214,924	251,917	207,740		238,880	
1982	276,921,035	0.105%	0.110%	0.139%	0.118%	0.126%	289,517	304,114	384,693	327,576	347,847	244,204	238,805	277,108	226,625		258,787	
1983	311,543,761	0.116%	0.121%	0.152%	0.128%	0.135%	361,905	376,351	472,135	399,243	421,440	271,337	262,685	302,300	245,511		278,694	
1984	372,535,568	0.128%	0.132%	0.164%	0.138%	0.145%	476,031	490,942	611,614	514,127	539,943	298,471	286,566	327,491	264,396		298,600	
1985	456,450,413	0.139%	0.143%	0.177%	0.148%	0.155%	636,282	651,655	807,027	674,931	705,671	325,605	310,446	352,683	283,281		318,507	
1986	575,847,592	0.151%	0.154%	0.189%	0.158%	0.164%	869,613	885,353	1,090,850	908,243	945,900	352,738	334,327	377,875	302,167		338,414	
1987	728,208,974	0.163%	0.165%	0.202%	0.168%	0.174%	1,184,293	1,199,577	1,471,439	1,220,336	1,266,535	379,872	358,207	403,066	321,052		358,320	
1988	803,578,792	0.174%	0.176%	0.215%	0.177%	0.184%	1,400,215	1,411,982	1,725,216	1,425,855	1,475,267	407,006	382,088	428,258	339,938		378,227	
1989	834,565,649	0.186%	0.187%	0.227%	0.187%	0.193%	1,551,156	1,558,082	1,897,139	1,563,107	1,612,795	434,140	405,968	453,450	358,823		398,134	
1990	760,063,373	0.197%	0.198%	0.240%	0.197%	0.203%	1,500,976	1,502,461	1,823,768	1,498,492	1,542,260	461,273	429,849	478,641	377,708		418,041	
1991	508,420,699	0.209%	0.209%	0.253%	0.207%	0.213%	1,063,092	1,060,859	1,284,161	1,052,488	1,080,773	488,407	453,729	503,833	396,594		437,947	
1992	312,473,246	0.221%	0.220%	0.265%	0.217%	0.222%	689,670	686,315	828,702	677,657	694,431	515,541	477,610	529,025	415,479		457,854	
1993	253,188,245	0.232%	0.231%	0.278%	0.227%	0.232%	588,232	583,907	703,449	574,045	587,142	542,675	501,490	554,216	434,365		477,761	
1994	205,663,616	0.244%	0.242%	0.290%	0.237%	0.242%	501,709	496,891	597,381	486,568	496,805	569,808	525,371	579,408	453,250		497,667	
1995	206,020,566	0.256%	0.253%	0.303%	0.246%		526,512	520,378	624,436	507,721		596,942	549,251	604,600	472,136			
1996	191,580,888	0.267%	0.264%	0.316%			511,865	504,945	604,865			624,076	573,132	629,791				
1997	199,475,908	0.279%	0.275%				556,131	547,660				651,209	597,012					
1998	217,451,423	0.290%					631,506					678,343						
1999	233,579,304																	
							14,096,906	13,640,511	16,087,087	12,876,734	12,886,475	8,818,462	7,761,157	8,187,287	6,137,763	6,469,675		
(6) Indicated Growth Factor:												0.626	0.569	0.509	0.477	0.502		
(7) Selected Growth Factor:												0.630	0.570	0.510	0.480	0.500		

II 000018

Notes:
 (2): Losses from Aggregate Financial Data evaluated as of 108 months.
 (3): Estimated % paid loss emergence for the report interval.
 (4) = (2) x (3)
 (5) = (3) x [(2) for PY199X] respectively for each 'Prior to 199X' column
 (6) = [Sum of (5)] / [Sum of (4)]

Growth Factor Adjustment
 Medical Paid Losses

Policy Year (1)	Paid Losses (2)	Relative Development for Report Interval (3)					Dollar Development (4)					On-Level Dollar Development (5)				
		Prior to 1999	Prior to 1998	Prior to 1997	Prior to 1996	Prior to 1995	Prior to 1999	Prior to 1998	Prior to 1997	Prior to 1996	Prior to 1995	Prior to 1999	Prior to 1998	Prior to 1997	Prior to 1996	Prior to 1995
1970	17,935,954				0.024%					4,321						21,879
1971	19,844,783				0.024%	0.048%			4,802	9,563					21,461	43,759
1972	19,854,253			0.026%	0.048%	0.072%								23,723	42,923	65,638
1973	26,362,657		0.022%	0.051%	0.073%	0.096%			5,078	9,609	14,351					87,518
1974	27,492,043	0.022%	0.044%	0.077%	0.097%	0.120%	6,183	12,173	21,094	26,612	33,119	23,830	44,703	71,168	85,846	109,397
1975	29,776,884	0.045%	0.066%	0.102%	0.121%	0.145%	13,393	19,777	30,462	36,029	43,046	47,660	67,055	94,891	107,307	131,276
1976	33,819,434	0.067%	0.089%	0.128%	0.145%	0.169%	22,816	29,949	43,247	49,105	57,038	71,490	89,407	118,613	128,769	153,156
1977	38,038,776	0.090%	0.111%	0.153%	0.169%	0.193%	34,217	42,107	58,371	64,436	73,319	95,320	111,759	142,336	150,230	175,035
1978	49,641,906	0.112%	0.133%	0.179%	0.194%	0.217%	55,819	65,942	88,873	96,104	107,644	119,150	134,110	166,059	171,692	196,914
1979	56,638,181	0.135%	0.155%	0.205%	0.218%	0.241%	76,423	87,775	115,883	123,355	136,461	142,980	156,462	189,782	193,153	218,794
1980	63,479,077	0.157%	0.177%	0.230%	0.242%	0.265%	99,929	112,430	146,115	153,616	168,238	166,810	178,814	213,504	214,615	240,673
1981	75,831,715	0.180%	0.199%	0.256%	0.266%	0.289%	136,428	151,097	193,942	201,859	219,246	190,640	201,165	237,227	236,076	262,553
1982	76,240,106	0.202%	0.221%	0.281%	0.290%	0.313%	154,308	168,790	214,486	221,396	238,796	214,470	223,517	260,950	257,538	284,432
1983	85,984,847	0.225%	0.244%	0.307%	0.315%	0.337%	193,367	209,400	263,891	270,502	290,035	238,300	245,869	284,672	278,999	306,311
1984	101,461,373	0.247%	0.266%	0.332%	0.339%	0.361%	250,989	269,553	337,339	343,743	366,684	262,130	268,221	308,395	300,460	328,191
1985	130,449,476	0.270%	0.288%	0.358%	0.363%	0.385%	352,034	375,447	467,081	473,520	502,877	285,960	290,572	332,118	321,922	350,070
1986	153,001,881	0.292%	0.310%	0.384%	0.387%	0.410%	447,303	474,229	586,962	592,409	626,679	309,790	312,924	355,840	343,383	371,949
1987	186,351,969	0.315%	0.332%	0.409%	0.411%	0.434%	586,710	618,854	762,563	766,633	808,177	333,620	335,276	379,563	364,845	393,829
1988	209,123,026	0.337%	0.354%	0.435%	0.436%	0.458%	705,431	740,772	909,228	910,917	957,316	357,450	357,627	403,286	386,306	415,708
1989	224,447,695	0.360%	0.376%	0.460%	0.460%	0.482%	807,600	844,748	1,033,260	1,031,985	1,081,546	381,280	379,979	427,009	407,768	437,588
1990	211,252,092	0.382%	0.399%	0.486%	0.484%	0.506%	807,628	841,853	1,026,542	1,022,435	1,068,858	405,110	402,331	450,731	429,229	459,467
1991	179,065,706	0.405%	0.421%	0.512%	0.508%	0.530%	724,847	753,232	915,934	909,989	949,150	428,940	424,683	474,454	450,691	481,346
1992	138,830,229	0.427%	0.443%	0.537%	0.532%	0.554%	593,197	614,719	745,633	739,114	769,328	452,770	447,034	498,177	472,152	503,226
1993	114,397,185	0.450%	0.465%	0.563%	0.557%	0.578%	514,525	531,860	643,665	636,719	661,495	476,600	469,386	521,899	493,614	525,105
1994	98,029,062	0.472%	0.487%	0.588%	0.581%	0.602%	462,951	477,464	576,640	569,339	590,466	500,430	491,738	545,622	515,075	546,985
1995	90,810,331	0.495%	0.509%	0.614%	0.605%		449,282	462,409	557,402	549,389		524,260	514,089	569,345	536,536	
1996	88,685,927	0.517%	0.531%	0.639%			458,716	471,226	567,044			548,090	536,441	593,067		
1997	92,756,023	0.540%	0.553%				500,627	513,387				571,920	558,793			
1998	100,959,668	0.562%					567,609					595,750				
1999	105,965,100															
							9,022,330	8,895,031	10,324,221	9,822,752	9,803,158	7,744,751	7,264,306	7,709,877	6,974,974	7,110,799
(6) Indicated Growth Factor:												0.858	0.817	0.747	0.710	0.725
(7) Selected Growth Factor:												0.860	0.820	0.750	0.710	0.730

II 000019

- Notes:
 (2): Losses from Aggregate Financial Data evaluated as of 108 months.
 (3): Estimated % paid loss emergence for the report interval.
 (4) = (2) x (3)
 (5) = (3) x [(2) for PY199X] respectively for each 'Prior to 199X' column
 (6) = [Sum of (5)] / [Sum of (4)]

Paid Plus Case Loss Tail Factors

Indemnity Paid Plus Case 252nd Month to Ultimate Loss Tail Development Factor

(1) Policy Year	(2) Losses for Policy Year 252 mo	(3) Losses for All Prior Years		(5) 252 - Ult for PY	(6) Growth Factor	(7) Indicated 252 - Ult for PY
		Previous	Current			
1994	226,250,009		9,275,085,644			
1995	225,776,852	9,501,335,653	9,509,392,209	1.036	0.470	1.017
1996	204,468,195	9,735,169,061	9,742,844,670	1.038	0.430	1.016
1997	217,139,138	9,947,312,865	9,953,370,311	1.028	0.480	1.013
1998	234,468,757	10,170,509,449	10,177,040,139	1.028	0.540	1.015
1999	248,701,254	10,411,508,896	10,420,137,991	1.035	0.600	1.021
					5yr average	1.016

Medical Paid Plus Case 252nd Month to Ultimate Loss Tail Development Factor

(8) Policy Year	(9) Losses for Policy Year 252 mo	(10) Losses for All Prior Years		(12) 252 - Ult for PY	(13) Growth Factor	(14) Indicated 252 - Ult for PY
		Previous	Current			
1994	123,219,172		2,991,021,145			
1995	109,935,789	3,114,240,317	3,125,251,202	1.100	0.700	1.070
1996	109,642,204	3,235,186,991	3,238,071,503	1.026	0.690	1.018
1997	109,617,639	3,347,713,707	3,343,030,942	0.957	0.730	0.969
1998	136,217,508	3,452,648,581	3,455,122,964	1.018	0.900	1.016
1999	142,500,682	3,591,340,472	3,592,876,422	1.011	0.900	1.010
					5yr average	1.017

Notes:

- (2), (3), (4): Indemnity Paid Plus Case Losses from Aggregate Financial Data.
- (9), (10), (11): Medical Paid Plus Case Losses from Aggregate Financial Data.
- (5) = $1.000 + ((4)-(3)) / (2)$
- (6): From Page 2
- (7) = $1.000 + [(5) - 1.000] \times (6)$
- (12) = $1.000 + ((11)-(10)) / (9)$
- (13): From Page 3
- (14) = $1.000 + [(12) - 1.000] \times (13)$

II 000020

Growth Factor Adjustment
 Indemnity Paid Plus Case Losses

Policy Year (1)	Incurred Losses (2)	Relative Development for Report Interval (3)					Dollar Development (4)					On-Level Dollar Development (5)					
		Prior to 1999	Prior to 1998	Prior to 1997	Prior to 1996	Prior to 1995	Prior to 1999	Prior to 1998	Prior to 1997	Prior to 1996	Prior to 1995	Prior to 1999	Prior to 1998	Prior to 1997	Prior to 1996	Prior to 1995	
1975	94,118,500				0.008%					7,438						17,687	
1976	111,635,916				0.008%				8,663	17,645					15,633	35,375	
1977	129,878,901			0.006%	0.016%	0.024%								13,384	31,267	53,062	
1978	180,931,363		0.007%	0.013%	0.023%	0.032%			12,844	22,894			16,143	26,767	46,900	70,750	
1979	209,145,757	0.010%	0.014%	0.019%	0.031%	0.040%			29,695	39,695	64,920	82,644	32,285	40,151	62,534	88,437	
1980	233,648,579	0.020%	0.021%	0.025%	0.039%	0.047%	20,833	46,547	49,761	59,128	90,658	110,792	48,835	48,428	53,534	78,167	106,124
1981	277,638,496	0.030%	0.028%	0.032%	0.047%	0.055%	82,966	78,839	87,825	129,271	153,593	73,253	64,570	66,918	93,801	123,812	
1982	302,126,638	0.040%	0.035%	0.038%	0.054%	0.063%	120,378	107,241	114,686	164,119	191,017	97,670	80,713	80,302	109,434	141,499	
1983	342,568,914	0.050%	0.043%	0.044%	0.062%	0.071%	170,614	145,915	151,711	212,671	243,660	122,088	96,855	93,685	125,068	159,187	
1984	405,050,571	0.060%	0.050%	0.051%	0.070%	0.079%	242,079	201,284	205,007	282,893	320,113	146,506	112,998	107,069	140,701	176,874	
1985	485,867,351	0.070%	0.057%	0.057%	0.078%	0.087%	338,776	275,937	276,650	377,041	422,381	170,923	129,140	120,452	156,335	194,562	
1986	615,824,603	0.080%	0.064%	0.063%	0.085%	0.095%	490,732	393,461	389,607	525,679	584,026	195,341	145,283	133,836	171,968	212,249	
1987	782,679,505	0.090%	0.071%	0.070%	0.093%	0.103%	701,655	555,630	544,687	728,847	804,120	219,758	161,425	147,219	187,602	229,936	
1988	850,017,116	0.100%	0.078%	0.076%	0.101%	0.111%	846,691	663,777	645,326	857,516	940,479	244,176	177,568	160,603	203,235	247,624	
1989	886,459,881	0.110%	0.085%	0.082%	0.109%	0.119%	971,291	755,166	729,076	963,071	1,050,858	268,594	193,710	173,987	218,868	265,311	
1990	806,979,158	0.120%	0.092%	0.089%	0.116%	0.126%	964,586	744,745	714,760	939,344	1,020,413	293,011	209,853	187,370	234,502	282,999	
1991	535,897,497	0.129%	0.099%	0.095%	0.124%	0.134%	693,941	532,613	508,561	665,385	719,986	317,429	225,995	200,754	250,135	300,686	
1992	330,105,459	0.139%	0.106%	0.101%	0.132%	0.142%	460,339	351,517	334,151	435,485	469,590	341,847	242,138	214,137	265,769	318,373	
1993	270,377,734	0.149%	0.114%	0.108%	0.140%	0.150%	403,980	307,109	290,797	377,672	405,993	366,264	258,280	227,521	281,402	336,061	
1994	223,631,814	0.159%	0.121%	0.114%	0.147%	0.158%	356,411	269,889	254,669	329,730	353,474	390,682	274,423	240,905	297,036	353,748	
1995	223,805,508	0.169%	0.128%	0.120%	0.155%		378,981	285,986	269,026	347,354		415,099	290,565	254,288	312,669		
1996	201,457,768	0.179%	0.135%	0.127%			361,205	271,731	254,908			439,517	306,708	267,672			
1997	211,544,763	0.189%	0.142%				400,362	300,355				463,935	322,850				
1998	227,388,940	0.199%					452,998					488,352					
1999	245,135,225																
							8,505,366	6,333,495	5,901,382	7,562,599	7,986,211	5,127,698	3,389,929	2,810,553	3,283,027	3,714,357	
(6) Indicated Growth Factor:												0.603	0.535	0.476	0.434	0.465	
(7) Selected Growth Factor:												0.600	0.540	0.480	0.430	0.470	

- Notes:
 (2): Losses from Aggregate Financial Data evaluated as of 108 months.
 (3): Estimated % paid loss emergence for the report interval.
 (4) = (2) x (3)
 (5) = (3) x [(2) for PY199X] respectively for each 'Prior to 199X' column
 (6) = [Sum of (5)] / [Sum of (4)]

II 000021

Growth Factor Adjustment
 Medical Paid Plus Case Losses

Policy Year (1)	Incurred Losses (2)	Relative Development for Report Interval (3)			Dollar Development (4)					On-Level Dollar Development (5)				
					Prior to 1999	Prior to 1998	Prior to 1997	Prior to 1996	Prior to 1995	Prior to 1999	Prior to 1998	Prior to 1997	Prior to 1996	Prior to 1995
1975	31,935,594			0.033%					10,589					34,607
1976	35,848,325			0.009%				3,098	23,772				8,848	69,213
1977	40,538,158			-0.015%	0.017%	0.099%							(15,664)	103,820
1978	52,386,790		0.008%	-0.030%	0.026%	0.133%						10,203	(31,328)	138,427
1979	60,704,663		0.005%	0.016%	-0.044%	0.035%	0.166%		2,800	9,503	(26,882)	20,981	100,638	173,033
1980	67,230,488		0.009%	0.023%	-0.059%	0.043%	0.199%		6,203	15,787	(39,695)	29,046	133,747	207,640
1981	83,085,174		0.014%	0.031%	-0.074%	0.052%	0.232%		11,498	26,013	(61,321)	43,075	192,837	242,247
1982	80,267,860		0.018%	0.039%	-0.089%	0.060%	0.265%		14,811	31,413	(71,090)	48,550	212,912	276,853
1983	91,348,952		0.023%	0.047%	-0.103%	0.069%	0.298%		21,069	42,900	(94,388)	63,146	272,593	311,460
1984	109,642,321		0.028%	0.055%	-0.118%	0.078%	0.332%		30,346	60,073	(129,474)	85,266	363,535	346,067
1985	144,597,512		0.032%	0.063%	-0.133%	0.086%	0.365%		46,692	90,542	(192,096)	124,944	527,378	380,673
1986	170,175,338		0.037%	0.070%	-0.148%	0.095%	0.398%		62,801	119,878	(251,195)	161,749	677,089	415,280
1987	206,082,789		0.042%	0.078%	-0.162%	0.104%	0.431%		85,559	161,303	(334,618)	213,686	888,287	449,887
1988	223,130,251		0.046%	0.086%	-0.177%	0.112%	0.464%		102,929	192,111	(395,234)	250,643	1,035,749	484,494
1989	236,001,380		0.051%	0.094%	-0.192%	0.121%	0.497%		119,753	221,664	(452,869)	285,493	1,173,745	519,100
1990	222,519,498		0.055%	0.102%	-0.207%	0.130%	0.531%		123,177	226,418	(459,844)	288,412	1,180,473	553,707
1991	189,003,207		0.060%	0.110%	-0.221%	0.138%	0.564%		113,342	207,108	(418,480)	261,302	1,065,335	588,314
1992	147,102,539		0.065%	0.117%	-0.236%	0.147%	0.597%		95,001	172,708	(347,420)	216,084	877,932	622,920
1993	129,907,619		0.069%	0.125%	-0.251%	0.156%	0.630%		89,889	162,688	(325,986)	202,051	818,383	657,527
1994	118,984,752		0.074%	0.133%	-0.266%	0.164%	0.663%		87,819	158,322	(316,139)	195,343	789,023	692,134
1995	104,373,871		0.078%	0.141%	-0.280%	0.173%			81,850	147,050	(292,725)	180,375		176,954
1996	102,394,268		0.083%	0.149%	-0.295%				85,021	152,275	(302,288)			
1997	106,116,375		0.088%	0.157%					93,007	166,116				
1998	130,359,416		0.092%						120,268					
1999	129,315,658													
					1,393,835	2,367,971	(4,533,194)	2,693,830	10,453,818	1,252,707	2,142,703	(3,289,398)	1,858,012	7,267,403
(6) Indicated Growth Factor:										0.899	0.905	0.726	0.690	0.695
(7) Selected Growth Factor:										0.900	0.900	0.730	0.690	0.700

- Notes:
- (2): Losses from Aggregate Financial Data evaluated as of 108 months.
- (3): Estimated % paid loss emergence for the report interval.
- (4) = (2) x (3)
- (5) = (3) x [(2) for PY199X] respectively for each 'Prior to 199X' column
- (6) = [Sum of (5)] / [Sum of (4)]

II 000022

II 000023

Section II - Loss Development
 Subsection D - Adjustment for Escalation of Benefits
 7/1/2022

Section II - D
 Exhibit 1
 Page 1

Differential in Indemnity Loss Development

Paid Loss Development Method Calculation of Adjustment for Differential in Loss Development

Escalated or Unescalated (1)	Injury Type (2)	Implicit LDF to Ultimate From Month				
		168	180	192 (3)	204	216
Escalated	Fatal	3.036	2.859	2.703	2.562	2.433
Escalated	Permanent Total	4.073	3.719	3.417	3.157	2.929
Escalated	Other Indemnity	1.000	1.000	1.000	1.000	1.000
Escalated	Total Indemnity	1.133	1.129	1.124	1.119	1.115
Unescalated	Fatal	1.942	1.861	1.789	1.725	1.668
Unescalated	Permanent Total	2.452	2.295	2.160	2.043	1.941
Unescalated	Other Indemnity	1.000	1.000	1.000	1.000	1.000
Unescalated	Total Indemnity	1.052	1.050	1.047	1.045	1.042

Escalated or Unescalated (4)	Injury Type (5)	Differential in Loss Development at Month				
		168	180	192 (6)	204	216
Escalated	Fatal	1.563	1.536	1.511	1.485	1.459
Escalated	Permanent Total	1.661	1.620	1.582	1.545	1.509
Escalated	Other Indemnity	1.000	1.000	1.000	1.000	1.000
Escalated	Total Indemnity	1.077	1.075	1.074	1.072	1.069

Selected Differential in Indemnity Loss Development at Month 408 1.037

Notes:

(3) = [(8) Exhibit 1, Page 2] / [(9) Exhibit 1, Page 2]

(6) = [(3) for Escalated] / [(3) for Unescalated]

II 000024

Differential in Indemnity Loss Development

Paid Loss Development Method Calculation of Adjustment for Differential in Loss Development

Escalated or Unescalated (1)	Injury Type (2)	Losses at Month						Injury Type Weights @ Ultimate (5)
		Ultimate (3)	168	180	192 (4)	204	216	
Escalated	Fatal	874,958	288,217	306,023	323,680	341,550	359,626	1.44%
Escalated	Permanent Total	1,668,738	409,709	448,697	488,350	528,641	569,759	9.18%
Escalated	Other Indemnity							56.43%
Escalated	Total Indemnity							67.06%
Unescalated	Fatal	465,615	239,708	250,218	260,195	269,862	279,221	0.77%
Unescalated	Permanent Total	824,906	336,400	359,427	381,858	403,713	424,987	4.54%
Unescalated	Other Indemnity							56.43%
Unescalated	Total Indemnity							61.74%

Escalated or Unescalated (6)	Injury Type (7)	Estimated Losses at Month					
		Ultimate (8)	168	180	192 (9)	204	216
Escalated	Fatal	1,443	475	505	534	563	593
Escalated	Permanent Total	9,179	2,254	2,468	2,686	2,908	3,134
Escalated	Other Indemnity	56,435	56,435	56,435	56,435	56,435	56,435
Escalated	Total Indemnity	67,057	59,164	59,408	59,655	59,906	60,162
Unescalated	Fatal	768	395	413	429	445	461
Unescalated	Permanent Total	4,537	1,850	1,977	2,100	2,221	2,338
Unescalated	Other Indemnity	56,435	56,435	56,435	56,435	56,435	56,435
Unescalated	Total Indemnity	61,740	58,681	58,825	58,965	59,101	59,233

Notes:

Escalation calculation applied only to Fatal and Permanent Total Injury Types.

(4): Average discounted losses are calculated from Simulation Model loss flows using a 3.5% discount rate.

(5): Escalated: From Section IV-E, Exhibit 2, Page 1. As a % of total losses, Indemnity and Medical.

Unescalated: [(5) for Escalated] x { [(3) for Unescalated] / [(3) for Escalated] }.

(8) = (5) x 100,000

(9) = (8) x [(4) / (3)]

II 000025

Section II - Loss Development
 Subsection D - Adjustment for Escalation of Benefits
 7/1/2022

Section II - D
 Exhibit 2
 Page 1

Differential in Indemnity Loss Development

Paid Plus Case Loss Development Method Calculation of Adjustment for Differential in Loss Development

Escalated or Unescalated (1)	Injury Type (2)	Implicit LDF to Ultimate From Month				
		168	180	192 (3)	204	216
Escalated	Fatal	1.364	1.340	1.317	1.295	1.274
Escalated	Permanent Total	1.398	1.368	1.340	1.313	1.288
Escalated	Other Indemnity	1.000	1.000	1.000	1.000	1.000
Escalated	Total Indemnity	1.047	1.044	1.042	1.039	1.037
Unescalated	Fatal	1.212	1.198	1.184	1.171	1.159
Unescalated	Permanent Total	1.253	1.234	1.215	1.198	1.183
Unescalated	Other Indemnity	1.000	1.000	1.000	1.000	1.000
Unescalated	Total Indemnity	1.017	1.016	1.015	1.014	1.013

Escalated or Unescalated (4)	Injury Type (5)	Differential in Loss Development at Month				
		168	180	192 (6)	204	216
Escalated	Fatal	1.125	1.119	1.112	1.105	1.099
Escalated	Permanent Total	1.115	1.109	1.102	1.096	1.089
Escalated	Other Indemnity	1.000	1.000	1.000	1.000	1.000
Escalated	Total Indemnity	1.029	1.027	1.026	1.024	1.023

Selected Differential in Indemnity Loss Development at Month 408 1.007

Notes:

(3) = [(8) Exhibit 2, Page 2] / [(9) Exhibit 2, Page 2]

(6) = [(3) for Escalated] / [(3) for Unescalated]

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Section II - Loss Development
 Subsection D - Adjustment for Escalation of Benefits
 7/1/2022

Section II - D
 Exhibit 2
 Page 2

Differential in Indemnity Loss Development

Paid Plus Case Loss Development Method Calculation of Adjustment for Differential in Loss Development

Escalated or Unescalated (1)	Injury Type (2)	Losses at Month						Injury Type Weights @ Ultimate (5)
		Ultimate (3)	168	180	192 (4)	204	216	
Escalated	Fatal	874,958	641,246	652,979	664,504	675,808	686,874	1.44%
Escalated	Permanent Total	1,668,738	1,193,905	1,219,988	1,245,595	1,270,688	1,295,221	9.18%
Escalated	Other Indemnity							56.43%
Escalated	Total Indemnity							67.06%
Unescalated	Fatal	465,615	384,035	388,719	393,217	397,535	401,676	0.77%
Unescalated	Permanent Total	824,906	658,201	668,658	678,696	688,321	697,538	4.54%
Unescalated	Other Indemnity							56.43%
Unescalated	Total Indemnity							61.74%

Escalated or Unescalated (6)	Injury Type (7)	Estimated Losses at Month					
		Ultimate (8)	168	180	192 (9)	204	216
Escalated	Fatal	1,443	1,058	1,077	1,096	1,115	1,133
Escalated	Permanent Total	9,179	6,567	6,711	6,851	6,989	7,124
Escalated	Other Indemnity	56,435	56,435	56,435	56,435	56,435	56,435
Escalated	Total Indemnity	67,057	64,060	64,223	64,383	64,539	64,692
Unescalated	Fatal	768	634	641	649	656	663
Unescalated	Permanent Total	4,537	3,620	3,678	3,733	3,786	3,837
Unescalated	Other Indemnity	56,435	56,435	56,435	56,435	56,435	56,435
Unescalated	Total Indemnity	61,740	60,689	60,754	60,817	60,877	60,934

Notes:

Escalation calculation applied only to Fatal and Permanent Total Injury Types.

(4): Average discounted losses are calculated from Simulation Model loss flows using a 3.5% discount rate.

(5): Escalated: From Section IV-E, Exhibit 2, Page 1. As a % of total losses, Indemnity and Medical.

Unescalated: [(5) for Escalated] x [(3) for Unescalated] / [(3) for Escalated] .

(8) = (5) x 100,000

(9) = (8) x [(4) / (3)]

Accident Year Aggregate Financial Data
 Summary of Loss Development Factors

Months of Development	Loss Development Factors From																			Tail Factor	Escalation Factor	
	12-24	24-36	36-48	48-60	60-72	72-84	84-96	96-108	108-120	120-132	132-144	144-156	156-168	168-180	180-192	192-204	204-216	216-228	228-240			240-252
<u>(1) Indemnity Paid Losses</u>																						
2 Year Average	2.984	1.572	1.217	1.074	1.040	1.017	1.013	1.006	1.007	1.005	1.004	1.002	1.003	1.003	1.002	1.002	1.001	1.000	1.001	1.001	1.036	1.037
Cumulative	7.337	2.458	1.564	1.285	1.196	1.151	1.131	1.117	1.110	1.102	1.096	1.092	1.090	1.087	1.083	1.081	1.079	1.077	1.077	1.076	1.074	1.037
<u>(2) Medical Paid Losses</u>																						
2 Yr Average	1.963	1.148	1.054	1.026	1.016	1.008	1.013	1.010	1.008	1.006	1.009	1.009	1.006	1.008	1.006	1.007	1.008	1.007	1.009	1.005	1.077	1.000
Cumulative	2.996	1.526	1.329	1.261	1.230	1.211	1.201	1.185	1.173	1.164	1.158	1.148	1.137	1.130	1.121	1.115	1.107	1.099	1.092	1.082	1.077	1.000

Notes:
 Tail Factors from Section II-C, Exhibit 1, Page 1 (accident year tail factors, were approximated using policy year tail factors).
 Escalation Factor from Section II-D, Exhibit 1, page 1.

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Accident Year Aggregate Financial Data
 Calculation of Indemnity Paid Loss Development Factors

Accident Year	Losses (in 000's) Evaluated at Month		Loss Development Factor	Accident Year	Losses (in 000's) Evaluated at Month		Loss Development Factor
	12	24			132	144	
2014	57,750	167,703	2.904	2004	327,949	330,458	1.008
2015	64,071	191,261	2.985	2005	335,424	338,178	1.008
2016	63,518	184,424	2.903	2006	321,194	322,283	1.003
2017	63,445	190,745	3.006	2007	334,221	336,085	1.006
2018	68,035	201,555	2.962	2008	344,294	344,866	1.002
2 Yr Average			2.984	2 Yr Average			1.004
5 Yr Average			2.952	5 Yr Average			1.005
Selected Average			2.984	Selected Average			1.004
	24	36			144	156	
2013	169,122	270,413	1.599	2003	306,685	308,954	1.007
2014	167,703	266,718	1.590	2004	330,458	331,662	1.004
2015	191,261	304,299	1.591	2005	338,178	339,250	1.003
2016	184,424	292,391	1.585	2006	322,283	323,044	1.002
2017	190,745	297,169	1.558	2007	336,085	336,887	1.002
2 Yr Average			1.572	2 Yr Average			1.002
5 Yr Average			1.585	5 Yr Average			1.004
Selected Average			1.572	Selected Average			1.002
	36	48			156	168	
2012	238,599	292,809	1.227	2002	281,108	281,470	1.001
2013	270,413	326,466	1.207	2003	308,954	310,359	1.005
2014	266,718	330,894	1.241	2004	331,662	332,435	1.002
2015	304,299	375,046	1.232	2005	339,250	339,888	1.002
2016	292,391	351,364	1.202	2006	323,044	324,242	1.004
2 Yr Average			1.217	2 Yr Average			1.003
5 Yr Average			1.222	5 Yr Average			1.003
Selected Average			1.217	Selected Average			1.003
	48	60			168	180	
2011	311,471	342,562	1.100	2001	268,655	269,551	1.003
2012	292,809	319,731	1.092	2002	281,470	281,769	1.001
2013	326,466	356,165	1.091	2003	310,359	310,540	1.001
2014	330,894	357,490	1.080	2004	332,435	333,260	1.002
2015	375,046	400,533	1.068	2005	339,888	341,320	1.004
2 Yr Average			1.074	2 Yr Average			1.003
5 Yr Average			1.086	5 Yr Average			1.002
Selected Average			1.074	Selected Average			1.003
	60	72			180	192	
2010	294,802	303,709	1.030	2000	264,611	265,215	1.002
2011	342,562	357,732	1.044	2001	269,551	271,176	1.006
2012	319,731	333,910	1.044	2002	281,769	282,236	1.002
2013	356,165	366,894	1.030	2003	310,540	310,877	1.001
2014	357,490	375,195	1.050	2004	333,260	334,232	1.003
2 Yr Average			1.040	2 Yr Average			1.002
5 Yr Average			1.040	5 Yr Average			1.003
Selected Average			1.040	Selected Average			1.002
	72	84			192	204	
2009	300,055	306,028	1.020	1999	228,542	229,038	1.002
2010	303,709	309,208	1.018	2000	265,215	265,711	1.002
2011	357,732	360,386	1.007	2001	271,176	271,309	1.000
2012	333,910	342,377	1.025	2002	282,236	282,810	1.002
2013	366,894	370,220	1.009	2003	310,877	311,378	1.002
2 Yr Average			1.017	2 Yr Average			1.002
5 Yr Average			1.016	5 Yr Average			1.002
Selected Average			1.017	Selected Average			1.002
	84	96			204	216	
2008	334,061	338,724	1.014	1998	229,705	231,156	1.006
2009	306,028	308,721	1.009	1999	229,038	230,016	1.004
2010	309,208	313,548	1.014	2000	265,711	265,992	1.001
2011	360,386	363,966	1.010	2001	271,309	271,814	1.002
2012	342,377	347,646	1.015	2002	282,810	283,121	1.001
2 Yr Average			1.013	2 Yr Average			1.001
5 Yr Average			1.012	5 Yr Average			1.003
Selected Average			1.013	Selected Average			1.001
	96	108			216	228	
2007	328,513	330,780	1.007	1997	198,752	199,001	1.001
2008	338,724	340,954	1.007	1998	231,156	232,166	1.004
2009	308,721	311,720	1.010	1999	230,016	230,586	1.002
2010	313,548	314,795	1.004	2000	265,992	266,353	1.001
2011	363,966	367,068	1.009	2001	271,814	271,649	0.999
2 Yr Average			1.006	2 Yr Average			1.000
5 Yr Average			1.007	5 Yr Average			1.002
Selected Average			1.006	Selected Average			1.000
	108	120			228	240	
2006	316,917	318,428	1.005	1996	209,111	209,416	1.001
2007	330,780	332,744	1.006	1997	199,001	199,250	1.001
2008	340,954	341,983	1.003	1998	232,166	232,615	1.002
2009	311,720	314,182	1.008	1999	230,586	230,811	1.001
2010	314,795	316,752	1.006	2000	266,353	266,752	1.001
2 Yr Average			1.007	2 Yr Average			1.001
5 Yr Average			1.006	5 Yr Average			1.001
Selected Average			1.007	Selected Average			1.001
	120	132			240	252	
2005	332,866	335,424	1.008	1995	212,343	212,902	1.003
2006	318,428	321,194	1.009	1996	209,416	209,697	1.001
2007	332,744	334,221	1.004	1997	199,250	199,465	1.001
2008	341,983	344,294	1.007	1998	232,615	233,049	1.002
2009	314,182	315,382	1.004	1999	230,811	230,978	1.001
2 Yr Average			1.005	2 Yr Average			1.001
5 Yr Average			1.006	5 Yr Average			1.002
Selected Average			1.005	Selected Average			1.001

Notes:
 Losses from Aggregate Financial Data.

II 000029

Section II - Loss Development
 Subsection E - Accident Year Data
 7/1/2022

Section II - E
 Exhibit 1
 Page 3

Accident Year Aggregate Financial Data Calculation of Medical Paid Loss Development Factors

Accident Year	Losses (in 000's) Evaluated at Month		Loss Development Factor	Accident Year	Losses (in 000's) Evaluated at Month		Loss Development Factor
	12	24			132	144	
2014	73,552	145,258	1.975	2004	163,934	170,485	1.009
2015	75,860	149,460	1.970	2005	171,320	172,948	1.009
2016	78,916	152,508	1.933	2006	162,061	163,269	1.007
2017	77,962	149,117	1.913	2007	179,238	181,507	1.013
2018	81,842	164,765	2.013	2008	170,206	171,020	1.005
2 Yr Average			1.963	2 Yr Average			1.009
5 Yr Average			1.961	5 Yr Average			1.009
Selected Average			1.963	Selected Average			1.009
	24	36			144	156	
2013	140,449	161,218	1.148	2003	156,309	157,641	1.009
2014	145,258	166,388	1.145	2004	170,485	171,883	1.008
2015	149,460	172,005	1.151	2005	172,948	174,381	1.008
2016	152,508	173,305	1.136	2006	163,269	164,301	1.006
2017	149,117	172,972	1.160	2007	181,507	183,706	1.012
2 Yr Average			1.148	2 Yr Average			1.009
5 Yr Average			1.148	5 Yr Average			1.009
Selected Average			1.148	Selected Average			1.009
	36	48			156	168	
2012	147,757	156,303	1.058	2002	139,652	141,115	1.010
2013	161,218	169,471	1.051	2003	157,641	158,865	1.008
2014	166,388	176,609	1.061	2004	171,883	173,127	1.007
2015	172,005	181,904	1.058	2005	174,381	175,263	1.005
2016	173,305	182,074	1.051	2006	164,301	165,550	1.008
2 Yr Average			1.054	2 Yr Average			1.006
5 Yr Average			1.056	5 Yr Average			1.008
Selected Average			1.054	Selected Average			1.006
	48	60			168	180	
2011	164,828	168,833	1.024	2001	121,956	122,702	1.006
2012	156,303	160,633	1.028	2002	141,115	142,562	1.010
2013	169,471	172,320	1.017	2003	158,865	159,855	1.006
2014	176,609	181,971	1.030	2004	173,127	174,441	1.008
2015	181,904	185,740	1.021	2005	175,263	176,629	1.008
2 Yr Average			1.026	2 Yr Average			1.008
5 Yr Average			1.024	5 Yr Average			1.008
Selected Average			1.026	Selected Average			1.008
	60	72			180	192	
2010	155,823	158,085	1.015	2000	119,950	121,461	1.013
2011	168,833	173,656	1.029	2001	122,702	123,289	1.005
2012	160,633	162,656	1.013	2002	142,562	144,197	1.011
2013	172,320	174,094	1.010	2003	159,855	160,778	1.006
2014	181,971	185,814	1.021	2004	174,441	175,608	1.007
2 Yr Average			1.016	2 Yr Average			1.006
5 Yr Average			1.017	5 Yr Average			1.008
Selected Average			1.016	Selected Average			1.006
	72	84			192	204	
2009	150,415	151,824	1.009	1999	115,056	115,965	1.008
2010	158,085	158,450	1.002	2000	121,461	123,078	1.013
2011	173,656	175,231	1.009	2001	123,289	123,896	1.005
2012	162,656	164,311	1.010	2002	144,197	145,416	1.008
2013	174,094	175,206	1.006	2003	160,778	161,585	1.005
2 Yr Average			1.008	2 Yr Average			1.007
5 Yr Average			1.007	5 Yr Average			1.008
Selected Average			1.008	Selected Average			1.007
	84	96			204	216	
2008	165,814	167,233	1.009	1998	105,080	105,620	1.005
2009	151,824	153,213	1.009	1999	115,965	116,891	1.008
2010	158,450	160,617	1.014	2000	123,078	124,622	1.013
2011	175,231	177,518	1.013	2001	123,896	124,359	1.004
2012	164,311	166,552	1.014	2002	145,416	147,067	1.011
2 Yr Average			1.013	2 Yr Average			1.008
5 Yr Average			1.012	5 Yr Average			1.008
Selected Average			1.013	Selected Average			1.008
	96	108			216	228	
2007	172,587	174,640	1.012	1997	96,966	97,550	1.006
2008	167,233	168,259	1.006	1998	105,620	106,477	1.008
2009	153,213	154,260	1.007	1999	116,891	117,726	1.007
2010	160,617	162,420	1.011	2000	124,622	125,865	1.010
2011	177,518	178,963	1.008	2001	124,359	124,749	1.003
2 Yr Average			1.010	2 Yr Average			1.007
5 Yr Average			1.009	5 Yr Average			1.007
Selected Average			1.010	Selected Average			1.007
	108	120			228	240	
2006	159,710	160,881	1.007	1996	98,031	99,266	1.013
2007	174,640	176,942	1.013	1997	97,550	97,988	1.004
2008	168,259	169,154	1.005	1998	106,477	107,160	1.006
2009	154,260	155,131	1.006	1999	117,726	118,270	1.005
2010	162,420	164,074	1.010	2000	125,865	127,476	1.013
2 Yr Average			1.008	2 Yr Average			1.009
5 Yr Average			1.008	5 Yr Average			1.008
Selected Average			1.008	Selected Average			1.009
	120	132			240	252	
2005	169,890	171,320	1.008	1995	101,657	102,247	1.006
2006	160,881	162,051	1.007	1996	99,266	99,856	1.006
2007	176,942	178,238	1.013	1997	97,988	98,456	1.005
2008	169,154	170,206	1.006	1998	107,160	107,606	1.004
2009	155,131	155,894	1.005	1999	118,270	118,857	1.005
2 Yr Average			1.006	2 Yr Average			1.005
5 Yr Average			1.008	5 Yr Average			1.005
Selected Average			1.006	Selected Average			1.005

Notes:
 Losses from Aggregate Financial Data.

PREMIUMS

Background

To derive a rate indication, this filing evaluates the adequacy of the current rate level by comparing a historical loss, Loss Adjustment Expense (“LAE”), and fixed expense ratio to a permissible loss, LAE, and fixed expense ratio. The historical loss ratio is the ratio of losses and loss adjustment expenses to earned premium. In the current ratemaking methodology, “earned premium” includes policy year earned standard premium and All Risk Adjustment Program (“ARAP”) premium. Policy year premiums are defined as the premiums associated with all policies taking effect in a given year. Policy year earned premiums are the premiums related to the portion of the policy year that has already expired. Standard premium is defined as the premium resulting from standard rating procedures, using WCRIBMA rates, after the application of experience rating adjustments, Merit Rating Plan adjustments, Construction Classification Premium Adjustment Program (“CCPAP”) Credits, expense constants, and loss constants. Since the ARAP premium reported on the Aggregate Financial Policy Year Call is impacted by deviations and schedule rating credits, a factor is applied to the reported ARAP premium to adjust the premium from Company Level to Bureau Designated Statistical Reporting (DSR) Level. Adjustment factors applicable to policy year 2017 and policy year 2018 are calculated in Section III-A.¹

¹ As described in Section I, this Rate Filing utilizes policy years 2017 and 2018 to eliminate the distortive impact of COVID-19 and use data more predictive of the prospective post July 2022 environment. Policy year 2017 data consist of premium and loss experience generated by policies written during 2017. Policy year 2018 data consist of premium and loss experience generated by policies written during 2018.

III 000002

Policy years 2017 and 2018 earned standard and adjusted ARAP premiums are used in the indication and are brought to the current rate level in Section III.

Summary

Initial workers' compensation insurance premiums are by necessity estimates. They are typically a function of the employer's payroll during the time the policy is in effect and consequently are not known definitively at policy inception. In addition to payroll audit adjustments, other adjustments may occur to the premium as a result of changes to the policy. For example, experience modification factors may change during the term of a policy or CCPAP credit applications may be filed up to six months after the termination date of a policy.

Insurance carriers typically try to estimate the impact of such premium adjustments. However, industry-wide policy year earned standard and ARAP premium historically develops until such time as all audits have been finalized and no further premium modifications can be made. Therefore, premiums must be developed to ultimate so that the premiums used in the indication properly reflect the actual exposure level which gave rise to the ultimate losses.

The currently-effective rates were derived using "estimated values" for the average experience modification, the average merit rating credit, the average ARAP surcharge, and the average CCPAP credit. However, the "actual values" for the policy years under review differ from the "estimated values" loaded into the current rates. The WCRIBMA applies factors to premiums to adjust the "actual values" of the experience modification, merit rating credit, ARAP surcharge, and CCPAP credit to the "estimated values" loaded

III 000003

in the current rates. These offsets are necessary to ensure that the change in the current manual rates (which contain the same “estimated values”) is consistent with the overall average indicated rate level change. Additionally, the loading for prior Insolvency Fund assessments is removed.

Premium Development

The WCRIBMA developed premium to 252 months utilizing historical premium development factors based on the average of the latest five age-to-age development factors, also known as link ratios. For a given policy year, a premium development link ratio is the ratio of the premium valued as of time (T+1) to the premium valued as of time T. As in recent filings, annual age-to-age link ratios are calculated using the sum of earned standard premium and adjusted ARAP premium. The calculation of standard premium plus adjusted ARAP premium development factors is completed in Section III-A.

Impact of Experience and Merit Rating, ARAP and Construction Credit

The currently-effective rates contain an assumed load to reflect an estimated average experience modification and merit rating impact, ARAP impact, and Construction Credit impact. The actual experience modifications, merit rating debits or credits, ARAP surcharges, and Construction Credits for the policy years under review differ from the estimated values used in deriving the current rates. A factor is applied to premiums to adjust the impact of these programs to the level anticipated in the current rates. Adjustment factors applicable to policy year 2017 and policy year 2018 are calculated in Section III-B.

III 000004

Consistent with past practice, the WCRIBMA uses the historical experience modification anticipated in the rates in the derivation of the adjustment factor. This is appropriate as the intention of the adjustment factor is to bring premium to the current rate level. The experience modification reflected in the rates for non-merit-rated risks is 1.00 and the average merit rating for merit-rated risks is -2.0%.

ARAP was introduced in Massachusetts for policies effective 1/1/1990 and after. The premium used to develop the rate indication is standard premium plus ARAP premium. An adjustment for the ARAP offset is included to reflect the fact that the ARAP surcharges during policy year 2017 and policy year 2018 were not precisely in balance with the ARAP surcharge anticipated by the offset in the rates.

An adjustment for the Construction Credit offset is necessary to reflect the fact that the extent to which Construction Credits were actually applied in the data for policy year 2017 and policy year 2018 differed from that which was anticipated in the rates.

Loading for Recoupment of Insolvency Fund Assessments

In Section III-C, factors are calculated to adjust the policy year 2017 and policy year 2018 premiums so that the one-time loadings for recoupment of Insolvency Fund assessments are excluded.

On-Level Adjustment

WCRIBMA also tests the adequacy of the overall rate level to determine whether there is a need for change in the indicated rates. In doing so, historical reported premium data is utilized to estimate the amount of future premium needed in the prospective effective period. The historical premium is adjusted to the level of the current rates to account for rate changes that occurred since the historical experience period. Otherwise the projected premium would not be appropriate for calculating the current rate need. Further, workers' compensation premium is not written evenly throughout the year, and a disproportionate number of policies take effect on January 1 and July 1. To take this into account, the on-level factors derived in this filing use rate level weights based on USR data for the historical period. Premium on-level factors are calculated in Section III-D.

Premium Adjustment Factor

Premium adjustment factors are intended to bring historical standard premium data to the level applicable for a different policy period. They are used to estimate the percentage of premium eligible for experience rating, adjust the layers of standard premium for premium discount and expense constant calculations, and determine weights used in calculating the weighted average premium collection pattern used to estimate the profit provision. Premium adjustment factors are composite factors that meld adjustments related to exposure growth and trend, premium on-leveling, changes in rating programs and the proposed rate change. These adjustments are calculated in Section III-E.

III 000006

Section III - Premiums
 Subsection A - Summary
 7/1/2022

Section III - A
 Exhibit 1
 Page 1

Policy Year Aggregate Financial Data
 Calculation of Adjusted On-Level Standard Premium plus Adjusted ARAP at Ultimate
 Industrywide

Summary Exhibit

	Policy Year as of 12/31/2019	
	2017	2018
(1) Standard Earned Premium plus Adjusted ARAP Premium	1,272,315,507	1,236,067,013
(2) Adjustment for Experience and Merit Rating, ARAP, and Construction Credit Off-balance	1.041	1.038
(3) Adjustment Factor to Remove the Impact of Loading for Recoupment of Insolvency Fund Assessments	1.002	1.000
(4) Composite Adjustment Factor = (2) x (3)	1.044	1.039
(5) Adjusted Standard Earned Premium plus ARAP = (1) x (4)	1,328,098,053	1,283,738,372
(6) Cumulative Premium Development Factor to Ultimate (see Page 2)	0.999	1.012
(7) Rate On-Level Factor	0.812	0.864
(8) Factor to Remove Expense Constant	0.962	0.962
(9) Adjusted On-Level Standard Earned Premium plus Adjusted ARAP at Ultimate = (5) x (6) x (7) x (8)	1,036,705,347	1,078,616,826

Notes:

- (1): Section III-B, Exhibit 2
- (2): Section III-B, Exhibit 1
- (3): Section III-C, Exhibit 1
- (6): Premiums are deemed to be fully developed at 252 months.
- (7): Section III-D, Exhibit 1
- (8): Section VI-F, Exhibit 2.

Policy Year Aggregate Financial Data
 Calculation of Standard Premium plus Adjusted ARAP Premium Development Factors
 Industrywide

		Premium Development Factors From:																	
Months of Development	24-36	36-48	48-60	60-72	72-84	84-96	96-108	108-120	120-132	132-144	144-156	156-168	168-180	180-192	192-204	204-216	216-228	228-240	240-252
2 Year Average	1.016	0.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Cumulative Factor to 252	1.015	0.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
5 Year Average	1.012	0.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Cumulative Factor to 252	1.012	0.999	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Notes:
 From Page 3

III 000007

III 000008

Section III - Premiums
 Subsection A - Summary
 7/1/2022

Section III - A
 Exhibit 1
 Page 3

Policy Year Aggregate Financial Data Calculation of Standard Premium plus Adjusted ARAP Premium Development Factors Industrywide

Policy Year	Premium (in 000's) Evaluated at Month		Premium Development Factor	Policy Year	Premium (in 000's) Evaluated at Month		Premium Development Factor
	24	36			132	144	
2013	969,574	977,351	1.008	2004	911,355	911,354	1.000
2014	1,013,545	1,028,781	1.015	2005	946,502	946,503	1.000
2015	1,080,427	1,088,524	1.007	2006	1,004,834	1,004,833	1.000
2016	1,117,787	1,132,501	1.013	2007	988,396	988,392	1.000
2017	1,183,358	1,204,893	1.018	2008	811,714	811,713	1.000
2 yr Average			1.016	2 yr Average			1.000
5 yr Average			1.012	5 yr Average			1.000
	36	48			144	156	
2012	932,514	930,454	0.998	2003	908,308	908,294	1.000
2013	977,351	976,011	0.999	2004	911,354	911,353	1.000
2014	1,028,781	1,027,787	0.999	2005	946,503	946,503	1.000
2015	1,088,524	1,088,017	1.000	2006	1,004,833	1,004,831	1.000
2016	1,132,501	1,131,655	0.999	2007	988,392	988,392	1.000
2 yr Average			0.999	2 yr Average			1.000
5 yr Average			0.999	5 yr Average			1.000
	48	60			156	168	
2011	913,508	916,122	1.003	2002	852,725	852,725	1.000
2012	930,454	930,375	1.000	2003	908,294	908,294	1.000
2013	976,011	975,743	1.000	2004	911,353	911,352	1.000
2014	1,027,787	1,027,443	1.000	2005	946,503	946,501	1.000
2015	1,088,017	1,087,541	1.000	2006	1,004,831	1,004,830	1.000
2 yr Average			1.000	2 yr Average			1.000
5 yr Average			1.000	5 yr Average			1.000
	60	72			168	180	
2010	845,601	846,003	1.000	2001	738,214	738,214	1.000
2011	916,122	915,931	1.000	2002	852,725	852,725	1.000
2012	930,375	930,270	1.000	2003	908,294	908,294	1.000
2013	975,743	975,711	1.000	2004	911,352	911,352	1.000
2014	1,027,443	1,027,373	1.000	2005	946,501	946,501	1.000
2 yr Average			1.000	2 yr Average			1.000
5 yr Average			1.000	5 yr Average			1.000
	72	84			180	192	
2009	773,793	773,834	1.000	2000	681,658	681,658	1.000
2010	846,003	845,791	1.000	2001	738,214	738,216	1.000
2011	915,931	915,886	1.000	2002	852,725	852,719	1.000
2012	930,270	930,284	1.000	2003	908,294	908,294	1.000
2013	975,711	975,697	1.000	2004	911,352	911,352	1.000
2 yr Average			1.000	2 yr Average			1.000
5 yr Average			1.000	5 yr Average			1.000
	84	96			192	204	
2008	811,659	811,669	1.000	1999	696,369	696,369	1.000
2009	773,834	773,808	1.000	2000	681,658	681,658	1.000
2010	845,791	845,815	1.000	2001	738,216	738,213	1.000
2011	915,886	915,897	1.000	2002	852,719	852,719	1.000
2012	930,284	930,274	1.000	2003	908,294	908,294	1.000
2 yr Average			1.000	2 yr Average			1.000
5 yr Average			1.000	5 yr Average			1.000
	96	108			204	216	
2007	988,470	988,415	1.000	1998	722,376	722,376	1.000
2008	811,669	811,753	1.000	1999	696,369	696,369	1.000
2009	773,808	773,800	1.000	2000	681,658	681,658	1.000
2010	845,815	845,834	1.000	2001	738,213	738,213	1.000
2011	915,897	915,878	1.000	2002	852,719	852,719	1.000
2 yr Average			1.000	2 yr Average			1.000
5 yr Average			1.000	5 yr Average			1.000
	108	120			216	228	
2006	1,004,820	1,004,831	1.000	1997	732,719	732,719	1.000
2007	988,415	988,399	1.000	1998	722,376	722,376	1.000
2008	811,753	811,708	1.000	1999	696,369	696,369	1.000
2009	773,800	773,824	1.000	2000	681,658	681,658	1.000
2010	845,834	846,017	1.000	2001	738,213	738,213	1.000
2 yr Average			1.000	2 yr Average			1.000
5 yr Average			1.000	5 yr Average			1.000
	120	132			228	240	
2005	946,487	946,502	1.000	1996	695,465	695,465	1.000
2006	1,004,831	1,004,834	1.000	1997	732,719	732,718	1.000
2007	988,399	988,396	1.000	1998	722,376	722,376	1.000
2008	811,708	811,714	1.000	1999	696,369	696,369	1.000
2009	773,824	773,822	1.000	2000	681,658	681,658	1.000
2 yr Average			1.000	2 yr Average			1.000
5 yr Average			1.000	5 yr Average			1.000
					240	252	
				1995	794,289	794,289	1.000
				1996	695,465	695,466	1.000
				1997	732,718	732,718	1.000
				1998	722,376	722,376	1.000
				1999	696,369	696,369	1.000
				2 yr Average			1.000
				5 yr Average			1.000

Adjustment for Experience and Merit Rating, ARAP and Construction Credit Off-Balance

Rate Level Effective Date (1)	Experience Mod for Non-Merit Rated Risks		Merit Rating Impact		Average Experience Mod and Merit Rating Factor (6)	ARAP Charge in Rates (7)	Construction Credit in Construction Rates (8)	Policy Year Written Weights		Calendar Year Earned Weights			
	Anticipated in Rates (2)	Percentage of Premium (3)	Anticipated in Rates (4)	Percentage of Premium (5)				2017 (9)	2018 (10)	2017 (11)	2018 (12)	2019 (13)	
													4/1/2014
7/1/2016	1.000	0.845	-0.020	0.155	0.997	0.052	-0.042						
7/1/2018	1.000	0.856	-0.021	0.144	0.997	0.051	-0.033		43.2%		89.6%	12.4%	88.3%
7/1/2020	1.000	0.866	-0.022	0.134	0.997	0.053	-0.033						

	Policy Year		Calendar Year Earned		
	2017	2018	2017	2018	2019
(14) Weighted Average Experience and Merit Rating factor anticipated in rates	0.997	0.997	0.997	0.997	0.997
(15) Weighted ARAP Charge anticipated in rates	0.052	0.052	0.052	0.052	0.051
(16) Percentage of Premium for CCPAP Eligible Classes	0.376	0.381	0.370	0.378	0.378
(17) Weighted Average Construction Credit anticipated in rates	-0.016	-0.015	-0.015	-0.015	-0.013
(18) Combined Weighted Average impact anticipated in rates = (14) x [1.0 + (15)] x [1.0 + (17)]	1.032	1.033	1.033	1.032	1.035
(19) Manual Premium	1,252,654,707	1,230,344,716	1,211,950,542	1,241,499,712	
(20) Standard Earned Premium at DSR Level, excluding Expense Constants	1,187,575,374	1,169,701,956	1,150,200,487	1,178,638,665	
(21) ARAP Premium	51,198,038	51,798,318	50,053,773	51,498,178	
(22) Adjustment Factor to Adjust from Company Level to DSR Level Premium	1.053	1.055	1.051	1.053	
(23) Standard Earned Premium plus Adjusted ARAP = (20) + [(21) x (22)]	1,241,509,621	1,224,325,187	1,202,815,280	1,232,875,608	
(24) Combined Actual impact = (23) / (19)	0.991	0.995	0.992	0.993	0.993
(25) Adjustment for Experience and Merit Rating, ARAP, and Construction Credit Off-balance = (18) / (24)	1.041	1.038	1.041	1.040	1.042

Notes:
 (3) = 1.0 - (5)
 (2), (4), (5), (7), (8): Previous filings.
 (6) = [(2) x (3)] + [1.0 + (4)] x (5)
 (9),(10): Section III-D, Exhibit 2.
 (11),(12): Section III-D, Exhibit 3.
 (13): Section III-D, Exhibit 4.
 (14) = Sum [(6) x (9) through (13)]
 (15) = Sum [(7) x (9) through (13)]
 (17) = Sum [(8) x (9) through (13)] x (16)
 (16), (19), (20), (21): Unit Statistical Plan Data, Excluding Large Deductible Policies. CY 2019 uses CY 2018 values
 (22): from Section III-B, Exhibit 2.

60000 III

Policy Year Aggregate Financial Data
 Calculation of Standard Premium plus ARAP Premium
 Industrywide

	Policy Year valued as of 12/31/2019		Calendar Years		
	2017	2018	2017	2018	2019
(1) Aggregate Financial: Standard Earned Premium at DSR Level	1,218,313,736	1,182,307,589	1,183,483,586	1,211,091,948	1,185,110,252
(2) Aggregate Financial: Standard Earned Premium at Company Level	1,156,505,866	1,121,162,973	1,125,877,630	1,149,936,295	1,122,556,750
(3) Aggregate Financial: ARAP Premium	51,262,136	50,979,184	50,885,501	51,610,877	52,633,448
(4) Adjustment Factor to Adjust from Company Level to DSR Level Premium = (1) / (2)	1.053	1.055	1.051	1.053	1.056
(5) Adjusted ARAP Premium = (3) x (4)	54,001,771	53,759,424	53,489,077	54,355,635	55,566,401
(6) Standard Earned Premium plus adjusted ARAP Premium = (1) + (5)	1,272,315,507	1,236,067,013	1,236,972,663	1,265,447,583	1,240,676,653

Notes:

(1),(2),(3): Aggregate Financial Policy Year Calls

III 000010

Factor to Remove the Impact of Loading for Recoupment of Insolvency Fund Assessments

Rate Level Effective Date (1)	Loading for Recoupment of Insolvency Fund Assessments (2)	Policy Year Weights		Calendar Year Earned Weights		
		2017 (3)	2018 (4)	2017 (5)	2018 (6)	2019 (7)
4/1/2014	0.19%			10.4%		
7/1/2016	-0.23%	100.0%	56.8%	89.6%	87.6%	11.7%
7/1/2018	0.26%		43.2%		12.4%	88.3%
7/1/2020						

Policy Year		Calendar Year Earned		
2017	2018	2017	2018	2019

(8) Weighted Average Loading for Recoupment of Insolvency Fund Assessment in the Rates = Sum [(2) x (3) through (7)]	-0.0023	-0.0002	-0.0019	-0.0017	0.0020
(9) Adjustment Factor to Remove the Impact of Loading for Recoupment of Insolvency Fund Assessments = [1.0 - (8)]	1.002	1.000	1.002	1.002	0.998

Notes:

- (2): Previous filings.
- (3),(4): Section III-D, Exhibit 2.
- (5),(6): Section III-D, Exhibit 3.
- (7): Section III-D, Exhibit 4.

III 000011

III 000012

Section III - Premiums
 Subsection D - Rate On-Level Factors
 7/1/2022

Section III - D
 Exhibit 1

Rate On-Level Factors

Rate Level Effective Date (1)	Rate Change (2)	Cumulative Rate Level Change (3)	Factor to Current Rate Level (4)	Policy Year Weights	
				2017 (5)	2018 (6)
7/1/2016		1.000	0.812	100.0%	56.8%
7/1/2018	0.871	0.871	0.932		43.2%
7/1/2020	0.932	0.812	1.000		

(7) Rate On-Level Factor
 = Sum [(4) x (5) through (6)]

Policy Year	
2017	2018
0.812	0.864

Notes:

(2) From previous filings.

(3): $(3)_t = (2)_t \times (3)_{t-1}$

(4): $(3)_{\text{latest rate level effective date}} / (3)$.

(5),(6): Exhibit 2.

III 000013

Section III - Premiums
 Subsection D - Premium On-Level Factors
 7/1/2022

Section III - D
 Exhibit 2

Policy Year Weights for On-Leveling Earned Premium

Policy Year (1)	Policy Month (2)	Standard Earned Premium plus ARAP at Rate Level Effective			Earned Premiums (6)
		4/1/2014 (3)	7/1/2016 (4)	7/1/2018 (5)	
2017	1		207,338,253		207,338,253
2017	2		77,277,639		77,277,639
2017	3		95,943,513		95,943,513
2017	4		118,742,165		118,742,165
2017	5		93,228,401		93,228,401
2017	6		109,368,490		109,368,490
2017	7		146,154,269		146,154,269
2017	8		76,702,606		76,702,606
2017	9		93,273,047		93,273,047
2017	10		94,333,680		94,333,680
2017	11		74,064,570		74,064,570
2017	12		99,214,454		99,214,454
2017	Total		1,285,641,088		1,285,641,088

2018	1		211,619,485		211,619,485
2018	2		79,730,946		79,730,946
2018	3		97,143,666		97,143,666
2018	4		117,740,978		117,740,978
2018	5		97,685,838		97,685,838
2018	6		116,200,326		116,200,326
2018	7			137,345,415	137,345,415
2018	8			72,464,164	72,464,164
2018	9			87,084,773	87,084,773
2018	10			90,026,589	90,026,589
2018	11			69,517,681	69,517,681
2018	12			92,076,752	92,076,752
2018	Total		720,121,238	548,515,375	1,268,636,612

2019	1			193,438,521	193,438,521
2019	2			72,892,984	72,892,984
2019	3			88,797,628	88,797,628
2019	4			107,625,227	107,625,227
2019	5			89,293,107	89,293,107
2019	6			106,216,976	106,216,976
2019	7			144,139,761	144,139,761
2019	8			76,048,926	76,048,926
2019	9			91,392,786	91,392,786
2019	10			94,480,133	94,480,133
2019	11			72,956,685	72,956,685
2019	12			96,631,718	96,631,718
2019	Total			1,233,914,453	1,233,914,453

Rate Level Effective Date (7)	Policy Year Weights		
	2017 (8)	2018 (9)	2019 (10)
4/1/2014			
7/1/2016	100.0%	56.8%	
7/1/2018		43.2%	100.0%

Notes:

(3),(4),(5): From Unit Statistical Plan Data. PY 2019 based on PY 2018 data subject to adjustments for rate level, exposure growth, and wage changes.

(6) = (3) + (4) + (5)

(8),(9),(10) = [PY Total of (3), (4) or (5)] / [PY Total of (6)]

III 000014

Section III - Premiums
 Subsection D - Premium On-Level Factors
 7/1/2022

Section III - D
 Exhibit 3

Calendar Year ("CY") Weights for On-Leveling Earned Premium

Policy Year (1)	Policy Month (2)	CY in which Premium is Earned (3)	Standard Earned Premium plus ARAP at Rate Level Effective			Earned Premiums (7)
			4/1/2014 (4)	7/1/2016 (5)	7/1/2018 (6)	
2015	12	2017				0
2016	1	2017	2,184,182			2,184,182
2016	2	2017	7,230,351			7,230,351
2016	3	2017	16,713,577			16,713,577
2016	4	2017	29,347,775			29,347,775
2016	5	2017	29,676,146			29,676,146
2016	6	2017	45,455,839			45,455,839
2016	7	2017		67,285,056		67,285,056
2016	8	2017		44,391,945		44,391,945
2016	9	2017		63,555,882		63,555,882
2016	10	2017		68,663,506		68,663,506
2016	11	2017		57,724,326		57,724,326
2016	12	2017		92,210,150		92,210,150
2017	1	2017		205,033,166		205,033,166
2017	2	2017		69,310,219		69,310,219
2017	3	2017		78,259,267		78,259,267
2017	4	2017		87,716,261		87,716,261
2017	5	2017		61,151,390		61,151,390
2017	6	2017		61,469,428		61,469,428
2017	7	2017		73,008,008		73,008,008
2017	8	2017		30,545,434		30,545,434
2017	9	2017		28,863,609		28,863,609
2017	10	2017		22,210,418		22,210,418
2017	11	2017		10,840,004		10,840,004
2017	12	2017		3,593,964		3,593,964
Total		2017	130,607,869	1,125,832,033		1,256,439,903

2016	12	2018		30		30
2017	1	2018		2,280,955		2,280,955
2017	2	2018		7,962,375		7,962,375
2017	3	2018		17,678,349		17,678,349
2017	4	2018		31,017,817		31,017,817
2017	5	2018		32,071,575		32,071,575
2017	6	2018		47,893,259		47,893,259
2017	7	2018		73,138,098		73,138,098
2017	8	2018		46,153,993		46,153,993
2017	9	2018		64,405,955		64,405,955
2017	10	2018		72,120,581		72,120,581
2017	11	2018		63,223,130		63,223,130
2017	12	2018		95,619,387		95,619,387
2018	1	2018		209,317,619		209,317,619
2018	2	2018		71,554,283		71,554,283
2018	3	2018		79,153,309		79,153,309
2018	4	2018		86,923,168		86,923,168
2018	5	2018		64,718,161		64,718,161
2018	6	2018		65,232,774		65,232,774
2018	7	2018			68,407,271	68,407,271
2018	8	2018			29,044,576	29,044,576
2018	9	2018			26,558,283	26,558,283
2018	10	2018			21,254,138	21,254,138
2018	11	2018			10,500,863	10,500,863
2018	12	2018			3,596,888	3,596,888
Total		2018		1,130,464,820	159,362,018	1,289,826,838

Rate Level Effective Date (8)	Calendar Year Earned Weights	
	2017 (9)	2018 (10)
4/1/2014	10.4%	
7/1/2016	89.6%	87.6%
7/1/2018		12.4%

Notes:

(4),(5),(6): From Unit Statistical Plan Data.

(7) = (4) + (5) + (6)

(9),(10) = [CY Total of (4), (5) or (6)] / [CY Total of (7)]

III 000015

Section III - Premiums
 Subsection D - Premium On-Level Factors
 7/1/2022

Section III - D
 Exhibit 4

Calendar Year ("CY") Weights for On-Leveling Earned Premium

Policy Year (1)	Policy Month (2)	CY in which Premium is Earned (3)	Standard Earned Premium plus ARAP at Rate Level Effective			PY Premiums Earned During CY (7)
			4/1/2014 (4)	7/1/2016 (5)	7/1/2018 (6)	
2017	12	2019		2		2
2018	1	2019		2,288,106		2,288,106
2018	2	2019		8,174,090		8,174,090
2018	3	2019		17,987,767		17,987,767
2018	4	2019		30,814,945		30,814,945
2018	5	2019		32,966,086		32,966,086
2018	6	2019		50,966,355		50,966,355
2018	7	2019			68,937,575	68,937,575
2018	8	2019			43,420,028	43,420,028
2018	9	2019			60,528,151	60,528,151
2018	10	2019			68,774,549	68,774,549
2018	11	2019			59,018,808	59,018,808
2018	12	2019			88,483,489	88,483,489
2019	1	2019			191,358,207	191,358,207
2019	2	2019			65,422,733	65,422,733
2019	3	2019			72,171,437	72,171,437
2019	4	2019			79,255,912	79,255,912
2019	5	2019			59,013,486	59,013,486
2019	6	2019			59,478,472	59,478,472
2019	7	2019			71,609,450	71,609,450
2019	8	2019			30,403,975	30,403,975
2019	9	2019			27,800,134	27,800,134
2019	10	2019			22,246,882	22,246,882
2019	11	2019			10,990,756	10,990,756
2019	12	2019			3,764,338	3,764,338
Total		2019		143,197,351	1,082,678,381	1,225,875,732

Rate Level Effective Date (8)	Calendar Year Earned Weights
	2019 (9)
4/1/2014	
7/1/2016	11.7%
7/1/2018	88.3%

Notes:

(4),(5),(6): From Unit Statistical Plan Data. PY 2019 based on PY 2018 data subject to adjustments for rate level, exposure growth, and wage changes.

(7) = (4) + (5) + (6)

(9) = [CY Total of (4), (5) or (6)] / [CY Total of (7)]

III 000016

Section III - Premiums
 Subsection E - Premium Adjustment Factors
 7/1/2022

Section III - E
 Exhibit 1

Calculation of Premium Adjustment Factor PY 2018 to Prospective Effective Period 7/1/2022 - 6/30/2023

(1)	Wage Trend from PY 2018 to Prospective Effective Period 7/1/2022 - 6/30/2023	1.173
(2)	Exposure Growth	1.063
(3)	Rate On-Level Factor	0.864
(4)	Overall Indicated Rate Change for Policies Effective 7/1/2022	1.027
(5)	Adjustment Factor to Balance Experience Rating, ARAP, and Construction Credits	1.038
(6)	Impact of Change in Indicated Loading for Recoupment of Insolvency Fund Assessments	1.005
(7)	Adjustment Factor = (1) x (2) x (3) x (4) x (5) x (6)	1.155
(8)	Selected Factor	1.16

Notes:

(1):	Statewide Average Weekly Wage for PY 2018 (Section V-G, Exhibit 1)	1,445.94
	Statewide Average Weekly Wage for 10/1/2020, based on data period 4/1/19 to 4/1/20 (Section V-G, Exhibit 1)	1,487.78
	Statewide Average Weekly Wage at 7/1/2023 (using wage trend of 3.6%, Section V-A, Exhibit 1)	1,696.58
(2):	Exposure growth from PY 2018 to Prospective Effective Period 7/1/2022 - 6/30/2023 (Section V-H, Exhibit 3)	
(3):	Section III-D Exhibit 1.	
(4):	Section I-B Exhibit 1.	
(5):	Exhibit 2.	
(6):	PY 2018 factor to load for Recoupment of Insolvency Fund (Section III-C, Exhibit 1: [1.0 + (8)]).	1.000
	Policy Effective factor to load for Recoupment of Insolvency Fund Assessments (Section IX-K, Exhibit 5, Page 1).	1.005

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Section III - Premiums
Subsection E - Premium Adjustment Factors
7/1/2022

Section III - E
Exhibit 2

Factor to Balance Experience Rating, ARAP, and Construction Credit

Beginning Period - PY 2018

(1)	Anticipated Impact on Manual Rates of Experience Rating, ARAP, and Construction Credits	1.033
(2)	Actual Impact on Manual Rates of Experience Rating, ARAP, and Construction Credits	0.995
(3)	Ratio of Anticipated to Actual = (1) / (2)	1.038

Ending Period - Prospective Effective Period 7/1/2022 - 6/30/2023

(4)	Anticipated Impact on Manual Rates of Experience Rating, ARAP, and Construction Credits	1.036
(5)	Actual is Assumed to be equal to the Anticipated, Since the Actual Impact has yet to be Determined	1.036
(6)	Ratio of Anticipated to Actual is Assumed to be 1.000	1.000
(7)	Adjustment Factor to Balance Experience Rating, ARAP, and Construction Credits = (3) / (6)	1.038

Notes:

(1),(2): PY 2018, Section III-B, Exhibit 1.

(4),(5): Prospective Effective Period, Section IX-K, Exhibit 1.

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BENEFIT CHANGE ADJUSTMENTS

In Section IV we calculate benefit change adjustment factors that are used in Sections I, II, V, VIII, IX, X, XI, and XII of the rate filing. Benefit change adjustment factors are used to adjust loss experience to the benefit level as of a given period or point in time.

Benefit Change Adjustments

The benefit change adjustments are summarized in Section IV-A, Exhibit 1. We calculate separate adjustments to bring indemnity and medical losses for policy years 2017 and 2018 to the July 1, 2022 benefit level, and additional adjustments to bring losses from the July 1, 2022 benefit level to the projected benefit level for the period the rates will be in effect. These benefit change adjustments are used in Section I of the filing. In the same exhibit we also present additional benefit level adjustments used in other sections of the filing.

Benefit changes considered in this section are the result of the reevaluations of the Statewide Average Weekly Wage (“SAWW”) made every October 1st by the Commonwealth’s Division of Unemployment Assistance. Historically, in the last decade, the SAWW in Massachusetts has increased annually by an average of 3.2% (range from 0.7% or \$8 increase to 4.4% or \$48 increase). However, due to the distortive impact of COVID-19, the latest SAWW, effective 10/1/2021, of \$1,694.24, is significantly higher than would otherwise be anticipated. The latest SAWW is 14% ($\$1,694.24/\$1,487.78$) higher than the prior year (\$206 increase). This large jump in SAWW is not entirely a reflection of rising

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wages. Rather, it is largely due to the disproportionate impact that the shutdowns had on job losses in lower wage, service industries such as hospitality and restaurants, as compared to higher wage paying professions which continued through remote work throughout mandated shutdowns. In an effort to estimate the prospective benefit levels when rates would be in effect under this valuing, the latest value of SAWW is not used to project values of the SAWW, instead the SAWW effective 10/1/2020¹ is used as the base year and utilizes a SAWW trend factor of 3.6% as shown in Section IV - D, Exhibit 3.

In Section IV-B, we display in detail the derivation of our estimates of the effects of the changes in the SAWW announced in 2021 and projected for 2022 and 2023. Section IV-C summarizes the provisions of Chapter 398, showing benefits that are tied to the SAWW. Section IV-D contains backup data used in the evaluations. The model underlying the estimates is described below. Section IV-E includes injury type weights, and Section IV-F details the USL&HW benefit level changes.

Section IV-B - Determination of the Effect of Announced SAWW Changes

Introduction

We use a version of the NCCI's "Automatics Model" to evaluate the effects of changes in the SAWW. The Automatics Model, a traditional approach, used in the prior rate filing, looks at benefits paid to average claimants.

¹ 10/1/2020 SAWW of \$1,487.78; The WCRIBMA has estimated that the 10/1/2020 SAWW reflects data underlying the period from 4/1/2019 to 3/31/2020 and remains largely unaffected by COVID-19 anomalies.

Description of the Model

NCCI's "Automatics Model" is used to evaluate benefit changes that are dependent on changes in the SAWW. In Massachusetts, SAWW changes are announced every October. Indemnity benefits are generally determined as a percentage of the SAWW, subject to maximum and minimum amounts.

For each injury type, the indemnity benefits payable to an average claimant are determined before and after each announced SAWW change. The estimated impact of the change in the SAWW is calculated by comparing the "before" and "after" costs.

Section IV-B details the estimation of changes in the costs of benefits arising from changes in the SAWW effective October 1, 2021, and the projected SAWW changes of October 1, 2022 and October 1, 2023. Exhibit 1, pages 1 and 2, estimate the effect on fatal benefits. Exhibit 2 evaluates the effect on permanent total benefits. Exhibit 3 evaluates the effect on permanent partial benefits. Exhibit 4 looks at temporary total benefits.

Section IV-B, Exhibit 1 – Benefits for Fatal Claims

Fatal benefits are the sum of dependent survivor benefits plus burial payments, both of which are functions of the SAWW.¹ Expected dependent survivor payments are valued on page 1. The NCCI provided the WCRIBMA with the distribution of dependents by category - none, widow alone, widow with children, etc. For each category of dependents,

¹ According to the National Funeral Directors Association, 2021 General Price List Survey, the national median cost of a funeral was \$7,848. If a vault is included, something that is typically required by a cemetery, the median cost is \$9,420. The cost does not take into account cemetery, monument or marker costs or miscellaneous cash-advance charges, such as for flowers or an obituary.

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the cost is estimated as the product of a contingent annuity value and an average weekly benefit.

The contingent annuity values represent the present value of a stream of payments of \$1 discounted to reflect not only the time value of money, but also the possible occurrence of a contingent event that would cause the payment stream to cease. Examples of contingent events that would affect dependent survivor benefits for workers' compensation include death or remarriage of the dependent survivor. The WCRIBMA estimated annuity values using the model that underlies the currently approved pension tables in the Massachusetts' Workers' Compensation Statistical Plan which assume an interest rate of 3.5% and COLA adjustments of 1.7%. The annuities reflect the appropriate U.S. life tables in all cases except for the category of "three orphans" and "widow with child(ren)," where an annuity certain was used to approximate joint survivorship.

Average weekly benefits before and after the SAWW revision are evaluated on page 2. The estimated average weekly benefit depends on the proportions of workers whose wages result in either the application of the statutory minimum benefit, the application of the statutory maximum benefit, or a benefit that falls somewhere between the minimum and the maximum. As in the last filing these proportions come from the Massachusetts Wage Table ("Wage Table"). As shown in Section IV-D Exhibit 1, the Wage Table is based on the NCCI 2019 Standard Wage Distribution Table.

Section IV-B, Exhibit 2 – Benefits for Permanent Total Cases

To evaluate the effect of announced SAWW changes on permanent total losses, we consider weekly wage loss benefits and specific injury payments separately, and then we

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weigh those benefits and payments together. Most permanent total payments are associated with weekly wage loss benefits. The statutory weekly wage loss benefit is two thirds of the pre-injury wage subject to a minimum and maximum. The minimum and maximum are a function of the promulgated SAWW. Therefore, changes to the SAWW affect the average benefit paid. The second component we consider is specific injury payments. These benefits vary directly with the SAWW. Specific injury payments are made for the loss of use of body parts and determined as various multiples of the SAWW as listed in Section 36 of M.G.L. Chapter 152.

Section IV-B, Exhibit 3 – Benefits for Permanent Partial Cases

Permanent partial disability cases typically include a temporary period of total disability, referred to as the “healing period,” followed by a period of partial disability during which the worker has a wage earning capacity at a level below his pre-injury wage. Different benefit structures apply to the two periods. In addition, under Section 36 of M.G.L. Chapter 152, specific injury payments are made for the loss of use of various body parts. In this exhibit, we weigh together the effect of the SAWW on wage loss, specific injury payments, and healing period payments, using weights provided by the NCCI.

Section IV-B, Exhibit 4 – Benefits for Temporary Total Cases

We evaluate the effect on temporary total benefits in Exhibit 4. Temporary total wage loss benefits under Section 34 of M.G.L. Chapter 152 provide an injured worker sixty percent of their pre-injury average weekly wage subject to a cap, the statutory maximum compensation rate, and a floor, the statutory minimum compensation rate. However, if the

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average weekly wage of the employee is less than the minimum compensation rate, his wage compensation rate is set equal to his average weekly wage.

Section IV-C – Provisions of the Law

Section IV-C summarizes the benefit changes due to the increase in the maximum and minimum weekly benefits. It includes both historical changes and projected changes.

Section IV-D – Massachusetts Data

Historical data used in the estimation of benefit change adjustments are shown in Section IV-D, along with the derivation of projected SAWW values. The WCRIBMA utilizes both historical DCI data and NCCI data.

Section IV-E – Injury Type Weights

Unit Statistical Plan Data are used in Section IV-E to calculate the relative weights for indemnity and medical benefits for the various injury types. Injury type weights are estimated at two valuation points, ultimate and at fifth-report.

Section IV-F – Effects of USL&HW Benefit Changes

Section IV-F contains the derivation of benefit change adjustment factors related to claims paid or payable under the USL&HW Act. The calculations are analogous to those for state workers' compensation benefits in Section IV-A. The assumed changes in benefit levels used in Section IV-F are provided by NCCI.

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Section IV - Benefit Change Adjustments
 Subsection A - Summary
 7/1/2022

Section IV - A
 Exhibit 1

Benefit Level Adjustment Factors

All Injury Types

Time Period		Indemnity					Medical	Total
Beginning Period	Ending Period	Death	Permanent Total	Permanent Partial	Temporary Total	All Injury Types	All Injury Types	All Injury Types
1/1/2022	Prosp. Eff. Period					0.988	1.000	
PY 2017	1/1/2022					1.072	1.000	
PY 2018	1/1/2022					1.062	1.000	
PY 2004	Prosp. Eff. Period	1.105	1.126	1.218	1.075	1.167	1.036	
PY 2005	Prosp. Eff. Period	1.099	1.117	1.201	1.070	1.155	1.032	
PY 2006	Prosp. Eff. Period	1.094	1.109	1.184	1.066	1.143	1.032	
PY 2007	Prosp. Eff. Period	1.088	1.100	1.167	1.061	1.130	1.032	
PY 2008	Prosp. Eff. Period	1.081	1.091	1.151	1.056	1.118	1.024	
PY 2009	Prosp. Eff. Period	1.079	1.088	1.145	1.054	1.113	1.002	
PY 2010	Prosp. Eff. Period	1.080	1.088	1.146	1.055	1.114	1.000	
PY 2011	Prosp. Eff. Period	1.076	1.083	1.136	1.053	1.107	1.000	
PY 2012	Prosp. Eff. Period	1.071	1.076	1.124	1.049	1.097	1.000	
PY 2013	Prosp. Eff. Period	1.069	1.073	1.118	1.047	1.093	1.000	
PY 2014	Prosp. Eff. Period	1.063	1.069	1.111	1.045	1.087	1.000	
PY 2015	Prosp. Eff. Period	1.051	1.063	1.100	1.041	1.078	1.000	
PY 2016	Prosp. Eff. Period	1.045	1.056	1.088	1.037	1.069	1.000	
PY 2017	Prosp. Eff. Period	1.039	1.048	1.076	1.032	1.059	1.000	
PY 2018	Prosp. Eff. Period	1.032	1.039	1.063	1.026	1.049	1.000	
PY 2016	CPY 2018_07	1.017	1.020	1.031	1.014		1.000	
PY 2017	CPY 2019_07	1.018	1.021	1.032	1.014		1.000	
PY 2018	CPY 2020_07	1.023	1.028	1.044	1.019		1.000	
CPY 2018_07	Prosp. Eff. Period							1.029
CPY 2019_07	Prosp. Eff. Period							1.022
CPY 2020_07	Prosp. Eff. Period							1.010
CPY 2008_09	Prosp. Eff. Period							1.075
Prior Eff. Period (using benefit level projections from prior filing)	Prosp. Eff. Period					1.024	1.000	1.016

Notes:

1/1/2022 refers to a point in time. All other time periods refer to Policy Years.

Example: PY 2010 to Prosp. Eff. Period for Permanent Partial = $1.146 = 1.228 / 1.072$

where 1.228 is the Index Factor for Prosp. Eff. Period and 1.072 is the Index Factor for PY 2010 for Indemnity Permanent Partial, from Exhibit 2.

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Section IV - Benefit Change Adjustments
 Subsection A - Summary
 7/1/2022

Section IV - A
 Exhibit 3

Historical and Estimated Benefit Level Changes

Effective Date (1)	Indemnity					Medical	Total
	Death (2)	Permanent Total (3)	Permanent Partial (4)	Temporary Total (5)	All Injury Types (6)	All Injury Types (7)	All Injury Types (8)
10/1/2002	-0.1%	-0.1%	-0.3%	-0.1%	-0.2%	0.0%	-0.1%
12/1/2002	0.0%	0.0%	0.0%	0.0%	0.0%	5.2%	2.0%
10/1/2003	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
9/1/2004	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	0.5%
10/1/2004	0.5%	0.7%	1.2%	0.4%	0.9%	0.0%	0.6%
10/1/2005	0.5%	0.8%	1.5%	0.4%	1.1%	0.0%	0.7%
10/1/2006	0.5%	0.7%	1.5%	0.4%	1.1%	0.0%	0.7%
10/1/2007	0.6%	0.9%	1.4%	0.5%	1.1%	0.0%	0.7%
10/1/2008	0.6%	0.8%	1.5%	0.5%	1.2%	0.0%	0.7%
4/1/2009	0.0%	0.0%	0.0%	0.0%	0.0%	3.2%	1.3%
10/1/2009	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
10/1/2010	-0.1%	-0.1%	-0.2%	-0.1%	-0.2%	0.0%	-0.1%
10/1/2011	0.6%	0.8%	1.4%	0.4%	1.1%	0.0%	0.7%
10/1/2012	0.4%	0.6%	1.0%	0.3%	0.8%	0.0%	0.5%
10/1/2013	0.1%	0.1%	0.2%	0.1%	0.2%	0.0%	0.1%
10/1/2014	0.4%	0.5%	0.9%	0.3%	0.7%	0.0%	0.5%
3/24/2015	0.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
10/1/2015	0.5%	0.6%	1.1%	0.3%	0.8%	0.0%	0.5%
10/1/2016	0.5%	0.7%	1.0%	0.4%	0.8%	0.0%	0.5%
10/1/2017	0.7%	0.8%	1.3%	0.6%	1.0%	0.0%	0.7%
10/1/2018	0.7%	0.8%	1.2%	0.5%	1.0%	0.0%	0.6%
10/1/2019	0.7%	0.8%	1.2%	0.5%	1.0%	0.0%	0.6%
10/1/2020	0.8%	1.0%	1.4%	0.7%	1.2%	0.0%	0.8%
10/1/2021	2.2%	2.8%	4.8%	1.9%	3.7%	0.0%	2.5%
10/1/2022	-1.0%	-1.3%	-2.0%	-0.9%	-1.6%	0.0%	-1.1%
10/1/2023	0.7%	0.8%	1.3%	0.6%	1.0%	0.0%	0.7%

Notes:

Estimated changes for 10/1/2022 and 10/1/2023 use projected SAWW values for 10/1/2022 and 10/1/2023.

Effects of SAWW Change

Person(s) Receiving Benefits (1)	Number of Cases (2)	Average Number of Dependents (3)	Average Arithmetic Age (4)	Annuity Symbol (5)	Annuity Value (6)	Effects of SAWW Change of 10/1/2020		Effects of SAWW Change of 10/1/2021		Effects of SAWW Change of 10/1/2022		Effects of SAWW Change of 10/1/2023	
						10/1/2019 Cost (7)	10/1/2020 Cost (8)	10/1/2020 Cost (9)	10/1/2021 Cost (10)	10/1/2021 Cost (11)	10/1/2022 Cost (12)	10/1/2022 Cost (13)	10/1/2023 Cost (14)
None	204	0	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx	xxx
Spouse, No Children	212	1	40	$a_{40:\overline{Li}\overline{fe}}$	24.75	229,177,845	231,006,927	228,650,923	233,448,498	240,604,641	238,319,851	245,232,796	246,810,240
Spouse with Children	407	1	38	$a_{38:\overline{Li}\overline{fe}}$	24.73	439,545,112	443,053,149	438,534,517	447,735,889	461,460,811	457,078,763	470,337,248	473,362,661
Child(ren)		1.9	10	$a_{\overline{8}}$	7.35								
Orphan, No Sibling	21	1	13	$a_{13:\overline{5}}$	4.69	4,302,885	4,337,227	4,292,992	4,383,068	4,517,427	4,474,529	4,604,322	4,633,939
Orphan with Sibling(s)	15	2.5	12	$a_{\overline{6}}$	5.59	3,665,395	3,694,649	3,656,968	3,733,699	3,848,152	3,811,609	3,922,173	3,947,402
Other Dependents (No Spouse)	141	1.7	58	$a_{58:\overline{Li}\overline{fe}}$	19.48	18,943,675	18,943,675	18,943,074	18,943,074	18,944,746	18,944,746	18,946,477	18,946,477
(15) Total Survivor Benefits	1,000					695,634,913	701,035,627	694,078,474	708,244,228	729,375,776	722,629,499	743,043,015	747,700,718
(16) Cost of Burial (1,000 cases)						11,453,280	11,902,240	11,902,240	13,553,920	13,553,920	12,765,789	12,765,789	13,220,782
(17) Total Monetary Cost [= (15) + (16)]						707,088,193	712,937,867	705,980,714	721,798,148	742,929,696	735,395,288	755,808,804	760,921,500
(18) Fatal Benefit Change Factors							1.008		1.022		0.990		1.007

Notes:

(2), (3): Section IV-D, Exhibit 2.

(4): Section IV-D, Exhibit 2, Column (4) rounded to nearest whole number.

(5): For two or more dependents, benefits are last-survivor contingent. An annuity certain is used to approximate the joint-survivor annuity for "Child(ren)" and "Orphan with Sibling(s)".

(6): Life annuity values from *Massachusetts Workers' Compensation Statistical Plan*, Part I, Section IX (Effective 7/1/2021).

Annuity certain values assume the same discount rate and elevation rate used in the derivation of the Pension Tables contained in the *Massachusetts Workers' Compensation Statistical Plan*.

(7), (9), (11), (13) = 52 x (2) x (6) x [Page 2, (14)] for Spouses and Orphans and = 52 x (2) x (3) x (6) x [Page 2, (30)] for All Others Dependents

(8), (10), (12), (14) = 52 x (2) x (6) x [Page 2, (15)] for Spouses and Orphans and = 52 x (2) x (3) x (6) x [Page 2, (31)] for All Others Dependents

(16) = 8 x SAWW

(18): Ratio of (17) for later date to (17) for earlier date.

IV 000010

IV 000011

Determination of the Average Weekly Survivor Benefit for Fatalities

Fatal: Spouse and Orphans - Effective 10/1/2020

(1)	Nominal Rate of Compensation Based on Gross Wages ("Comp. Rate")	66.67%
(2)	Min Weekly Compensation	110.00
(3)	Max Weekly Compensation	1,487.78
(4)	Average Injured Worker Weekly Wage ("AIWWW") for 12 months starting 10/1/2020	1,360.40

Wage Intervals (5)	Benefit (6)	Wage Distribution Entry Ratios = (5) / (4) (7)		Percentage in Interval		Average Wage in Interval = (9) / (8) x (4) (10)	Average Benefit in Interval (11)
				Workers (8)	Wages (9)		
0.00 165.00	Statutory Minimum	0.00	0.10	0.35%	0.02%	86.77	110.00
165.00 2,231.67	Actual Wage x Comp. Rate	0.10	1.65	88.63%	75.22%	1,154.60	769.73
2,231.67 over	Statutory Maximum	1.65	over	11.03%	24.76%	3,054.43	1,487.78

(12) Average Weekly Benefit **846.63**

	Effects of SAWW Change			
	10/1/2020	10/1/2021	10/1/2022	10/1/2023
(13) Starting date of 12 month period for AIWWW	10/1/2020	10/1/2021	10/1/2022	10/1/2023
(14) Benefits Effective	10/1/2019	10/1/2020	10/1/2021	10/1/2022
Average Weekly Benefits	839.92	837.99	881.80	898.76
(15) Benefits Effective	10/1/2020	10/1/2021	10/1/2022	10/1/2023
Average Weekly Benefits	846.63	855.58	873.43	904.55
(16) Fatal: Spouse and Orphans Benefit Change Factors	1.008	1.021	0.991	1.006

Fatal: All Others - Effective 10/1/2020

(17)	Nominal Rate of Compensation Based on Gross Wages ("Comp. Rate")	66.67%
(18)	Min Weekly Compensation	0.00
(19)	Max Weekly Compensation	80.00
(20)	Average Injured Worker Weekly Wage ("AIWWW") for 12 months starting 10/1/2020	1,360.40

Wage Intervals (21)	Benefit (22)	Wage Distribution Entry Ratios = (21) / (20) (23)		Percentage in Interval		Average Wage in Interval = (25) / (24) x (20) (26)	Average Benefit in Interval (27)
				Workers (24)	Wages (25)		
0.00 0.00	Statutory Minimum	0.00	0.00	0.00%	0.00%	0.00	0.00
0.00 120.00	Actual Wage x Comp. Rate	0.00	0.10	0.35%	0.02%	86.77	57.84
120.00 over	Statutory Maximum	0.10	over	99.65%	99.98%	1,364.83	80.00

(28) Average Weekly Benefit **79.92**

	Effects of SAWW Change			
	10/1/2020	10/1/2021	10/1/2022	10/1/2023
(29) Starting date of 12 month period for AIWWW	10/1/2020	10/1/2021	10/1/2022	10/1/2023
(30) Benefits Effective	10/1/2019	10/1/2020	10/1/2021	10/1/2022
Average Weekly Benefits	79.92	79.92	79.93	79.94
(31) Benefits Effective	10/1/2020	10/1/2021	10/1/2022	10/1/2023
Average Weekly Benefits	79.92	79.92	79.93	79.94
(32) Fatal: All Others Benefit Change Factors	1.000	1.000	1.000	1.000

Notes:

- (1)-(3), (17)-(19): Section IV-C, Exhibit 1.
- (4), (20): Section IV-D, Exhibit 3.
- (5), (21): Wage Intervals follow Massachusetts General Law.
- (7), (23): Rounded to nearest 0.05.
- (8), (24): Section IV-D, Exhibit 1, column (2).
- (9), (25): Section IV-D, Exhibit 1, column (3).
- (11), (27): Comp Rate x Average Wage in Interval, subject to a statutory maximum and statutory minimum.
- (12) = Sum [(8) x (11)]
- (14), (15): Average Weekly Benefits results from an Excel Data Table that repeats the calculation of (12) for different dates.
- (16) = (15) / (14)
- (28) = Sum [(24) x (27)]
- (30), (31): Average Weekly Benefits results from an Excel Data Table that repeats the calculation of (28) for different dates.
- (32) = (31) / (30)

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Section IV - Benefit Change Adjustments
 Subsection B - Effects of SAWW Change
 7/1/2022

Section IV-B
 Exhibit 2

Determination of the Average Weekly Benefit for Permanent Totals

Permanent Total - Effective 10/1/2020

(1)	Nominal Rate of Compensation Based on Gross Wages ("Comp. Rate")	66.67%
(2)	Min Weekly Compensation	297.56
(3)	Max Weekly Compensation	1,487.78
(4)	Average Injured Worker Weekly Wage ("AIWWW") for 12 months starting 10/1/2020	1,360.40

Wage Intervals (5)		Benefit (6)	Wage Distribution Entry Ratios = (5) / (4) (7)		Percentage in Interval		Average Wage in Interval = (9) / (8) x (4) (10)	Average Benefit in Interval (11)
					Workers (8)	Wages (9)		
0.00	446.33	Statutory Minimum	0.00	0.35	7.27%	1.83%	341.66	297.56
446.33	2,231.67	Actual Wage x Comp. Rate	0.35	1.65	81.70%	73.41%	1,222.41	814.94
2,231.67	over	Statutory Maximum	1.65	over	11.03%	24.76%	3,054.43	1,487.78

(12) Average Weekly Benefit **851.52**

	Effects of SAWW Change			
	10/1/2020	10/1/2021	10/1/2022	10/1/2023
(13) Starting date of 12 month period for AIWWW	10/1/2020	10/1/2021	10/1/2022	10/1/2023
(14) Benefits Effective Average Weekly Wage Loss Benefit	10/1/2019 844.22	10/1/2020 843.09	10/1/2021 889.33	10/1/2022 904.26
(15) Benefits Effective Average Weekly Wage Loss Benefit	10/1/2020 851.52	10/1/2021 863.75	10/1/2022 879.52	10/1/2023 910.87
(16) Permanent Total Wage Loss Benefit Change Factors	1.009	1.024	0.989	1.007
(17) Specific Injury Benefits SAWW Effect on Specific Injury Benefits	1.039	1.139	0.942	1.036
(18) Benefit Proportions Associated with Permanent Total Claims				
(a) Permanent Total Wage Loss Benefits	96.50%	96.50%	96.50%	96.50%
(b) Specific Injury Benefits	3.50%	3.50%	3.50%	3.50%
(19) Permanent Total Benefit Change Factors = [(16) x (18a)] + [(17) x (18b)]	1.010	1.028	0.987	1.008

Notes:

- (1), (2), (3): Section IV-C, Exhibit 1.
- (4): Section IV-D, Exhibit 3.
- (5): Wage Intervals follow Massachusetts General Law.
- (7): Rounded to nearest 0.05.
- (8): Section IV-D, Exhibit 1, column (2).
- (9): Section IV-D, Exhibit 1, column (3).
- (11): Comp Rate x Average Wage in Interval, subject to a statutory maximum and statutory minimum.
- (12) = Sum [(8) x (11)]
- (14), (15): Average Weekly Benefits results from an Excel Data Table that repeats the calculation of (12) for different dates.
- (16) = (15) / (14)
- (17): Ratio of SAWW from Section IV-D, Exhibit 3.
 Example: Effect of SAWW Change of 10/1/2021 = SAWW 10/1/2021 / SAWW 10/1/2020 = 1.139 = 1,487.78 / 1,431.66
- (18): Estimated Average Schedule Benefit compared to Average Indemnity Cost per Claim.
 DCI data for Permanent Total Claims in Massachusetts.

IV 000013

Section IV - Benefit Change Adjustments
 Subsection B - Effects of SAWW Change
 7/1/2022

Section IV-B
 Exhibit 3

Determination of the Average Weekly Benefit for Permanent Partial

Permanent Partial - Effective 10/1/2020

(1)	Nominal Rate of Compensation Based on Gross Wages ("Comp. Rate")	37.20%
(2)	Min Weekly Compensation	0.00
(3)	Max Weekly Compensation	1,115.84
(4)	Average Injured Worker Weekly Wage ("AIWWW") for 12 months starting 10/1/2020	1,360.40
(5)	SAWW effective 10/1/2020	1,487.78

Wage Intervals (6)		Benefit (7)	Wage Distribution Entry Ratios = (6) / (4) (8)		Percentage in Interval		Average Wage in Interval =(10) / (9) x (4) (11)	Average Benefit in Interval (12)
					Workers (9)	Wages (10)		
0.00	2,999.56	Actual Wage x Comp. Rate	0.00	2.20	96.38%	89.09%	1,257.48	467.78
2,999.56	4,894.01	Statutory Maximum	2.20	3.60	3.03%	7.93%	3,563.32	1115.84
4,894.01	7,830.42	Statutorily Reduced	3.60	5.75	0.50%	2.16%	5,915.21	727.78
7,830.42	over	Exceeds Statutory Limit	5.75	over	0.09%	0.82%	12,028.18	0.00

(13) Average Weekly Benefit **488.27**

	Effects of SAWW Change			
	10/1/2020	10/1/2021	10/1/2022	10/1/2023
(14) Starting date of 12 month period for AIWWW				
(15) Benefits Effective Average Weekly Wage Loss Benefit	10/1/2019 486.31	10/1/2020 482.69	10/1/2021 503.84	10/1/2022 517.71
(16) Benefits Effective Average Weekly Wage Loss Benefit	10/1/2020 488.27	10/1/2021 487.67	10/1/2022 501.48	10/1/2023 519.35
(17) Permanent Partial Wage Loss Benefit Change Factors	1.004	1.010	0.995	1.003
(18) Specific Injury Benefits SAWW Effect on Specific Injury Benefits	1.039	1.139	0.942	1.036
(19) Permanent Partial Healing Period Effect on Healing Period Benefits	1.007	1.019	0.991	1.006
(20) Benefit Proportions Associated with Permanent Partial Claims				
(a) Permanent Partial Wage Loss Benefits	27%	27%	27%	27%
(b) Specific Injury Benefits	26%	26%	26%	26%
(c) Healing Period - Temporary Total Benefits	47%	47%	47%	47%
(21) Permanent Partial Benefit Change Factors = [(17) x (20a)] + [(18) x (20b)] + [(19) x (20c)]	1.014	1.048	0.980	1.013

Notes:

- (1), (2), (3): Section IV-C, Exhibit 1.
- (4), (5): Section IV-D, Exhibit 3.
- (6): Wage Intervals follow Massachusetts General Law.
- (7): Statutory Maximum: Insurer may reduce benefit to level at which benefits + earnings = 2 x SAWW.
- (8): Rounded to nearest 0.05.
- (9): Section IV-D, Exhibit 1, column (2).
- (10): Section IV-D, Exhibit 1, column (3).
- (12): Comp Rate x Average Wage in Interval, subject to a statutory maximum and a statutory limitation.
- (13) = Sum [(9) x (12)]
- (15), (16): Average Weekly Benefits results from an Excel Data Table that repeats the calculation of (13) for different dates.
- (17) = (16) / (15)
- (18): Ratio of SAWW from Section IV-D, Exhibit 3.
 Example: Effect of SAWW Change of 10/1/2021 = 1.139 = 1,487.78 / 1,431.66
- (19): Temporary Total Benefit Change Factors, Exhibit 4.
- (20): DCI data for Permanent Partial Claims in Massachusetts.

IV 000014

Section IV - Benefit Change Adjustments
 Subsection B - Effects of SAWW Change
 7/1/2022

Section IV-B
 Exhibit 4

Determination of the Average Weekly Benefit for Temporary Totals

Temporary Total - Effective 10/1/2020

(1)	Nominal Rate of Compensation Based on Gross Wages ("Comp. Rate")	60.00%
(2)	Min Weekly Compensation	297.56
(3)	Max Weekly Compensation	1,487.78
(4)	Average Injured Worker Weekly Wage ("AIWWW") for 12 months starting 10/1/2020	1,360.40

Wage Intervals (5)	Benefit (6)	Wage Distribution Entry Ratios = (5) / (4) (7)		Percentage in Interval		Average Wage in Interval = (9) / (8) x (4) (10)	Average Benefit in Interval (11)
				Workers (8)	Wages (9)		
0.00 - 297.56	Actual Wage	0.00	0.20	1.71%	0.24%	190.28	190.28
297.56 - 495.93	Statutory Minimum	0.20	0.35	5.56%	1.59%	388.33	297.56
495.93 - 2,479.63	Actual Wage x Comp. Rate	0.35	1.80	84.70%	78.57%	1,261.98	757.19
2,479.63 over	Statutory Maximum	1.80	over	8.03%	19.60%	3,320.51	1,487.78
(12) Average Weekly Benefit							780.61

(13) Starting date of 12 month period for AIWW

(14) Benefits Effective
 Average Weekly Benefits

(15) Benefits Effective
 Average Weekly Benefits

(16) Temporary Total Benefit Change Factors

	Effects of SAWW Change			
	10/1/2020	10/1/2021	10/1/2022	10/1/2023
(13) Starting date of 12 month period for AIWW	10/1/2020	10/1/2021	10/1/2022	10/1/2023
(14) Benefits Effective Average Weekly Benefits	10/1/2019 775.33	10/1/2020 772.31	10/1/2021 811.29	10/1/2022 828.35
(15) Benefits Effective Average Weekly Benefits	10/1/2020 780.61	10/1/2021 786.91	10/1/2022 804.31	10/1/2023 832.97
(16) Temporary Total Benefit Change Factors	1.007	1.019	0.991	1.006

Notes:

- (1), (2), (3): Section IV-C, Exhibit 1.
- (4): Section IV-D, Exhibit 3.
- (5): Wage Intervals follow Massachusetts General Law.
- (7): Rounded to nearest 0.05.
- (8): Section IV-D, Exhibit 1, column (2).
- (9): Section IV-D, Exhibit 1, column (3).
- (11): Comp Rate x Average Wage in Interval, subject to a statutory maximum and statutory minimum, unless the actual wage is less than the statutory minimum.
- (12) = Sum [(8) x (11)]
- (14), (15): Average Weekly Benefits results from an Excel Data Table that repeats the calculation of (12) for different dates.
- (16) = (15) / (14)

Summary of Principal Benefit Changes Due to the Increase in the Maximum and Minimum Weekly Benefits

	10/1/2019	10/1/2020	10/1/2021	10/1/2022	10/1/2023
(1) Fatal					
% Rate of Compensation	66.67%	66.67%	66.67%	66.67%	66.67%
Minimum Weekly Benefit					
Widow/Orphan	\$110.00	\$110.00	\$110.00	\$110.00	\$110.00
Others	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Maximum Weekly Benefit					
Widow/Orphan	\$1,431.66	\$1,487.78	\$1,694.24	<i>\$1,595.72</i>	<i>\$1,652.60</i>
Others	\$80.00	\$80.00	\$80.00	\$80.00	\$80.00
Each Additional Child	\$6.00, if benefit under \$150.00	\$6.00, if benefit under \$150.00	\$6.00, if benefit under \$150.00	\$6.00, if benefit under \$150.00	\$6.00, if benefit under \$150.00
Maximum Aggregate Payable	250 x SAWW	250 x SAWW	250 x SAWW	250 x SAWW	250 x SAWW
Burial Allowance	8 X SAWW	8 X SAWW	8 X SAWW	8 X SAWW	8 X SAWW
Cost of Living Adjustment - benefits increase annually by:	Each October 1 after 2 years after injury. Based on the lesser of 5%, N.E. region urban area CPI, and the % change in the SAWW	Each October 1 after 2 years after injury. Based on the lesser of 5%, N.E. region urban area CPI, and the % change in the SAWW	Each October 1 after 2 years after injury. Based on the lesser of 5%, N.E. region urban area CPI, and the % change in the SAWW	Each October 1 after 2 years after injury. Based on the lesser of 5%, N.E. region urban area CPI, and the % change in the SAWW	Each October 1 after 2 years after injury. Based on the lesser of 5%, N.E. region urban area CPI, and the % change in the SAWW
(2) Total Disability					
Permanent Total					
% Rate of Compensation	66.67%	66.67%	66.67%	66.67%	66.67%
Minimum Weekly Benefit	\$286.33	\$297.56	\$338.85	<i>\$319.14</i>	<i>\$330.52</i>
Maximum Weekly Benefit	\$1,431.66	\$1,487.78	\$1,694.24	<i>\$1,595.72</i>	<i>\$1,652.60</i>
Duration	Lifetime	Lifetime	Lifetime	Lifetime	Lifetime
Cost of Living Adjustment - benefits increase annually by:	Same as Fatal	Same as Fatal	Same as Fatal	Same as Fatal	Same as Fatal
Temporary Total					
% Rate of Compensation	60.00%	60.00%	60.00%	60.00%	60.00%
Minimum Weekly Benefit	\$286.33	\$297.56	\$338.85	<i>\$319.14</i>	<i>\$330.52</i>
Maximum Weekly Benefit	\$1,431.66	\$1,487.78	\$1,694.24	<i>\$1,595.72</i>	<i>\$1,652.60</i>
Waiting Period/Retroactive After	5 days/21 days	5 days/21 days	5 days/21 days	5 days/21 days	5 days/21 days
(3) Permanent Partial Disability					
% Rate of Compensation	37.20%	37.20%	37.20%	37.20%	37.20%
Minimum Weekly Benefit	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Maximum Weekly Benefit	\$1,073.75	\$1,115.84	\$1,270.68	<i>\$1,196.79</i>	<i>\$1,239.45</i>
(4) Specific Injury Payments					
Scheduled Injuries	According to the injury, a scheduled number multiplied by the SAWW	According to the injury, a scheduled number multiplied by the SAWW	According to the injury, a scheduled number multiplied by the SAWW	According to the injury, a scheduled number multiplied by the SAWW	According to the injury, a scheduled number multiplied by the SAWW
Non-Scheduled Injuries	32 x SAWW	32 x SAWW	32 x SAWW	32 x SAWW	32 x SAWW
Disfigurement					
Maximum Benefit	\$15,000	\$15,000.00	\$15,000.00	\$15,000.00	\$15,000.00
Benefit	As determined by the reviewing board	As determined by the reviewing board	As determined by the reviewing board	As determined by the reviewing board	As determined by the reviewing board

Notes:
 Source: The General Laws of Massachusetts, Chapter 152, Sections 31-36.
 (1), (2): Maximum Weekly Benefit for Fatalities and Tot
 (2): Minimum Weekly Benefit for Total Disability is 20% of the SAWW.
 (3): Maximum Weekly Benefit for Permanent Partial is 75% of the SAWW. There is no Minimum Weekly Benefit for Permanent Partial Di:
 (3): Permanent Partial % Rate of Compensation is 60% of 62%, the lost wage-earning capacity,

Values in Italics are Projected

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Section IV - Benefit Change Adjustments
 Subsection D - Massachusetts Data
 7/1/2022

Section IV-D
 Exhibit 1

Standard Wage Distribution Table

R = Ratio to Average Wage
 A = Cumulative Percentage of Workers
 B = Cumulative Percentage of Wages

R (1)	A (2)	B (3)	R (1)	A (2)	B (3)	R (1)	A (2)	B (3)
0.05	0.1035	0.0031	2.40	97.4598	91.5605	4.75	99.7840	98.5435
0.10	0.3465	0.0221	2.45	97.6612	92.0487	4.80	99.7930	98.5865
0.15	0.8421	0.0854	2.50	97.8414	92.4948	4.85	99.8017	98.6281
0.20	1.7130	0.2396	2.55	98.0031	92.9029	4.90	99.8099	98.6684
0.25	3.0495	0.5424	2.60	98.1483	93.2767	4.95	99.8178	98.7074
0.30	4.8994	1.0533	2.65	98.2789	93.6197	5.00	99.8254	98.7452
0.35	7.2702	1.8259	2.70	98.3968	93.9349	5.05	99.8327	98.7817
0.40	10.1357	2.9025	2.75	98.5033	94.2251	5.10	99.8397	98.8171
0.45	13.4453	4.3108	2.80	98.5998	94.4929	5.15	99.8463	98.8513
0.50	17.1314	6.0631	2.85	98.6875	94.7405	5.20	99.8527	98.8844
0.55	21.1178	8.1571	2.90	98.7673	94.9700	5.25	99.8589	98.9165
0.60	25.3249	10.5770	2.95	98.8402	95.1832	5.30	99.8648	98.9475
0.65	29.6752	13.2963	3.00	98.9069	95.3817	5.35	99.8704	98.9775
0.70	34.0956	16.2803	3.05	98.9682	95.5670	5.40	99.8758	99.0065
0.75	38.5205	19.4883	3.10	99.0246	95.7404	5.45	99.8810	99.0346
0.80	42.8927	22.8764	3.15	99.0767	95.9031	5.50	99.8859	99.0618
0.85	47.1638	26.3995	3.20	99.1249	96.0561	5.55	99.8907	99.0881
0.90	51.2943	30.0131	3.25	99.1696	96.2003	5.60	99.8953	99.1135
0.95	55.2534	33.6745	3.30	99.2112	96.3365	5.65	99.8996	99.1381
1.00	59.0180	37.3442	3.35	99.2500	96.4654	5.70	99.9038	99.1619
1.05	62.5721	40.9863	3.40	99.2862	96.5878	5.75	99.9078	99.1848
1.10	65.9060	44.5693	3.45	99.3202	96.7041	5.80	99.9117	99.2071
1.15	69.0152	48.0662	3.50	99.3521	96.8149	5.85	99.9154	99.2286
1.20	71.8995	51.4543	3.55	99.3821	96.9206	5.90	99.9189	99.2493
1.25	74.5623	54.7154	3.60	99.4103	97.0216	5.95	99.9223	99.2694
1.30	77.0100	57.8353	3.65	99.4370	97.1183	6.00	99.9255	99.2888
1.35	79.2510	60.8038	3.70	99.4622	97.2110	6.05	99.9287	99.3076
1.40	81.2954	63.6140	3.75	99.4861	97.2999	6.10	99.9316	99.3257
1.45	83.1542	66.2621	3.80	99.5087	97.3853	6.15	99.9345	99.3432
1.50	84.8392	68.7468	3.85	99.5302	97.4674	6.20	99.9372	99.3601
1.55	86.3625	71.0693	3.90	99.5506	97.5465	6.25	99.9399	99.3765
1.60	87.7363	73.2324	3.95	99.5700	97.6227	6.30	99.9424	99.3923
1.65	88.9725	75.2406	4.00	99.5885	97.6961	6.35	99.9448	99.4075
1.70	90.0825	77.0995	4.05	99.6061	97.7670	6.40	99.9471	99.4223
1.75	91.0777	78.8156	4.10	99.6229	97.8354	6.45	99.9493	99.4365
1.80	91.9684	80.3962	4.15	99.6389	97.9014	6.50	99.9514	99.4502
1.85	92.7646	81.8489	4.20	99.6542	97.9653	6.55	99.9535	99.4635
1.90	93.4755	83.1815	4.25	99.6688	98.0270	6.60	99.9554	99.4763
1.95	94.1096	84.4019	4.30	99.6827	98.0866	6.65	99.9573	99.4887
2.00	94.6749	85.5181	4.35	99.6961	98.1443	6.70	99.9591	99.5007
2.05	95.1785	86.5377	4.40	99.7088	98.2001	6.75	99.9608	99.5122
2.10	95.6272	87.4684	4.45	99.7210	98.2541	6.80	99.9624	99.5233
2.15	96.0267	88.3172	4.50	99.7327	98.3064	6.85	99.9640	99.5341
2.20	96.3826	89.0911	4.55	99.7439	98.3569	6.90	99.9655	99.5445
2.25	96.6997	89.7965	4.60	99.7546	98.4059	6.95	99.9670	99.5545
2.30	96.9824	90.4395	4.65	99.7648	98.4533	7.00	99.9684	99.5642
2.35	97.2346	91.0257	4.70	99.7746	98.4991			

Notes:

Source: NCCI - The 2019 Standard Wage Distribution Table.

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Section IV - Benefit Change Adjustments
 Subsection D - Massachusetts Data
 7/1/2022

Section IV-D
 Exhibit 2

Dependency Table

Dependency Class (1)	Number of Cases (2)	Average Number of Dependents (3)	Average Dependent Age (4)
No Dependents	204	0	N/A
Spouse, No Children	212	1	40
Spouse with Children	153	1	38
1 Child		1	11
Spouse with Children	166	1	38
2 Children		2	10
Spouse with Children	63	1	37
3 Children		3	10
Spouse with Children	18	1	37
4 Children		4	10
Spouse with Children	5	1	37
5 Children		5	10
Spouse with Children	2	1	38
More than 5 Children		7	10
Spouse with Children	407	1	38
Summary		1.9	10
Orphan, No Sibling	21	1	13
1 Child			
Orphans with Sibling(s)	10	2	12
2 Children		3	12
3 Children		1	12
4 Children		1	12
More than 4 Children		5	12
Orphans with Sibling(s)	15	2.5	12
Summary			
Other Dependents (No Spouse)	41	1	62
1 Parent			
2 Parents		2	58
Sibling		7	37
Other		2	31
Other Dependents	141	1.7	58
Summary			

Notes:

Source: NCCI, CPS data, 1989-1993, reweighted using DCI Data for Fatalities, 1984-1993.

(2): Dependent count includes working adult household members standardized to a total of 1,000 cases.

Derivation of Estimated SAWW (Statewide Average Weekly Wage) and AIWWW (Average Injured Worker Weekly Wage)

SAWW Effective Date (1)	SAWW Based on Data (2)	Midpoint of the SAWW Data (3)	Actual SAWW (4)	Estimated Annual SAWW Trend Factor (5)	Actual and Projected SAWW (6)	AIWWW Period (7)	Actual and Projected Effective AIWWW (8)
10/1/2019	4/1/18 to 4/1/19	10/1/2018	1,431.66		1,431.66	10/1/19 to 10/1/20	1,315.77
10/1/2020	4/1/19 to 4/1/20	10/1/2019	1,487.78		1,487.78	10/1/20 to 10/1/21	1,360.40
10/1/2021	4/1/20 to 4/1/21	10/1/2020	1,694.24		1,694.24	10/1/21 to 10/1/22	1,343.18
10/1/2022	4/1/21 to 4/1/22	10/1/2021		1.036	1,595.72	10/1/22 to 10/1/23	1,391.05
10/1/2023	4/1/22 to 4/1/23	10/1/2022		1.036	1,652.60	10/1/23 to 10/1/24	1,440.63

Notes:

(4): Source: Department of Unemployment Assistance (DUA); previously this data was compiled by the Division of Employment and Training (DET).

(5): 3.6% Estimated Annual Trend in SAWW, Section V-A, Exhibit 1.

(6): For SAWW Effective Date 10/1/2019 - 10/1/2021, (6) = (4)

For SAWW Effective Date 10/1/2022, (6) = (5)² x (6) from 10/1/2020

For SAWW Effective Date 10/1/2023, (6) = (5) x (6) from prior period

(8): For the AIWWW Period 10/1/19 to 10/1/20, (8) is the product of .827 and the average of the SAWWs effective 10/1/2020 and 10/1/2021, respectively.

For the AIWWW Period 10/1/20 to 10/1/21, (8) is the product of .827 and the average of the SAWWs effective 10/1/2021 and 10/1/2022, respectively.

For the AIWWW Period 10/1/21 to 10/1/22, (8) is the product of .827 and the average of the SAWWs effective 10/1/2022 and 10/1/2023, respectively.

For the AIWWW Periods 10/1/22 to 10/1/23 and 10/1/23 to 10/1/24, (8) = (5) x (8) from Prior Period).

Historical Relationship of .827 for the ratio of AIWWW to SAWW is selected based on DCI data.

4/1/1996: SAWW = 648, AIWWW = 536

4/1/1994: SAWW = 595, AIWWW = 492

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 Subsection D - Massachusetts Data
 7/1/2022

Section IV-D
 Exhibit 4

Average Wage Loss for Permanent Partial Claimants

DCI Report Level	(Pre-Injury - Post-Injury) / Pre-Injury Wage					Average
	1979 (1)	1980 (2)	1981 (3)	1982 (4)	1983 (5)	
Average Wage Loss for Major Permanent Partial Claimants						
1	0.61	0.62	0.60	0.62	0.60	0.61
2	0.62	0.62	0.59	0.63	0.62	0.62
3	0.64	0.60	0.65	0.60		0.62
4	0.60	0.64	0.62			0.62
(6) Selected Average Wage Loss for Major Permanent Partial Claimants						0.62

Average Wage Loss for Minor Permanent Partial Claimants						
1	0.58	0.58	0.58	0.60	0.59	0.59
2	0.62	0.60	0.59	0.58	0.64	0.61
3	0.66	0.64	0.65	0.56		0.63
4	0.62	0.70	0.66			0.66
(7) Selected Average Wage Loss for Minor Permanent Partial Claimants						0.62

Notes:

Source: Detail Claim Information ("DCI") Data, compiled as of 10/1/1985.

(6), (7): These data were compiled prior to Chapter 398. To be consistent with Chapter 398, 62% will be used as the wage loss as a percent of pre-injury wage.

The percent of that that is paid is 60% subject to maximums.

Post-Chapter 398 Injury Type Weights at 5th Report

Injury Type (1)	Policy Year (2)	Indemnity - Likely to Develop			Indemnity - Not Likely to Develop			Indemnity On-level Losses at Fifth Report = (5) + (8) (9)	Weights at 5th report (10)
		Losses at Fifth Report (3)	Benefit On-Level Factor to Prosp. Eff. Period (4)	On-level Losses at Fifth Report = (3) x (4) (5)	Losses at Fifth Report (6)	Benefit On-Level Factor to Prosp. Eff. Period (7)	On-level Losses at Fifth Report = (6) x (7) (8)		
Death	2010	1,255,173	1.080	1,355,120	4,442,116	1.080	4,795,833	6,150,952	
Death	2011	381,438	1.076	410,355	7,241,840	1.076	7,790,839	8,201,193	
Death	2012	1,909,719	1.071	2,045,060	8,207,921	1.071	8,789,612	10,834,672	
Death	2013	1,592,212	1.069	1,701,491	8,255,702	1.069	8,822,318	10,523,809	
Death	2014	6,153,067	1.063	6,540,915	2,550,363	1.063	2,711,121	9,252,036	
Total Death		11,291,609		12,052,940	30,697,942		32,909,722	44,962,662	1.43%
Permanent Total	2010	32,871,502	1.088	35,780,240	0	1.088	0	35,780,240	
Permanent Total	2011	41,480,634	1.083	44,932,773	0	1.083	0	44,932,773	
Permanent Total	2012	57,202,597	1.076	61,559,074	0	1.076	0	61,559,074	
Permanent Total	2013	56,331,180	1.073	60,451,579	0	1.073	0	60,451,579	
Permanent Total	2014	66,479,058	1.069	71,064,643	0	1.069	0	71,064,643	
Total Permanent Total		254,364,971		273,788,309	0		0	273,788,309	8.72%
Permanent Partial	2010	81,838,021	1.146	93,770,890	129,360,236	1.146	148,222,358	241,993,247	
Permanent Partial	2011	86,955,593	1.136	98,804,016	124,132,645	1.136	141,046,750	239,850,766	
Permanent Partial	2012	74,757,767	1.124	84,005,841	118,069,159	1.124	132,675,164	216,681,006	
Permanent Partial	2013	72,325,331	1.118	80,877,157	123,591,722	1.118	138,205,342	219,082,499	
Permanent Partial	2014	87,506,291	1.111	97,200,137	137,778,943	1.111	153,041,936	250,242,073	
Total Permanent Partial		403,383,003		454,658,041	632,932,705		713,191,550	1,167,849,591	37.21%
Temporary Total	2010	30,374,666	1.055	32,042,228	63,374,026	1.055	66,853,246	98,895,474	
Temporary Total	2011	31,778,863	1.053	33,447,795	77,335,587	1.053	81,397,023	114,844,818	
Temporary Total	2012	36,565,807	1.049	38,359,713	72,654,892	1.049	76,219,316	114,579,028	
Temporary Total	2013	31,820,845	1.047	33,324,239	83,026,205	1.047	86,948,824	120,273,063	
Temporary Total	2014	40,794,937	1.045	42,621,839	85,028,986	1.045	88,836,801	131,458,640	
Total Temporary Total		171,335,118		179,795,813	381,419,696		400,255,210	580,051,023	18.48%
(11) Total Indemnity		840,374,701		920,295,103	1,045,050,343		1,146,356,482	2,066,651,585	65.85%

- (12) Aggregate Financial Policy Year Call, Indemnity Fifth to Ultimate Development Factor Paid + Case 1.044
 (13) Tail Development Attributed to Likely to Develop Claims 0.8
 (14) Percentage Likely to Develop 0.445
 (15) Indemnity Likely to Develop - Loss Development Factor from 5th Report to Ultimate = $1.0 + \{ [(12) - 1.0] \times (13) \} / (14)$ 1.078
 (16) Indemnity Not Likely to Develop - Loss Development Factor from 5th Report to Ultimate = $1.0 + \{ [(12) - 1.0] \times [1.0 - (13)] \} / [1.0 - (14)]$ 1.016

Notes:

- (3), (6): Unit Statistical Plan data, excluding Large Deductibles.
 (4), (7): Section IV - A, Exhibit 1
 (10) = (9), Total / Page 2, Column (9), Total Medical & Indemnity
 (12) = $1.02 \times 1.016 \times 1.007$ where 1.02 is the loss development factor from Section II - B, Exhibit 1, 1.016 is the tail factor from Section II - C, Exhibit 2, Page 1.
 and 1.007 is the escalation factor from Section II - D, Exhibit 2, Page 1.
 (14) = (5), Total Indemnity / (9), Total Indemnity

IV 000020

Post-Chapter 398 Injury Type Weights at 5th Report

Injury Type (1)	Policy Year (2)	Medical - Likely to Develop			Medical - Not Likely to Develop			Medical On-level Losses at Fifth Report = (5) + (8) (9)	Weights at 5th report (10)
		Losses at Fifth Report (3)	Benefit On-Level Factor to Prosp. Eff. Period (4)	On-level Losses at Fifth Report = (3) x (4) (5)	Losses at Fifth Report (6)	Benefit On-Level Factor to Prosp. Eff. Period (7)	On-level Losses at Fifth Report = (6) x (7) (8)		
Death	2010	23,434	1.000	23,434	176,427	1.000	176,427	199,861	
Death	2011	13,739	1.000	13,739	271,119	1.000	271,119	284,858	
Death	2012	233,322	1.000	233,322	334,710	1.000	334,710	568,032	
Death	2013	277,312	1.000	277,312	593,619	1.000	593,619	870,931	
Death	2014	2,281,814	1.000	2,281,814	198,777	1.000	198,777	2,480,591	
Total Death		2,829,621		2,829,621	1,574,652		1,574,652	4,404,273	0.14%
Permanent Total	2010	31,011,650	1.000	31,011,650	0	1.000	0	31,011,650	
Permanent Total	2011	29,242,012	1.000	29,242,012	0	1.000	0	29,242,012	
Permanent Total	2012	41,548,609	1.000	41,548,609	0	1.000	0	41,548,609	
Permanent Total	2013	28,303,749	1.000	28,303,749	0	1.000	0	28,303,749	
Permanent Total	2014	39,102,359	1.000	39,102,359	0	1.000	0	39,102,359	
Total Permanent Total		169,208,379		169,208,379	0		0	169,208,379	5.39%
Permanent Partial	2010	27,983,168	1.000	27,983,168	51,649,304	1.000	51,649,304	79,632,472	
Permanent Partial	2011	40,335,790	1.000	40,335,790	47,011,933	1.000	47,011,933	87,347,723	
Permanent Partial	2012	32,572,485	1.000	32,572,485	43,145,138	1.000	43,145,138	75,717,623	
Permanent Partial	2013	27,627,669	1.000	27,627,669	48,590,145	1.000	48,590,145	76,217,814	
Permanent Partial	2014	40,221,218	1.000	40,221,218	50,671,304	1.000	50,671,304	90,892,522	
Total Permanent Partial		168,740,330		168,740,330	241,067,824		241,067,824	409,808,154	13.06%
Temporary Total	2010	14,345,982	1.000	14,345,982	48,355,786	1.000	48,355,786	62,701,768	
Temporary Total	2011	16,306,663	1.000	16,306,663	55,232,405	1.000	55,232,405	71,539,068	
Temporary Total	2012	16,484,002	1.000	16,484,002	55,961,666	1.000	55,961,666	72,445,668	
Temporary Total	2013	13,067,702	1.000	13,067,702	58,890,156	1.000	58,890,156	71,957,858	
Temporary Total	2014	21,363,196	1.000	21,363,196	60,754,029	1.000	60,754,029	82,117,225	
Total Temporary Total		81,567,545		81,567,545	279,194,042		279,194,042	360,761,587	11.50%
Medical Only	2010	0	1.000	0	25,553,029	1.000	25,553,029	25,553,029	
Medical Only	2011	0	1.000	0	25,617,224	1.000	25,617,224	25,617,224	
Medical Only	2012	0	1.000	0	25,210,964	1.000	25,210,964	25,210,964	
Medical Only	2013	0	1.000	0	25,635,723	1.000	25,635,723	25,635,723	
Medical Only	2014	0	1.000	0	25,478,305	1.000	25,478,305	25,478,305	
Total Medical Only		0		0	127,495,245		127,495,245	127,495,245	4.06%
(11) Total Medical		422,345,875		422,345,875	649,331,763		649,331,763	1,071,677,638	34.15%
(12) Total Medical & Indemnity		1,262,720,576		1,342,640,978	1,694,382,106		1,795,688,245	3,138,329,223	

- (13) Medical Only fraction of Total Medical 11.90%
- (14) Aggregate Financial Policy Year Call, Medical Fifth to Ultimate Development Factor Paid + Case 0.989
- (15) Tail Development Attributed to Likely to Develop Claims 0.8
- (16) Percentage Likely to Develop 0.394
- (17) Medical Likely to Develop - Loss Development Factor from 5th Report to Ultimate = $1.0 + \{ [(14) - 1.0] \times (15) \} / (16)$ 0.977
- (18) Medical Not Likely to Develop - Loss Development Factor from 5th Report to Ultimate = $1.0 + \{ [(14) - 1.0] \times [1.0 - (15)] \} / [1.0 - (16)]$ 0.996
- (19) Indemnity Likely Weight at 5th Report 29.32%
- (20) Indemnity Not Likely Weight at 5th Report 36.53%
- (21) Medical Likely Weight at 5th Report 13.46%
- (22) Medical Not Likely Weight at 5th Report 20.69%

Notes:

- (3), (6): Unit Statistical Plan data, excluding Large Deductibles.
- (4), (7): Section IV - A, Exhibit 1
- (10) = (9), Total / (9), Total Medical & Indemnity
- (13) = (10), Total Medical Only / (10), Total Medical
- (14) = 0.972×1.017 where 0.972 is the loss development factor from Section II - B, Exhibit 1, 1.017 is the tail factor from Section II - C, Exhibit 2, Page 1.
- (16) = (5), Total Medical / (9), Total Medical
- (19) = Page 1, (5), Total Indemnity / (9), Total Medical & Indemnity
- (20) = Page 1, (8), Total Indemnity / (9), Total Medical & Indemnity
- (21) = (5), Total Medical / (9), Total Medical & Indemnity
- (22) = (8), Total Medical / (9), Total Medical & Indemnity

IV 000021

Post-Chapter 398 Injury Type Weights at Ultimate

Injury Type (1)	Policy Year (2)	Indemnity - Likely to Develop			Indemnity - Not Likely to Develop			Indemnity Ult. On-level Losses at Ultimate = (5) + (8) (9)	Weights at Ultimate (10)
		On-level Losses at Fifth Report (3)	Development Factors 5th to Ultimate (4)	Est. Ult On-level Losses = (3) x (4) (5)	On-level Losses at Fifth Report (6)	Development Factors 5th to Ultimate (7)	Est. Ult On-level Losses = (6) x (7) (8)		
Death	2010	1,355,120	1.078	1,461,130	4,795,833	1.016	4,871,130	6,332,260	
Death	2011	410,355	1.078	442,456	7,790,839	1.016	7,913,160	8,355,616	
Death	2012	2,045,060	1.078	2,205,044	8,789,612	1.016	8,927,614	11,132,658	
Death	2013	1,701,491	1.078	1,834,597	8,822,318	1.016	8,960,834	10,795,431	
Death	2014	6,540,915	1.078	7,052,607	2,711,121	1.016	2,753,687	9,806,295	
Total Death		12,052,940		12,995,835	32,909,722		33,426,426	46,422,260	1.44%
Permanent Total	2010	35,780,240	1.078	38,579,306	0	1.016	0	38,579,306	
Permanent Total	2011	44,932,773	1.078	48,447,837	0	1.016	0	48,447,837	
Permanent Total	2012	61,559,074	1.078	66,374,804	0	1.016	0	66,374,804	
Permanent Total	2013	60,451,579	1.078	65,180,670	0	1.016	0	65,180,670	
Permanent Total	2014	71,064,643	1.078	76,623,987	0	1.016	0	76,623,987	
Total Permanent Total		273,788,309		295,206,604	0		0	295,206,604	9.18%
Permanent Partial	2010	93,770,890	1.078	101,106,530	148,222,358	1.016	150,549,544	251,656,074	
Permanent Partial	2011	98,804,016	1.078	106,533,394	141,046,750	1.016	143,261,275	249,794,669	
Permanent Partial	2012	84,005,841	1.078	90,577,568	132,675,164	1.016	134,758,250	225,335,817	
Permanent Partial	2013	80,877,157	1.078	87,204,128	138,205,342	1.016	140,375,255	227,579,383	
Permanent Partial	2014	97,200,137	1.078	104,804,046	153,041,936	1.016	155,444,793	260,248,838	
Total Permanent Partial		454,658,041		490,225,666	713,191,550		724,389,115	1,214,614,781	37.77%
Temporary Total	2010	32,042,228	1.078	34,548,873	66,853,246	1.016	67,902,885	102,451,757	
Temporary Total	2011	33,447,795	1.078	36,064,396	81,397,023	1.016	82,675,009	118,739,404	
Temporary Total	2012	38,359,713	1.078	41,360,570	76,219,316	1.016	77,416,008	118,776,578	
Temporary Total	2013	33,324,239	1.078	35,931,174	86,948,824	1.016	88,313,977	124,245,150	
Temporary Total	2014	42,621,839	1.078	45,956,119	88,836,801	1.016	90,231,596	136,187,716	
Total Temporary Total		179,795,813		193,861,131	400,255,210		406,539,474	600,400,605	18.67%
(11) Total Indemnity		920,295,103		992,289,236	1,146,356,482		1,164,355,015	2,156,644,251	67.06%

IV 000022

Notes:

- (3): Exhibit 1, Page 1, Column (5)
- (4): Exhibit 1, Page 1, Row (15)
- (6): Exhibit 1, Page 1, Column (8)
- (7): Exhibit 1, Page 1, Row (16)
- (10) = (9), Total / Page 2, Column (9), Total Medical & Indemnity

Post-Chapter 398 Injury Type Weights at Ultimate

Injury Type (1)	Policy Year (2)	Medical - Likely to Develop			Medical - Not Likely to Develop			Medical On-level Losses at Ultimate = (5) + (8) (9)	Weights at Ultimate (10)
		On-level Losses at Fifth Report (3)	Development Factors 5th to Ultimate (4)	Est. Ult On-level Losses = (3) x (4) (5)	On-level Losses at Fifth Report (6)	Development Factors 5th to Ultimate (7)	Est. Ult On-level Losses = (6) x (7) (8)		
Death	2010	23,434	0.977	22,893	176,427	0.996	175,764	198,657	
Death	2011	13,739	0.977	13,422	271,119	0.996	270,100	283,522	
Death	2012	233,322	0.977	227,931	334,710	0.996	333,453	561,384	
Death	2013	277,312	0.977	270,905	593,619	0.996	591,389	862,294	
Death	2014	2,281,814	0.977	2,229,094	198,777	0.996	198,030	2,427,125	
Total Death		2,829,621		2,764,245	1,574,652		1,568,736	4,332,981	0.13%
Permanent Total	2010	31,011,650	0.977	30,295,148	0	0.996	0	30,295,148	
Permanent Total	2011	29,242,012	0.977	28,566,396	0	0.996	0	28,566,396	
Permanent Total	2012	41,548,609	0.977	40,588,658	0	0.996	0	40,588,658	
Permanent Total	2013	28,303,749	0.977	27,649,811	0	0.996	0	27,649,811	
Permanent Total	2014	39,102,359	0.977	38,198,927	0	0.996	0	38,198,927	
Total Permanent Total		169,208,379		165,298,941	0		0	165,298,941	5.14%
Permanent Partial	2010	27,983,168	0.977	27,336,637	51,649,304	0.996	51,455,261	78,791,898	
Permanent Partial	2011	40,335,790	0.977	39,403,861	47,011,933	0.996	46,835,312	86,239,173	
Permanent Partial	2012	32,572,485	0.977	31,819,921	43,145,138	0.996	42,983,044	74,802,966	
Permanent Partial	2013	27,627,669	0.977	26,989,352	48,590,145	0.996	48,407,595	75,396,946	
Permanent Partial	2014	40,221,218	0.977	39,291,936	50,671,304	0.996	50,480,935	89,772,871	
Total Permanent Partial		168,740,330		164,841,706	241,067,824		240,162,147	405,003,853	12.59%
Temporary Total	2010	14,345,982	0.977	14,014,528	48,355,786	0.996	48,174,116	62,188,645	
Temporary Total	2011	16,306,663	0.977	15,929,909	55,232,405	0.996	55,024,900	70,954,810	
Temporary Total	2012	16,484,002	0.977	16,103,151	55,961,666	0.996	55,751,421	71,854,572	
Temporary Total	2013	13,067,702	0.977	12,765,782	58,890,156	0.996	58,668,909	71,434,691	
Temporary Total	2014	21,363,196	0.977	20,869,615	60,754,029	0.996	60,525,780	81,395,395	
Total Temporary Total		81,567,545		79,682,986	279,194,042		278,145,127	357,828,113	11.13%
Medical Only	2010	0	0.977	0	25,553,029	0.996	25,457,028	25,457,028	
Medical Only	2011	0	0.977	0	25,617,224	0.996	25,520,982	25,520,982	
Medical Only	2012	0	0.977	0	25,210,964	0.996	25,116,248	25,116,248	
Medical Only	2013	0	0.977	0	25,635,723	0.996	25,539,411	25,539,411	
Medical Only	2014	0	0.977	0	25,478,305	0.996	25,382,585	25,382,585	
Total Medical Only		0		0	127,495,245		127,016,253	127,016,253	3.95%
(11) Total Medical		422,345,875		412,587,877	649,331,763		646,892,264	1,059,480,141	32.94%
(12) Total Medical & Indemnity		1,342,640,978		1,404,877,113	1,795,688,245		1,811,247,278	3,216,124,392	

- (13) Medical Only fraction of Total Medical 11.99%
- (14) Indemnity Likely to Develop at Ultimate 30.85%
- (15) Indemnity Not Likely to Develop at Ultimate 36.20%
- (16) Medical Likely to Develop at Ultimate 12.83%
- (17) Medical Not Likely to Develop at Ultimate 20.11%

Notes:

- (3): Exhibit 1, Page 2, Column (5)
- (4): Exhibit 1, Page 2, Row (17)
- (6): Exhibit 1, Page 2, Column (8)
- (7): Exhibit 1, Page 2, Row (18)
- (10) = (9), Total / Total Medical & Indemnity
- (12) = (11), Total Medical + Page 1, (11) Total Indemnity
- (13) = (10), Total Medical Only / (10), Total Medical

IV 000023

USL&HW Benefit Level Factors

All Injury Types

Time Period		Indemnity					Medical	Total
Beginning Period	Ending Period	Death	Permanent Total	Permanent Partial	Temporary Total	All Injury Types	All Injury Types	All Injury Types
PY 2014	Prosp. Eff. Period	1.043	1.034	1.016	1.034		1.000	
PY 2015	Prosp. Eff. Period	1.039	1.031	1.015	1.031		1.000	
PY 2016	Prosp. Eff. Period	1.035	1.028	1.014	1.028		1.000	
PY 2017	Prosp. Eff. Period	1.030	1.024	1.012	1.024		1.000	
PY 2018	Prosp. Eff. Period	1.025	1.020	1.010	1.020		1.000	
CPY 2018_07	Prosp. Eff. Period							1.008
CPY 2019_07	Prosp. Eff. Period							1.006
CPY 2020_07	Prosp. Eff. Period							1.004
Prior Eff. Period (using benefit level projections from prior filing)	Prosp. Eff. Period					1.006	1.000	1.004

IV 000024

Notes:

All time periods refer to Policy Years.

Example: PY 2018 to Prosp. Eff. Period for Indemnity Permanent Partial = 1.010 = 1.017 / 1.007

where 1.017 is the Index Factor of Prosp. Eff. Period and 1.007 is the Index Factor of PY 2018 for Indemnity Permanent Partial, from Exhibit 2.

USL&HW Benefit Level Changes and Weights

Death												
Benefit Level Change	10/1/2013	10/1/2014	10/1/2015	10/1/2016	10/1/2017	10/1/2018	10/1/2019	10/1/2020	10/1/2021	10/1/2022	10/1/2023	Weighted Average Benefit Level
Cumulative Benefit Level Change	1.000	1.004	1.008	1.012	1.017	1.022	1.027	1.032	1.038	1.043	1.048	
Time Period												
PY 2014	0.396	0.594	0.010									1.002
PY 2015		0.368	0.626	0.006								1.007
PY 2016			0.383	0.612	0.005							1.011
PY 2017				0.323	0.673	0.005						1.015
PY 2018					0.349	0.648	0.003					1.020
CPY 2018_07					0.012	0.436	0.553					1.025
CPY 2019_07						0.008	0.398	0.594				1.030
CPY 2020_07							0.008	0.398	0.594			1.035
Prior Eff. Period							0.008	0.398	0.594			1.035
Prosp. Eff. Period									0.008	0.397	0.595	1.046

Indemnity All Injury Types - Average Benefit Level for Current Policy Period, Estimated at 7/1/2020 (using benefit level projections from prior filing).

Date of Change	10/1/2013	10/1/2014	10/1/2015	10/1/2016	10/1/2017	10/1/2018	10/1/2019	10/1/2020	10/1/2021	Weighted Average Benefit Level
Benefit Level Change	1.000	1.003	1.002	1.002	1.003	1.003	1.003	1.003	1.003	
Cumulative Level Change	1.000	1.003	1.005	1.007	1.010	1.013	1.016	1.019	1.022	1.021

Medical All Injury Types - Average Benefit Level for Current Policy Period, Estimated at 7/1/2020 (using benefit level projections from prior filing).

Date of Change	10/1/2013	10/1/2014	10/1/2015	10/1/2016	10/1/2017	10/1/2018	10/1/2019	10/1/2020	10/1/2021	Weighted Average Benefit Level
Benefit Level Change	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
Cumulative Level Change	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

All Injury Types - Average Benefit Level for Current Policy Period, Estimated at 7/1/2020 (using benefit level projections from prior filing).

Date of Change	10/1/2013	10/1/2014	10/1/2015	10/1/2016	10/1/2017	10/1/2018	10/1/2019	10/1/2020	10/1/2021	Weighted Average Benefit Level
Benefit Level Change	1.000	1.002	1.001	1.001	1.002	1.002	1.002	1.002	1.002	
Cumulative Level Change	1.000	1.002	1.003	1.004	1.006	1.008	1.010	1.012	1.014	1.013

Index Factors for All Injury Types

Time Period	Indemnity					Medical	Total
	Death	Permanent Total	Permanent Partial	Temporary Total	All Injury Types	All Injury Types	All Injury Types
PY 2014	1.002	1.002	1.001	1.002	1.002	1.000	1.001
PY 2015	1.007	1.006	1.003	1.006	1.004	1.000	1.003
PY 2016	1.011	1.009	1.004	1.009	1.006	1.000	1.004
PY 2017	1.015	1.013	1.005	1.013	1.009	1.000	1.005
PY 2018	1.020	1.017	1.007	1.017	1.012	1.000	1.007
CPY 2018_07	1.025	1.020	1.009	1.020	1.015	1.000	1.009
CPY 2019_07	1.030	1.025	1.011	1.025	1.018	1.000	1.011
CPY 2020_07	1.035	1.029	1.013	1.029	1.021	1.000	1.013
Prior Eff. Period	1.035	1.029	1.013	1.029	1.021	1.000	1.013
Prosp. Eff. Period	1.046	1.037	1.017	1.037	1.027	1.000	1.017

Notes:

All time periods refer to Policy Years.

Index Factors for All Injury Types is an Excel Data Table that repeats the calculation of the Weighted Average Benefit Level for all Injury Types.

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 Subsection F - Effects of USL&HW Benefit Changes
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 Exhibit 3

USL&HW Historical and Estimated Benefit Level Changes

Effective Date (1)	Indemnity					Medical	Total
	Death (2)	Permanent Total (3)	Permanent Partial (4)	Temporary Total (5)	All Injury Types (6)	All Injury Types (7)	All Injury Types (8)
10/1/2013	0.3%	0.3%	0.1%	0.3%	0.2%	0.0%	0.1%
10/1/2014	0.4%	0.4%	0.2%	0.4%	0.3%	0.0%	0.2%
10/1/2015	0.4%	0.3%	0.1%	0.3%	0.2%	0.0%	0.1%
10/1/2016	0.4%	0.3%	0.1%	0.3%	0.2%	0.0%	0.1%
10/1/2017	0.5%	0.4%	0.2%	0.4%	0.3%	0.0%	0.2%
10/1/2018	0.5%	0.4%	0.2%	0.4%	0.3%	0.0%	0.2%
10/1/2019	0.5%	0.4%	0.2%	0.4%	0.3%	0.0%	0.2%
10/1/2020	0.5%	0.4%	0.2%	0.4%	0.3%	0.0%	0.2%
10/1/2021	0.5%	0.4%	0.2%	0.4%	0.3%	0.0%	0.2%
10/1/2022	0.5%	0.4%	0.2%	0.4%	0.3%	0.0%	0.2%
10/1/2023	0.5%	0.4%	0.2%	0.4%	0.3%	0.0%	0.2%

Notes:

Values prior to 10/1/2018 are from NCCI's Annual Statistical Bulletin, 2020 Edition, Exhibit 3.
 Changes for 10/1/2018 - 10/1/2023 are assumed to be the same as 10/1/2017.

NET TREND**The Role of Trend**

The rate level indication in this filing is based on recent historical Massachusetts premium and loss data. Since the filing develops rates for a future period (beginning with policies issued July 1, 2022), basic principles of ratemaking require that historical losses and premiums be adjusted to the levels expected during the prospective rate period. The trend factors used represent the expected change from the experience period (in this filing, policy years 2017 and 2018) to July 1, 2023, the midpoint of the policy period for which rates are being set. The trend factors reflect expected movements in the frequency of claims, the average cost of claims (also called “severity”), and payroll levels (which drive the amount of premium collected). Trend factors exclude certain other changes over time such as statutorily-mandated changes in benefits and on-level factors for historical rate changes, which are considered elsewhere in the filing.

WCRIBMA Recommendation

The composite trend factor developed in this section is expressed as a “net” trend, meaning that it incorporates the combined effects on loss ratios of claim frequency movements, claim severity movements, and wage inflation – which may offset one another. Net trends are developed in this section separately for indemnity losses and medical losses (including medical only claims and medical on lost-time claims). Based on the methodology documented in this section, the WCRIBMA has used net trend factors of -2.9% per year for indemnity losses, and

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-2.9% per year for medical losses.¹ The indicated trend factors and their key components are summarized in Section V-A Exhibit 1, Page 1.

Indemnity Net Trend	-2.9%
Medical Net Trend	-2.9%

We are projecting that average claim costs for workers' compensation will continue to rise, as they have in recent years in both Massachusetts and elsewhere, at annual rates of 2.0% and 2.3% for indemnity and lost-time medical benefits, respectively and 2.8% for medical-only benefits. We are projecting downward movement in claim frequency per worker week, at a pace of 1.5% annually for lost-time indemnity and medical claims and 4.0% for medical-only claims. Finally, we are projecting an increase of 3.6% annually in average wages.

Trend	Indemnity	Lost-time Medical	Medical Only
Severity	2.0%	2.3%	2.8%
Frequency	-1.5%	-1.5%	-4.0%
SAWW	3.6%		
Net	-2.9%	-2.9%	

The annual net trends used in this filing reflect our expectations about the extent to which growth in the average cost of claims will be offset by declining claim frequencies and by the growth of premium that results from wage inflation.

¹ Based on NCCI's latest pending and approved filings as of October 29, 2021, with respect to medical net trend, four NCCI states filed higher medical trends than the WCRIBMA is proposing in this filing. With respect to indemnity net trend, five NCCI states filed higher indemnity trends than the WCRIBMA is proposing in this filing.

General Methodology

The WCRIBMA has separately calculated claim severity trends (for indemnity benefits, for medical on lost-time claims, and for medical only claims); claim frequency trends (for lost-time claims and for medical only claims); and average weekly wage trends.

The WCRIBMA recommends that the calculation of trend factors be based on movements in the underlying factors of claim severity, claim frequency, and wages – rather than fitting time trends to loss ratios themselves. Given the differences in the behavior of claim severity, claim frequency and wage trends, analyzing them separately provides better insights into the drivers of net trend.

For each component (claim severity, frequency, and wage trend), our primary method of measuring trends is an exponential least squares regression fit to the historical Massachusetts Unit Statistical Plan Data. As we did in the 2020 filing, we are relying on paid data for measuring our loss trends. Paid data tends to reduce the volatility in the development of ultimate severities and therefore results in better fits of the data, higher credibility and better predictive power. Due to higher credibility of the Massachusetts fitted data there is also less reliance on the complement of credibility. We performed regressions using data series of varying lengths, spanning from five to ten policy years, all ending with Policy Year 2018. A summary of the results is shown in the attached exhibits, Section V-A. The results of each of these regressions indicate an annual rate of change. Next, we tested the credibility of each of these indicated trends on the basis of the

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consistency between the historical data and the fitted exponential curves. Using a methodology from the actuarial literature,² we assigned higher credibility to the indicated trend if the trend line more closely fit the data, and a lower credibility if the data displayed wide departures from the fitted trend line. Third, to the extent that this credibility test suggested that the indicated trend from the historical data sets should be given less than 100% weight, we complemented the Massachusetts indication with an indicated trend from a larger database. In the case of claim frequency trends, claim severity trends, and average weekly wage trends, we looked to longer term (i.e., 15 years) Massachusetts trends to provide the complement to the Massachusetts trend indications. For each of the components of claim severity trend detailed above, the process generates six trend estimates, one each for the 5, 6, 7, 8, 9, and 10 year data series underlying the Massachusetts indicated trends. We then selected the shortest series with the best fit of these six trend indications for each component of the net trend. The various results of our calculations and the selections we have made are summarized in Exhibits 1 through 3 of Section V-A for claim severity, claim frequency, and average weekly wage, respectively.

² Venter, Gary, "Classical Partial Credibility with Application to Trend," *PCAS LXXIII* (the "Venter Paper") (1986) pp. 27-51.

Section V-A – Net Trend Calculation

Section V-A documents the calculation of the separate trends for claim severity, claim frequency, and average weekly wage.

Exhibit 1 in this section summarizes and combines all of the trend components, beginning with the indicated trend based on the historical Massachusetts data and its credibility parameter (Row (1)), applying the credibility parameter to each based on how well the indicated trend fits the underlying data (Row (10), Exhibits 2 and 3), and applying the complement of the credibility to the trend indications that are based on longer data series (Row (3)). The claim severity trend and the claim frequency trend are then combined to produce total loss trends (Row (8)). The medical trends for lost-time claims and medical only claims are weighted together, based on the relative volume of claim dollars by type of claim, to produce an overall medical loss trend (Row (7)). Finally, the loss trends for indemnity and medical losses are offset by the credibility-weighted average weekly wage trend to produce the total net annual trend (Row (10)).

Exhibits 2 and 3 of Section V-A document the calculation of the severity trends, frequency trends, and average weekly wage trends. In each of these exhibits, the first step is to calculate the exponential fits to the historical Massachusetts data, using data series of varying lengths, spanning from five to ten policy years, all ending with Policy Year 2018. The exponential method yields fitted values for each year in the data series and also an indicated annual rate of change in the data series. The exponential fits here and elsewhere in this section

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were calculated using a standard function within Microsoft Excel, the LOGEST function returns statistics that describes an exponential curve matching known data points.

Next, these exhibits document the calculation of the credibility associated with each of the fitted annual trends. This calculation uses a procedure described in the Venter Paper, which requires that the parameters of a confidence interval be chosen. Based on the Venter Paper, actuarial judgment, and sensitivity testing, we defined the confidence interval to achieve at least a 90% probability that the trend observed in the future will be within 6% of the projected trend in this filing. Selecting a higher required degree of confidence (probability) or a lower tolerance for error would reduce the amount of credibility assigned to the trend estimates derived from the historical Massachusetts data, while a lower required degree of confidence (probability) or higher tolerance for error would increase the credibility assigned to indications derived from historical Massachusetts data.

The specific steps and calculations that implement Venter's procedure to calculate the credibility assigned to the historical Massachusetts trend (Row (1)) are detailed in Exhibits 2 and 3 of Section V-A, in Rows numbered (3) through (10). Row (2), denoted "n," is the number of years, data points, used in the exponential fitting of the historical data. Row (3), denoted "s," quantifies the goodness of fit of the exponential curve to the "n" years of Massachusetts data. $S = \text{SQRT} (\text{SSR} / (n-2))$, where SSR is the sum of the squared differences between the observed and fitted points over the years of Massachusetts data analyzed, and n-2 is an adjustment for degrees of freedom. Row (4), denoted "t," is the 95th percentile of

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the t-distribution with $n-2$ degrees of freedom. We use the 95th percentile one-sided distribution to correspond to the selected 90% probability of being within a specified tolerance in either direction. Row (6) implements the formula that Venter provides for a component element of the standard deviation of the projected point, given the distance into the future that we are projecting, and Row (7) then calculates the confidence interval for the projection. The confidence interval incorporates both the uncertainty about the parameters of the trend line and the potential variability of the actual future point from its expected value on the line. Row (9) expresses this confidence interval as a percentage of the projected value of frequency, severity, or average weekly wage, which is calculated in Row (8). If Row (9) is less than the selected error tolerance (i.e., 6% in this filing), then there is at least 90% probability that the actual value is within 6% of the fitted value, and the credibility procedure assigns 100% to the indicated historical Massachusetts trend. If the ratio in Row (9) is greater than the selected error tolerance, then the credibility assigned to the historical Massachusetts trend must be less than 100%. Specifically, the credibility is calculated in Row (10) as the ratio of the selected error tolerance divided by the calculated confidence interval.

To the extent that the credibility assigned to each of the fitted trends based on the historical Massachusetts data is less than 100%, the balance of the credibility is assigned to a longer-term Massachusetts trend for frequency, claim severity and average weekly wage. The calculations of the annual trend rates from these complementary data series are documented in Section V-B (frequency), Sections V-C (indemnity severity), Section V-D (medical severity) and Section V-

G (average weekly wage), and use the same exponential fit function (LOGEST) within Microsoft Excel.

The complementary data set to be given weight when the historical Massachusetts indications are not fully credible provides a trend indication for a particular component (severity, frequency, average weekly wage) that would be reasonable to use if we had no recent local data. For severity, the WCRIBMA is changing the severity complement³ from a countrywide severity trend to one more specific to Massachusetts economic cycles and business environment. The WCRIBMA expects trends observed over a longer period of time (i.e., 15 years) using Massachusetts data will provide useful information related to variation in the claim data resulting from the Great Recession of 2008 and the ensuing economic recovery specific to Massachusetts⁴. The 15 years of severities and supporting information are provided in Section V-C and V-D.

For claim frequency and average weekly wages, it is our expectation that Massachusetts trends observed in the short-term will tend to revert to long-term Massachusetts averages, and that these long-term Massachusetts averages would thus represent a reasonable expectation of future trends in the absence of recent observations. Consequently, we selected a long-term Massachusetts trend as the complement of credibility for the historical Massachusetts frequency and

³ The prior complement relied on adjusted NCCI severities. NCCI no longer calculates the on-level factors previously used for the adjustment.

⁴ According to Massachusetts Labor Market Statistics, <https://www.mass.gov/find-other-labor-market-information> (January 2001 to March 2020), Massachusetts experienced lower unemployment rates than the U.S. as a whole during the 2008 recession and recovered more quickly (higher participation rates).

average weekly wage trends. We then selected fifteen years of data to calculate the long-term Massachusetts trends.

Finally, Section V-A, Exhibits 2 and 3 Row (12) calculate the credibility-weighted annual trend, which is:

Credibility-weighted annual trend =

$[Z] \times [\text{indicated annual trend based on historical n-years of Massachusetts data}]$

+ $[1.0 \text{ minus } Z] \times [\text{indicated annual trend based on complementary data}]$,

Where $Z = \text{credibility}$

These various components of the final net trend calculation are shown graphically on Exhibits 4 through 5 of Section V-A. In Exhibit 1, we demonstrate the selection process of choosing the shortest series of Massachusetts trend with the greatest credibility.

Data Used in the WCRIBMA Trend Analysis

For the trend analysis, the WCRIBMA has continued to use Unit Statistical Plan Data. The WCRIBMA selected this data source because it provides detailed, matching payroll, claim count, and claim dollar data that can be used to calculate historical claim frequencies and claim severities. Unit Statistical Plan Data are reported on a policy-by-policy basis and in individual claim detail (except for the smallest claims, which previously could be reported in a batch for an individual employer and policy period).

Unit Statistical Plan Data are available for policies written through December 2019. For the trend section of this filing, we use Unit Statistical Plan Data for policies written through December 2018. This is consistent with the WCRIBMA's overall approach regarding COVID-19 era data as described in Section I⁵. Unit Statistical Plan Data used in this trend analysis have been compiled on a "policy year" basis. Policy year 2018, for example, includes all policies with inception dates between January 1, 2018 and December 31, 2018. For policy year 2018, the average policy inception date is assumed to be July 1, 2018 and the average accident date is assumed to be January 1, 2019.

Unit Statistical Plan Data include coding that designates the "injury type" of a claim (i.e., fatal, permanent total, permanent partial, temporary total, medical only). We have used separate data for lost-time claims and medical only claims as the starting point for our analysis because the medical only claims are quite numerous but small in average severity, and thus could mask important trends if combined with the lost-time claims. The Unit Statistical Plan Data also report medical loss dollars separately from indemnity loss dollars, and we have preserved this separation in the data we used in our analysis.

The Unit Statistical Plan Data for a particular policy are first reported to the WCRIBMA eighteen months after policy inception (i.e., six months after a twelve month policy expires). Subsequent experience on each policy is reported at

⁵ Trend is less affected by COVID-19 data anomalies, due to how frequency and severity are calculated as well as the credibility weighting of trend factors. Despite that, we believe it is appropriate to use trend data from the same time period as other data used in this rate filing.

successive twelve month intervals, 30, 42, 54, 66, 78, 90, 102, 114, and 126 months after policy inception.⁶ These successive reports are compiled in order to evaluate each policy year at various maturities. This in turn enables us to aggregate loss development histories that allow us to develop the most recent, least mature policy years to the same tenth-report maturity as the older, more mature policy years.

Unit Statistical Plan Data have been compiled out to tenth report for each of the years included in the analysis. For purposes of the trend analysis, we have used each of the policy years developed to tenth report. While it is possible to use other data sources to derive development factors from tenth report to ultimate, the same (or very similar) tenth-to-ultimate development factors would likely apply to all policy years, and thus would not produce a different trend indication. Consequently, we use the data for all policy years at tenth report in the interest of not adding unnecessary complexity to the filing.

Overview of Sections V-B – V-D

Section V-B documents the calculation of historical claim counts developed to tenth report, which are used in the calculation of claim frequencies and average claim severities. Section V-C and Section V-D document the calculation of historical loss dollars for indemnity and medical, respectively, developed to tenth

⁶ The Unit Statistical Plan Data reporting timeline thus differs from some other policy year data in which all policies are reported at a common calendar date, such as December 31.

report and adjusted to current benefit levels; the resulting on-level developed losses are used in the calculation of average claim severities.

These sections use standard loss development techniques to develop the claim counts and losses to a tenth-report basis. We have developed indemnity losses separately from medical, and medical only losses separately from lost-time medical.

Consistent with the loss development factors in Section II - Loss Development used to determine the overall indication, paid data relies on two years of data to calculate age-to-age factors and paid plus case relies on five years of data.

For purposes of the trend calculations, we have developed the claim counts and loss dollars to tenth report, since the Unit Statistical Plan Data provides information as far as a tenth report.

After the losses and claim counts are developed to tenth report, as described above, Sections V-B, V-C and V-D of the filing describe the historical year-by-year average claim severities and claim frequencies that are used in the calculation of the indicated Massachusetts loss trends in Section V-A.

Section V-B – Massachusetts Claim Frequency

The historical claim frequencies derived in Section V-B for each year are the ratio of:

- (a) the reported claim counts from Unit Statistical Plan Data, developed to tenth report, and adjusted to the current mix of Massachusetts payrolls by employment classification, divided by

(b) estimated worker weeks underlying the Unit Statistical Plan Data (described below in Section V-E).

For purposes of the trend calculations, we calculate claim frequencies separately for lost-time claims and for medical only claims.

The adjustment to the current mix of Massachusetts payrolls by employment classification is intended to remove any trend in claim frequency that is attributable to historical shifts in the mix of employment in Massachusetts. We make this adjustment because our objective is to estimate the level of premiums that would be adequate for the *current* mix of classes, not the historical mix of classes. Any future shifts in the mix of employment would be adjusted for automatically in the premium base because these shifts would move payroll to differently-rated classifications. Details of the class mix adjustment calculations are provided in Section V-F.

Section V-B also displays the indicated claim frequency trend based on the exponential fit to fifteen years of Massachusetts data, calculated using the claim frequencies as shown, and the standard LOGEST function in Microsoft Excel. This long-term claim frequency trend is used as the complement of credibility in Section V-A.

Sections V-C and V-D – Massachusetts Average Claim Severities

The historical average claim severities derived in Section V-C and Section V-D for each year are simply the ratio of: reported losses as of the most recent Unit Statistical Plan Data compilation, developed to tenth report, and adjusted to

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July 1, 2022 benefit levels, divided by reported claim counts as of the most recent Unit Statistical Plan Data compilation, developed to tenth report.

The reported Unit Statistical Plan Data reflect the statutory benefit provisions that applied to each individual claim. Thus, claims from the 2011 policy year were handled and reported based on the benefits in effect at that time. Similarly, claims from the 2018 policy year were handled and reported based on the benefits in effect at that time. The changes in statutory benefits over time would contribute to a trend in the average claim severity data. However, the statutory benefit changes are specifically addressed in Section IV of the filing and their impact should not be reflected here. Therefore, before the Unit Statistical Plan Data are used in our trend analysis, the losses are all adjusted to a common benefit level. In Sections V-C and V-D the developed loss dollars are placed “on-level” to the July 1, 2022 Massachusetts benefit levels. By placing all of the loss data on July 1, 2022 benefit level, we avoid a distortion in the trend analysis.

The resulting Massachusetts historical average claim severities in the final columns of Sections V-C and V-D are carried forward to Section V-A for use in calculating the historical fitted Massachusetts trends.

Section V-C and V-D also display the indicated loss severity trend based on an exponential fit to fifteen years of Massachusetts data, calculated using the loss severities as shown, and the standard (LOGEST) function in Microsoft Excel. This long-term loss severity trend is used as the complement of credibility in Section V-A.

Section V-E – Payroll Development and Worker-Weeks

Section V-E documents the estimation of worker weeks, which is used as the denominator of the claim frequency calculation in Section V-B, as described above.

The historical worker weeks estimated in Section V-E for each policy year are derived as the ratio of: the reported payroll as of the most recent Unit Statistical Plan Data compilation, developed to tenth report, divided by the state average weekly wage – corresponding to the same period.⁷

As with claim counts and frequency, we have consistently developed the payrolls to tenth report.

The state average weekly wage is based on Massachusetts wage data compiled by the Department of Unemployment Assistance (DUA). Although it is not compiled for workers' compensation purposes and is defined in a slightly different way than payrolls used in workers' compensation calculations, the overall movement over time in this series is reasonably representative of the overall movement to be expected in the average wages used to calculate workers' compensation premiums. The underlying Massachusetts average wage series is documented in Section V-G.

⁷ We have used the actual values for the state average weekly wage in the corresponding periods, as opposed to utilizing a smoothed value. The WCRIBMA has estimated that the 10/1/2020 SAWW reflects data underlying the period from 4/1/2019 to 3/31/2020 and remains largely unaffected by COVID-19 anomalies.

Section V-F – Adjustment Factor for Class Mix

Section V-F documents the quantification of the estimated effect of a shifting mix of payrolls by classification over time. This effect is estimated by examining the proportion of payrolls that are in high-rated classifications versus low-rated classifications; specifically by calculating a weighted average of the current average rates, weighted by each year's payrolls by classification. For example, using the 2018 distribution of payrolls by classification, the weighted average of the current rates is \$0.795, while using the 2004 distribution of payrolls by classification against the same current rates produces an average rate of \$.922. Since the average rate in each classification is based on the workers' compensation claims experience within that classification, this movement in average rates indicates that the insured employment mix in Massachusetts has shifted towards less hazardous occupations. The claim trends caused by this shift should not be included in the trend factors because other sections of the filing (specifically the classification rate section, Section IX) incorporate an explicit distribution of payrolls. Any further movement in the insured employment mix towards less hazardous occupations will automatically produce premium reductions by means of the lower rates that apply to those less hazardous occupations.

While the class mix change may affect the average severity of claims as well as the frequency of claims, we have made the assumption that all of the effect

is related to claim frequency, and we have applied the class mix adjustment to the claim frequency series developed in Section V-B.

Section V-G – External Data

Section V-G displays the Massachusetts average weekly wage data used in our analysis.

Section V-H – Expense Trends

Section V-H displays fixed expenses trended over two separate time periods. Fixed expenses are first trended from the historical periods for which they are reported to the periods on which the rate indication is based. Next, fixed expenses are trended forward to the period for which the rates are being set. For the first trend period, reported external index values (such as the CPI) are available that span the time period over which the WCRIBMA is trending. Consequently, the first trend factor is taken as a ratio of index values for the corresponding time periods, Section V-H, Exhibit 1. We projected values for the proposed effective period of the rates since comparable Index values are not yet available. The WCRIBMA used an exponential least squares regression to project expense trends into the future.

The trends in the individual components of insurance company expenses have been estimated by using government indices that reflect changes in the prices of the goods and services used in operating an insurance company. With regards to the Average Weekly Earnings, the WCRIBMA believes using the Average Weekly Earnings of Massachusetts Private Fire, Marine, and Casualty Insurance Employees in estimating expense trends is preferable to using SAWW because it more accurately reflects insurers' expenses, as opposed to payroll trends in the market as a whole.

Specifically, the selected indices are:

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Expense	Index
Average Weekly Earnings	Average Weekly Earnings of Massachusetts Private Fire, Marine, and Casualty Insurance Employees. This series is provided on an annual basis.
Food Away From Home	Consumer Price Index for Food Away from Home
Private Transportation	Consumer Price Index for Private Transportation
Telephone Services	Consumer Price Index for Telephone
Postage	Consumer Price Index for Postage
Office and Store Machines and Equipment	Producer Price Index for Office and Store Machines and Equipment
Paper	Producer Price Index for Paper

First, we calculate the year-to-year changes in each of the component economic indices. We then calculate the yearly weighted averages of the percentage changes in the economic indices, using the weights shown in Section V-H, Exhibit 2, Page 3 for calendar year 2018, Exhibit 2, Page 4 for calendar year 2019, and weights from prior filings for all other years to derive the overall average percentage change in costs. The weights attributed to the various components of insurance company expenses for the workers' compensation line are based on the experience of the "Commercial Casualty" line as compiled in Best's Aggregates and Averages. These are then accumulated into indices that are normalized to a value of 100 with Calendar Year 2019 serving as the base, for the calculation of expense trend. Premium taxes, which are not incorporated in the expenses to which the expense trends and projection factors apply, are excluded from the determination of the component weights.

Paid Trend Summary

	Indemnity				Medical								SAWW		
	Severity		Frequency		Lost-Time Medical				Medical Only				Trend	Credibility	
	Trend	Credibility	Trend	Credibility	Severity		Frequency		Severity		Frequency				
					Trend	Credibility	Trend	Credibility	Trend	Credibility	Trend	Credibility			
(1) Massachusetts Trend															
5 Year	1.1%	83.0%	-1.2%	53.5%	1.1%	47.5%	-1.2%	53.5%	2.8%	100.0%	-2.3%	38.9%	3.6%	100.0%	
6 Year	1.9%	71.8%	-1.4%	76.7%	2.3%	49.1%	-1.4%	76.7%	2.2%	100.0%	-2.9%	44.1%	3.4%	100.0%	
7 Year	2.0%	94.8%	-1.5%	100.0%	2.3%	65.2%	-1.5%	100.0%	2.0%	100.0%	-3.3%	52.1%	3.4%	100.0%	
8 Year	2.0%	100.0%	-1.6%	100.0%	2.2%	79.5%	-1.6%	100.0%	2.2%	100.0%	-3.7%	47.0%	3.3%	100.0%	
9 Year	2.3%	100.0%	-1.8%	100.0%	2.3%	93.0%	-1.8%	100.0%	2.2%	100.0%	-4.1%	47.2%	3.1%	100.0%	
10 Year	2.1%	100.0%	-1.6%	85.2%	2.0%	89.8%	-1.6%	85.2%	2.1%	100.0%	-4.0%	52.8%	3.0%	100.0%	
(2) Selected Trend	2.0%		-1.5%		2.3%		-1.5%		2.8%		-4.0%		3.6%		
(3) 15 Year Massachusetts Complement of Credibility	2.3%		-1.7%		2.1%		-1.7%		2.0%		-4.1%		2.7%		
(4) Credibility Weighted Trend	2.0%		-1.5%		2.3%		-1.5%		2.8%		-4.0%		3.6%		

	Lost-Time Medical	Medical Only
(5) Medical Loss Trend	0.8%	-1.4%
(6) Fraction of Total Medical	88.0%	12.0%
(7) Total Medical Loss Trend	0.6%	

	Indemnity	Medical
(8) Total Loss Trend	0.5%	0.6%
(9) SAWW Trend	3.6%	3.6%
(10) Total Net Trend	-2.9%	-2.9%

Notes:

- (1), (3): Section V, Exhibit 2 Severity; Exhibit 3 Frequency and SAWW
- (2): Selection based on the fit with the highest credibility and least number of years
- (4) = Credibility Weighted Selected Trend
- (5) = $[(1.0 + \text{Credibility Weighted Severity Trend}) \times (1.0 + \text{Credibility Weighted Frequency Trend})] - 1.0$
- (6) Medical Only = Medical Only Fraction of Total Medical from Section IV-E, Exhibit 2
 Lost Time Medical = $1.0 - \text{Medical Only}$
- (7) = Weighted Average of (5) using (6) as weights
- (8): Indemnity = $(1.0 + \text{Credibility Weighted Severity Trend}) \times (1.0 + \text{Credibility Weighted Frequency Trend}) - 1.0$
 Medical = Row (7)
- (9): (4) for SAWW.
- (10) = $[(1.0 + (8)) / (1.0 + (9))] - 1.0$

V 000020

Indemnity Paid Severity Trend Calculation

Policy Year	Massachusetts Indemnity Severity	5 Year		6 Year		7 Year		8 Year		9 Year		10 Year	
		Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared
2009	26,824											26,274	302,308
2010	25,861									26,590	530,715	26,835	949,411
2011	27,538							27,585	2,217	27,204	111,173	27,408	16,696
2012	28,048					28,166	13,903	28,138	8,178	27,833	46,223	27,994	2,961
2013	28,039			28,805	586,292	28,724	469,570	28,703	441,202	28,476	191,238	28,591	304,939
2014	30,366	29,991	140,764	29,351	1,029,569	29,294	1,149,357	29,279	1,180,210	29,135	1,516,011	29,202	1,355,231
2015	30,090	30,314	50,070	29,908	33,071	29,874	46,351	29,867	49,542	29,808	79,405	29,825	70,032
2016	30,384	30,640	65,444	30,475	8,311	30,467	6,830	30,467	6,830	30,497	12,743	30,462	6,055
2017	30,639	30,970	109,339	31,053	171,575	31,071	186,270	31,078	192,873	31,202	316,695	31,112	223,857
2018	31,748	31,303	197,447	31,642	11,062	31,687	3,708	31,702	2,064	31,923	30,805	31,777	837
(1)	Massachusetts Trend		1.1%		1.9%		2.0%		2.0%		2.3%		2.1%
(2)	n		5		6		7		8		9		10
(3)	s		433.23		678.21		612.53		560.23		636.40		635.64
(4)	t		2.35		2.13		2.02		1.94		1.89		1.86
(5)	m		6.49		7.00		7.50		8.00		8.50		9.00
(6)	$[1 + 1/n + 12 \times m^2 / (n^3 - n)]^{.5}$		2.33		1.99		1.77		1.63		1.52		1.44
(7)	Confidence Interval		2,373.04		2,879.01		2,190.56		1,771.75		1,834.10		1,705.40
(8)	Projected Value Prospective Period		32,846.74		34,434.84		34,610.72		34,669.93		35,376.97		34,947.09
(9)	CI/Projected Severity		0.07		0.08		0.06		0.05		0.05		0.05
(10)	Credibility - MA Trend (Z)		83%		72%		95%		100%		100%		100%
(11)	Complement of Credibility								2.3%				
(12)	Credibility Weighted Severity Trend		1.3%		2.0%		2.0%		2.0%		2.3%		2.1%

- Notes:
- (1): Massachusetts Trend from exponential fit to Severities.
 - (2): Number of data points used in the exponential fitting of the severities.
 - (3): $\sqrt{SSR / (n - 2)}$ where SSR is the sum of squared residuals and n is the number of data points used in the exponential fitting of the data.
 - (4): T-value based on a two-tailed t-test with probability parameter, p, of 90% and a t-distribution with n - 2 degrees of freedom.
 - (5): Number of years between midpoint of data and projected point.
 - (7) = (3) x (4) x (6)
 - (8): Severity projected to policy effective period using exponential fit to data.
 - (9) = (7) / (8)
 - (10): The credibility is the ratio of the target value, k, to the quotient of the confidence interval and the projected frequency, capped at 100%. Numerically, (10) = the minimum of k / (9) and 100%.
 - (11): Complement of credibility is based on a fifteen-year exponential fit to the MA Indemnity Paid Severities. Section C, Exhibit 1, Page 3
 - (12) = [(1) x (10)] + [(11) x [1.0 - (10)]]

V 000021

Lost Time Medical Paid Severity Trend Calculation

Policy Year	Lost Time Medical Severity	5 Year		6 Year		7 Year		8 Year		9 Year		10 Year	
		Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared
2009	10,502											10,113	150,838
2010	10,024									10,145	14,631	10,316	85,435
2011	10,529							10,443	7,323	10,381	21,909	10,523	34
2012	10,609					10,622	190	10,672	4,024	10,622	176	10,734	15,633
2013	10,480			10,877	157,870	10,868	150,480	10,906	181,472	10,869	151,075	10,949	219,599
2014	11,766	11,462	92,142	11,126	409,269	11,119	417,937	11,145	385,049	11,121	415,212	11,168	357,254
2015	11,333	11,594	68,321	11,380	2,272	11,376	1,912	11,390	3,248	11,380	2,232	11,392	3,500
2016	11,575	11,727	23,287	11,640	4,309	11,639	4,178	11,639	4,178	11,644	4,848	11,620	2,050
2017	11,745	11,862	13,788	11,906	26,130	11,908	26,800	11,895	22,450	11,915	28,979	11,853	11,672
2018	12,237	11,999	57,048	12,178	3,471	12,184	2,878	12,155	6,727	12,192	2,072	12,090	21,663
(1)	Massachusetts Trend		1.1%		2.3%		2.3%		2.2%		2.3%		2.0%
(2)	n		5		6		7		8		9		10
(3)	s		291.31		388.37		347.67		320.02		302.64		329.33
(4)	t		2.35		2.13		2.02		1.94		1.89		1.86
(5)	m		6.49		7.00		7.50		8.00		8.50		9.00
(6)	$[1 + 1/n + 12 \times m^2 / (n^3 - n)]^{1.5}$		2.33		1.99		1.77		1.63		1.52		1.44
(7)	Confidence Interval		1,595.67		1,648.63		1,243.35		1,012.08		872.21		883.58
(8)	Projected Value Prospective Period		12,631.20		13,482.26		13,502.47		13,402.47		13,518.51		13,219.50
(9)	CI/Projected Severity		0.13		0.12		0.09		0.08		0.06		0.07
(10)	Credibility - MA Trend (Z)		47%		49%		65%		79%		93%		90%
(11)	Complement of Credibility							2.1%					
(12)	Credibility Weighted Severity Trend		1.6%		2.2%		2.2%		2.2%		2.3%		2.0%

Notes:

- (1): Massachusetts Trend from exponential fit to Severities.
- (2): Number of data points used in the exponential fitting of the severities.
- (3): $\sqrt{SSR / (n - 2)}$ where SSR is the sum of squared residuals and n is the number of data points used in the exponential fitting of the data.
- (4): T-value based on a two-tailed t-test with probability parameter, p, of 90% and a t-distribution with n - 2 degrees of freedom.
- (5): Number of years between midpoint of data and projected point.
- (7) = (3) x (4) x (6)
- (8): Severity projected to policy effective period using exponential fit to data.
- (9) = (7) / (8)
- (10): The credibility is the ratio of the target value, k, to the quotient of the confidence interval and the projected frequency, capped at 100%. Numerically, (10) = the minimum of k / (9) and 100%.
- (11): Complement of credibility is based on a fifteen-year exponential fit to the MA Lost Time Medical Paid Severities. Section D, Exhibit 1, Page 3.
- (12) = [(1) x (10)] + [(11) x [1.0 - (10)]]

V 000022

Medical Only Paid Severity Trend Calculation

Policy Year	Massachusetts Medical Only Severity	5 Year		6 Year		7 Year		8 Year		9 Year		10 Year	
		Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared
2009	789											784	30
2010	797									798	0	800	10
2011	807							815	75	815	69	817	108
2012	846					838	70	833	181	833	189	834	147
2013	865			849	256	855	107	851	204	851	210	852	178
2014	848	855	41	868	372	872	544	869	427	869	421	870	449
2015	887	879	76	887	0	889	4	888	0	888	0	888	0
2016	902	903	0	906	15	907	20	907	20	907	20	907	17
2017	929	928	2	926	11	925	20	926	10	926	9	926	15
2018	950	954	11	947	14	943	48	946	16	946	15	945	28
(1)	Massachusetts Trend		2.8%		2.2%		2.0%		2.2%		2.2%		2.1%
(2)	n		5		6		7		8		9		10
(3)	s		6.60		12.93		12.75		12.47		11.55		11.09
(4)	t		2.35		2.13		2.02		1.94		1.89		1.86
(5)	m		6.49		7.00		7.50		8.00		8.50		9.00
(6)	$[1 + 1/n + 12 \times m^2 / (n^3 - n)]^{.5}$		2.33		1.99		1.77		1.63		1.52		1.44
(7)	Confidence Interval		36.16		54.88		45.59		39.44		33.29		29.74
(8)	Projected Value Prospective Period		1,078.25		1,043.78		1,031.00		1,041.43		1,041.95		1,037.74
(9)	CI/Projected Severity		0.03		0.05		0.04		0.04		0.03		0.03
(10)	Credibility - MA Trend (Z)		100%		100%		100%		100%		100%		100%
(11)	Complement of Credibility								2.0%				
(12)	Credibility Weighted Severity Trend		2.8%		2.2%		2.0%		2.2%		2.2%		2.1%

- Notes:
- (1): Massachusetts Trend from exponential fit to Severities.
 - (2): Number of data points used in the exponential fitting of the severities.
 - (3): $\sqrt{SSR / (n - 2)}$ where SSR is the sum of squared residuals and n is the number of data points used in the exponential fitting of the data.
 - (4): T-value based on a two-tailed t-test with probability parameter, p, of 90% and a t-distribution with n - 2 degrees of freedom.
 - (5): Number of years between midpoint of data and projected point.
 - (7) = (3) x (4) x (6)
 - (8): Severity projected to policy effective period using exponential fit to data.
 - (9) = (7) / (8)
 - (10): The credibility is the ratio of the target value, k, to the quotient of the confidence interval and the projected frequency, capped at 100%. Numerically, (10) = the minimum of k / (9) and 100%.
 - (11): Complement of credibility is based on a fifteen-year exponential fit to the MA Medical Only Paid Severities. Section D, Exhibit 2, Page 2.
 - (12) = [(1) x (10)] + [(11) x [1.0 - (10)]]

V 000023

Lost Time Frequency Trend Calculation

Policy Year	Adjusted Claim Frequency	5 Year		6 Year		7 Year		8 Year		9 Year		10 Year	
		Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared
2009	183.51											190	43
2010	193.60											187	42
2011	187.40											184	10
2012	181.06					180	0	182	1	183	4	181	0
2013	178.34			177	1	178	0	179	0	180	2	179	0
2014	176.63	174	6	175	3	175	2	176	1	176	0	176	1
2015	169.58	172	6	172	8	173	9	173	12	173	13	173	12
2016	167.04	170	8	170	9	170	10	170	10	170	9	170	11
2017	171.07	168	10	168	11	168	12	167	14	167	17	168	11
2018	165.43	166	0	165	0	165	0	165	1	164	3	165	0
(1)	Massachusetts Trend		-1.2%		-1.4%		-1.5%		-1.6%		-1.8%		-1.6%
(2)	n		5		6		7		8		9		10
(3)	s		3.21		2.86		2.59		2.70		2.97		4.04
(4)	t		2.35		2.13		2.02		1.94		1.89		1.86
(5)	m		6.49		7.00		7.50		8.00		8.50		9.00
(6)	$[1 + 1/n + 12 \times m^2 / (n^3 - n)]^{.5}$		2.33		1.99		1.77		1.63		1.52		1.44
(7)	Confidence Interval		17.59		12.15		9.25		8.53		8.55		10.83
(8)	Projected Value Prospective Period		156.93		155.40		154.70		152.74		150.70		153.89
(9)	CI/Projected Frequency		0.11		0.08		0.06		0.06		0.06		0.07
(10)	Credibility - MA Trend (Z)		54%		77%		100%		100%		100%		85%
(11)	Complement of Credibility								-1.7%				
(12)	Credibility Weighted Frequency Trend		-1.5%		-1.5%		-1.5%		-1.6%		-1.8%		-1.6%

- Notes:
- (1): Massachusetts Trend from exponential fit to Adjusted Claim Frequencies
 - (2): Number of data points used in the exponential fitting of the adjusted claim frequencies.
 - (3): $\sqrt{SSR / (n - 2)}$ where SSR is the sum of squared residuals and n is the number of data points used in the exponential fitting of the data.
 - (4): T-value based on a two-tailed t-test with probability parameter, p, of 90% and a t-distribution with n - 2 degrees of freedom.
 - (5): Number of years between midpoint of data and projected point.
 - (7) = (3) x (4) x (6)
 - (8): Frequency projected to policy effective period using exponential fit to data.
 - (9) = (7) / (8)
 - (10): The credibility is the ratio of the target value, k, to the quotient of the confidence interval and the projected frequency, capped at 100%. Numerically, (10) = the minimum of k / (9) and 100%.
 - (11): Complement of credibility is based on a fifteen-year exponential fit to the Adjusted Claim Frequencies. Section B, Exhibit 1.
 - (12) = [(1) x (10)] + { (11) x [1.0 - (10)] }

V 000024

Medical Only Frequency Trend Calculation

Policy Year	Adjusted Med Only Claim Frequency	5 Year		6 Year		7 Year		8 Year		9 Year		10 Year	
		Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared
2009	415.10												
2010	417.68												
2011	395.54												
2012	366.74												
2013	352.17			345	59	349	13	354	3	357	24	356	18
2014	336.14	329	57	334	3	337	1	341	20	343	41	342	36
2015	316.86	321	18	325	61	326	87	328	120	329	137	328	135
2016	304.86	314	80	315	106	316	114	316	114	315	106	315	110
2017	308.70	307	4	306	8	305	12	304	25	302	41	303	35
2018	303.46	300	15	297	42	295	67	292	124	290	181	291	163
(1)	Massachusetts Trend		-2.3%		-2.9%		-3.3%		-3.7%		-4.1%		-4.0%
(2)	n		5		6		7		8		9		10
(3)	s		7.60		8.33		8.19		9.93		10.61		10.25
(4)	t		2.35		2.13		2.02		1.94		1.89		1.86
(5)	m		6.49		7.00		7.50		8.00		8.50		9.00
(6)	$[1 + 1/n + 12 \times m^2 / (n^3 - n)]^{.5}$		2.33		1.99		1.77		1.63		1.52		1.44
(7)	Confidence Interval		41.66		35.38		29.28		31.40		30.59		27.49
(8)	Projected Value Prospective Period		270.13		259.93		254.33		246.21		240.53		242.04
(9)	CI/Projected Frequency		0.15		0.14		0.12		0.13		0.13		0.11
(10)	Credibility - MA Trend (Z)		39%		44%		52%		47%		47%		53%
(11)	Complement of Credibility								-4.1%				
(12)	Credibility Weighted Frequency Trend		-3.4%		-3.6%		-3.7%		-3.9%		-4.1%		-4.0%

- Notes:
- (1): Massachusetts Trend from exponential fit to Adjusted Claim Frequencies
 - (2): Number of data points used in the exponential fitting of the adjusted claim frequencies.
 - (3): $\sqrt{SSR / (n - 2)}$ where SSR is the sum of squared residuals and n is the number of data points used in the exponential fitting of the data.
 - (4): T-value based on a two-tailed t-test with probability parameter, p, of 90% and a t-distribution with n - 2 degrees of freedom.
 - (5): Number of years between midpoint of data and projected point.
 - (7) = (3) x (4) x (6)
 - (8): Frequency projected to policy effective period using exponential fit to data.
 - (9) = (7) / (8)
 - (10): The credibility is the ratio of the target value, k, to the quotient of the confidence interval and the projected frequency, capped at 100%. Numerically, (10) = the minimum of k / (9) and 100%.
 - (11): Complement of credibility is based on a fifteen-year exponential fit to the Adjusted Claim Frequencies. Section B, Exhibit 2.
 - (12) = [(1) x (10)] + { (11) x [1.0 - (10)] }

V 000025

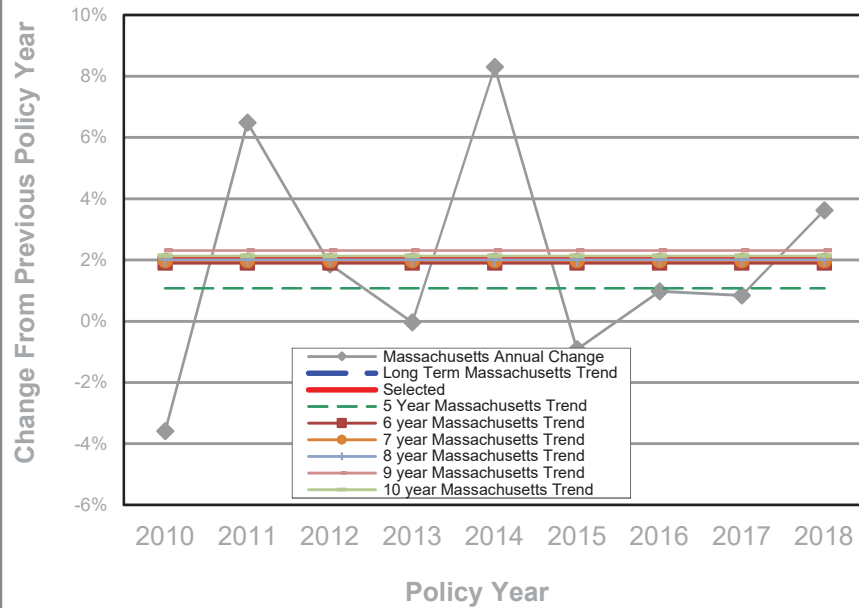
Statewide Average Weekly Wage Trend Calculation

Data Period	Statewide Average Weekly Wage	5 Year		6 Year		7 Year		8 Year		9 Year		10 Year	
		Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared	Exponential Fit	Difference Squared
4/1/10 to 4/1/11	1,135.82											1,123	165
4/1/11 to 4/1/12	1,173.06											1,157	257
4/1/12 to 4/1/13	1,181.28											1,192	118
4/1/13 to 4/1/14	1,214.99					1,212	7	1,215	0	1,224	89	1,228	177
4/1/14 to 4/1/15	1,256.47			1,252	22	1,254	8	1,256	0	1,263	39	1,266	82
4/1/15 to 4/1/16	1,291.74	1,291	0	1,295	11	1,296	21	1,298	38	1,302	111	1,304	149
4/1/16 to 4/1/17	1,338.05	1,337	1	1,340	3	1,340	6	1,341	10	1,343	25	1,343	30
4/1/17 to 4/1/18	1,383.41	1,385	2	1,386	6	1,386	7	1,386	7	1,385	3	1,384	1
4/1/18 to 4/1/19	1,431.66	1,434	6	1,434	4	1,433	2	1,432	0	1,428	10	1,426	29
4/1/19 to 4/1/20	1,487.78	1,485	6	1,483	22	1,482	33	1,480	58	1,473	212	1,470	334
(1)	Massachusetts Trend		3.6%		3.4%		3.4%		3.3%		3.1%		3.0%
(2)	n		5		6		7		8		9		10
(3)	s		2.28		4.08		4.10		4.85		11.97		12.95
(4)	t		2.35		2.13		2.02		1.94		1.89		1.86
(5)	m		5.75		6.25		6.75		7.25		7.75		8.25
(6)	$[1 + 1/n + 12 \times m^2 / (n^3 - n)]^{.5}$		2.12		1.84		1.66		1.54		1.45		1.39
(7)	Confidence Interval		11.41		16.04		13.75		14.52		32.96		33.41
(8)	Projected Value Prospective Period		1,693.75		1,684.43		1,680.24		1,674.43		1,653.80		1,643.95
(9)	CI/Projected Wage		0.01		0.01		0.01		0.01		0.02		0.02
(10)	Credibility - MA Trend (Z)		100%		100%		100%		100%		100%		100%
(11)	Complement of Credibility								2.7%				
(12)	Credibility Weighted Wage Trend		3.6%		3.4%		3.4%		3.3%		3.1%		3.0%

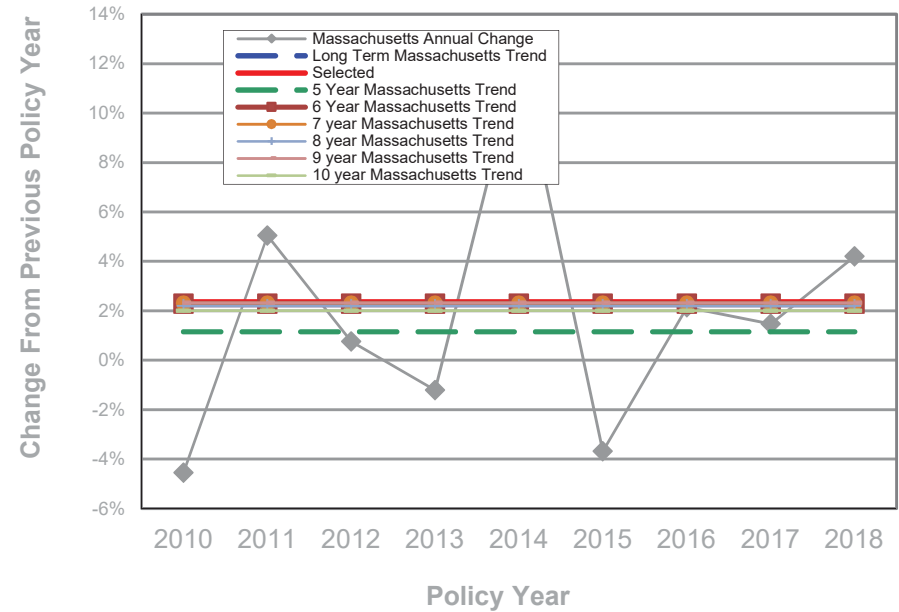
- Notes:
- (1): Massachusetts Trend from exponential fit to the SAWW.
 - (2): Number of data points used in the exponential fitting of the statewide average weekly wage:
 - (3): $\sqrt{SSR / (n - 2)}$ where SSR is the sum of squared residuals and n is the number of data points used in the exponential fitting of the data
 - (4): T-value based on a two-tailed t-test with probability parameter, p, of 90% and a t-distribution with n - 2 degrees of freedom
 - (5): Number of years between midpoint of data and projected point
 - (7) = (3) x (4) x (6)
 - (8): SAWW projected to policy effective period using exponential fit to data
 - (9) = (7) / (8)
 - (10): The credibility is the ratio of the target value, k, to the quotient of the confidence interval and the projected frequency, capped at 100%. Numerically, (10) = the minimum of k / (9) and 100%
 - (11): Complement of credibility is based on a fifteen-year exponential fit to the SAWWs. Section G, Exhibit 1
 - (12) = $[(1) \times (10)] + \{(11) \times [1.0 - (10)]\}$.

V 000026

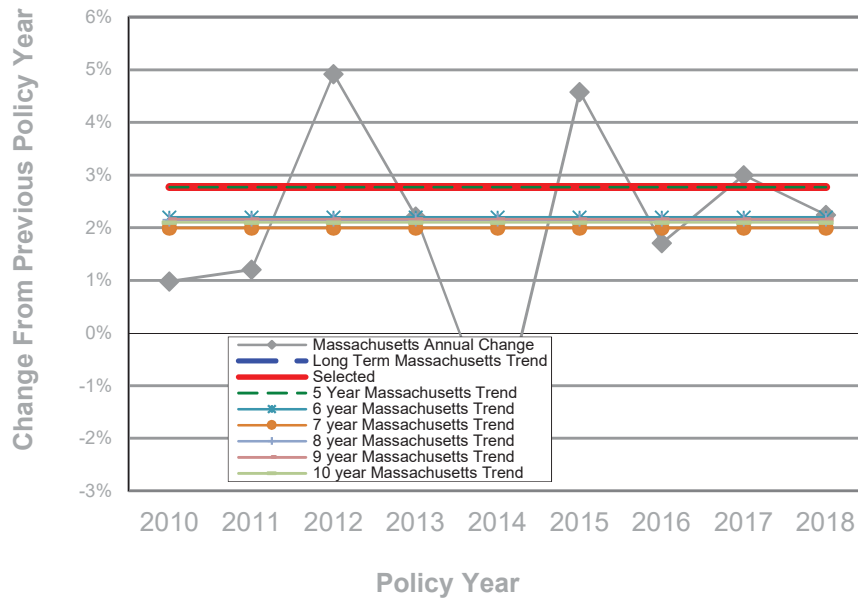
Indemnity Severity Trend



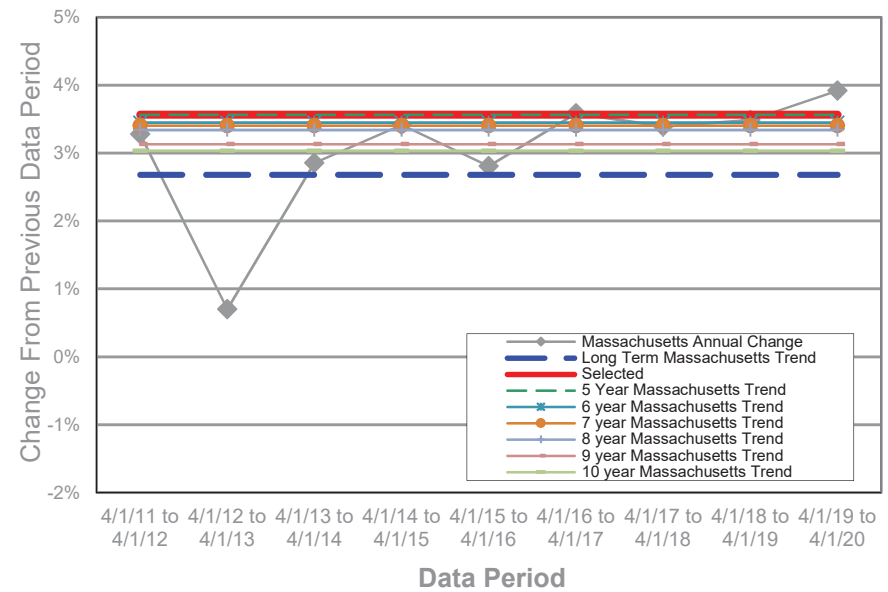
Lost Time Medical Severity Trend



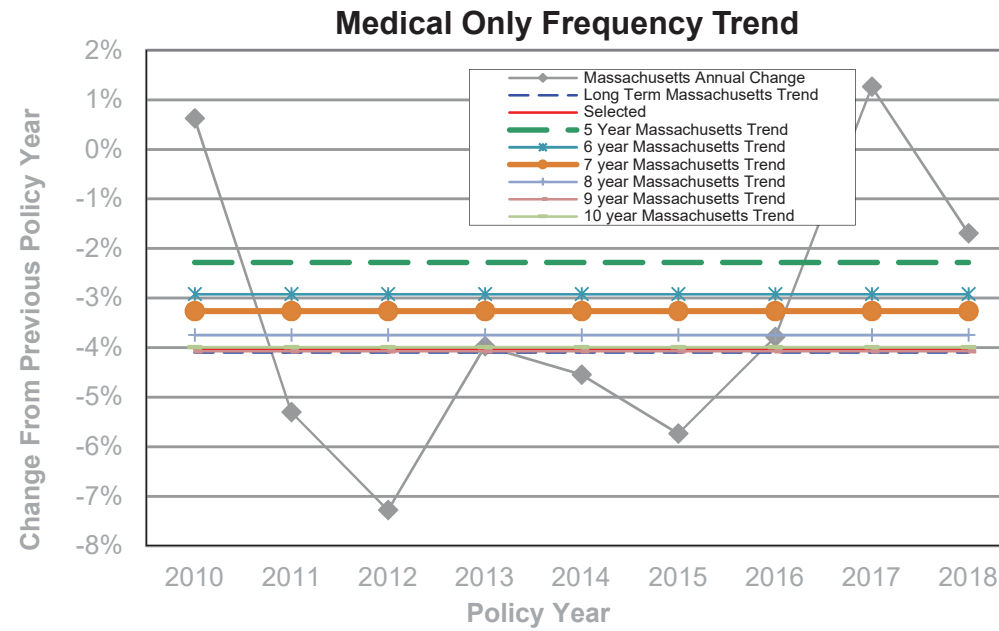
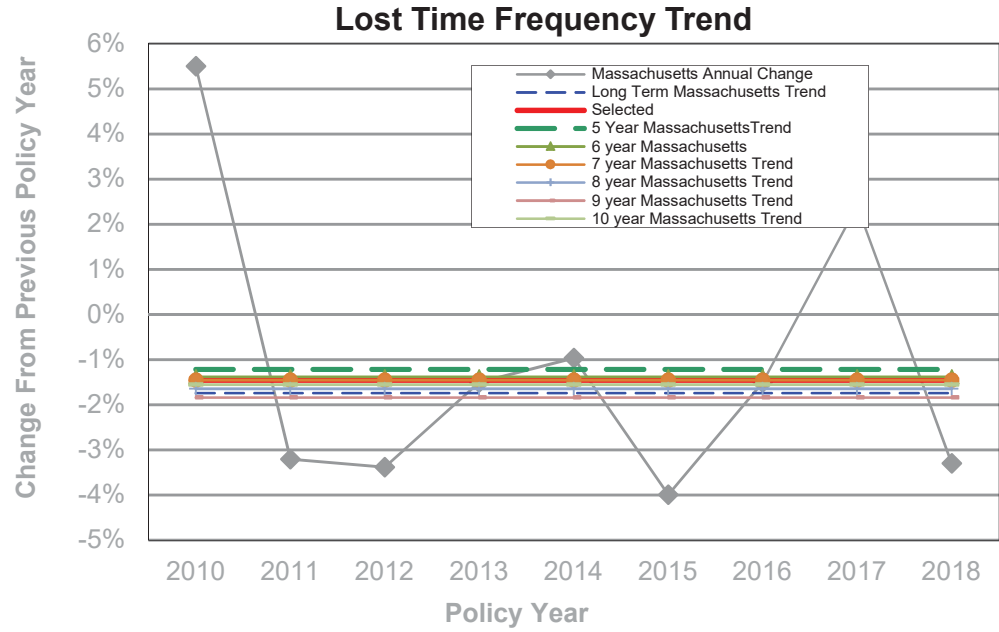
Medical Only Severity Trend



SAWW Trend



V 000027



V 000028

Lost Time Reported Claim Counts - Industrywide

Policy Year (1)	Lost Time Reported Claim Counts											Developed to Tenth Report (3)	Estimated Million Worker-Weeks (4)	Unadjusted Claim Frequency = (3) / (4) (5)	Class Mix Adjustment (6)	Adjusted Claim Frequency = (5) x (6) (7)	Percent Change = (7)/previous year (7)-1 (8)	
	Age of Development																	
	18	30	42	54	66	78	90	102	114	126	(2)							
2004_01	17,495	17,733	17,781	17,836	17,865	17,872	17,882	17,886	17,880	17,882	17,882	17,882	71.62	249.68	0.863	215.37		
2005_01	16,774	17,058	17,138	17,174	17,199	17,208	17,215	17,218	17,230	17,237	17,237	17,237	73.57	234.29	0.893	209.20	-2.9%	
2006_01	15,489	15,766	15,865	15,914	15,925	15,942	15,943	15,943	15,962	15,968	15,968	15,968	75.65	211.07	0.947	199.86	-4.5%	
2007_01	15,211	15,548	15,655	15,698	15,720	15,729	15,733	15,740	15,752	15,756	15,756	15,756	78.30	201.23	0.993	199.78	0.0%	
2008_01	13,908	14,174	14,264	14,313	14,352	14,365	14,367	14,374	14,381	14,387	14,387	14,387	78.57	183.11	1.026	187.82	-6.0%	
2009_01	12,975	13,210	13,270	13,305	13,317	13,327	13,334	13,336	13,346	13,346	13,345	13,345	75.29	177.25	1.035	183.51	-2.3%	
2010_01	14,379	14,656	14,725	14,773	14,799	14,814	14,817	14,816	14,816	14,816	14,819	14,819	79.76	185.79	1.042	193.60	5.5%	
2011_01	14,468	14,697	14,790	14,830	14,865	14,878	14,878	14,882	14,882	14,890	14,890	14,890	82.97	179.47	1.044	187.40	-3.2%	
2012_01	14,207	14,462	14,532	14,562	14,587	14,590	14,596	14,596	14,605	14,605	14,605	14,605	83.65	174.61	1.037	181.06	-3.4%	
2013_01	14,410	14,671	14,747	14,797	14,818	14,822	14,834	14,834	14,834	14,834	14,834	14,834	85.14	174.23	1.024	178.34	-1.5%	
2014_01	14,800	15,071	15,155	15,194	15,212	15,212	15,228	15,228	15,228	15,228	15,228	15,228	87.12	174.80	1.010	176.63	-1.0%	
2015_01	14,850	15,068	15,146	15,188	15,188	15,188	15,224	15,224	15,224	15,224	15,224	15,224	90.34	168.53	1.006	169.58	-4.0%	
2016_01	14,636	14,850	14,935	14,935	14,935	14,935	15,011	15,011	15,011	15,011	15,011	15,011	90.17	166.47	1.003	167.04	-1.5%	
2017_01	15,270	15,545	15,545	15,545	15,545	15,545	15,709	15,709	15,709	15,709	15,709	15,709	91.63	171.43	0.998	171.07	2.4%	
2018_01	14,914	14,914	14,914	14,914	14,914	14,914	15,318	15,318	15,318	15,318	15,318	15,318	92.59	165.43	1.000	165.43	-3.3%	
	Age-to-Age Development Factors																	
	18 - 30	30 - 42	42 - 54	54 - 66	66 - 78	78 - 90	90 - 102	102 - 114	114 - 126									
2 Yr Weighted Average	1.016	1.005	1.003	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000						
Selected	1.016	1.005	1.003	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000						
Cumulative	1.027	1.011	1.005	1.002	1.001	1.001	1.001	1.001	1.001	1.001	1.001	1.001						
													Selected Complement of Credibility					-1.7%

Notes:
 Development factors are claim count weighted averages from latest two years.
 (4): Section V-E, Exhibit 1.
 (6): Section V-F, Exhibit 1.

V 000029

Medical Only Reported Claim Counts - Industrywide

Policy Year (1)	Medical Only Reported Claim Counts										Developed to Tenth Report (3)	Estimated Million Worker-Weeks (4)	Unadjusted Claim Frequency = (3) / (4) (5)	Class Mix Adjustment (6)	Adjusted Claim Frequency = (5) x (6) (7)	Percent Change = (7)/previous year (7)-1 (8)	
	Age of Development																
	18	30	42	54	66	78	90	102	114	126							
2004_01	41,844	42,823	42,924	42,980	42,989	42,998	43,004	43,003	43,008	43,016	43,016	71.62	600.61	0.863	518.09		
2005_01	40,395	41,188	41,301	41,315	41,320	41,323	41,320	41,328	41,331	41,332	41,332	73.57	561.79	0.893	501.63	-3.2%	
2006_01	37,304	38,011	38,090	38,118	38,117	38,118	38,123	38,146	38,177	38,176	38,176	75.65	504.63	0.947	477.83	-4.7%	
2007_01	36,550	37,075	37,123	37,122	37,131	37,121	37,124	37,161	37,161	37,159	37,159	78.30	474.58	0.993	471.16	-1.4%	
2008_01	32,711	33,074	33,138	33,153	33,174	33,171	33,190	33,193	33,191	33,194	33,194	78.57	422.48	1.026	433.35	-8.0%	
2009_01	29,840	30,132	30,166	30,174	30,180	30,187	30,186	30,186	30,181	30,187	30,187	75.29	400.96	1.035	415.10	-4.2%	
2010_01	31,550	31,919	31,969	31,976	31,969	31,967	31,969	31,967	31,966	31,971	31,971	79.76	400.83	1.042	417.68	0.6%	
2011_01	30,939	31,372	31,423	31,446	31,441	31,437	31,430	31,427		31,428	31,428	82.97	378.81	1.044	395.54	-5.3%	
2012_01	29,128	29,510	29,565	29,592	29,587	29,585	29,584			29,583	29,583	83.65	353.67	1.037	366.74	-7.3%	
2013_01	28,893	29,224	29,285	29,303	29,300	29,298				29,293	29,293	85.14	344.05	1.024	352.17	-4.0%	
2014_01	28,527	28,929	28,989	28,987	28,988					28,981	28,981	87.12	332.66	1.010	336.14	-4.6%	
2015_01	27,918	28,379	28,443	28,454						28,446	28,446	90.34	314.89	1.006	316.86	-5.7%	
2016_01	26,911	27,369	27,399							27,396	27,396	90.17	303.82	1.003	304.86	-3.8%	
2017_01	27,939	28,303								28,348	28,348	91.63	309.35	0.998	308.70	1.3%	
2018_01	27,640									28,098	28,098	92.59	303.46	1.000	303.46	-1.7%	
	Age-to-Age Development Factors																
	18 - 30	30 - 42	42 - 54	54 - 66	66 - 78	78 - 90	90 - 102	102 - 114	114 - 126								
2 Yr Weighted Average	1.015	1.002	1.000	1.000	1.000	1.000	1.000	1.000	1.000								
Selected	1.015	1.002	1.000	1.000	1.000	1.000	1.000	1.000	1.000								
Cumulative	1.017	1.002	1.000	1.000	1.000	1.000	1.000	1.000	1.000								
												Selected Complement of Credibility					-4.1%

Notes:
 Development factors are claim count weighted averages from latest two years.
 (4): Section V-E, Exhibit 1.
 (6): Section V-F, Exhibit 1.

V 000030

Indemnity Paid Losses (in 000's)

Policy Year (1)	Developed to Tenth Report (2)	Indemnity On-Level Factor (3)	On-Level Indemnity Losses (in 000's) Developed to Tenth Report = (2) x (3) (4)	Developed Claim Counts (5)	Severity = 1,000 x (4) / (5) (6)
2004_01	359,957	1.167	420,075	17,882	23,491
2005_01	349,657	1.155	403,849	17,237	23,429
2006_01	343,142	1.143	392,041	15,968	24,552
2007_01	342,885	1.130	387,491	15,756	24,593
2008_01	332,279	1.118	371,324	14,387	25,810
2009_01	321,646	1.113	357,970	13,345	26,824
2010_01	343,998	1.114	383,226	14,819	25,861
2011_01	370,442	1.107	410,033	14,890	27,538
2012_01	373,380	1.097	409,648	14,605	28,048
2013_01	380,697	1.093	415,943	14,834	28,039
2014_01	425,554	1.087	462,423	15,228	30,366
2015_01	424,986	1.078	458,091	15,224	30,090
2016_01	426,600	1.069	456,082	15,011	30,384
2017_01	454,446	1.059	481,303	15,709	30,639
2018_01	463,676	1.049	486,296	15,318	31,748

15 Year Indemnity Trend

2.3%

Notes:

- (2): (3) Exhibit 1, Page 2
- (3): Section IV-A, Exhibit 1.
- (5): Section V-B, Exhibit 1.

V 000031

Indemnity Paid Losses (in 000's)
 Industrywide

Policy Year (1)	Age of Development											Developed to Tenth Report (3)
	18	30	42	54	66	78	90	102	114	126		
	(2)											
2004_01	107,820	198,020	260,479	301,960	327,370	339,300	348,443	352,669	356,713	359,957	359,957	
2005_01	110,114	196,752	259,782	297,958	321,547	335,386	342,734	344,717	347,959	349,657	349,657	
2006_01	100,324	186,197	254,668	293,733	313,566	324,673	333,625	338,678	341,533	343,142	343,142	
2007_01	106,029	195,075	253,709	293,152	314,356	325,087	333,860	339,052	341,169	342,885	342,885	
2008_01	103,033	194,337	253,244	288,542	309,174	320,808	324,438	327,815	329,773	332,279	332,279	
2009_01	96,346	181,298	241,870	281,307	301,938	311,416	316,235	318,413	320,696	321,646	321,646	
2010_01	101,956	196,131	261,018	302,564	325,334	333,604	337,047	339,468	342,181	343,998	343,998	
2011_01	108,820	209,336	285,745	327,104	346,063	355,377	362,544	365,708		370,442	370,442	
2012_01	109,341	213,099	283,775	327,474	349,051	359,355	365,689			373,380	373,380	
2013_01	117,487	223,350	294,451	335,757	356,510	365,942				380,697	380,697	
2014_01	127,547	247,414	334,872	379,771	397,930					425,554	425,554	
2015_01	132,254	250,966	331,099	376,902						424,986	424,986	
2016_01	132,665	252,932	332,983							426,600	426,600	
2017_01	140,223	269,156								454,446	454,446	
2018_01	143,541									463,676	463,676	

	Age-to-Age Development Factors									
	18 - 30	30 - 42	42 - 54	54 - 66	66 - 78	78 - 90	90 - 102	102 - 114	114 - 126	
2004_01	1.837	1.315	1.159	1.084	1.036	1.027	1.012	1.011	1.009	
2005_01	1.787	1.320	1.147	1.079	1.043	1.022	1.006	1.009	1.005	
2006_01	1.856	1.368	1.153	1.068	1.035	1.028	1.015	1.008	1.005	
2007_01	1.840	1.301	1.155	1.072	1.034	1.027	1.016	1.006	1.005	
2008_01	1.886	1.303	1.139	1.072	1.038	1.011	1.010	1.006	1.008	
2009_01	1.882	1.334	1.163	1.073	1.031	1.015	1.007	1.007	1.003	
2010_01	1.924	1.331	1.159	1.075	1.025	1.010	1.007	1.008		
2011_01	1.924	1.365	1.145	1.058	1.027	1.020	1.009			
2012_01	1.949	1.332	1.154	1.066	1.030	1.018				
2013_01	1.901	1.318	1.140	1.062	1.026					
2014_01	1.940	1.353	1.134	1.048						
2015_01	1.898	1.319	1.138							
2016_01	1.907	1.316								
2017_01	1.919									
2 Yr Weighted Average	1.913	1.318	1.136	1.054	1.028	1.019	1.008	1.008	1.005	
5 Yr Weighted Average	1.913	1.328	1.142	1.061	1.028	1.015	1.010	1.007	1.005	
Selected	1.913	1.318	1.136	1.054	1.028	1.019	1.008	1.008	1.005	
Cumulative	3.230	1.688	1.281	1.128	1.069	1.040	1.021	1.013	1.005	

Notes:
 Development factors are loss weighted average, paid data uses two years.

V 000032

Lost Time Medical Paid Losses (in 000's)

Policy Year (1)	Developed to Tenth Report (2)	Medical On-Level Factor (3)	On-Level Lost Time Medical Losses (in 000's) Developed to Tenth Report = (2) x (3) (4)	Developed Claim Counts (5)	Severity = 1,000 x (4) / (5) (6)
2004_01	156,198	1.036	161,825	17,882	9,050
2005_01	148,621	1.032	153,377	17,237	8,898
2006_01	152,728	1.032	157,616	15,968	9,871
2007_01	152,795	1.032	157,684	15,756	10,008
2008_01	135,151	1.024	138,443	14,387	9,623
2009_01	139,906	1.002	140,147	13,345	10,502
2010_01	148,539	1.000	148,539	14,819	10,024
2011_01	156,770	1.000	156,770	14,890	10,529
2012_01	154,941	1.000	154,941	14,605	10,609
2013_01	155,465	1.000	155,465	14,834	10,480
2014_01	179,172	1.000	179,172	15,228	11,766
2015_01	172,528	1.000	172,528	15,224	11,333
2016_01	173,742	1.000	173,742	15,011	11,575
2017_01	184,495	1.000	184,495	15,709	11,745
2018_01	187,447	1.000	187,447	15,318	12,237

15 Year Lost Time Medical Trend

2.1%

Notes:

- (2): (3) Exhibit 1, Page 2
- (3): Section IV-A, Exhibit 1.
- (5): Section V-B, Exhibit 1.

V 000033

Lost Time Medical Paid Losses (in 000's)
 Industrywide

Policy Year (1)	Age of Development										Developed to Tenth Report (3)
	18	30	42	54	66	78	90	102	114	126	
	(2)										
2004_01	87,471	118,219	131,022	139,202	144,312	147,598	149,998	152,404	154,748	156,198	156,198
2005_01	88,369	115,528	127,448	134,077	138,067	140,547	143,417	145,078	146,961	148,621	148,621
2006_01	85,564	112,793	126,804	133,695	138,424	141,821	145,744	148,143	150,548	152,728	152,728
2007_01	92,238	120,976	132,565	138,596	142,037	144,973	147,725	149,794	151,366	152,795	152,795
2008_01	84,096	110,557	122,487	127,169	129,750	131,263	132,319	133,517	134,272	135,151	135,151
2009_01	86,941	113,382	124,678	129,710	132,469	134,607	135,955	137,559	138,929	139,906	139,906
2010_01	88,055	116,161	127,772	133,970	137,178	141,219	143,573	145,595	147,536		148,539
2011_01	93,517	121,633	136,257	142,710	146,925	149,825	152,043	153,911			156,770
2012_01	96,025	126,297	136,907	142,691	145,929	147,930	150,140				154,941
2013_01	96,069	124,445	136,659	143,134	146,183	148,441					155,465
2014_01	107,811	141,090	155,274	163,632	168,618						179,172
2015_01	105,924	139,818	152,571	158,221							172,528
2016_01	108,971	138,462	152,400								173,742
2017_01	113,962	147,669									184,495
2018_01	116,894										187,447

Age-to-Age Development Factors

	18 - 30	30 - 42	42 - 54	54 - 66	66 - 78	78 - 90	90 - 102	102 - 114	114 - 126
2004_01	1.352	1.108	1.062	1.037	1.023	1.016	1.016	1.015	1.009
2005_01	1.307	1.103	1.052	1.030	1.018	1.020	1.012	1.013	1.011
2006_01	1.318	1.124	1.054	1.035	1.025	1.028	1.016	1.016	1.014
2007_01	1.312	1.096	1.045	1.025	1.021	1.019	1.014	1.010	1.009
2008_01	1.315	1.108	1.038	1.020	1.012	1.008	1.009	1.006	1.007
2009_01	1.304	1.100	1.040	1.021	1.016	1.010	1.012	1.010	1.007
2010_01	1.319	1.100	1.049	1.024	1.029	1.017	1.014	1.013	
2011_01	1.301	1.120	1.047	1.030	1.020	1.015	1.012		
2012_01	1.315	1.084	1.042	1.023	1.014	1.015			
2013_01	1.295	1.098	1.047	1.021	1.015				
2014_01	1.309	1.101	1.054	1.030					
2015_01	1.320	1.091	1.037						
2016_01	1.271	1.101							
2017_01	1.296								
2 Yr Weighted Average	1.283	1.096	1.046	1.026	1.015	1.015	1.013	1.012	1.007
5 Yr Weighted Average	1.298	1.095	1.046	1.026	1.019	1.013	1.012	1.011	1.010
Selected	1.283	1.096	1.046	1.026	1.015	1.015	1.013	1.012	1.007
Cumulative	1.604	1.249	1.140	1.090	1.063	1.047	1.032	1.019	1.007

Notes:
 Development factors are loss weighted averages, paid data uses two years

V 000034

Medical Only Paid Losses (in 000's)

Policy Year (1)	Developed to Tenth Report (2)	Medical On-Level Factor (3)	On-Level Medical Only Losses (in 000's) Developed to Tenth Report = (2) x (3) (4)	Developed Claim Counts (5)	Severity = 1,000 x (4) / (5) (6)
2004_01	27,544	1.036	28,536	43,016	663
2005_01	28,840	1.032	29,763	41,332	720
2006_01	28,353	1.032	29,260	38,176	766
2007_01	28,845	1.032	29,768	37,159	801
2008_01	26,531	1.024	27,177	33,194	819
2009_01	23,784	1.002	23,825	30,187	789
2010_01	25,480	1.000	25,480	31,971	797
2011_01	25,351	1.000	25,351	31,428	807
2012_01	25,036	1.000	25,036	29,583	846
2013_01	25,339	1.000	25,339	29,293	865
2014_01	24,587	1.000	24,587	28,981	848
2015_01	25,238	1.000	25,238	28,446	887
2016_01	24,721	1.000	24,721	27,396	902
2017_01	26,347	1.000	26,347	28,348	929
2018_01	26,702	1.000	26,702	28,098	950

15 Year Medical Only Trend

2.0%

Notes:

- (2): (3) Exhibit 2, Page 2
- (3): Section IV-A, Exhibit 1.
- (5): Section V-B, Exhibit 2.

V 000035

Medical Only Paid Losses (in 000's)
 Industrywide

Policy Year (1)	Age of Development										Developed to Tenth Report (3)
	18	30	42	54	66	78	90	102	114	126	
	(2)										
2004_01	24,717	26,986	27,384	27,426	27,459	27,520	27,497	27,511	27,524	27,544	27,544
2005_01	26,403	28,509	28,742	28,784	28,775	28,798	28,790	28,807	28,825	28,840	28,840
2006_01	25,974	27,944	28,154	28,278	28,296	28,344	28,192	28,258	28,354	28,353	28,353
2007_01	26,357	28,208	28,474	28,642	28,693	28,681	28,714	28,837	28,837	28,845	28,845
2008_01	24,281	25,926	26,165	26,213	26,321	26,367	26,412	26,528	26,536	26,531	26,531
2009_01	21,701	23,376	23,513	23,670	23,777	23,851	23,870	23,891	23,768	23,784	23,784
2010_01	23,381	25,035	25,324	25,363	25,424	25,457	25,475	25,486	25,475		25,480
2011_01	23,243	25,043	25,329	25,448	25,412	25,440	25,421	25,415			25,351
2012_01	22,799	24,519	24,895	25,047	25,033	25,077	25,097				25,036
2013_01	23,730	24,877	25,213	25,280	25,333	25,400					25,339
2014_01	22,820	24,293	24,676	24,570	24,593						24,587
2015_01	22,946	24,744	25,082	25,205							25,238
2016_01	22,503	24,303	24,680								24,721
2017_01	24,490	25,926									26,347
2018_01	24,582										26,702

	Age-to-Age Development Factors									
	18 - 30	30 - 42	42 - 54	54 - 66	66 - 78	78 - 90	90 - 102	102 - 114	114 - 126	
2004_01	1.092	1.015	1.002	1.001	1.002	0.999	1.001	1.000	1.001	
2005_01	1.080	1.008	1.001	1.000	1.001	1.000	1.001	1.001	1.001	
2006_01	1.076	1.007	1.004	1.001	1.002	0.995	1.002	1.003	1.000	
2007_01	1.070	1.009	1.006	1.002	1.000	1.001	1.004	1.000	1.000	
2008_01	1.068	1.009	1.002	1.004	1.002	1.002	1.004	1.000	1.000	
2009_01	1.077	1.006	1.007	1.005	1.003	1.001	1.001	0.995	1.001	
2010_01	1.071	1.012	1.002	1.002	1.001	1.001	1.000	1.000		
2011_01	1.077	1.011	1.005	0.999	1.001	0.999	1.000			
2012_01	1.075	1.015	1.006	0.999	1.002	1.001				
2013_01	1.048	1.013	1.003	1.002	1.003					
2014_01	1.065	1.016	0.996	1.001						
2015_01	1.078	1.014	1.005							
2016_01	1.080	1.016								
2017_01	1.059									
2 Yr Weighted Average	1.069	1.015	1.000	1.002	1.002	1.000	1.000	0.997	1.000	
5 Yr Weighted Average	1.066	1.015	1.003	1.001	1.002	1.001	1.002	1.000	1.000	
Selected	1.069	1.015	1.000	1.002	1.002	1.000	1.000	0.997	1.000	
Cumulative	1.086	1.016	1.002	1.001	1.000	0.998	0.998	0.997	1.000	

Notes:
 Development factors are loss weighted averages, paid data uses two years

V 000036

Worker Weeks by Policy Year

Policy Year (1)	Payroll (in millions of dollars)								Developed to Tenth Report (3)	State Average Weekly Wage (4)	Estimated Million Worker-Weeks = (3) / (4) (5)	
	Age of Development											
	18	30	42	54	66	78	90	102				114
	(2)											
2004_01									69,408	69,408	969.11	71.62
2005_01									74,399	74,399	1,011.25	73.57
2006_01									79,901	79,901	1,056.18	75.65
2007_01									85,512	85,512	1,092.12	78.30
2008_01								85,859	85,859	85,859	1,092.79	78.57
2009_01						82,942	82,944	82,944	82,944	82,944	1,101.70	75.29
2010_01					91,313	91,311	91,311	91,311	91,311	91,311	1,144.80	79.76
2011_01					97,427	97,424	97,419	97,419	97,419	97,418	1,174.21	82.97
2012_01				99,600	99,595	99,579	99,582			99,582	1,190.50	83.65
2013_01			104,396	104,382	104,352	104,351				104,350	1,225.60	85.14
2014_01		110,264	110,244	110,230	110,227					110,216	1,265.09	87.12
2015_01	117,826	117,820	117,798	117,799						117,769	1,303.66	90.34
2016_01	121,768	121,733	121,711							121,673	1,349.36	90.17
2017_01	127,651	127,946								127,882	1,395.56	91.63
2018_01	133,812									133,884	1,445.94	92.59

Age-to-Age Development Factors

	18 - 30	30 - 42	42 - 54	54 - 66	66 - 78	78 - 90	90 - 102	102 - 114	114 - 126
2 Yr Weighted Average	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Selected	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Cumulative	1.001	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Notes:

Development factors are payroll weighted average from latest two years.

(4): Section V-G, Exhibit 1.

For all policy years the following class codes are excluded from reported Schedule Z payrolls: 0059, 0065, 0066, 0067, 0088, 0770, 0771, 0773, 0774, 0775, 0776, 0779, 0799, 0908, 0909, 0912, 0913, 7445, 7453, and 9985.

V 000037

V 000038

Section V - Trend
Subsection F - Calculation of Class Mix Adjustment Factor
7/1/2022

Section V - F
Exhibit 1

Class Mix Adjustment Factors

Policy Year (1)	Average Rates Based on Rates Effective 7/1/20 (2)	Class Mix Adjustment Factor = 0.795 / (2) (3)
2004_01	0.922	0.863
2005_01	0.891	0.893
2006_01	0.840	0.947
2007_01	0.801	0.993
2008_01	0.775	1.026
2009_01	0.768	1.035
2010_01	0.763	1.042
2011_01	0.762	1.044
2012_01	0.767	1.037
2013_01	0.777	1.024
2014_01	0.787	1.010
2015_01	0.790	1.006
2016_01	0.793	1.003
2017_01	0.797	0.998
2018_01	0.795	1.000

Notes:

(2): Current rates (Effective 7/1/20) averaged over class payrolls (excluding large deductibles) by Policy Year.

(3): Adjustment to 2018_01 Policy Year level.

V 000039

Section V - Trend
 Subsection G - External Data
 7/1/2022

Section V - G
 Exhibit 1

Summary of Statewide Average Weekly Wage (SAWW) Data

Date Promulgated by DUA (1)	Period of Data Used by DUA (2)	SAWW (3)
10/1/02	4/1/01 to 4/1/02	882.57
10/1/03	4/1/02 to 4/1/03	884.46
10/1/04	4/1/03 to 4/1/04	918.78
10/1/05	4/1/04 to 4/1/05	958.58
10/1/06	4/1/05 to 4/1/06	1,000.43
10/1/07	4/1/06 to 4/1/07	1,043.54
10/1/08	4/1/07 to 4/1/08	1,093.27
10/1/09	4/1/08 to 4/1/09	1,094.70
10/1/10	4/1/09 to 4/1/10	1,088.06
10/1/11	4/1/10 to 4/1/11	1,135.82
10/1/12	4/1/11 to 4/1/12	1,173.06
10/1/13	4/1/12 to 4/1/13	1,181.28
10/1/14	4/1/13 to 4/1/14	1,214.99
10/1/15	4/1/14 to 4/1/15	1,256.47
10/1/16	4/1/15 to 4/1/16	1,291.74
10/1/17	4/1/16 to 4/1/17	1,338.05
10/1/18	4/1/17 to 4/1/18	1,383.41
10/1/19	4/1/18 to 4/1/19	1,431.66
10/1/20	4/1/19 to 4/1/20	1,487.78
15 Year Exponential Fit, Trend =		2.7%

Policy Year (4)	SAWW (5)
2004_01	969.11
2005_01	1,011.25
2006_01	1,056.18
2007_01	1,092.12
2008_01	1,092.79
2009_01	1,101.70
2010_01	1,144.80
2011_01	1,174.21
2012_01	1,190.50
2013_01	1,225.60
2014_01	1,265.09
2015_01	1,303.66
2016_01	1,349.36
2017_01	1,395.56
2018_01	1,445.94

Notes:

(5): SAWW for Policy Year i = [0.03125 x SAWW during period 4/1/(i-1) to 4/1/i] +
 [0.6875 x SAWW during period 4/1/i to 4/1/(i+1)] + [0.28125 x SAWW during period 4/1/(i+1) to 4/1/(i+2)]

The DUA is the Department of Unemployment Assistance; previously this data was compiled by the DET (Division of Employment and Training).

V 000040

Section V - Trend
 Subsection H - Expense Trends
 7/1/2022

Section V - H
 Exhibit 1

Calculation of Expense Trend Index

Time Interval (1)	Time Index (2)	Expense Trend Index (3)	Expense Trend Factors		
			PY2017 (4)	PY2018 (5)	7/1/2022 (6)
CY2005	7/1/2005	69.61			
CY2006	7/1/2006	68.12			
CY2007	7/1/2007	75.10			
CY2008	7/1/2008	79.85			
CY2009	7/1/2009	80.18			
CY2010	7/1/2010	82.45			
CY2011	7/1/2011	79.48			
CY2012	7/1/2012	79.73			
CY2013	7/1/2013	84.48			
CY2014	7/1/2014	84.82			
CY2015	7/1/2015	90.01			
CY2016	7/1/2016	91.54			
CY2017	7/1/2017	92.59	1.023	1.063	1.210
CY2018	7/1/2018	96.77	0.978	1.017	1.158
CY2019	7/1/2019	100.00	0.947	0.984	1.121

15 Year Exponential Fit, Trend: 2.4%

PY2017	1/1/2018	94.68			1.184
PY2018	1/1/2019	98.39			1.139
7/1/2021	7/1/2022	108.93			1.029
7/1/2022	7/1/2023	112.07			

Notes:

- (1): 7/1/21 and 7/1/22 are time intervals comparable to the policy years.
- (2): Midpoint of the time interval used for determination of Expense Trend Index exponential trend rate of 2.9%.
- (3): Calendar Years: Exhibit 2, Page 2, col (17), Converted to Index with 2019 = 100.
 PY2017 - Average of indices for CY2017 and CY2018.
 PY2018 - Average of indices for CY2018 and CY2019.
 The exponential trend rate derived from an exponential regression of the Expense Trend Index for CY2013 - CY2019 is applied to the CY2019 Expense Trend Index value to derive the Expense Trend Index values for 7/1/2021 and 7/1/2022.
- (4) = [(3) for PY2017] / (3)
- (5) = [(3) for PY2018] / (3)
- (6) = [(3) for 7/1/2022] / (3)

V 000041

Section V - Trend
 Subsection H - Expense Trends
 7/1/2022

Section V - H
 Exhibit 2
 Page 1

Calculation of Credibility Weighted Expense Trend

Calendar Year (1)	Expense Index (2)	7 Year Exponential Fit (3)	Difference Squared (4)
2013	84.48	83.83	0.43
2014	84.82	86.25	2.03
2015	90.01	88.74	1.62
2016	91.54	91.31	0.05
2017	92.59	93.94	1.83
2018	96.77	96.66	0.01
2019	100.00	99.45	0.30

(5)	7 Year Expense Index Trend	2.9%
(6)	n	7
(7)	s	1.12
(8)	t	2.02
(9)	m	7.00
(10)	$[1 + 1/n + 12 \times m^2 / (n^3 - n)]^{.5}$	1.70
(11)	Confidence Interval	3.84
(12)	Projected Value Prospective Period	111.45
(13)	CI/Projected Expense Index	0.03
(14)	Credibility - 7 Year Expense Index Trend (Z)	100%
(15)	Complement of Credibility - 15 year	2.4%
(16)	Credibility Weighted Expense Trend	2.9%

Notes:

(2): Exhibit 1.

(5): 7 Year Massachusetts Trend from seven-year exponential fit to expense trend indices.

(6): Number of data points used in the exponential fitting of the 7 Year Massachusetts Trend.

(7): $\sqrt{SSR/(n-2)}$ where SSR is the sum of squared residuals and n is the number of data points used in the exponential fitting of the data.

(8): T-value based on a two-tailed t-test with probability parameter, p, of 90% and a t-distribution with 5 (= n - 2) degrees of freedom.

(9): Number of years between midpoint of data and projected point.

(11) = (7) x (8) x (10)

(12): Projected to prospective effective period using exponential fit to data.

(13) = (11) / (12)

(14): The credibility is the ratio of the target value, k, to the quotient of the confidence interval and the projected frequency, capped at 100%. Numerically, (14) = the minimum of k / (13) and 100%.

(15): Complement of credibility is based on a 15-year exponential fit, Exhibit 1.

(16) = [(5) x (14)] + [(15) x [1.0 - (14)]]

V 000042

Section V - Trend
 Subsection H - Expense Trends
 7/1/2022

Section V - H
 Exhibit 2
 Page 2

Calculation of Expense Trend Index

Economic Indices							
Calendar Year (1)	Average Weekly Earnings (2)	Food (3)	Private Transportation (4)	Phone (5)	Postage (6)	Machines & Equipment (7)	Paper (8)
2005	1,609.00	193.30	170.30	95.00	191.70	115.10	159.60
2006	1,559.00	199.10	177.50	95.90	201.90	114.70	167.40
2007	1,752.00	206.41	181.50	98.37	206.88	114.60	169.30
2008	1,865.00	215.61	192.49	100.50	213.86	122.10	184.30
2009	1,873.00	223.38	173.49	102.34	224.22	123.50	179.60
2010	1,940.00	226.20	189.26	102.09	230.14	121.00	182.10
2011	1,842.00	231.50	209.94	100.63	239.40	122.20	191.20
2012	1,847.00	238.19	215.46	100.96	247.83	121.20	191.60
2013	1,985.00	243.13	214.71	100.64	263.37	117.60	190.80
2014	1,990.00	249.00	212.77	99.93	274.08	118.80	192.70
2015	2,136.00	256.18	193.84	97.74	274.84	122.70	189.80
2016	2,180.00	262.91	188.94	97.17	276.56	123.10	186.70
2017	2,212.00	269.03	196.44	89.56	283.79	122.50	186.40
2018	2,338.00	276.13	207.10	88.00	289.73	121.10	197.60
2019	2,430.00	284.61	206.11	86.61	305.97	122.10	200.60

Economic Indices, Percentage Changes from Prior Calendar Year								
Calendar Year (9)	Average Weekly Earnings (10)	Food (11)	Private Transportation (12)	Phone (13)	Postage (14)	Machines & Equipment (15)	Paper (16)	Weighted Average (17)
2005								
2006	-3.1%	3.0%	4.2%	0.9%	5.3%	-0.3%	4.9%	-2.1%
2007	12.4%	3.7%	2.3%	2.6%	2.5%	-0.1%	1.1%	10.2%
2008	6.4%	4.5%	6.1%	2.2%	3.4%	6.5%	8.9%	6.3%
2009	0.4%	3.6%	-9.9%	1.8%	4.8%	1.1%	-2.6%	0.4%
2010	3.6%	1.3%	9.1%	-0.2%	2.6%	-2.0%	1.4%	2.8%
2011	-5.1%	2.3%	10.9%	-1.4%	4.0%	1.0%	5.0%	-3.6%
2012	0.3%	2.9%	2.6%	0.3%	3.5%	-0.8%	0.2%	0.3%
2013	7.5%	2.1%	-0.3%	-0.3%	6.3%	-3.0%	-0.4%	6.0%
2014	0.3%	2.4%	-0.9%	-0.7%	4.1%	1.0%	1.0%	0.4%
2015	7.3%	2.9%	-8.9%	-2.2%	0.3%	3.3%	-1.5%	6.1%
2016	2.1%	2.6%	-2.5%	-0.6%	0.6%	0.3%	-1.6%	1.7%
2017	1.5%	2.3%	4.0%	-7.8%	2.6%	-0.5%	-0.2%	1.2%
2018	5.7%	2.6%	5.4%	-1.7%	2.1%	-1.1%	6.0%	4.5%
2019	3.9%	3.1%	-0.5%	-1.6%	5.6%	0.8%	1.5%	3.3%

Weights							
Calendar Year (18)	Average Weekly Earnings (19)	Food (20)	Private Transportation (21)	Phone (22)	Postage (23)	Machines & Equipment (24)	Paper (25)
2005	79.8%	2.1%	2.1%	2.0%	2.0%	10.0%	2.0%
2006	80.9%	2.1%	2.1%	1.8%	1.8%	9.3%	1.8%
2007	79.9%	2.1%	2.1%	1.8%	1.8%	10.4%	1.8%
2008	78.3%	2.1%	2.1%	1.9%	1.9%	11.9%	1.8%
2009	79.5%	1.6%	1.6%	1.8%	1.8%	12.3%	1.4%
2010	80.3%	1.8%	1.8%	2.0%	2.0%	10.7%	1.4%
2011	81.8%	1.8%	1.8%	1.7%	1.7%	9.9%	1.1%
2012	82.0%	1.8%	1.8%	1.6%	1.6%	10.0%	1.1%
2013	81.2%	1.9%	1.9%	1.5%	1.5%	11.0%	0.9%
2014	80.9%	2.1%	2.1%	1.5%	1.5%	10.9%	0.9%
2015	80.7%	1.9%	1.9%	1.4%	1.4%	12.0%	0.8%
2016	80.0%	1.7%	1.7%	1.3%	1.3%	13.3%	0.7%
2017	79.0%	1.7%	1.7%	1.3%	1.3%	14.4%	0.6%
2018	79.2%	1.7%	1.7%	1.3%	1.3%	14.4%	0.6%
2019	79.9%	1.7%	1.7%	1.2%	1.2%	13.6%	0.6%

Notes:

- (2): Average Weekly Earnings, Covered Employment and Wages, Private Fire, Marine, and Casualty Insurers - Massachusetts Unadjusted for Seasonality
 Years CY2013 - CY2019: Bureau of Labor Statistics, Series ID ENU25000405524126 (Direct Property and Casualty Insurers Average Weekly Wage.)
- (3): Food Away From Home, Consumer Price Index, Urban Wage Earners and Clerical Workers - U.S.
 Unadjusted for Seasonality, Base: 1982 - 1984 = 100. Bureau of Labor Statistics, Series ID CWUR0000SEFV.
- (4): Private Transportation, Consumer Price Index, Urban Wage Earners and Clerical Workers - U.S.
 Unadjusted for Seasonality, Base: 1982 - 1984 = 100. Bureau of Labor Statistics, Series ID CWUR0000SAT1.
- (5): Telephone Services, Consumer Price Index, Urban Wage Earners and Clerical Workers - U.S.
 Unadjusted for Seasonality, Base: December 1997= 100. Bureau of Labor Statistics, Series ID CWUR0000SEED.
- (6): Postage, Consumer Price Index, Urban Wage Earners and Clerical Workers - U.S.
 Unadjusted for Seasonality, Base: 1982 - 1984 = 100. Bureau of Labor Statistics, Series ID CWUR0000SEEC01.
- (7): Office and Store Machines and Equipment, Producer Price Index
 Unadjusted for Seasonality, Base: 1982 = 100. Bureau of Labor Statistics, Series ID WPU1193.
- (8): Paper, Producer Price Index
 Unadjusted for Seasonality, Base: 1982 - 1984 = 100. Bureau of Labor Statistics, Series ID WPU0913.
- (17) Weighted average of (10)-(16) using weights for prior year from columns (19)-(25)
- (19)-(25): Section V-H, Exhibit 2, Page 3 and Page 4 for Calendar Year 2018-2019. Prior Filings for all other years.

V 000043

Section V - Trend
 Subsection H - Expense Trends
 7/1/2022

Section V - H
 Exhibit 2
 Page 3

Calendar Year 2018
 Weights for Expense Trends

Expense Component (1)	Percentage of Net Written Premium (2)	% of Total = (2) / Total (2) (3)	Corresponding Index (4)	Weights (5)
Salaries	7.21%	64.4%	Average Weekly Earnings Covered Employment and Wages; Private Fire, Marine, Casualty Massachusetts	79.2%
Payroll Taxes	0.46%	4.1%		
Employee Relations	1.19%	10.6%		
Travel & Travel Items	0.37%	3.3%	Food Away From Home-CPI-US	1.7%
			Private Transportation-CPI-US	1.7%
Postage & Telephone	0.28%	2.5%	Postage-CPI-US	1.3%
			Telephone-CPI-US	1.3%
Equipment	1.61%	14.4%	Office & Stores Machines & Equipment-PPI	14.4%
Printing & Stationery	0.07%	0.6%	Paper-PPI	0.6%
Total	11.19%	100.0%		100.0%

Notes:

(2): 2019 Best's Aggregates and Averages, Property-Casualty, Totals for Commercial Casualty Companies with Written Premium Net of Reinsurance Ceded over \$15 million.

(5) = Based on (3)

V 000044

Section V - Trend
 Subsection H - Expense Trends
 7/1/2022

Section V - H
 Exhibit 2
 Page 4

Calendar Year 2019
 Weights for Expense Trends

Expense Component (1)	Percentage of Net Written Premium (2)	% of Total = (2) / Total (2) (3)	Corresponding Index (4)	Weights (5)
Salaries	7.27%	64.7%	Average Weekly Earnings Covered Employment and Wages; Private Fire, Marine, Casualty Massachusetts	79.9%
Payroll Taxes	0.49%	4.4%		
Employee Relations	1.22%	10.9%		
Travel & Travel Items	0.38%	3.4%	Food Away From Home-CPI-US	1.7%
			Private Transportation-CPI-US	1.7%
Postage & Telephone	0.28%	2.5%	Postage-CPI-US	1.2%
			Telephone-CPI-US	1.2%
Equipment	1.53%	13.6%	Office & Stores Machines & Equipment-PPI	13.6%
Printing & Stationary	0.07%	0.6%	Paper-PPI	0.6%
Total	11.24%	100.0%		100.0%

Notes:

(2): 2020 Best's Aggregates and Averages, Property-Casualty, Totals for Commercial Casualty Companies with Written Premium Net of Reinsurance Ceded over \$15 million.

(5) = Based on (3)

V 000045

Section V - Trend
Subsection H - Expense Trends
7/1/2022

Section V - H
Exhibit 3

Exposure Growth Estimate Based on Trend in Million Worker-Weeks

Policy Year (1)	Estimated Million Worker-Weeks (2)	5 Year Exponential Fit (3)	Difference Squared (4)
2004	71.62		
2005	73.57		
2006	75.65		
2007	78.30		
2008	78.57		
2009	75.29		
2010	79.76		
2011	82.97		
2012	83.65		
2013	85.14		
2014	87.12	87.93	0.65
2015	90.34	89.13	1.45
2016	90.17	90.35	0.03
2017	91.63	91.59	0.00
2018	92.59	92.85	0.06
15 Year Million Worker-Weeks Trend	1.9%		
(5)	5 Year MA Trend		1.4%
(6)	n		5
(7)	s		0.86
(8)	t		2.35
(9)	m		6.49
(10)	$[1 + 1/n + 12 \times m^2 / (n^3 - n)]^{.5}$		2.33
(11)	Confidence Interval		4.69
(12)	Projected		98.70
(13)	CI / Projected		0.05
(14)	Credibility - 5 Year MA Trend (Z)		100%
(15)	Complement of Credibility		1.9%
(16)	Credibility-Weighted Overall Exposure Growth		1.4%

Notes:

(2): Section V-E, Exhibit 1.

(5): 5 Year Massachusetts Trend from five-year exponential fit to estimated million worker-weeks.

(6): Number of data points used in the exponential fitting of the 5 Year Massachusetts Trend.

(7): $\sqrt{SSR/(n-2)}$ where SSR is the sum of squared residuals and n is the number of data points used in the exponential fitting of the data.

(8): T-value based on a two-tailed t-test with probability parameter, p, of 90% and a t-distribution with 3 (= n - 2) degrees of freedom.

(9): Number of years between midpoint of data and projected point.

(11) = (7) x (8) x (10)

(12): Million Worker-Weeks projected to prospective effective period using exponential fit to data.

(13) = (11) / (12)

(14): The credibility is the ratio of the target value, k, to the quotient of the confidence interval and the projected frequency, capped at 100%.

Numerically, (14) = the minimum of k / (13) and 100%.

(15): Complement of credibility is based on a 15-year exponential fit.

(16) = [(5) x (14)] + { (15) x [1.0 - (14)] }

EXPENSES

In this filing, the WCRIBMA has used the same methods to calculate expenses as it has in the 2020 rate filing. These methods are described below.

Fixed Expenses

The provision for fixed expenses has three components: general expenses, Massachusetts Workers' Compensation Assigned Risk (Pool) expenses, and other taxes; and was calculated using the same methods used to calculate these expenses in the rate filings since 2011.

The determination of the general expense allowance involves estimating general expenses from calendar years 2017, 2018, and 2019¹ (Section VI-B, Exhibit 2, Page 2). For each of the three years, a general expense ratio calculated from industrywide data is applied to Massachusetts standard earned premium plus ARAP, excluding expense constant revenue, to obtain an estimate of Massachusetts general expenses for all companies (Section VI-B, Exhibit 2, Page 1). These estimated general expense dollars are trended and adjusted for exposure growth to be consistent with the data periods on which the rate indication in Section I is based (the midpoint of the experience period, 7/1/2023). The three years of estimated general expenses are averaged to obtain an estimate of Massachusetts general expense requirements for all companies. As in all of the filings from 2003 forward, general expenses relating to Boards and Bureaus were

¹ Expenses are less affected by COVID-19 data anomalies, due to the stability of the calculated expense ratios in our methodology. Despite that, we believe it is appropriate to use expense data from the same time period as other data used in the rate filing.

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estimated using the actual WCRIBMA expenses taken from WCRIBMA Financial Statements and Expense Analysis Report rather than the Incurred Boards and Bureaus expense item from the Expense Call.

Calendar year data (2017-2019), taken from the Massachusetts Workers' Compensation Assigned Risk Pool (Pool) Annual Report and the WCRIBMA Financial Statements and Expense Analysis Report, is used to determine the Pool expense allowance (Section VI-B, Exhibit 1). The estimated Pool expense dollars are trended and adjusted for exposure growth to be consistent with the data periods on which the rate indication in Section I is based (the midpoint of the experience period, 7/1/2023). The three years of estimated Pool expenses are averaged to obtain an estimate of Pool expense requirements for all companies.

The WCRIBMA used the “Other Tax” percentage for the “Commercial Casualty” line as compiled in Best's Aggregates and Averages (2021) to estimate the allowance for miscellaneous taxes in Massachusetts. The resulting allowance for other taxes is then trended and adjusted for exposure growth to be consistent with the experience periods on which the rate indication in Section I is based (the midpoint of the experience period, 7/1/2023) (Section VI-C).

Variable Expenses

As in the past, the variable expense ratio is comprised of the following components: commissions, other acquisition expenses, premium discounts and premium taxes. As in recent filings, the WCRIBMA has also considered two additional variable

expenses which are described below: earned but uncollectible premium net of incidental income and the “frictional costs” of reinsurance.

Commissions

The provision for commission expenses is calculated in this filing using the same method as has been used since the 2012 rate filing. The WCRIBMA calculated ratios of direct commission expenses to direct written premium for three calendar years (2017-2019) using data reported on carriers’ Annual Statements. A three-year average is used to derive the commission expense ratio (Section VI-G, Exhibit 3). The provision for commission expenses could also be evaluated using data that excludes large deductible policies, for which producers are often compensated directly by an insured resulting in no, or very small commissions paid by the insurer.²

Commissions associated with retrospective premium adjustments do not create any distortion in the WCRIBMA estimation of the provision for commission expense because commissions are not paid (or returned) in response to retrospective rating adjustments and premium in a balanced retrospective plan should approximate guaranteed cost premium.

Other Acquisition Expense

The WCRIBMA calculates the other acquisition expense load by taking the ratios of reported other acquisition expenses to reported standard earned premium for three calendar years (2017-2019). The WCRIBMA then averages these three ratios to determine the other acquisition expense ratio (Section VI-G, Exhibit 2).

² The Massachusetts Division of Insurance published a regulatory bulletin that addresses this trend on October 4, 2013. Bulletin 2013-09; Fees Charged by Insurance Producers Relative to the Sale of Insurance in the Commonwealth.

Premium Discounts

The average premium discount is calculated from the Premium Discount Schedules using the methodology used in the 1999 Rate Decision and used in each of the WCRIBMA's subsequent rate filings. For interstate-rated risks, the Massachusetts portion of the interstate-rated premium is based on actual historical rating data which is considered more accurate and representative of the market.

Insurers in Massachusetts may elect to use either the Type A or the Type B premium discount table. Based on the projected distribution of policy size and the two available premium discount tables, the WCRIBMA estimated an average premium discount for the Type A and Type B tables, separately. These two averages are weighted using the percentages of voluntary market premium written by Type A insurers and Type B insurers (Section VI-E, Exhibit 1) as weights. The resulting average premium discount for the voluntary market is used, in turn, to obtain the premium discount used in the overall rate indication in Section I.

Premium Taxes

The premium tax rate is 2.28% of net premiums (Section VI-B, Exhibit 3). To put this expense on a "standard premium plus ARAP" basis, the WCRIBMA multiplies the premium tax rate by one minus the "average premium discount for the total market" in Section VI-A, Exhibit 1.

Incidental Income and Earned but Uncollectible Premium

The WCRIBMA treats incidental income as a negative expense item which is applied as an offset to earned but uncollectible premium ("EBUP"). The calculation used

by the WCRIBMA, which accounts for both incidental income and EBUP, is based upon the average of the experience reported in calendar years 2017, 2018, and 2019. This year, the selected net effect of including both incidental income and EBUP is zero (Section VI-G, Exhibit 5).

Frictional Costs of Reinsurance

Fundamental to the business of insurance is the concept of sharing underwriting risk among risk bearers. Examples include the sharing of large property risks across a syndicate of primary insurers; self-insureds participating in group self-insurance funds; and reinsurers assuming risks from primary carriers. In workers' compensation, primary insurers utilize reinsurance to reduce their overall underwriting risk, and reinsurers (not unlike primary insurers) must commit capital (surplus) to support the underwriting risk they assume from primary insurers. Reinsurance allows primary insurers to underwrite risks that, but for the existence of a risk-sharing business partner, they would not be able to insure.

Primary insurers must cover their costs of purchasing reinsurance and provide an opportunity for reinsurers to earn a fair rate of return on their invested capital. Since the 2005 filing, the WCRIBMA has calculated an expense load intended to recognize the “frictional costs” of reinsurance. Frictional costs, as that term is used in this filing, are the sum of the acquisition expenses (reduced for recognition of ceding commissions), general expenses and taxes associated with providing reinsurance coverage that must be borne by the primary carriers. The estimation of the load for frictional costs associated with the purchase of reinsurance is detailed in Section VI-G, Exhibit 4.

Expense Constants

The current expense constants³ are \$159 for risk sizes less than \$200, \$250 for risk sizes greater than or equal to \$200 but less than \$1,000, and \$338 for risk sizes greater than or equal to \$1,000. The WCRIBMA is seeking no change in the existing expense constants.

Loss Adjustment Expense

Loss adjustment expense is made up of two components, Defense and Cost Containment Expense (“DCCE”) and Adjusting and Other Expense (“AO”). In this filing, the WCRIBMA continues to use Aggregate Financial data, specifically the Policy Year Call (Call #2) which excludes data for large deductible policies and therefore is not subject to any distortion created by the various treatments of DCCE that exist in the large deductible market.⁴ Using the Policy Year Call, the WCRIBMA calculated policy year ratios of paid DCCE to paid loss (this is consistent with the policy year ratios calculated in the 2020 filing). Deriving ratios provides a more stable and predictive estimate that allowed the utilization of the most recent partial policy year. The WCRIBMA developed these ratios to a tenth report (120 months) utilizing historical policy year paid DCCE to paid loss ratio development factors based on the weighted average of the three policy

³ WCRIBMA introduced a three tiered expense constants system in the September 1, 2008 rate filing.

⁴ The DOI has historically approved large deductible filings that allow for the allocation of DCCE expense between insurer and insured in a number of different ways. DCCE expense may be paid entirely by the insurer or the insured. Alternatively, the DCCE expense may be included with loss before the application of the deductible resulting in a pro rata sharing of DCCE expense based on the respective amounts for which the insured and the insurer are responsible in accordance with the deductible agreement.

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years (2017-2019). Although policy year 2019 is utilized in this portion of the filing, it is evaluated as of year-end 2019 and therefore is unaffected by anomalies related to COVID-19. Evaluating this expense on a policy year basis, aligns the dollar spend of DCCE with the losses being paid and claims being adjudicated. (Section VI-H, Exhibit 1 Page 2). The average of three policy year ratios was selected as the DCCE load (Section VI-H, Exhibit 1, Page 1).⁵

The AO portion of the LAE ratio is adjusted for the effects of losses eliminated by large deductibles. The reported AO for large deductible policies is assumed to be less than it would have been had the policies been written on a full coverage basis, but more than it would have been as a percentage of net losses.⁶ In other words, AO is assumed to be partially variable and partially fixed with respect to large deductible losses. The selected adjustment factor is an average of that which would result from assuming all AO is fixed and from assuming all AO is variable (Section VI-I, Exhibit 1, Page 1).

⁵ The WCRIBMA has previously analyzed alternative approaches to this method, including (1) the development of calendar year paid DCCE to paid loss ratios and (2) the development of policy year paid plus case DCCE to paid plus case loss ratios. The resulting estimates using the paid to paid policy year ratios were more stable than the alternative methods and stability lends itself to better predictability.

⁶ “*The Role of Large Deductible Policies for PEO’s in the Failures of Small Workers’ Compensation Insurers*,” a white paper available at www.NAIC.org, provides some insight as to why, for a certain insureds, AO expense incurred by the insurer is less when the insured is issued a large deductible policy instead of a guaranteed cost policy. The white paper, on page 6, states, “[t]he intention of insurance regulators and workers’ compensation administrators is that the large deductible workers’ compensation policies should provide employees with exactly the same coverage for accidents and injuries as policies that do not have deductibles. The reality is that side agreements made outside of the policy contract may make these policies perform more like self-insurance with an excess policy. The difference between large deductible policies and excess insurance is that with large deductibles the insurer is presumed to adjust the claims, report the loss data to statistical agents, and assume the risk of not being paid in a timely manner by the employer. With excess policies the insurer only steps in when the losses occur above the agreed-upon attachment point (losses in excess of preset amount).”
www.naic.org/documents/committees_c_wctf_related_150819_lg_deduct_policy_role_in_failures.pdf.

VI 000008

Section VI - Expenses
Subsection A - Summary
7/1/2022

Section VI - A
Exhibit 1

Summary of Expense Ratios

(1)	Commission and Other Acquisition Expense Ratio	12.7%
(2)	Average Premium Discount as a % of Standard Premium + ARAP	5.5%
(3)	Premium Tax Ratio = 2.28% x [1.0 - (2)]	2.2%
(4)	Variable Expense Ratio = (1) + (2) + (3)	20.3%
(5)	Fixed Expense Ratio	5.8%
(6)	Total Loss Adjustment Expense Ratio (LAE / Loss)	18.7%

Notes:

(1): Section VI-G, Exhibit 1.

(2): Section VI-E, Exhibit 1.

(3): 2.28% from Section VI-B, Exhibit 3.

(5): Section VI-B, Exhibit 1.

(6): Section VI-H, Exhibit 1.

Calculation of Fixed Expenses

Calendar Year (1)	General Expense Exclusive of Expense Constant Premium (2)	Total Pool Expenses for non-Large Deductible (3)	Total General Expense = (2) + (3) (4)	Projected to PY 2017			Projected to PY 2018		
				Expense Trend Factor (5)	Exposure Growth Factor (6)	Projected General Expense = (4) x (5) x (6) (7)	Expense Trend Factor (8)	Exposure Growth Factor (9)	Projected General Expense = (4) x (8) x (9) (10)
2017	39,359,190	1,327,872	40,687,062	1.023	1.007	41,889,294	1.063	1.021	44,124,602
2018	35,801,361	1,415,243	37,216,604	0.978	0.993	36,166,092	1.017	1.007	38,095,997
2019	34,800,931	1,313,173	36,114,104	0.947	0.980	33,502,213	0.984	0.993	35,289,967
Average			38,005,923			37,185,866			39,170,189

Policy Year (11)	Three Year Average Projected General Expense to PY (12)	Provision for Other Taxes (13)	Provision for Fixed Expenses = (12) + (13) (14)	Expense Trends from PYs to 7/1/2023 (15)	Trended Fixed Expenses = (14) x (15) (16)	Standard Earned Premium plus ARAP Projected to Prospective Effective Period (17)	Fixed Expense Ratio to Standard Earned Premium plus ARAP = (16) / (17) (18)
2017	37,185,866	2,133,135	39,319,001	1.184	46,540,912	793,863,444	5.9%
2018	39,170,189	2,246,964	41,417,152	1.139	47,178,686	809,418,185	5.8%
Average							5.8%

Notes:

(2): Exhibit 2, Page 1.

(3): Exhibit 2, Page 3.

(5): Section V-H, Exhibit 1.

(6): 1.4% annual growth in worker-weeks, from Section V-H, Exhibit 3; 0.5 years from CY 2017 to PY 2017, -0.5 years from CY 2018 to PY 2017, -1.5 years from CY 2019 to PY 2017.

(8): Section V-H, Exhibit 1.

(9): 1.4% annual growth in worker-weeks, from Section V-H, Exhibit 3; 1.5 years from CY 2017 to PY 2018, 0.5 years from CY 2018 to PY 2018, -0.5 years from CY 2019 to PY 2018.

(13): Section VI-C, Exhibit 1.

(15): Section V-H, Exhibit 1.

(17): These premium amounts do not match those displayed in Section I. This is due to the exclusion of data from company groups included in the Section I data. The premium amounts displayed have been adjusted by the same development, trend, and premium level factors shown in Section I and off-balance factors shown in Section III.

The ARAP premium has been adjusted from company level to DSR level premium using the policy year adjustment factors from Section III-B, Exhibit 2.

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VI 000010

Section VI - Expenses
 Subsection B - Fixed Expenses
 7/1/2022

Section VI - B
 Exhibit 2
 Page 1

General Expense Exclusive of Proposed Expense Constant

	Calendar Year		
	2017	2018	2019
(1) Standard Earned Premium Including Expense Constant Premium	747,041,873	770,886,926	759,618,201
(2) ARAP Premium at Company Level	29,559,592	31,088,424	31,534,080
(3) Adjustment Factor to Adjust from Company Level to DSR Level Premium	1.051	1.053	1.056
(4) Standard Earned Premium plus Adjusted ARAP = (1) + [(2) x (3)]	778,113,893	803,628,688	792,909,490
(5) Adjustment for Experience and Merit Rating, ARAP, and Construction Credit Off-balance	1.041	1.040	1.042
(6) Adjustment Factor to Remove the Impact of Loading for Recoupment of Insolvency Fund Assessments	1.002	1.002	0.998
(7) Adjusted Standard Earned Premium plus ARAP = (4) x (5) x (6)	811,253,735	836,927,365	824,554,604
(8) Ratio of Adjusted General Expense to Adjusted Standard Earned Premium plus ARAP	6.5%	6.0%	6.0%
(9) General Expenses = (7) x (8)	52,626,465	49,894,938	49,364,853
(10) Expense Constant Premium	30,008,841	30,483,056	30,504,577
(11) General Expense Portion of Expense Constant	51.0%	51.0%	51.0%
(12) Average Expense Constant in Effect	253.05	252.90	253.08
(13) Proposed Average Expense Constant	265.66	265.66	265.66
(14) Expense Trend Factor - Calendar Year XXXX to 7/1/23, the midpoint of the Prospective Effective Period	1.210	1.158	1.121
(15) Trend Factor to Adjust Proposed Average Expense Constant to Calendar Year XXXX = 1.0 / (14)	0.826	0.863	0.892
(16) Detrended Proposed Average Expense Constant = (13) x (15)	219.48	229.39	237.04
(17) Adjusted General Expenses Generated by the Expense Constant = [(10) x (11)] x [(16) / (12)]	13,267,275	14,093,577	14,563,921
(18) General Expenses Exclusive of Expense Constant Premium = (9) - (17)	39,359,190	35,801,361	34,800,931

Notes:

- (1),(2): Aggregate Financial Policy Year Call, excludes large deductible policies.
 (3): Section III-B, Exhibit 2.
 (5): Section III-B, Exhibit 1.
 (6): Section III-C, Exhibit 1.
 (8): Page 2.
 (10): Calculated expense constant premium based on historical Unit Statistical Plan Data.
 (11): Exhibit 3.
 (12): Calculated average expense constant in effect based on historical Unit Statistical Plan Data.
 (13): Section VI-D, Exhibit 1.
 (14): Section V-H, Exhibit 1.

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Section VI - Expenses
 Subsection B - Fixed Expenses
 7/1/2022

Section VI - B
 Exhibit 2
 Page 2

Calculation of General Expense

	Calendar Year		
	2017	2018	2019
(1) Standard Earned Premium Including Expense Constant Premium	896,751,631	931,573,495	950,622,544
(2) ARAP Premium at Company Level	35,842,348	38,295,877	38,795,384
(3) Adjustment Factor to Adjust from Company Level to DSR Level Premium	1.051	1.053	1.056
(4) Standard Earned Premium plus Adjusted ARAP = (1) + [(2) x (3)]	934,427,866	971,906,015	991,579,767
(5) Adjustment for Experience and Merit Rating, ARAP, and Construction Credit Off-balance	1.041	1.040	1.042
(6) Adjustment Factor to Remove the Impact of Loading for Recoupment of Insolvency Fund Assessments	1.002	1.002	0.998
(7) Adjusted Standard Earned Premium plus ARAP = (4) x (5) x (6)	974,225,115	1,012,177,331	1,031,153,835
(8) Actual WCRIBMA Expenses	10,838,906	9,145,885	8,929,031
(9) General Expenses (excluding Boards & Bureaus Expenses)	52,359,600	51,196,896	52,804,609
(10) Adjusted General Expense = (8) + (9)	63,198,506	60,342,781	61,733,640
(11) Ratio of Adjusted General Expense to Adjusted Standard Earned Premium plus ARAP (including expense constants) = (10) / (7)	6.5%	6.0%	6.0%

Notes:

- (1),(2): Aggregate Financial Reconciliation Report Calls, Calendar Years 2017 - 2019, including large deductible policies.
 (3): Section III-B, Exhibit 2.
 (5): Section III-B, Exhibit 1.
 (6): Section III-C, Exhibit 1.
 (8): WCRIBMA Financial Statements and Expense Analysis Report. Excludes Workers' Compensation Bureau Pool Expenses.
 (9): Aggregate Financial Expense Calls, Calendar Years 2017 - 2019.

VI 000012

Section VI - Expenses
 Subsection B - Fixed Expenses
 7/1/2022

Section VI - B
 Exhibit 2
 Page 3

Calculation of Pool Expense

	Calendar Year		
	2017	2018	2019
(1) Administrative Expenses	520,626	484,110	548,444
(2) Other Expense Allowances	-	-	-
(3) Workers' Compensation Bureau Pool Expenses	2,294,318	2,403,510	2,121,129
(4) Total Pool Expenses = (1) + (2) + (3)	2,814,944	2,887,620	2,669,573
(5) Target Pool Expenses for Excluded Companies	1,020,960	975,596	895,450
(6) Total Pool Expenses, excluding 4 company(ies) = (4) - (5)	1,793,984	1,912,024	1,774,124
(7) Proportion of Voluntary Assessable Premium Not from Large Deductibles " u "	0.740	0.740	0.740
(8) Total Pool Expenses for Non-Large Deductibles = (6) x (7)	1,327,872	1,415,243	1,313,173

Notes:

- (1),(2): Massachusetts Workers' Compensation Assigned Risk Pool Annual Report and WCRIBMA Financial Statements and Expense Analysis Report, adjusted for non-large deductible policies.
- (3): From the WCRIB Financial Statements and Expense Analysis Report
- (7): Section I-E, Exhibit 2.

VI 000013

Section VI - Expenses
Subsection B - Fixed Expenses
7/1/2022

Section VI - B
Exhibit 3

Expense Constant Components

(1)	Portion of Expense Constant for General Expenses Loaded for Premium Taxes	52.2%
(2)	Current Premium Tax Rate	2.28%
(3)	General Expense Portion of Expense Constant = (1) x [1.0 - (2)]	51.0%
(4)	Other Acquisition Portion of Expense Constant = [1.0 - (1)] x [1.0 - (2)]	46.7%

Notes:

(1): NCCI 1991 Calendar Year Expense database.

(2): Massachusetts Department of Revenue, 2020 Form 63-23P.

2.28% is Premium Tax as % of Net Premium.

VI 000014

Section VI - Expenses
 Subsection C - Other Taxes
 7/1/2022

Section VI - C
 Exhibit 1

Calculation of Other Taxes

(1)	Calendar Year 2019 Standard Earned Premium Including Expense Constant Premium	759,618,201	
(2)	Calendar Year 2019 ARAP Premium at Company Level	31,534,080	
(3)	Adjustment Factor to Adjust from Company Level to DSR Level Premium	1.056	
(4)	Calendar Year 2019 Standard Earned Premium plus Adjusted ARAP = (1) + [(2) x (3)]	792,909,490	
(5)	Calendar Year 2019 Other Taxes Ratio	0.29%	
(6)	Calendar Year 2019 Other Taxes = (4) x (5)	2,299,438	
		<u>PY2017</u>	<u>PY2018</u>
(7)	Other Tax Trend Factor from CY 2019 to PY XXXX	0.947	0.984
(8)	Annual Exposure Growth	1.4%	1.4%
(9)	Trend Length	-1.5	-0.5
(10)	Provision for Other Taxes = (6) x (7) x { [1.0 + (8)] ^ (9) }	2,133,135	2,246,964

Notes:

(1),(2): Based on from Aggregate Financial Policy Year Call.

(3): Section III-B, Exhibit 2.

(5): 2020 Best's Aggregates and Averages. Page 26.

(7): Section V-H, Exhibit 1.

(8): Section V-H, Exhibit 3.

(9): -1.5 years from CY 2019 to PY 2017, -0.5 years from CY 2019 to PY 2018.

VI 000015

Section VI - Expenses
 Subsection D - Expense Constant
 7/1/2022

Section VI - D
 Exhibit 1

Calculation of Expense Constant

Standard Premium Ranges		PY 2018 Adjusted Policy Count	Adjusted Policy Distribution	Current Expense Constant	Trend Factor from 7/1/22 to 7/1/23	Selected Trend Factor	Proposed Expense Constant = (5) x (7)
Unadjusted	Adjusted						
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Less than \$200	Less Than \$172	35,712	29%	\$159.00	1.029	1.000	\$159.00
\$200 to \$1,000	\$172 to \$862	27,254	22%	\$250.00	1.029	1.000	\$250.00
\$1,000 or more	\$862 or more	58,550	48%	\$338.00	1.029	1.000	\$338.00
Total		121,517	100%	\$265.66			\$265.66

Notes:

Risk sizes in terms of Massachusetts Standard Premium.

(2): Instead of projecting the premiums for all policies forward to the prospective effective period, the end points of the Standard Premium Ranges are adjusted. This is done by dividing the end points by the Premium Adjustment Factor, 1.16, from Section III-E, Exhibit 1.

(3): Unit Statistical Plan Data PY 2018 (excluding Large Deductible policies).

(4) = (3) / Total (3)

TOTAL (5) = (5) weighted by (4)

(6): Section V-H, Exhibit 1.

Total (8) = (8) weighted by (4)

VI 000016

Section VI - Expenses
Subsection E - Expenses Net of Premium Discount
7/1/2022

Section VI - E
Exhibit 1

Calculation of Average Premium Discount

	<u>Elected Premium Discount Table</u>	
	<u>Type A</u>	<u>Type B</u>
(1) Average Premium Discount as a % of Standard Premium	7.7%	4.1%
(2) Percentage of Voluntary Written Premium by Discount Type	74.7%	25.3%
(3) Weighted Average Premium Discount as a % of Standard Premium in Voluntary Market = (1) weighted by (2)	6.8%	
(4) Voluntary Market Share	85.3%	
(5) Average Premium Discount in Total Market = (3) x (4)	5.8%	
(6) Average ARAP Surcharge for Prospective Effective Period as a % of Standard Premium	5.4%	
(7) Average Premium Discount as a % of Standard Premium + ARAP = (5) / [1.0 + (6)]	5.5%	

Notes:

(1): Type "A" - Exhibit 2, Total (10).

Type "B" - Exhibit 3, Total (10).

(2): Exhibit 4.

(4): Special Bulletin 10/27/2021 Market Share is estimated using Standard Premium plus ARAP.

(6): Section IX-K, Exhibit 3.

VI 000017

Section VI - Expenses
 Subsection E - Expenses Net of Premium Discount
 7/1/2022

Section VI - E
 Exhibit 2

Average Premium Discount Voluntary Market Risks - Type "A" Discounts

Intrastate Intervals						
Layer of Standard Premium (1)	Standard Premium Ranges - PY 2018				Total = [Sum of (2)] (3)	
	0 - 10,000	10,000 - 200,000	200,000 - 1,750,000	1,750,000 & Over		
0 - 10,000	110,172,326	82,320,000	3,260,000	70,000	195,822,326	
10,000 - 200,000		201,855,647	61,940,000	1,330,000	265,125,647	
200,000 - 1,750,000			74,427,349	10,850,000	85,277,349	
1,750,000 - & Over				10,008,315	10,008,315	
Total	110,172,326	284,175,647	139,627,349	22,258,315	556,233,637	

Interstate Intervals					
Layer of Standard Premium (4)	Standard Premium Ranges - PY 2018				Total Premium in Layer (6)
	0 - 10,000	10,000 - 200,000	200,000 - 1,750,000	1,750,000 & Over	
0 - 10,000	112,833	4,026,267	1,748,387	229,593	6,117,080
10,000 - 200,000		25,532,656	33,219,371	4,362,269	63,114,296
200,000 - 1,750,000			62,341,990	35,586,931	97,928,921
1,750,000 - & Over				82,855,351	82,855,351
Total	112,833	29,558,923	97,309,748	123,034,144	250,015,648

Total		Proportion of Premium in Layer (9)	% Premium Discount Type A Company (10)
Layer of Standard Premium (7)	Total = (3) + (6) (8)		
0 - 10,000	201,939,406	25.0%	0.0%
10,000 - 200,000	328,239,943	40.7%	9.1%
200,000 - 1,750,000	183,206,270	22.7%	11.3%
1,750,000 - & Over	92,863,666	11.5%	12.3%
Total	806,249,285	100.0%	7.7%

Notes:

Unit Statistical Plan Data.

Layers correspond to the Premium Discount layers.

For interstate rated policies, the ratio of Massachusetts Standard Premium to Countrywide Standard Premium is assumed to equal the ratio of Massachusetts Expected Losses (used in an interstate experience modification) to Countrywide Expected Losses.

(9) = (8) / Total (8)

Total (10) = (10) weighted by (9)

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Average Premium Discount Voluntary Market Risks - Type "B" Discounts

Intrastate Intervals						
Layer of Standard Premium (1)	Standard Premium Ranges - PY 2018				Total = [Sum of (2)] (3)	
	0 - 10,000	10,000 - 200,000	200,000 - 1,750,000	1,750,000 & Over		
0 - 10,000	58,714,782	31,600,000	820,000	20,000	91,154,782	
10,000 - 200,000		54,341,523	15,580,000	380,000	70,301,523	
200,000 - 1,750,000			16,116,581	3,100,000	19,216,581	
1,750,000 - & Over				2,681,852	2,681,852	
Total	58,714,782	85,941,523	32,516,581	6,181,852	183,354,738	

Interstate Intervals					
Layer of Standard Premium (4)	Standard Premium Ranges - PY 2018				Total Premium in Layer (6)
	0 - 10,000	10,000 - 200,000	200,000 - 1,750,000	1,750,000 & Over	
0 - 10,000	44,118	1,456,568	474,120	66,822	2,041,628
10,000 - 200,000		8,777,914	9,008,282	1,269,615	19,055,811
200,000 - 1,750,000			15,867,750	10,357,392	26,225,142
1,750,000 - & Over				47,313,998	47,313,998
Total	44,118	10,234,482	25,350,152	59,007,827	94,636,579

Total			
Layer of Standard Premium (7)	Total = (3) + (6) (8)	Proportion of Premium in Layer (9)	% Premium Discount Type B Company (10)
0 - 10,000	93,196,410	33.5%	0.0%
10,000 - 200,000	89,357,334	32.1%	5.1%
200,000 - 1,750,000	45,441,723	16.3%	6.5%
1,750,000 - & Over	49,995,850	18.0%	7.5%
Total	277,991,317	100.0%	4.1%

Notes:

Unit Statistical Plan Data.

Layers correspond to the Premium Discount layers.

For interstate rated policies, the ratio of Massachusetts Standard Premium to Countrywide Standard Premium is assumed to equal the ratio of Massachusetts Expected Losses (used in an interstate experience modification) to Countrywide Expected Losses.

(9) = (8) / Total (8)

Total (10) = (10) weighted by (9)

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Calendar Year 2019 Direct Written Premiums by Premium Discount Election - Type "A" or Type "B"

NAIC Company Number (1)	Company Name (2)	Elected Discount Schedule (3)	Direct Written Premium (4)	Residual Market Written Premium (5)	Adjusted Voluntary Written Premium		
					Total Written Premium (6)	Type A Written Premium (7)	Type B Written Premium (8)
33758	ASSOCIATED INDUSTRIES OF MASS. MUTUAL INS. CO.	A	95,375,511	53,289,843	42,085,668	42,085,668	0
23841	NEW HAMPSHIRE INSURANCE COMPANY	B	72,941,293	0	72,941,293	0	72,941,293
22667	ACE AMERICAN INSURANCE COMPANY	A	58,247,324	26,043,989	32,203,335	32,203,335	0
25682	TRAVELERS INDEMNITY COMPANY OF CONNECTICUT	A	49,889,231	0	49,889,231	49,889,231	0
11104	ASSOCIATED EMPLOYERS INSURANCE COMPANY	B	38,267,233	0	38,267,233	0	38,267,233
25666	TRAVELERS INDEMNITY COMPANY OF AMERICA	A	38,175,420	32,641,589	5,533,831	5,533,831	0
44326	ATLANTIC CHARTER INSURANCE COMPANY	A	33,909,088	10,334,548	23,574,540	23,574,540	0
30104	HARTFORD UNDERWRITERS INSURANCE COMPANY	A	33,544,242	20,576,511	12,967,731	12,967,731	0
42390	AMGUARD INSURANCE COMPANY	A	31,756,346	18,286,747	13,469,599	13,469,599	0
40142	AMERICAN ZURICH INSURANCE COMPANY	A	31,095,561	11,541,821	19,553,740	19,553,740	0
25658	TRAVELERS INDEMNITY COMPANY	A	29,274,227	-7,555	29,281,782	29,281,782	0
33600	LM INSURANCE CORPORATION	A	28,697,532	25,976,466	2,721,066	2,721,066	0
23035	LIBERTY MUTUAL FIRE INSURANCE COMPANY	A	27,891,821	0	27,891,821	27,891,821	0
31470	NORGUARD INSURANCE COMPANY	A	27,388,611	0	27,388,611	27,388,611	0
16535	ZURICH AMERICAN INSURANCE COMPANY	A	25,333,303	0	25,333,303	25,333,303	0
29459	TWIN CITY FIRE INSURANCE COMPANY	B	24,600,153	0	24,600,153	0	24,600,153
25674	TRAVELERS PROPERTY CASUALTY COMPANY OF AMERICA	A	23,748,931	22,915,420	833,511	833,511	0
11984	INDEPENDENCE CASUALTY INSURANCE COMPANY	A	22,874,807	0	22,874,807	22,874,807	0
42404	LIBERTY INSURANCE CORPORATION	A	20,914,210	0	20,914,210	20,914,210	0
19682	HARTFORD FIRE INSURANCE COMPANY	B	19,150,422	0	19,150,422	0	19,150,422
25011	WESCO INSURANCE COMPANY	A	18,780,426	0	18,780,426	18,780,426	0
22357	HARTFORD ACCIDENT AND INDEMNITY COMPANY	A	17,636,474	0	17,636,474	17,636,474	0
19429	INSURANCE COMPANY OF THE STATE OF PENNSYLVANIA	A	16,372,529	0	16,372,529	16,372,529	0
20281	FEDERAL INSURANCE COMPANY	A	15,215,194	0	15,215,194	15,215,194	0
31325	ACADIA INSURANCE COMPANY	B	14,862,261	873,829	13,988,432	0	13,988,432
12886	MASSACHUSETTS EMPLOYERS INSURANCE COMPANY	A	14,233,288	0	14,233,288	14,233,288	0
37478	HARTFORD INSURANCE COMPANY OF THE MIDWEST	B	14,217,628	0	14,217,628	0	14,217,628
24074	OHIO CASUALTY INSURANCE COMPANY (THE)	A	13,830,568	0	13,830,568	13,830,568	0
24147	OLD REPUBLIC INSURANCE COMPANY	A	13,381,705	0	13,381,705	13,381,705	0
12262	PENNSYLVANIA MANUFACTURERS' ASSOCIATION INS. CO.	A	11,814,503	0	11,814,503	11,814,503	0
29424	HARTFORD CASUALTY INSURANCE COMPANY	B	11,218,503	0	11,218,503	0	11,218,503
41360	ARBELLA PROTECTION INSURANCE COMPANY, INC.	A	10,988,191	0	10,988,191	10,988,191	0
13083	NEW HAMPSHIRE EMPLOYERS INSURANCE COMPANY	A	10,861,937	0	10,861,937	10,861,937	0
11030	MEMIC INDEMNITY COMPANY	A	10,281,450	0	10,281,450	10,281,450	0
12777	CHUBB INDEMNITY INSURANCE COMPANY	A	8,590,690	0	8,590,690	8,590,690	0
23965	NORFOLK & DEDHAM MUTUAL FIRE INSURANCE COMPANY	A	7,910,464	0	7,910,464	7,910,464	0
22292	HANOVER INSURANCE COMPANY (THE)	A	7,378,545	0	7,378,545	7,378,545	0
21113	UNITED STATES FIRE INSURANCE COMPANY	A	7,352,347	0	7,352,347	7,352,347	0
28258	CONTINENTAL INDEMNITY COMPANY	B	7,096,473	0	7,096,473	0	7,096,473
20443	CONTINENTAL CASUALTY COMPANY	B	7,020,304	2,844,619	4,175,685	0	4,175,685
39926	SELECTIVE INSURANCE COMPANY OF THE SOUTHEAST	A	6,955,867	0	6,955,867	6,955,867	0
11150	ARCH INSURANCE COMPANY	A	6,883,405	0	6,883,405	6,883,405	0
18023	STAR INSURANCE COMPANY	A	6,715,865	0	6,715,865	6,715,865	0
20346	PACIFIC INDEMNITY COMPANY	A	6,648,870	0	6,648,870	6,648,870	0
20052	NATIONAL LIABILITY & FIRE INSURANCE COMPANY	A	6,615,395	0	6,615,395	6,615,395	0
21458	EMPLOYERS INSURANCE COMPANY OF WAUSAU	B	6,330,370	0	6,330,370	0	6,330,370
13374	ARROW MUTUAL LIABILITY INSURANCE COMPANY	B	6,211,179	0	6,211,179	0	6,211,179
13803	FARM FAMILY CASUALTY INSURANCE COMPANY	A	6,092,808	0	6,092,808	6,092,808	0
19445	NATIONAL UNION FIRE INS. CO. OF PITTSBURGH PA	B	6,050,709	0	6,050,709	0	6,050,709
19038	TRAVELERS CASUALTY AND SURETY COMPANY	A	5,935,045	0	5,935,045	5,935,045	0
13935	FEDERATED MUTUAL INSURANCE COMPANY	A	5,852,900	0	5,852,900	5,852,900	0
25224	GREAT DIVIDE INSURANCE COMPANY	A	5,828,262	0	5,828,262	5,828,262	0
42376	TECHNOLOGY INSURANCE COMPANY INC.	A	5,408,741	0	5,408,741	5,408,741	0

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Calendar Year 2019 Direct Written Premiums by Premium Discount Election - Type "A" or Type "B"

NAIC Company Number (1)	Company Name (2)	Elected Discount Schedule (3)	Direct Written Premium (4)	Residual Market Written Premium (5)	Adjusted Voluntary Written Premium		
					Total Written Premium (6)	Type A Written Premium (7)	Type B Written Premium (8)
25976	UTICA MUTUAL INSURANCE COMPANY	A	5,355,666	0	5,355,666	5,355,666	0
25623	PHOENIX INSURANCE COMPANY, (THE)	A	5,153,817	0	5,153,817	5,153,817	0
38318	STARR INDEMNITY & LIABILITY COMPANY	A	4,825,776	0	4,825,776	4,825,776	0
23817	ILLINOIS NATIONAL INSURANCE COMPANY	B	4,777,052	0	4,777,052	0	4,777,052
24988	SENTRY INSURANCE A MUTUAL COMPANY	A	4,686,597	0	4,686,597	4,686,597	0
21415	EMPLOYERS MUTUAL CASUALTY COMPANY	A	4,648,518	0	4,648,518	4,648,518	0
14788	NGM INSURANCE COMPANY	A	4,420,351	0	4,420,351	4,420,351	0
12416	PROTECTIVE INSURANCE COMPANY	A	4,154,540	0	4,154,540	4,154,540	0
15105	SAFETY NATIONAL CASUALTY CORPORATION	A	4,119,150	0	4,119,150	4,119,150	0
31534	CITIZENS INSURANCE COMPANY OF AMERICA	A	4,094,354	0	4,094,354	4,094,354	0
22306	MASSACHUSETTS BAY INSURANCE COMPANY	A	4,089,808	0	4,089,808	4,089,808	0
12831	STATE NATIONAL INSURANCE COMPANY INC.	A	4,064,386	0	4,064,386	4,064,386	0
21784	FIREMEN'S INSURANCE COMPANY OF WASHINGTON, D.C.	B	3,905,049	0	3,905,049	0	3,905,049
16608	NEW YORK MARINE AND GENERAL INSURANCE COMPANY	A	3,645,918	0	3,645,918	3,645,918	0
24139	OLD REPUBLIC GENERAL INSURANCE CORPORATION	A	3,616,786	0	3,616,786	3,616,786	0
20478	NATIONAL FIRE INSURANCE COMPANY OF HARTFORD	B	3,503,694	0	3,503,694	0	3,503,694
25615	CHARTER OAK FIRE INSURANCE COMPANY, (THE)	A	3,349,357	0	3,349,357	3,349,357	0
14164	MEMIC CASUALTY COMPANY	A	3,330,277	0	3,330,277	3,330,277	0
10664	ENDEAVOUR INSURANCE COMPANY	B	3,298,041	0	3,298,041	0	3,298,041
21261	ELECTRIC INSURANCE COMPANY	A	3,288,807	0	3,288,807	3,288,807	0
24082	OHIO SECURITY INSURANCE COMPANY	A	3,270,308	0	3,270,308	3,270,308	0
20427	AMERICAN CASUALTY COMPANY OF READING, PENNSYLVANIA	B	3,246,787	0	3,246,787	0	3,246,787
21105	NORTH RIVER INSURANCE COMPANY	A	3,214,408	0	3,214,408	3,214,408	0
21172	VANLINER INSURANCE COMPANY	A	3,211,630	0	3,211,630	3,211,630	0
10017	ARBELLA INDEMNITY INSURANCE COMPANY, INC.	A	3,191,432	0	3,191,432	3,191,432	0
10052	CHUBB NATIONAL INSURANCE COMPANY	A	3,105,395	0	3,105,395	3,105,395	0
20494	TRANSPORTATION INSURANCE COMPANY	B	2,908,739	0	2,908,739	0	2,908,739
23809	GRANITE STATE INSURANCE COMPANY	B	2,747,964	-532	2,748,496	0	2,748,496
35289	CONTINENTAL INSURANCE COMPANY, (THE)	B	2,695,995	0	2,695,995	0	2,695,995
25844	UNION INSURANCE COMPANY	B	2,695,431	0	2,695,431	0	2,695,431
27855	ZURICH AMERICAN INSURANCE COMPANY OF ILLINOIS	A	2,603,610	0	2,603,610	2,603,610	0
19259	SELECTIVE INSURANCE COMPANY OF SOUTH CAROLINA	A	2,524,289	0	2,524,289	2,524,289	0
37257	PRAETORIAN INSURANCE COMPANY	A	2,361,758	0	2,361,758	2,361,758	0
12475	REPUBLIC FRANKLIN INSURANCE COMPANY	A	2,353,765	0	2,353,765	2,353,765	0
11000	SENTINEL INSURANCE COMPANY, LTD.	A	2,275,292	0	2,275,292	2,275,292	0
16109	STARR SPECIALTY INSURANCE COMPANY	A	2,217,597	0	2,217,597	2,217,597	0
35408	IMPERIUM INSURANCE COMPANY	A	2,207,864	0	2,207,864	2,207,864	0
36064	HANOVER AMERICAN INSURANCE COMPANY (THE)	A	2,199,095	0	2,199,095	2,199,095	0
23329	MERCHANTS MUTUAL INSURANCE COMPANY	A	2,045,921	0	2,045,921	2,045,921	0
10687	UTICA NATIONAL ASSURANCE COMPANY	A	2,020,505	0	2,020,505	2,020,505	0
31003	TRI-STATE INSURANCE COMPANY OF MINNESOTA	A	1,995,594	0	1,995,594	1,995,594	0
20303	GREAT NORTHERN INSURANCE COMPANY	A	1,983,704	0	1,983,704	1,983,704	0
31232	WORK FIRST CASUALTY COMPANY	A	1,983,572	0	1,983,572	1,983,572	0
10120	EVEREST NATIONAL INSURANCE COMPANY	B	1,962,677	0	1,962,677	0	1,962,677
25402	EMPLOYERS ASSURANCE COMPANY	A	1,899,991	0	1,899,991	1,899,991	0
37885	XL SPECIALTY INSURANCE COMPANY	A	1,893,931	0	1,893,931	1,893,931	0
25984	GRAPHIC ARTS MUTUAL INSURANCE COMPANY	A	1,872,659	0	1,872,659	1,872,659	0
20508	VALLEY FORGE INSURANCE COMPANY	B	1,856,456	0	1,856,456	0	1,856,456
41840	ALLMERICA FINANCIAL BENEFIT INSURANCE COMPANY	A	1,795,856	0	1,795,856	1,795,856	0
29939	MAIN STREET AMERICA ASSURANCE COMPANY	A	1,793,937	0	1,793,937	1,793,937	0
10166	ACCIDENT FUND INSURANCE COMPANY OF AMERICA	A	1,770,490	0	1,770,490	1,770,490	0
14702	EASTGUARD INSURANCE COMPANY	A	1,766,567	0	1,766,567	1,766,567	0
20044	BERKSHIRE HATHAWAY HOMESTATE INSURANCE COMPANY	A	1,757,284	0	1,757,284	1,757,284	0

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NAIC Company Number	Company Name	Elected Discount Schedule	Direct Written Premium	Residual Market Written Premium	Adjusted Voluntary Written Premium		
					Total Written Premium	Type A Written Premium	Type B Written Premium
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
10346	EMPLOYERS PREFERRED INSURANCE COMPANY	A	1,738,700	0	1,738,700	1,738,700	0
13706	DORCHESTER MUTUAL INSURANCE COMPANY	A	1,688,671	0	1,688,671	1,688,671	0
24554	XL INSURANCE AMERICA, INC.	A	1,638,886	0	1,638,886	1,638,886	0
11149	MAINE EMPLOYERS' MUTUAL INSURANCE COMPANY	B	1,625,685	0	1,625,685	0	1,625,685
33588	FIRST LIBERTY INSURANCE CORPORATION (THE)	A	1,584,331	0	1,584,331	1,584,331	0
21423	UNION INSURANCE COMPANY OF PROVIDENCE	A	1,560,438	0	1,560,438	1,560,438	0
19801	ARGONAUT INSURANCE COMPANY	A	1,552,841	0	1,552,841	1,552,841	0
41343	HDI GLOBAL INSURANCE COMPANY	A	1,481,264	0	1,481,264	1,481,264	0
40045	STARNET INSURANCE COMPANY	A	1,426,296	0	1,426,296	1,426,296	0
18767	CHURCH MUTUAL INSURANCE COMPANY	B	1,419,098	0	1,419,098	0	1,419,098
40460	SAGAMORE INSURANCE COMPANY	A	1,405,916	0	1,405,916	1,405,916	0
38911	BERKLEY NATIONAL INSURANCE COMPANY	A	1,402,289	0	1,402,289	1,402,289	0
28460	SENTRY CASUALTY COMPANY	A	1,364,028	0	1,364,028	1,364,028	0
26247	AMERICAN GUARANTEE AND LIABILITY INSURANCE COMPANY	A	1,336,955	0	1,336,955	1,336,955	0
20230	CENTRAL MUTUAL INSURANCE COMPANY	B	1,317,553	0	1,317,553	0	1,317,553
42552	NOVA CASUALTY COMPANY	A	1,226,039	0	1,226,039	1,226,039	0
11126	SOMPO JAPAN INSURANCE COMPANY OF AMERICA	A	1,184,610	0	1,184,610	1,184,610	0
31348	CRUM & FORSTER INDEMNITY COMPANY	B	1,144,137	0	1,144,137	0	1,144,137
25496	STARSTONE NATIONAL INSURANCE COMPANY	A	1,134,974	0	1,134,974	1,134,974	0
11512	EMPLOYERS COMPENSATION INSURANCE COMPANY	A	1,118,797	0	1,118,797	1,118,797	0
24414	GENERAL CASUALTY COMPANY OF WISCONSIN	A	1,059,143	0	1,059,143	1,059,143	0
23434	MIDDLESEX INSURANCE COMPANY	A	1,040,349	0	1,040,349	1,040,349	0
20397	VIGILANT INSURANCE COMPANY	A	1,005,835	0	1,005,835	1,005,835	0
27154	ATLANTIC SPECIALTY INSURANCE COMPANY	A	999,047	0	999,047	999,047	0
38997	SOMPO AMERICAN FIRE AND MARINE INSURANCE COMPANY	A	986,465	0	986,465	986,465	0
23442	PATRIOT GENERAL INSURANCE COMPANY	A	967,787	0	967,787	967,787	0
16045	EVEREST PREMIER INSURANCE COMPANY	A	960,773	0	960,773	960,773	0
28932	MARKEL AMERICAN INSURANCE COMPANY	A	949,963	0	949,963	949,963	0
11673	REDWOOD FIRE AND CASUALTY INSURANCE COMPANY	A	892,797	0	892,797	892,797	0
32620	NATIONAL INTERSTATE INSURANCE COMPANY	A	886,979	0	886,979	886,979	0
38970	MARKEL INSURANCE COMPANY	A	866,837	0	866,837	866,837	0
19410	COMMERCE AND INDUSTRY INSURANCE COMPANY	B	835,835	0	835,835	0	835,835
22136	GREAT AMERICAN INSURANCE COMPANY OF NEW YORK	A	790,353	0	790,353	790,353	0
15954	AMTRUST INSURANCE COMPANY	A	708,664	0	708,664	708,664	0
28304	FEDERATED SERVICE INSURANCE COMPANY	A	701,963	0	701,963	701,963	0
19879	SECURITY NATIONAL INSURANCE COMPANY	A	695,006	0	695,006	695,006	0
10340	STONINGTON INSURANCE COMPANY	A	678,937	0	678,937	678,937	0
15067	QUINCY MUTUAL FIRE INSURANCE COMPANY	A	667,791	0	667,791	667,791	0
12901	MERCHANTS PREFERRED INSURANCE COMPANY	A	662,978	0	662,978	662,978	0
10804	CONTINENTAL WESTERN INSURANCE COMPANY	B	659,832	0	659,832	0	659,832
20362	MITSUI SUMITOMO INSURANCE COMPANY OF AMERICA	A	640,105	0	640,105	640,105	0
11991	NATIONAL CASUALTY COMPANY	A	625,076	0	625,076	625,076	0
43478	UTICA NATIONAL INSURANCE COMPANY OF TEXAS	A	583,691	0	583,691	583,691	0
13978	FLORISTS' MUTUAL INSURANCE COMPANY	A	576,617	0	576,617	576,617	0
12304	ACCIDENT FUND GENERAL INSURANCE COMPANY	A	555,771	0	555,771	555,771	0
10391	BERKSHIRE HATHAWAY DIRECT INSURANCE COMPANY	A	555,388	0	555,388	555,388	0
13714	PHARMACISTS MUTUAL INSURANCE COMPANY	A	548,929	0	548,929	548,929	0
20222	ALL AMERICA INSURANCE COMPANY	A	538,347	0	538,347	538,347	0
44393	WEST AMERICAN INSURANCE COMPANY	A	496,458	0	496,458	496,458	0
41106	TRIUMPH CASUALTY COMPANY	A	478,619	0	478,619	478,619	0
28886	TRANSGUARD INSURANCE COMPANY OF AMERICA, INC.	A	476,893	0	476,893	476,893	0
10945	TOKIO MARINE AMERICA INSURANCE COMPANY	A	469,196	0	469,196	469,196	0
21180	SENTRY SELECT INSURANCE COMPANY	A	444,955	0	444,955	444,955	0

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NAIC Company Number	Company Name	Elected Discount Schedule	Direct Written Premium	Residual Market Written Premium	Adjusted Voluntary Written Premium		
					Total Written Premium	Type A Written Premium	Type B Written Premium
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
26832	GREAT AMERICAN ALLIANCE INSURANCE COMPANY	A	437,846	0	437,846	437,846	0
26182	HARLEYSVILLE WORCESTER INSURANCE COMPANY	A	436,860	0	436,860	436,860	0
27626	FIRSTCOMP INSURANCE COMPANY	A	431,217	0	431,217	431,217	0
14923	PATRONS MUTUAL INSURANCE COMPANY OF CONNECTICUT	A	426,925	0	426,925	426,925	0
29157	UNITED WISCONSIN INSURANCE COMPANY	A	425,376	0	425,376	425,376	0
22551	mitsui sumitomo insurance usa inc.	A	423,190	0	423,190	423,190	0
23396	AMERISURE MUTUAL INSURANCE COMPANY	B	387,710	0	387,710	0	387,710
15032	GUIDEONE MUTUAL INSURANCE COMPANY	A	385,084	0	385,084	385,084	0
10510	CAROLINA CASUALTY INSURANCE COMPANY	A	359,159	0	359,159	359,159	0
10800	PREMIER GROUP INSURANCE COMPANY	B	356,257	0	356,257	0	356,257
14190	OBI NATIONAL INSURANCE COMPANY	A	338,791	0	338,791	338,791	0
24066	AMERICAN FIRE AND CASUALTY COMPANY	A	333,754	0	333,754	333,754	0
16044	EVEREST DENALI INSURANCE COMPANY	A	316,086	0	316,086	316,086	0
10724	EASTERN ALLIANCE INSURANCE COMPANY	A	312,472	0	312,472	312,472	0
21849	AMERICAN AUTOMOBILE INSURANCE COMPANY	A	305,609	0	305,609	305,609	0
10665	AMERITRUST INSURANCE CORPORATION	A	304,997	0	304,997	304,997	0
41394	BENCHMARK INSURANCE COMPANY	A	301,838	0	301,838	301,838	0
10677	CINCINNATI INSURANCE COMPANY	A	289,228	0	289,228	289,228	0
21881	NATIONAL SURETY CORPORATION	A	288,360	0	288,360	288,360	0
16024	FEDERATED RESERVE INSURANCE COMPANY	A	265,573	0	265,573	265,573	0
31925	FALLS LAKE NATIONAL INSURANCE COMPANY	A	257,446	0	257,446	257,446	0
11371	GREAT WEST CASUALTY COMPANY	A	255,220	0	255,220	255,220	0
19828	ARGONAUT-MIDWEST INSURANCE COMPANY	A	254,830	0	254,830	254,830	0
41238	TRANS PACIFIC INSURANCE COMPANY	A	236,945	0	236,945	236,945	0
23582	HARLEYSVILLE INSURANCE COMPANY	A	233,280	0	233,280	233,280	0
15563	CLEAR SPRING PROPERTY AND CASUALTY COMPANY	A	229,938	0	229,938	229,938	0
28665	CINCINNATI CASUALTY COMPANY	A	207,861	0	207,861	207,861	0
13269	ZENITH INSURANCE COMPANY	A	206,033	0	206,033	206,033	0
21873	FIREMAN'S FUND INSURANCE COMPANY	A	201,663	0	201,663	201,663	0
26662	MILWAUKEE CASUALTY INSURANCE CO.	A	200,879	0	200,879	200,879	0
25135	STATE AUTOMOBILE MUTUAL INSURANCE COMPANY	A	185,980	0	185,980	185,980	0
13528	BROTHERHOOD MUTUAL INSURANCE COMPANY	B	179,547	0	179,547	0	179,547
25127	STATE AUTO PROPERTY & CASUALTY INSURANCE COMPANY	A	178,054	0	178,054	178,054	0
31895	AMERICAN INTERSTATE INSURANCE COMPANY	A	175,785	0	175,785	175,785	0
18279	BANKERS STANDARD INSURANCE COMPANY	A	174,917	0	174,917	174,917	0
24767	ST. PAUL FIRE & MARINE INSURANCE COMPANY	A	160,365	0	160,365	160,365	0
21857	AMERICAN INSURANCE COMPANY, (THE)	A	152,096	0	152,096	152,096	0
35696	HARLEYSVILLE PREFERRED INSURANCE COMPANY	A	151,250	0	151,250	151,250	0
27847	INSURANCE COMPANY OF THE WEST	A	145,433	0	145,433	145,433	0
12866	T.H.E INSURANCE COMPANY	B	139,459	0	139,459	0	139,459
13056	RLI INSURANCE COMPANY	A	137,051	0	137,051	137,051	0
22322	GREENWICH INSURANCE COMPANY	A	130,192	0	130,192	130,192	0
24198	PEERLESS INSURANCE COMPANY	A	124,119	0	124,119	124,119	0
23280	CINCINNATI INDEMNITY COMPANY	A	121,744	0	121,744	121,744	0
10642	CHEROKEE INSURANCE COMPANY	A	117,646	0	117,646	117,646	0
28223	NATIONWIDE AGRIBUSINESS INSURANCE COMPANY	B	117,470	0	117,470	0	117,470
19488	AMERISURE INSURANCE COMPANY	B	115,326	0	115,326	0	115,326
11123	SAFETY FIRST INSURANCE COMPANY	A	102,388	0	102,388	102,388	0
15645	OBI AMERICA INS CO	A	92,775	0	92,775	92,775	0
27740	NORTH POINTE INSURANCE COMPANY	A	90,585	0	90,585	90,585	0
23043	LIBERTY MUTUAL INSURANCE COMPANY	B	79,058	16,763,985	0	0	0
34630	OAK RIVER INSURANCE COMPANY	A	56,149	0	56,149	56,149	0
40517	ADVANTAGE WORKERS COMPENSATION INSURANCE COMPANY	A	55,757	0	55,757	55,757	0

VI 000023

Section VI - Expenses
 Subsection E - Expenses Net of Premium Discount
 7/1/2022

Section VI - E
 Exhibit 4
 Page 5

Calendar Year 2019 Direct Written Premiums by Premium Discount Election - Type "A" or Type "B"

NAIC Company Number (1)	Company Name (2)	Elected Discount Schedule (3)	Direct Written Premium (4)	Residual Market Written Premium (5)	Adjusted Voluntary Written Premium		
					Total Written Premium (6)	Type A Written Premium (7)	Type B Written Premium (8)
15911	AMERICAN MINING INSURANCE COMPANY	A	55,635	0	55,635	55,635	0
19984	ACIG INSURANCE COMPANY	A	55,294	0	55,294	55,294	0
19380	AMERICAN HOME ASSURANCE COMPANY	B	55,230	0	55,230	0	55,230
29580	BERKLEY REGIONAL INSURANCE COMPANY	A	52,033	0	52,033	52,033	0
18333	PEERLESS INDEMNITY INSURANCE COMPANY	A	36,584	0	36,584	36,584	0
25143	STATE FARM FIRE AND CASUALTY COMPANY	A	32,235	0	32,235	32,235	0
12305	ACCIDENT FUND NATIONAL INSURANCE COMPANY	A	28,949	0	28,949	28,949	0
24449	REGENT INSURANCE COMPANY	A	28,558	0	28,558	28,558	0
36897	MANUFACTURERS ALLIANCE INSURANCE COMPANY	A	24,987	0	24,987	24,987	0
16691	GREAT AMERICAN INSURANCE COMPANY	A	24,099	0	24,099	24,099	0
26344	GREAT AMERICAN ASSURANCE COMPANY	A	20,798	0	20,798	20,798	0
10212	ALLMERICA FINANCIAL ALLIANCE INSURANCE COMPANY	A	19,232	0	19,232	19,232	0
23469	AMERICAN MODERN HOME INSURANCE COMPANY	A	14,352	0	14,352	14,352	0
14982	PENN MILLERS INSURANCE COMPANY	A	14,013	0	14,013	14,013	0
21709	TRUCK INSURANCE EXCHANGE	A	13,356	0	13,356	13,356	0
38300	SAMSUNG FIRE & MARINE INSURANCE CO. LTD (U.S. BRANCH)	A	12,293	0	12,293	12,293	0
43575	INDEMNITY INSURANCE COMPANY OF NORTH AMERICA	A	11,996	0	11,996	11,996	0
23612	MIDWEST EMPLOYERS CASUALTY COMPANY	A	11,207	0	11,207	11,207	0
36684	RIVERPORT INSURANCE COMPANY	A	10,826	0	10,826	10,826	0
22713	INSURANCE COMPANY OF NORTH AMERICA	A	9,920	0	9,920	9,920	0
26069	WAUSAU BUSINESS INSURANCE COMPANY	A	8,841	0	8,841	8,841	0
11242	ALLIED EASTERN INDEMNITY COMPANY	A	7,516	0	7,516	7,516	0
39152	SERVICE AMERICAN INDEMNITY COMPANY	A	6,187	0	6,187	6,187	0
10749	INTREPID INS CO	B	4,996	0	4,996	0	4,996
20931	ATLANTA INTERNATIONAL INSURANCE COMPANY	B	4,610	0	4,610	0	4,610
32280	WELLFLEET INSURANCE COMPANY	A	4,224	0	4,224	4,224	0
34690	PROPERTY AND CASUALTY INSURANCE CO. OF HARTFORD	A	4,045	0	4,045	4,045	0
12297	PETROLEUM CASUALTY COMPANY	A	3,954	0	3,954	3,954	0
19690	AMERICAN ECONOMY INSURANCE COMPANY	A	3,952	0	3,952	3,952	0
24171	NETHERLANDS INSURANCE COMPANY (THE)	A	3,794	0	3,794	3,794	0
14990	PENNSYLVANIA NATIONAL MUTUAL CASUALTY INS. CO.	B	2,480	0	2,480	0	2,480
20095	BITCO GENERAL INSURANCE CORPORATION	A	2,318	0	2,318	2,318	0
22748	PACIFIC EMPLOYERS INSURANCE COMPANY	A	1,769	0	1,769	1,769	0
23663	NATIONAL AMERICAN INSURANCE COMPANY	A	1,359	0	1,359	1,359	0
13019	EASTERN ADVANTAGE ASSURANCE COMPANY	A	957	0	957	957	0
36307	GRAY INSURANCE COMPANY (THE)	A	910	0	910	910	0
20699	ACE PROPERTY AND CASUALTY INSURANCE COMPANY	A	255	0	255	255	0
20702	ACE FIRE UNDERWRITERS INSURANCE COMPANY	A	69	0	69	69	0
23450	AMERICAN FAMILY HOME INSURANCE COMPANY	A	16	0	16	16	0
23787	NATIONWIDE MUTUAL INSURANCE COMPANY	A	3	0	3	3	0
Total			1,278,752,921	242,081,280	1,053,356,568	787,144,846	266,211,722

Percentage of Voluntary written premium electing Type A Discount: 74.7%
 Percentage of Voluntary written premium electing Type B Discount: 25.3%

Notes:

- (4) = Annual Statement Exhibit of Premium and Losses
- (5) = consistent with the Annual Statement Exhibit of Premium and Losses
- (6) = (4) - (5), subject to a minimum of 0

VI 000024

Section VI - Expenses
Subsection F - Expense Constant Offset
7/1/2022

Section VI - F
Exhibit 1

Calculation of Expense Constant as Percent of Premium for Prospective Effective Period

(1) Expense Constant Offset for Policy Year 2018	0.962
(2) Expense Constant as Percent of Premium for Policy Year 2018 = 1.0 - (1)	3.8%
(3) Calculated Expense Constant for Policy Year 2018	\$251.91
(4) Factor to Bring Policy Year 2018 Premium to Premium Level of Prospective Effective Period	1.16
(5) Estimated Expense Constant for Prospective Effective Period	\$265.66
(6) Expense Constant as Percent of Premium for Prospective Effective Period = { (2) x [(5) / (3)] } / { [(1) x (4)] + [(2) x ((5) / (3))] }	3.5%

Notes:

(1): Exhibit 2.

(3): Based on Unit Statistical Plan Data

(4): Section III-E, Exhibit 1.

(5): Section D, Exhibit 1.

VI 000025

Section VI - Expenses
 Subsection F - Expense Constant Offset
 7/1/2022

Section VI - F
 Exhibit 2

Expense Constant Offsets

Used in Section I and Section III

Policy Year (1)	Standard Premium Excluding Expense Constant (2)	ARAP at Company Level (3)	Factor to Adjust ARAP from Company Level to DSR Level Premium (4)	Expense Constant (5)	Expense Constant Offset (6)
2017	1,181,140,014	51,198,038	1.053	48,300,467	0.962
2018	1,163,068,414	51,798,318	1.055	48,597,576	0.962

Used in the Calculation of Expense Constant as Percent of Premium for Prospective Effective Period

Policy Year (7)	Standard Premium Excluding Expense Constant (8)	ARAP at Company Level (9)	Factor to Adjust ARAP from Company Level to DSR Level Premium (10)	Expense Constant (11)	Expense Constant Offset (12)
2018	742,261,083	31,580,296	1.055	30,870,044	0.962

Notes:

Based on Unit Statistical Plan Data, excluding Large Deductible Policies.

(4) Section III-B, Exhibit 2.

(6) = $\{ (2) + [(3) * (4)] \} / [\{ (2) + [(3) * (4)] \} + (5)]$

(10) Section III-B, Exhibit 2.

(12) = $\{ (8) + [(9) * (10)] \} / [\{ (8) + [(9) * (10)] \} + (11)]$

The Standard Premium excluding Expense Constant values for Policy Year 2018 used in Section I and Section III differ from those used in the calculation of the Expense Constant because of a differing company mixes.

VI 000026

Section VI - Expenses
Subsection G - Acquisition Expenses
7/1/2022

Section VI - G
Exhibit 1

Provision for Commission and Other Acquisition Expense Including Frictional Reinsurance Expenses

(1)	Other Acquisition and Field Supervision Expense Ratio, Excluding Expense Constants	2.4%
(2)	Selected Average Commission Ratio, Excluding Expense Constants	9.3%
(3)	Selected Frictional Reinsurance Expenses Ratio (relative to Standard plus ARAP premiums, excluding expense constants)	1.0%
(4)	Selected Effect of Incidental Income and EBUP Expense, Excluding of Expense Constants	0.0%
(5)	Commission and Other Acquisition Expense Ratio = (1) + (2) + (3) + (4)	12.7%

Notes:

(1): Exhibit 2.

(2): Exhibit 3.

(3): Exhibit 4, Page 1.

(4): Exhibit 5.

VI 000027

Section VI - Expenses
 Subsection G - Acquisition Expenses
 7/1/2022

Section VI - G
 Exhibit 2

Calculation of Other Acquisition Expense

	Calendar Year		
	2017	2018	2019
(1) Standard Earned Premium Including Expense Constant Premium	896,751,631	931,573,495	950,622,544
(2) ARAP Premium at Company Level	35,842,348	38,295,877	38,795,384
(3) Adjustment Factor to Adjust from Company Level to DSR Level Premium	1.051	1.053	1.056
(4) Standard Earned Premium plus Adjusted ARAP = (1) + [(2) x (3)]	934,427,866	971,906,015	991,579,767
(5) Adjustment for Experience and Merit Rating, ARAP, and Construction Credit Off-balance	1.041	1.040	1.042
(6) Adjustment Factor to Remove the Impact of Loading for Recoupment of Insolvency Fund Assessments	1.002	1.002	0.998
(7) Adjusted Standard Earned Premium plus ARAP = (4) x (5) x (6)	974,225,115	1,012,177,331	1,031,153,835
(8) Other Acquisition, Field Supervision, Collection Expenses for Home Office and Branch Office, excluding Commissions	35,741,309	40,403,086	41,841,671
(9) Other Acquisition Expense Ratio = (8) / (7)	3.7%	4.0%	4.1%
(10) Three Year Average		3.9%	
(11) Expense Constant as Percent of Premium for Prospective Effective Period		3.5%	
(12) Other Acquisition Portion of Expense Constant		46.7%	
(13) Percent of Premium due to Portion of Expense Constant for Other Acquisition Expense = (11) x (12)		1.6%	
(14) Other Acquisition and Field Supervision Expense Ratio, Excluding Expense Constants = [(10) - (13)] / [1.0 - (11)]		2.4%	

Notes:

- (1), (2): Aggregate Financial Reconciliation Report Calls, Calendar Years 2017 - 2019.
 Reported Premium, plus ARAP, and including Large Deductible Policies at Standard Premium.
- (3): Section III-B, Exhibit 2.
- (5): Section III-B, Exhibit 1.
- (6): Section III-C, Exhibit 1.
- (8): Aggregate Financial Expense Calls, Calendar Years 2017 - 2019.
- (11): Section VI-F, Exhibit 1.
- (12): Section VI-B, Exhibit 3.

VI 000028

Section VI - Expenses
Subsection G - Acquisition Expenses
7/1/2022

Section VI - G
Exhibit 3

Calculation of Average Commission Rate

	Calendar Year		
	2017	2018	2019
(1) Direct Written Premium	792,540,870	801,524,045	803,391,423
(2) Total Commissions for Agents and Brokers	75,329,409	71,855,548	68,877,762
(3) Average Commission Rate = (2) / (1)	9.5%	9.0%	8.6%
(4) Three Year Average		9.0%	
(5) Expense Constant as Percent of Premium for Prospective Effective Period		3.5%	
(6) Average Commission Ratio, Excluding Expense Constants = (4) / [1.0 - (5)]		9.3%	
(7) Selected Average Commission Ratio, Excluding Expense Constants		9.3%	

Notes:

(1): Annual Statement Exhibit of Premium and Losses, Calendar Years 2017 - 2019.

(2): Total Commissions for Agents and Brokers comes from Statutory Page 14, Exhibit of Premium and Loss.

(5): Section VI-F, Exhibit 1.

VI 000029

Section VI - Expenses
 Subsection G - Acquisition Expenses
 7/1/2022

Section VI - G
 Exhibit 4
 Page 1

Frictional Reinsurance Expenses

Calendar Year (1)	Reinsurer Underwriting Expenses as Percentage of Net Written Premium				
	Commission and Brokerage (2)	Other Acquisition (3)	General Expenses (4)	Taxes (5)	Total Underwriting Expenses = (2) + (3) + (4) + (5) (6)
2005	26.2%	8.0%	6.4%	0.7%	41.3%
2006	13.3%	4.6%	4.4%	0.5%	22.8%
2007	14.0%	4.9%	4.2%	0.5%	23.6%
2008	18.4%	4.3%	3.9%	0.6%	27.2%
2009	19.8%	2.9%	3.4%	0.2%	26.3%
2010	17.7%	3.2%	3.8%	0.2%	24.9%
2011	19.2%	3.0%	2.8%	0.2%	25.2%
2012	19.1%	3.1%	2.7%	0.3%	25.2%
2013	17.4%	3.6%	3.5%	0.3%	24.8%
2014	18.1%	3.5%	5.3%	0.4%	27.3%
2015	18.5%	3.2%	3.2%	0.3%	25.2%
2016	18.2%	3.0%	3.4%	0.3%	24.9%
2017	18.8%	2.6%	3.0%	0.3%	24.7%
2018	20.9%	2.0%	2.1%	0.2%	25.2%
2019	19.8%	1.8%	2.7%	0.3%	24.6%
(7) Average	18.6%	3.6%	3.7%	0.4%	26.2%
(8)	16.1%				
(9)	2.5%	3.6%	3.7%	0.4%	10.1%

- (10) Estimated % of Direct Premium Ceded for Workers' Compensation Non-Proportional Reinsurance 14.6%
- (11) Implied Frictional Reinsurance Expenses Relative to Direct Premiums (as a %)
 = Total (9) x (10) 1.47%
- (12) Selected Frictional Reinsurance Expenses Ratio
 (relative to Standard plus ARAP premiums, excluding expense constants) 1.0%

Notes:

(2)-(5): Insurance Expense Exhibit database - By Line Underwriting Experience from Best's Aggregates & Averages for Reinsurance Editions 2006 - 2020.

(8): Page 2, (10).

(10): Page 2, (11).

VI 000030

Section VI - Expenses
 Subsection G - Acquisition Expenses
 7/1/2022

Section VI - G
 Exhibit 4
 Page 2

Estimate of Ceding Commission & Brokerage Rate for Workers' Compensation Non-Proportional Reinsurance

Calendar Year	Written Premiums (000's)			Ratio of Commission & Brokerage Incurred to Written Premium		Commission & Brokerage Expenses Incurred (000's)		
	Direct	Net	Direct - Net = (2) - (3)	Direct	Net	Direct = (2) x (5)	Net = (3) x (6)	Direct - Net = (7) - (8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
2005	53,139,231	46,633,441	6,505,790	0.068	0.056	3,613,468	2,611,473	1,001,995
2006	50,942,134	45,033,012	5,909,122	0.072	0.069	3,667,834	3,107,278	560,556
2007	50,367,861	44,207,021	6,160,840	0.071	0.061	3,576,118	2,696,628	879,490
2008	42,686,615	37,535,546	5,151,069	0.077	0.060	3,286,869	2,252,133	1,034,737
2009	37,879,014	32,642,883	5,236,131	0.079	0.060	2,992,442	1,958,573	1,033,869
2010	37,180,836	32,184,623	4,996,213	0.079	0.060	2,937,286	1,931,077	1,006,209
2011	41,651,380	35,751,070	5,900,310	0.084	0.068	3,498,716	2,431,073	1,067,643
2012	44,555,061	37,992,643	6,562,418	0.084	0.070	3,742,625	2,659,485	1,083,140
2013	49,384,867	41,250,232	8,134,635	0.084	0.068	4,148,329	2,805,016	1,343,313
2014	52,613,735	44,053,515	8,560,220	0.084	0.066	4,419,554	2,907,532	1,512,022
2015	54,522,916	45,090,969	9,431,947	0.088	0.073	4,798,017	3,291,641	1,506,376
2016	58,255,242	47,961,376	10,293,866	0.085	0.067	4,951,696	3,213,412	1,738,283
2017	55,749,285	45,032,688	10,716,597	0.092	0.075	5,128,934	3,377,452	1,751,483
2018	54,900,760	47,963,539	6,937,221	0.091	0.085	4,995,969	4,076,901	919,068
2019	54,118,597	47,105,490	7,013,107	0.091	0.086	4,924,792	4,051,072	873,720
Total	737,947,534	630,438,048	107,509,486	0.082	0.069	60,682,648	43,370,745	17,311,904

- (10) Estimated Ceding Commission & Brokerage Rate for Workers' Compensation Non-Proportional Reinsurance = Total (9) / Total (4) 16.1%
- (11) Estimated % of Direct Premium Ceded for Workers' Compensation Non-Proportional Reinsurance = Total (4) / Total (2) 14.6%

Notes:

(2), (3), (5), (6): Insurance Expense Exhibit database - By Line Underwriting Experience from Best's Aggregates & Averages for Workers' Comp Editions 2006 - 2020.

VI 000031

Section VI - Expenses
 Subsection G - Acquisition Expenses
 7/1/2022

Section VI - G
 Exhibit 5

Effect of Incidental Income and Earned but Uncollected Premium

	Calendar Year		
	2017	2018	2019
(1) Standard Earned Premium Including Expense Constant Premium	896,751,631	931,573,495	950,622,544
(2) ARAP Premium at Company Level	35,842,348	38,295,877	38,795,384
(3) Adjustment Factor to Adjust from Company Level to DSR Level Premium	1.051	1.053	1.056
(4) Standard Earned Premium plus Adjusted ARAP = (1) + [(2) x (3)]	934,427,866	971,906,015	991,579,767
(5) Adjustment for Experience and Merit Rating, ARAP, and Construction Credit Off-balance	1.041	1.040	1.042
(6) Adjustment Factor to Remove the Impact of Loading for Recoupment of Insolvency Fund Assessments	1.002	1.002	0.998
(7) Adjusted Standard Earned Premium plus ARAP = (4) x (5) x (6)	974,225,115	1,012,177,331	1,031,153,835
(8) Earned But Uncollected Premium ("EBUP")	5,475,413	5,715,900	5,148,442
(9) Incidental Income	1,240,215	1,203,959	1,237,766
(10) Net Effect of Incidental Income and EBUP Expense = [(8) - (9)] / (7)	0.4%	0.4%	0.4%
(11) Three Year Average		0.4%	
(12) Expense Constant as Percent of Premium for Prospective Effective Period		3.5%	
(13) Effect of Incidental Income and EBUP Expense, Exclusive of Expense Constants = (11) / [1.0 - (12)]		0.4%	
(14) Selected Effect of Incidental Income and EBUP Expense, Excluding of Expense Constants		0.0%	

Notes:

- (1), (2): Aggregate Financial Reconciliation Report Calls, Calendar Years 2017 - 2019.
 Reported Premium and ARAP, including Large Deductible Policies at Standard Premium.
- (3): Section III-B, Exhibit 2.
- (5): Section III-B, Exhibit 1.
- (6): Section III-C, Exhibit 1.
- (8),(9): Aggregate Financial Expense Call.
- (12): Section VI-F, Exhibit 1.

VI 000032

Section VI - Expenses
Subsection H - Loss Adjustment Expense
7/1/2022

Section VI - H
Exhibit 1
Page 1

Defense and Cost Containment Expense ("DCCE") Ratio and Total Loss Adjustment Expense ("LAE") Ratio

	Policy Year		
	2017	2018	2019
(1) Defense and Cost Containment Expense Ratio	8.8%	8.7%	8.0%
(2) Three Year Average Defense and Cost Containment Expense Ratio = Average of (1)		8.5%	
(3) Selected Three Year Average Defense and Cost Containment Expense Ratio		8.5%	
(4) Total Loss Adjustment Expense Ratio (LAE / Loss)		18.7%	

Notes:

(1): Section VI-H, Exhibit 1, Page 2

(4): (3) + [(9) from Section VI-H, Exhibit 2]

VI 000034

Section VI - Expenses
 Subsection H - Loss Adjustment Expense
 7/1/2022

Section VI - H
 Exhibit 2

Adjusting and Other ("AO") Expense Ratio

		Calendar Year		
		2017	2018	2019
(1)	Direct Incurred Losses	483,834,527	455,473,000	453,267,327
(2)	Factor to Adjust the Direct Losses to Full Coverage Losses	1.182	1.189	1.221
(3)	Estimated Full Coverage Incurred Losses = (1) x (2)	571,873,330	541,719,261	553,429,121
(4)	Direct Incurred Adjusting and Other Expense	49,212,879	50,609,742	55,588,038
(5)	Factor to Adjust the Direct Adjusting and Other Expense to Full Coverage AO Expense	1.083	1.086	1.099
(6)	Estimated Full Coverage Adjusting and Other Expense = (4) x (5)	53,316,896	54,986,933	61,118,799
(7)	Adjusted Adjusting and Other Expense Ratio = (6) / (3)	9.32%	10.15%	11.04%
(8)	Three Year Average Adjusted Adjusting and Other Expense Ratio = Average of (7)		10.2%	
(9)	Selected Three Year Average Adjusted Adjusting and Other Expense Ratio		10.2%	

Notes:

(1): Direct Incurred Losses comes from Statutory Page 14 Exhibit of Premium and Loss.

(4): Aggregate Financial Calendar Year Expense Data Calls, 2017 - 2019.

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Section VI - Expenses
 Subsection I - Adjustment for Large Deductible Policies
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Adjustment to the Adjusting and Other Expense Provision

	Calendar Year		
	2017	2018	2019
(1) Average Premium Reduction Factor for Large Deductible Policies	0.815	0.820	0.837
(2) Loss Elimination Ratio (LER) for Large Deductible Policies = (1) x 1.123	91.5%	92.0%	94.0%
(3) Market Share (Standard Premium Basis) of Large Deductible Policies	16.8%	17.3%	19.3%
(4) LER for Full Coverage plus Large Deductible Policies = [(2) x (3)] + { 0.0 x [1.0 - (3)] }	15.4%	15.9%	18.1%
(5) Factor to Adjust the Direct Losses to Full Coverage Losses = 1.0 / [1.0 - (4)]	1.182	1.189	1.221
(6) Factor to Adjust the Direct AO Expense to Full Coverage AO Expense = 1.0 / { 1.0 - [0.5 x (4)] }	1.083	1.086	1.099

Notes:

(1),(3): Exhibit 2.

(2): 1.123 from Exhibit 1, Page 2.

(6): Assumes 50% of Adjusting & Other expense varies directly with losses.

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Section VI - Expenses
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 Exhibit 1
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Loss Elimination Ratio for Large Deductible Policies

	<u>As a % of Standard Premium plus ARAP</u>
(1) Commission and Other Acquisition Expense Ratio	12.2%
(2) Average Premium Discount as a % of Standard Premium + ARAP	5.3%
(3) Premium Tax Ratio = 2.28% x [1.0 - (2)]	2.2%
(4) Profit Provision	-0.8%
(5) Insolvency Fund Assessment	-0.5%
(6) Residual Market Subsidy (Retrospectively-rated policies)	0.2%
(7) Variable Expense Ratio = (1) + (2) + (3) + (4) + (5) + (6)	18.6%
(8) Expected Loss Ratio without LAE	63.8%
(9) Defense and Cost Containment Expense ("DCC")	5.6%
(10) Adjusting and Other Expenses ("AO")	6.3%
(11) Variable Adjusting and Other Expenses = 0.5 x (10)	3.2%
(12) Portion of Expected Loss + LAE Ratio that varies with deductible (ELARD) = (8) + (9) + (11)	72.5%
(13) LER / D = [1.0 - (7)] / (12)	1.123

D = Average Premium Reduction Factor for Large Deductible Policies

LER = Loss Elimination Ratio

ELARD = Loss + DCC + (1/2 x AO)

$D = [LER \times ELARD] / [100\% - (\text{Variable Expense})]$

$LER = D \times [1.0 - (\text{Variable Expense})] / LER \times (1.0 + DCC + 1/2 \times AO)$

Notes:

Values approved for rates effective 7/1/20.

(1) - (6) = From prior Rate Decision/Stipulation

(8) = From prior Rate Decision/Stipulation

(9) = 8.8% x (8), ratio of DCC to Losses from the 7/1/20 filing.

(10) = 10.0% x (8), ratio of AO to Losses from the 7/1/20 filing.

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Section VI - Expenses
 Subsection I - Adjustment for Large Deductible Policies
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 Exhibit 2

Average Large Deductible Premium Reduction Factor and Large Deductible Market Share

	Policy Year			
	2016	2017	2018	2019*
(1) Standard Earned Premium Excluding Large Deductible Policies	713,674,095	772,224,702	759,104,707	410,527,469
(2) Earned Premium Net of Deductible Credit for Large Deductible Policies	27,239,007	28,348,942	29,279,229	15,824,497
(3) Standard Earned Premium for Large Deductible Policies	146,106,152	154,359,797	165,874,767	106,329,997
(4) Standard Earned Premium for All Policies = (1) + (3)	859,780,247	926,584,499	924,979,474	516,857,466
(5) Average Premium Reduction Factor for Large Deductible Policies = $1.0 - [(2) / (3)]$	0.814	0.816	0.823	0.851
(6) Market Share (Standard Premium Basis) of Large Deductible Policies = (3) / (4)	17.0%	16.7%	17.9%	20.6%

	Calendar Year		
	2017	2018	2019
(7) Average Premium Reduction Factor for Large Deductible Policies = Average of PY-1 and PY	0.815	0.820	0.837
(8) Market Share (Standard Premium Basis) of Large Deductible Policies = Average of PY-1 and PY	16.8%	17.3%	19.3%

Notes:

- (1): Aggregate Financial Policy Year Call, Policy Year Accumulated Earned Premium – Standard at Bureau DSR Level.
- (2): Aggregate Financial Policy Year Large Deductible Call, Policy Year Accumulated Earned Premium – Net.
- (3): Aggregate Financial Policy Year Large Deductible Call, Policy Year Accumulated Earned Premium – Standard at Bureau DSR Level.
- * Policy Year 2019 is an incomplete Policy Year, valued as of 12/31/2019

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Section VI - Expenses
Subsection J - Expected Loss Ratios Underlying the Proposed Rates & Rating Values
7/1/2022

Section VI - J
Exhibit 1

Expected Loss Ratios Underlying the Proposed Rates & Rating Values

	<u>As a % of Standard Premium plus Adjusted ARAP</u>
(1) Commission and Other Acquisition Expense Ratio	12.7%
(2) Average Premium Discount as a % of Standard Premium + ARAP	5.5%
(3) Premium Tax Ratio = 2.28% x [1.0 - (2)]	2.2%
(4) Variable Expense Ratio = (1) + (2) + (3)	20.3%
(5) Underwriting Profit Provision	4.1%
(6) Permissible Loss, LAE, and Fixed Expense Ratio = 1.0 - [(4) + (5)]	75.5%
(7) Fixed Expense Ratio	5.7%
(8) Expected Loss and Loss Adjustment Expense Ratio = (6) - (7)	69.8%
(9) Total Loss Adjustment Expense Ratio (LAE / Loss)	18.7%
(10) Expected Loss Ratio without Loss Adjustment Expense = (8) / [1.0 + (9)]	58.9%

Notes:

(1): Section VI-G, Exhibit 1.

(2): Section VI-E, Exhibit 1.

(3): 2.28% from Section VI-B, Exhibit 3.

(5): Section VII-A, Exhibit 1.

(7): Section VI-B, Exhibit 1. The Average Fixed Expense Ratio, 5.8%, is divided by [1.0 + indicated rate change], 2.7%, to derive the Fixed Expense Ratio underlying the proposed rates.

(9): Section VI-H, Exhibit 1.

UNDERWRITING PROFIT PROVISION**Background**

The Commissioner approved the use of the IRR for purposes of estimating underwriting profit provisions in the decision on 2003 rates, and the WCRIBMA continues to rely on that model in this filing.¹ Additionally, consistent with filings since 2014, the WCRIBMA is using a secondary analysis, the insurer capital cost (ICC) model, to augment the IRR that is used to set the profit provision in the filing. The ICC model is not a replacement for the IRR; rather, it provides an alternative view of the cash flows from the insurance transaction, taken from the perspective of the insurance company (as opposed to the investor).

Both the IRR and ICC models are variants of the generic discounted cash flow (DCF) methodology that is the standard investment decision tool relied upon in corporate and managerial finance. Such models have several features that make them particularly appealing for use in rate regulation.

Fundamental principles of economics tell us that the price of insurance should be set to cover the expected value of future costs associated with the risk transfer under consideration.² In addition to losses and expenses, one of the costs of insurance is the cost of capital: there must be a provision in the rates that compensates investors for the

¹ See, 2003 Decision, page 40: “For the following reasons, we conclude that use of an IRR model for the underwriting profits provisions will be superior to the M-C model.”

² This is simply the insurance specific application of the general proposition that price should equal marginal cost. This is not only a principle of economics; basic precepts of actuarial science require the same thing. See, for example, the CAS Statement of Principles on Property Casualty Insurance Ratemaking or the Standard of Practice on Rate of Return in Ratemaking.

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opportunity cost of the capital committed to the insurance activity. The underwriting profit provision is the component of the rates that, taken along with investment income, should provide insurers with a fair rate of return.

This suggests that to set an underwriting profit provision in insurance rates, one should first establish a fair and reasonable rate of return, and then select a profit provision that produces that fair return. Such an analysis is consistent with the traditional practice in other regulated industries, where rates include allowances for the expected costs of providing the regulated product or service, along with a provision for a fair rate of return on the capital required to produce the regulated product or service. This type of procedure comports with the legal standard under which fair regulation is applied, as articulated in the Hope Natural Gas decision of the U.S. Supreme Court.³ It is also consistent with the procedures relied upon in Massachusetts for the regulation of public utilities.

To that end, the WCRIBMA requested that George Zanjani, a Professor of Finance and the Frank Park Samford Chair of Insurance at the University of Alabama, assist the WCRIBMA's staff in developing a procedure for setting the profit factor in workers' compensation rates that will yield insurers a fair and reasonable return on the capital invested in support of the insurance transaction. Dr. Zanjani has performed the following work for the WCRIBMA:

³ The Hope decision states, in part, that "...the return to the equity owner should be commensurate with the returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital." Federal Power Commission v. Hope Natural Gas Co., 320 U.S. 591, 603 (1944).

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1. He has assisted the WCRIBMA in refining and applying a methodology to estimate the cost of capital, or fair rate of return, insurers should be allowed for bearing the risk of underwriting workers' compensation insurance in Massachusetts.
2. He has assisted the WCRIBMA in refining and applying the two DCF models (IRR and ICC) used in this filing to estimate the underwriting profit factor required to yield the indicated fair rate of return.
3. He has assisted the WCRIBMA in refining and applying the portfolio rate of return analysis.
4. He has reviewed the critical inputs to these models, particularly the leverage ratios, returns on assets, tax rates, and cost of capital, and the underwriting profit factors they produce. He has assessed the suitability of these models, and the inputs and outputs for the Massachusetts workers' compensation market.

In this filing, the calculated underwriting profit provision is 4.13%. The DCF models and the cost of capital calculation are financially sound and produce a rate in the statutorily required range of reasonableness. We therefore recommend that the Commissioner approve their use.

Section VII-A – Summary

Table A1 summarizes the main parameters needed for the calculation of the profit provision.

VII-B– Discounted Cash Flow Models

In Section VII-B we present the DCF models. Exhibit 1 presents the IRR model and the relevant cash flows to investors. Exhibit 2 presents the ICC model and the relevant cash flows to insurers. This section also includes a detailed appendix that shows that the IRR and ICC models are mathematical equivalents and yield the same results.

VII-C – Underwriting Cash Flows

In Section VII-C we estimate the actual underwriting cash flows that accrue to the insurer in each time period. These cash flows include premium, losses and LAE, other expenses, taxes, investment income and surplus. Each one of these cash flows is estimated quarterly over a period of 36 years to calculate the final flow of funds related to the insurance transaction.

Tables C5_1 and C5_2 provide cash flow patterns and amounts for premium collection, payment of losses, LAE and expenses calculated by the WCRIBMA. In this filing, consistent with filing since 2014, the WCRIBMA made distinct assumptions (detailed below) for the payment pattern of each of these various types of expenses. The cash flow patterns for a single policy were converted to a policy year basis for use in DCF models.

General Expenses

We assume that the payment pattern for general expenses is equal to the average of the written premium flow and earned premium flow. This corresponds to an assumption

that on average half of the general expense payments are made as premium is written and half are made as premium is earned.

Commission & Brokerage

We assume that the commission and brokerage flow pattern coincides with the collected premium flow.

Other Acquisition Expense

Other acquisition costs are assumed to be paid as follows: one sixth in the period preceding the writing of premium, and five sixths in the period the premium is written.

Premium Taxes

The distribution of premium taxes is assumed to be equal to the written premium pattern with a single period lag.

Miscellaneous and Other Taxes

We assume that the miscellaneous and other taxes flow pattern coincides with written premium flow.

Reinsurance Expenses

We assume that the reinsurance expense flow pattern coincides with the written premium flow.

Premium Discount

We assume that the premium discount flow pattern coincides with the collected premium flow.

VII-D – Capital Needed From Investors

Table D1 derives the amount of capital required to be supplied from investors.

VII-E – Cost of Capital

In Section VII-E we present the cost of capital analysis including a detailed appendix describing the methods used. In 2020 filing, the WCRIBMA relied exclusively on Value Line sample of companies to calculate the cost of capital. The sample included data from Value Line Investment Survey, Part 3 – The Ratings and Report and from Value Line Investment Survey, Mid Cap Edition. In this filing, consistent with the sample of companies used in the calculation of the leverage ratio and the portfolio composition, the WCRIBMA instead bases its estimates on groups writing workers' compensation insurance in Massachusetts. The motivation for this change is to obtain a better assessment of the risk and required returns for capital that is actually supporting the business of workers compensation in Massachusetts, since industry composites may be affected by carriers that are serving other lines or geographic areas.

Consistent with filings since 2016, the WCRIBMA has implemented a three-stage dividend growth model to reflect the assumption that in the long run the industry's dividend growth rate will revert to a level equal to the growth rate of the economy as a whole. The

calculation of the three-stage dividend growth model is shown in Section VII-E, Exhibit 2, Page 1.

VII-F – Leverage Ratio

In this filing, the amount of surplus is estimated using a total reserve-to-surplus ratio, as approved in the Commissioner's decision on 2005 automobile insurance rates and used in workers' compensation rate filings since 2005.

Consistent with the 2020 filing, in an effort to add more accuracy in the calculations, the WCRIBMA relies on all groups that write workers' compensation in Massachusetts, a total of 79 groups. The motivation for this change is to obtain a better assessment of the average surplus leverage of the companies that are actually bearing the workers compensation risks in Massachusetts, since industry composites may be affected by carriers that are serving other lines or geographic areas. This data is obtained from A.M. Best's Global Insurance Database using BestLink, an online service that allows you to access data, including data from statutory filings, from Best's Financial Suite and Best's Insurance Reports via the Internet.

We estimate this ratio by calculating a premium weighted average of group-level leverage ratios (loss and LAE reserves plus unearned premium reserves divided by surplus) for each of the past five years. We use Massachusetts workers compensation direct premiums written in each respective year for the weights. We then take a straight average of the five years of figures. The calculation of the ratio is shown in Exhibit 1.

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VII-G - Premium Flow

The WCRIBMA continues to rely on the 2007 special premium payment call with underlying premium cash flow pattern from a representative group of carriers. Each company group was asked to obtain a random sample of fifty complete-year guaranteed cost (non large deductible) policies with policy effective dates in 2004 that include premiums related to Massachusetts' workers' compensation exposures. The 50 randomly selected policies were stratified, based on the total premium for all states covered by the policy, as follows:

Policy Premium Range	Number of Policies in Sample
0 – 9,999	10
10,000 – 199,999	24
Over 200,000	16

If the population of policies in any of the premium ranges was not sufficient to allow for the recommended sample size, the size of the samples for the other premium layers was increased so that 50 policies were sampled in total. The premium flow used in the profit model is shown in Exhibit 1.

VII-H - Expense Weights

In the current filing, separate policy year 2017 and policy year 2018 weights are calculated for general expenses, miscellaneous and other taxes, and loss and loss

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adjustment expenses. The weights used to combine the various expense flow patterns into final expense flows are calculated using the expense provisions from Section VI. The average of the two policy year weights is used in the DCF models.

Acquisition expenses, premium taxes and premium discounts are treated as varying in proportion to standard premium plus ARAP. Loss adjustment expenses are treated as varying in proportion to losses. General expenses and other taxes are treated as fixed expenses.

Since the total premium amount will vary with the profit provision, and since losses, loss adjustment expenses and fixed expense amounts are all treated as not varying with premium levels, the proportion of premium attributable to losses, LAE and fixed expenses depends on the underwriting profit provision. Thus their weights relative to those items that vary in proportion to total premium will change as the profit provision does but their weights relative to each other will not.

VII-I - Loss and LAE Flow

The WCRIBMA has updated the data underlying both the medical and the indemnity loss flows used in determining the profit provision. The WCRIBMA has used Aggregate Financial data to derive estimates of the patterns of loss payments. Loss development factors used in Exhibit 2 for the calculation of the combined loss flow, are from Section II, Exhibit 1, Pages 1 and 4.

Exhibit 1 shows the calculation of loss and LAE payout pattern used in the DCF models. The Defense and Cost Containment Expense (DCC) flow is assumed to have

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the same pattern as the loss flow. This corresponds to an assumption that on average DCC payments occur at approximately the same time as claim payments.

The pattern of the Adjusting and Other Expense (AO) flow is assumed to be the same as the average of the loss flow and an earned premium flow. This corresponds to an assumption that on average half of the AO payments are made as accidents occur over the course of the policy effective period and that the other half of the AO payments are made as claims are paid.

The combined loss and LAE flow on a single policy basis used in the profit model, which reflects a weighted average of the medical and indemnity flows, is shown in Exhibit 1. This is then converted to a full policy year basis and appears in Table C5_1 (Section VII-C, Exhibit 5, Page 1).

VII-J - Portfolio Rate of Return

Portfolio Composition

The mix of securities in the insurance industry asset portfolio is based on data compiled in A.M. Best's Aggregates & Averages. A.M. Best's is the single most widely recognized source of insurer financial data, and is the source that is routinely relied upon for insurer asset information. These data are compiled directly from insurer annual statements, and they contain substantial detail on the mix and maturity of bonds. Hence this is a preferred source for estimating the mix of securities in the insurer asset portfolio.

Prior to the 2020 filing the WCRIBMA relied on A.M. Best's aggregation of the total US Property and Casualty Industry, taken from the latest annual edition of Best's

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Aggregates and Averages, to estimate the proportion of assets in the portfolio. As in the prior filing, and consistent with the calculation of the leverage ratio (Section VII – F, Exhibit 1), and Cost of Capital (Section VII - E) the WCRIBMA instead bases its estimates on the portfolios of the groups writing workers' compensation insurance in Massachusetts. The motivation for this change is to obtain a better assessment of the asset portfolio that is actually supporting the business of workers compensation in Massachusetts, as the industry portfolio allocations reflect the investments of personal lines underwriters and other companies that do not underwrite workers compensation in Massachusetts. These data are taken from A.M. Best's Global Insurance Database using BestLink.

We begin our calculation of the portfolio rate of return by assigning weights to each asset category. In this filing, in addition to the categories used in the past that include: cash and short-term investments, government securities and other taxable bonds including industrials, tax exempt bonds including bonds issued by states and territories and special revenue bonds, common stocks, real estate (the sum of real estate investments, offices and sales), preferred stocks and other assets, we include a mortgage loans category in our portfolio composition. The proportion of each asset (shown in column (2) of Exhibit 1, Page 1) is based on a premium weighted average of the corresponding proportions from each of the 79 company groups in the sample. The data is sourced from the latest available annual statement for each group, with the premium weights again being based on Massachusetts workers compensation premiums. Supporting data for the calculation are provided in Exhibit 1, Page 3.

Investment Yields

Prior to its 2005 filing the WCRIBMA relied on 12-month average yields to estimate expected future investment income. It is more appropriate, however, to rely on more recent data for this purpose, as it is more likely to be predictive of future investment earnings for investments made today or in the near future. In the DCF models used this year (and in the filings from 2005 to present), the WCRIBMA has relied on yields averaged over the last 3 months.⁴

Using yields developed from the data shown on Exhibit 2, Page 3 (calculated on Exhibit 2, Page 2), we calculate an average yield (based on a 3-month average of yields) for each of the bond categories included in the Best's data (Exhibit 2, Page 1). We use the return on 1-month T-bill to estimate the pre-tax return for cash and short-term investments (3-month average from Exhibit 2, Page 3). We derive the pre-tax return on common stocks using a three horizon CAPM calculation, assuming that these assets have a beta of 1.0. In this filing, the pre-tax return on real estate is calculated using data from Damodaran Online for the real estate investment trusts (REIT) sector. This approach provides a more current projection of real estate returns than the approach it replaced--- which was the sum of the 3-month treasury rate and the real estate differential of 3.94% taken from the 1984 paper by Ibbotson and Siegel, "Real Estate Returns: A Comparison with Other Investments." The pre-tax return on preferred stocks is taken from the yield data in Exhibit 2, Page 3.

⁴ Following the Commissioner's Decision in the 2012 rate case, the WCRIBMA studied the distribution of bonds held by insurers, to identify whether the bond maturities that impact the yield calculations were reasonably proxied by the Schedule D data used in the filing. Although there were small differences in the maturities of newly purchased compared to existing bonds, they did not appear to have a material impact on the yield calculation.

In this filing, the WCRIBMA is calculating the pretax return on other assets by looking at Schedule BA for the same Massachusetts workers' compensation group of companies. For purpose of classification, we used the NAIC assignments and classified the various Schedule BA categories into four groups: hedge funds, private equity, real estate and fixed income. The calculation of the pretax return on other assets is shown in Exhibit 2, Page 4.

Market Risk Premium

We use market returns from 1926-2020 to calculate the short term, intermediate term and long term market risk premiums used to calculate the yield on stocks. (As discussed in Section VII-E, these are the same risk premiums used to calculate the cost of capital, which is required for internal consistency in the rate filing.) The calculation, shown on Exhibit 4, uses data drawn from the *2021 SBBi Yearbook*.

Investment Expenses

The WCRIBMA has relied on the same data source and sample for this value as for the asset portfolio and leverage ratio, A.M. Best's Global Insurance Database. This is appropriate. Since investment yields are estimated based on the actual portfolios held by insurers, it is consistent to estimate the reported investment expenses that are associated with those portfolios.

We subtract after-tax investment expenses from after-tax returns in Exhibit 1. In Exhibit 5, Page 1 we calculate investment expenses using data from the annual statement for all Massachusetts Workers' Compensation group of companies. In this filing, consistent

with the 2014 and subsequent filings, the WCRIBMA did not include interest expense and depreciation of real estate in the calculation of total invested expenses.⁵ The pre-tax average investment expense is estimated using an average of ten years of premium weighted data, with the premium weights again based on Massachusetts workers compensation direct premiums written.

Tax Rate on Common Stocks

We calculate the effective tax rate on common stock in Exhibit 6. The effective tax rate for capital gains on common stocks is shown in Exhibit 6, Page 2. That rate is based on a 36% turnover ratio, taken from an AIB study of Massachusetts auto insurers' portfolio stock sales. The interest rate used in calculating the present value of the taxes is the weighted average cost of capital from Section VII-E, Exhibit 1. In this filing, consistent with the 2010 and subsequent filings, the WCRIBMA relied on capital gains and dividend data since 1926. Combining a tax rate of 13.13% for common stock dividends and 15.79% on capital gains, we derive an overall average tax rate of 14.92% (Exhibit 6, Page 1).

Exhibit 6, Page 3 displays the calculation of common stock tax rate for different discount rates and turnover rates.

⁵ The State Rating Bureau contested the inclusion of depreciation, interest expense, and aggregate write-ins for investment expenses in the estimation of an investment expense allowance. With respect to depreciation and interest expense, we anticipate objections to their inclusion on the grounds that it would result in double counting. However, we know of no reason to believe including aggregate write-ins presents a double counting problem. For purposes of limiting the debate on investment expenses, the WCRIBMA has opted in this filing to exclude depreciation and interest expense.

Overall Result

The after-tax portfolio rate of return used in this filing is 1.76%. The tax rates used in these calculations fully reflect the changes associated with the Tax Cut and Jobs Act of 2017, including the reduction in the base corporate rate, as well as the adjustments to the proration provision and the dividends received deduction.

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Section VII - Profit
Subsection A - Summary
7/1/2022

Section VII-A
Exhibit 1

TABLE A1: ASSUMPTIONS AND PROFIT PROVISION CALCULATION

Underwriting Assumptions:		
(1)	Written Premium	
(a)	Gross - Before Premium Discount	1,000.00
(b)	Net - After Premium Discount	945.22
(2)	Collected Premium Net - After Premium Discount	945.22
(3)	Loss & LAE Ratio	69.85%
(4)	Commission Ratio	9.34%
(5)	Premium Discount	5.48%
(6)	General Expense Ratio	5.38%
(7)	Other Acquisition Expense Ratio	2.36%
(8)	Premium Tax Rate	2.16%
(9)	Reinsurance Expense Ratio	1.00%
(10)	Miscellaneous and Other Taxes	0.31%
Cost of Capital:		
(11)	Weighted Average Cost of Capital	7.14%
Portfolio Rate of Return:		
(12)	After Tax Portfolio Rate of Return	1.76%
Leverage Ratio:		
(13)	Reserves to Surplus Ratio	1.96
Profit Provision:		
(14)	Profit Provision Calculation	4.13%

Notes:

(1b) = (1a) x [1.0 - (5)]

(2) = (1b), assumed that all premium is collectible.

(3) - (10): Section VII-H, Exhibit 1 (average of the two policy years).

(3), (6), (10) are divided by (1.0 + Rate Change).

(11): Section VII-E, Exhibit 1.

(12): Section VII-J, Exhibit 1, page 1.

(13): Section VII-F, Exhibit 1.

(14) = 1.0 - [(3) + (4) + (5) + (6) + (7) + (8) + (9) + (10)]

DISCOUNTED CASH FLOW (DCF) MODELS:**INTERNAL RATE OF RETURN (IRR) AND INSURER CAPITAL COST (ICC)****General Considerations**

For more than a decade the WCRIBMA has relied on an internal rate of return (IRR) model to estimate the profit provision that should be included in Massachusetts workers' compensation insurance rates. Once the fair rate of return has been established (based on the cost of capital analyses presented in the filing), the underwriting profit provision can be determined so that the total return on equity (including both underwriting and investment income) is equal to the fair return.

The WCRIBMA's IRR model projects the cash flows attributable to the sale of workers' compensation insurance coverage and calculates the implied rate of return on those cash flows. Virtually every textbook on modern corporate and managerial finance cites the IRR model along with the net present value method as the most widely supported investment decision-making rules currently known. Many insurers rely on IRR models to estimate the expected rate of return associated with alternative insurance transactions.

Since the 2014 filing, the WCRIBMA has introduced an additional analysis, the Insurer Capital Cost (ICC) model, to augment the IRR model used to set the profit provision in the filing. The ICC model is not a replacement for the IRR model. Rather, while it produces exactly the same results as the IRR model, the ICC model provides an alternative view of the cash flows derived from the insurance transaction, taken from the perspective of the insurance company (as opposed to the investor). The purpose of the

ICC model is to clarify the sources and uses of funds related to the sale of workers' compensation policies; detail the capital contributions by investors that are required to finance the underwriting of insurance; and properly recognize the cost of that capital to the insurer.

The IRR and ICC Models

Both the IRR and ICC models are variants of the more generic discounted cash flow (DCF) methodology that is a standard investment decision tool relied upon in corporate and managerial finance. Such models have several features that make them particularly appealing for use in rate regulation.

1. DCF models are prospective and therefore consistent with both actuarial principles and regulatory standards.

Discounted cash flow models, such as IRR and ICC, attempt to estimate the rate of return attributable to policies sold in the future. From a financial perspective, this is the essence of the rate approval process: to set a price that yields a fair rate of return on the insurance contracts sold under the proposed rates.

2. DCF analyses account for all investment income on both policyholder and investor supplied funds.

Both the IRR and ICC models account for investment income in ratemaking and credit the investment income insurers expect to earn in the time period

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between the sale of policies and the payment of all losses and expenses against otherwise-indicated premium requirements.

Both DCF models account for all such income based on the investment yields insurers can expect to earn when the investible funds are received. However, the ICC model is designed so it explicitly identifies and tracks the investible funds derived from both investors and policyholders in order to avoid any confusion regarding the nature of the cash flows from the insurance transaction.

3. DCF analyses account for the time value of money.

The cash flows for some lines of insurance can extend for literally decades after the sale of the policy. In such a case, the relative value of the income stream that occurs in future years should be discounted to obtain its present value. Only in this fashion can insurers make rational decisions regarding alternative investment opportunities.

Textbooks on modern financial theory typically recommend discounted cash flow techniques for evaluating investments that pay returns over a period of years into the future. This is because such techniques place all investments on a common footing: that is, they evaluate the future cash flows in the context of the present. This is the only sound basis for comparing alternatives.

4. DCF analyses account for federal income taxes.

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The impact of taxes on insurance rates of return can be substantial, particularly given the special provisions of the internal revenue code applied to insurers. These provisions generally affect the timing of taxable income, and the only way to correctly account for them is to look at the flow of taxes over time, which can be readily accomplished using a DCF model.

The IRR and ICC models focus solely on the policy or block of policies that will be sold when the approved rates are actually in effect. These are exactly the policies for which the rate of return should be calculated, as they are the ones to which the premium rates approved in this filing will apply. To calculate the rate of return, the models follow these policies through their lifetime, estimating in each time period the actual cash flows that accrue to the insurer. These cash flows include the following:

- Premiums
- Losses
- Loss Adjustment Expenses
- Other Expenses
- Taxes
- Investment Income
- Surplus

In principle, when an insurer sells a policy it sets into motion a series of events, including the collection of premium; the payment of losses, expenses and taxes; the earning of investment income; and the commitment and later release of surplus. Each one of these cash flows is estimated quarterly over a period of 36 years, to calculate the

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final flow of funds related to the insurance transaction. In essence the models produce an estimate of the "cash in, cash out" attributable to the policies sold at a given rate.

When a DCF model is developed from the perspective of the investor, as in the IRR model, the relevant cash flows are the ones in and out of the investor's equity account. These include the commitment of equity to support insurance reserves, the provision of additional funds to support the pre-payment of expenses and taxes, the flows of after-tax income arising from both underwriting and investment activities, and the ultimate release of equity as losses are paid and reserves are run-off. Once the final cash flows are known, the internal rate of return is then calculated; it is simply the interest rate that discounts the stream of final investor cash flows to yield a net present value of zero. This can be interpreted as the compound annual rate of return, or the yield to maturity, of the investment.

When a DCF model is developed from the perspective of the insurance company, we call it the ICC model. The main difference between the ICC and the IRR models is that in the ICC model the final cash flows are those that accrue to the insurance company, as opposed to the insurance investor. From the vantage point of the insurance company, incoming cash flows arise from funds supplied by investors (initial capital to support reserves and additional capital to prepay expenses and taxes) along with premium revenues from the sale of insurance policies and income from the investment of policyholder and investor supplied funds. Cash then flows out of the company due to the payment of insurance-related losses and expenses, as well as the payments to investors for the cost of the capital they have advanced to the company. Those payments are the

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product of the amount of capital invested at the beginning of each quarter and the previously established cost of capital, or fair rate of return.

When the DCF model is configured as an IRR model (i.e., from the investor perspective), it solves for an underwriting profit factor that produces an internal rate of return equal to the cost of capital. This is appropriate, since an IRR equal to the cost of capital implies that investors earn a fair and reasonable return. However, when the model is configured as an ICC model (i.e., from the insurer perspective), the end result is different, because in the ICC one of the cash outflows is the periodic payment of the cost of capital to investors. Since that cost has already been considered explicitly, the residual cash flows accruing to the insurance company need not incorporate any additional provision for profit. Therefore, instead of solving for the underwriting profit that produces an IRR equal to the cost of capital, the ICC model solves for the underwriting profit factor that produces a net present value of future insurance company cash flows equal to zero. That profit factor is identical to the result obtained when solving for the underwriting profit that produces an IRR to the investor equal to the cost of capital.

IRR and ICC Model Examples:

Although DCF models may appear complex, the underlying concepts are quite straightforward and are common to a wide range of financial analyses. A very simple example illustrates these concepts, beginning with the IRR model.

Consider an investor placing \$120 at risk in support of an insurance policy. This is the initial contribution of equity, from which a series of cash flows will develop. Let us

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assume that after all the events have taken place this set of policies will pay the investor the following amounts at the end of each indicated time period:

Year	Capital Flow	Income Flow	Total Cash Flow
0	-120.00		-120.00
1	50.00	5.00	55.00
2	40.00	8.40	48.40
3	30.00	9.93	39.93

As indicated in the table, the cash flows are the result of an initial contribution of capital, followed by the earning of income and return of capital in subsequent periods. After year 3 the transaction is over; that is, it produces no further cash flows to the investor. In this case the internal rate of return on the investment is 10%. This is calculated as follows:

IRR Model					
Year	Capital Flow	Income Flow	Total Cash Flow	Discount Factor @ 10%	Total Cash Flow (NPV)
0	-120.00		-120.00	1.0000	-120.00
1	50.00	5.00	55.00	0.9091	50.00
2	40.00	8.40	48.40	0.8264	40.00
3	30.00	9.93	39.93	0.7513	30.00
Total			23.33		0.00

Ten percent is the interest rate that discounts the set of cash flows to a net present value of zero. Thus, for the investor who makes a \$120 investment today, with the expectation of future cash flows as indicated in the table above, the compound annual return on the equity investment is 10%. While the cash flows that derive from a real

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insurance transaction are substantially more complicated, the procedure for discounting them to present value is identical.

The same transaction can also be viewed from the perspective of the insurance company, as in the ICC model. In this case the cash flows from the insurance transaction are the same as in the IRR model, but the cost of capital is explicitly charged as an expense against earnings. Because the cost of capital is already recognized as an expense there is no additional return necessary, and therefore the net present value of the cash flows to the insurance company should be zero. That can be seen in the example below:

ICC Model							
Year	Capital Flow	Amount of Capital	Capital Charge	Income Flow	Net Flow To Insurer	Discount Factor @ 10%	Net Flow to Insurer (NPV)
0	-120.00	120.00				1.0000	0.00
1	50.00	70.00	12.00	5.00	-7.00	0.9091	-6.36
2	40.00	30.00	7.00	8.40	1.40	0.8264	1.16
3	30.00	0.00	3.00	9.93	6.93	0.7513	5.21
Total					1.33		0.00

In the ICC model, the 10% charge for the cost of the capital used during each period is explicitly counted as an expense, shown in the column entitled Capital Charge. That expense is charged against the income earned from the insurance transaction, resulting in the final cash flow to the insurer, shown as Net Flow to Insurer above. As can be seen, the net present value of the flow to the insurer is zero, under the identical

circumstances (i.e., cash flows) that produced an IRR of exactly 10%. This demonstrates the equivalence of the IRR and ICC models – the cash flows that produce an IRR of 10% also produce an NPV of zero to the insurer, after compensating investors for the cost of their capital.

The IRR and ICC Models for Massachusetts Workers' Compensation Insurance

The IRR model is used in this filing to determine the underwriting profit provision that produces a return on equity equal to the current cost of capital. The ICC model views the insurance cash flows from a different perspective, and solves for the underwriting profit that produces a zero NPV for the insurer, after accounting for the cost of capital paid to the investor as an expense. Both of these DCF models use the cost of capital as the “target” rate of return. If the allowed rates produce an expected return at least equal to the cost of capital, insurers will “invest” by providing adequate capacity and offering coverage in the market. However, when the rate of return falls below the cost of capital, insurers have an incentive to restrict underwriting and withdraw capacity from the market. Thus, from the regulatory perspective, setting an underwriting profit that yields a rate of return equal to the cost of capital properly balances the interests of insurers and policyholders.

The section below briefly describes the Tables in the filing containing the detailed cash flows underlying the IRR and ICC models. The Tables present the assumptions and parameters underlying the models (Subsection A - Table A1); the development of the final cash flows associated with the alternative IRR/ICC perspectives (Subsection B - Tables

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B1 and B2); the detailed cash flow patterns and calculations that produce the flows in Tables B1 and B2 (Subsection C - Tables C1 through C5_2); and the flow of capital needed from investors (Subsection D - Table D1).

Table A1 identifies the flows used by the WCRIBMA for premiums, losses and expenses, and summarizes the main parameters needed for the calculation of the profit provision. These inputs apply equally to both the IRR and ICC models.

Table B1 presents the final IRR cash flows; i.e., the cash flows that are relevant when the model is viewed from the perspective of the investor. The cash flow to investors is the sum of the after tax cash flow from underwriting (net of the tax deduction for debt interest), the flow of surplus and the flow of income expected from the investment of reserves and surplus.

Table B2 presents the final ICC cash flows; i.e., the cash flows that are relevant when the model is viewed from the perspective of the insurer. The cash flow to insurers is the sum of the capital charge paid to investors net of the tax deduction for debt interest, the investment return on capital contributed by investors, the investment return on policyholder funded investable reserves and the after tax underwriting cash flow (net of policyholder funded investable reserves).

Table C1 calculates the policyholder supplied underwriting cash flows, derived as the difference between collected premium and the sum of losses, LAE and total pretax underwriting expenses paid. In addition, federal income taxes on underwriting (calculated in Tables C2_1 through C2_7) are deducted to obtain the post-tax cash flows from underwriting.

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Tables C2_1 through C2_7 present the tax credits and liabilities arising from insurance operations, with special attention to the provisions of the Internal Revenue Code applicable to property casualty insurers. The details supporting the acceleration of income and discounting of each accident year's losses are provided in Tables C2_1 through C2_4. Table C2_5 calculates the total underwriting tax deductions used in Table C2_6 to calculate the federal income tax expense on underwriting. Table C2_7 then calculate the amount of admitted prepaid taxes (DTA's or Deferred Tax Assets. Admitted DTA's are non-cash assets that can be used to fund reserves, resulting in reduced investible balances attributable to reserves.)

Table C3 derives the amount of policyholder supplied funds available for investment, calculated as the sum of loss, LAE and unearned premium reserves less non-cash assets used to support reserves (admitted DTA's and admitted premium receivables). It also derives the additional funds required from investors to support the reserves (i.e., to the extent that the net revenues from underwriting fail to provide sufficient cash to fully fund required reserves, investors must contribute additional capital).

Table C4 displays the derivation of admitted and non-admitted premium receivables. Statutory accounting rules permit premium balances less than 90 days past due to be carried as balance sheet assets, but balances more than 90 days past due are non-admitted. As with DTA's, admitted assets can be used to support reserves, while non-admitted assets cannot.

Tables C5_1 and C5_2 provide the underlying cash flow patterns from which all the calculations in the IRR and ICC models are derived. These include both cash flows

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(i.e., premiums collected, losses, LAE and all other expenses paid) as well as accounting flows (premium written and earned, and losses and LAE incurred). (These policy year patterns were developed by the WCRIBMA based on cash flow patterns for a single policy that were converted to a policy year basis.)

Finally, Table D1 derives the amount of capital required to be supplied from investors. Required capital includes the surplus that must stand behind total reserves along with any additional capital amounts required to fund cash shortfalls due to non-admitted DTA's and admitted premium receivables.

DCF Model Results

As shown in Table A1 of this Section, given the assumptions in the filing regarding losses, expenses, investment yields and cash flow patterns, if the underwriting profit provision is set to 4.13%, as proposed by the WCRIBMA, Massachusetts workers' compensation insurance would be expected to produce a rate of return on equity equal to the cost of capital of 7.14%. Since the underwriting profit provision is set specifically to yield this fair and reasonable return on equity, if the actuarial projections underlying the rates are reasonable, the rates as filed must be reasonable and satisfy the regulatory requirement that they be neither excessive nor inadequate.

APPENDIX – DCF MODELS

The purpose of this appendix is to demonstrate the equivalence between the two discounted cash flow models, the IRR model and the ICC model, which appear in Section VII – B, Exhibit 1 and Exhibit 2.

IRR MODEL (investor’s perspective)

The relevant cash flows in the IRR model are the following:

- Debt Financing Deduction (DFD)
- Investment Return on Surplus (IR_S)
- Investment Return on Reserves (IR_R)
- After-Tax Underwriting Cash Flow Net of Investable Reserves (UWCF)
- Change in Surplus Contributed by Investor (S)

Given these cash flows, we solve for the profit provision that results in a net present value of cash flows of zero.

$$\text{“IRR” NPV} = \text{PV(DFD)} + \text{PV(IR_S)} + \text{PV(IR_R)} + \text{PV(UWCF)} - \text{PV(S)} = 0$$

ICC MODEL (insurer’s perspective)

The relevant cash flows in the ICC model are the following:

- Debt Financing Deduction (DFD)
- Investment Return on Capital Contributed by Investors (IR_INV)

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- Investment Return on Policyholder Funded Investable Reserves (IR_PH)
- After-Tax Underwriting Cash Flow (Net of Policyholder Funded Investable Reserves) (UWCF)
- Capital Charge Paid to Investors (CC)

Given these cash flows, we solve for the profit provision that results in a net present value of cash flows of zero.

$$\text{“ICC” NPV} = \text{PV(DFD)} + \text{PV(IR_INV)} + \text{PV(IR_PH)} + \text{PV(UWCF)} - \text{PV(CC)}$$

Model Equivalence

To prove that the IRR model and the ICC model are equivalent, we need to demonstrate that:

$$\text{“IRR” NPV} = \text{“ICC” NPV} = 0 \quad \text{for a given profit provision}$$

Simplifying the Problem – Comparison of Relevant Cash Flows from the Two Models

➤ Debt Financing Deduction:

Same for IRR and ICC:

$$\text{DFD}_{\text{IRR}} = \text{DFD}_{\text{ICC}}$$

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➤ **Total Investable Funds:**

IRR:

- Investable Reserves = Unearned Premium Reserves + Loss & LAE Reserves
– Admitted Premium Receivables – Admitted Prepaid Taxes (DTA)
- Implied Surplus = $\frac{\text{Unearned Premium Reserves} + \text{Loss \& LAE Reserves}}{\text{Reserves to Surplus Ratio}}$

ICC:

- Policyholder Supplied Investable Funds = Investable Reserves - Reserves
Funded by Investors
- Capital Contributed by Investors = Implied Surplus + Reserves Funded by
Investors

Consequently, total investable funds are equal in the two models. Hence, total investment returns are equal as well.

$$IR_{S_{IRR}} + IR_{R_{IRR}} = IR_{INV_{ICC}} + IR_{PH_{ICC}}$$

➤ **After-Tax Underwriting Cash Flow Net of Investable Reserves:**

IRR:

$UWCF_{IRR} = \text{Collected Premium} - \text{Losses \& LAE Paid} - \text{Total Pretax Underwriting Expenses} - \text{Federal Income Tax Expense on Underwriting} - \text{Investable Reserves}$

ICC:

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$UWCF_{ICC} = \text{Collected Premium} - \text{Losses \& LAE Paid} - \text{Total Pretax Underwriting Expenses} - \text{Federal Income Tax Expense on Underwriting} - \text{Investor Supplied Reserves}$

Consequently,

$$UWCF_{IRR} = UWCF_{ICC} - \text{Change in Investor Supplied Reserves}$$

Note: The sign convention is from perspective of the investor. If the investor has to contribute capital to fund reserves, that would be a negative cash flow to the investor. Subtracting a negative value effectively results in an addition.

Given the results from above, the comparison of the “IRR” NPV and the “ICC” NPV can be simplified to a comparison of:

$$PV(S) + PV(\text{Change in Investor Supplied Reserves}) = PV(CC)$$

Moreover, the sum of the surplus contributions and the investor supplied reserves is precisely the capital needed from investors, leaving you with:

$$PV(C) = PV(CC)$$

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where C is Change in Capital Provided by Investors and CC is Capital Charge Paid to Investors.

PV(C) = PV(CC)

The IRR model and ICC model are mathematically equivalent if $PV(C) = PV(CC)$, where the Capital Charge Paid to Investors for a given period is equal to the contributed capital from the prior period time the cost of capital. This is demonstrated below.

Given:

- C_i is the capital cash flow in period i
- r is the weighted average cost of capital

PROOF OF EQUIVALENCE OF NPV OF CAPITAL CHARGES AND CAPITAL CONTRIBUTIONS

$$\begin{aligned} \sum_{i=1}^n \frac{C_i}{(1+r)^{i-1}} &= \sum_{i=1}^{n-1} \frac{(\sum_{j=1}^i C_j) \times r}{(1+r)^i} \\ &= r \times \left[\frac{C_1}{(1+r)} + \frac{C_1 + C_2}{(1+r)^2} + \frac{C_1 + C_2 + C_3}{(1+r)^3} + \dots + \frac{C_1 + C_2 + C_3 + \dots + C_{n-1}}{(1+r)^{n-1}} \right] \\ &= r \times \left[\left(\sum_{i=1}^{n-1} \frac{C_1}{(1+r)^i} \right) + \left(\sum_{i=2}^{n-1} \frac{C_2}{(1+r)^i} \right) + \dots + \left(\sum_{i=n-1}^{n-1} \frac{C_{n-1}}{(1+r)^i} \right) \right] \\ &= r \times \left[C_1 \left(\frac{1}{(1+r)} - \frac{1}{(1+r)^n} \right) + C_2 \left(\frac{1}{(1+r)^2} - \frac{1}{(1+r)^n} \right) + \dots \right. \\ &\quad \left. + C_{n-1} \left(\frac{1}{(1+r)^{n-1}} - \frac{1}{(1+r)^n} \right) \right] \\ &= r \times \left[C_1 \left(\frac{1}{r} - \frac{1}{r(1+r)^{n-1}} \right) + C_2 \left(\frac{1}{r(1+r)} - \frac{1}{r(1+r)^{n-1}} \right) + \dots + C_{n-1} \left(\frac{1}{r(1+r)^{n-2}} - \frac{1}{r(1+r)^{n-1}} \right) \right] \\ &= \left[C_1 \left(1 - \frac{1}{(1+r)^{n-1}} \right) + C_2 \left(\frac{1}{(1+r)} - \frac{1}{(1+r)^{n-1}} \right) + \dots + C_{n-1} \left(\frac{1}{(1+r)^{n-2}} - \frac{1}{(1+r)^{n-1}} \right) \right] \\ &= C_1 + \frac{C_2}{(1+r)} + \dots + \frac{C_{n-1}}{(1+r)^{n-2}} - \frac{C_1}{(1+r)^{n-1}} - \frac{C_2}{(1+r)^{n-1}} - \dots - \frac{C_{n-1}}{(1+r)^{n-1}} \\ &= \sum_{i=1}^{n-1} \frac{C_i}{(1+r)^{i-1}} - \frac{(\sum_{i=1}^{n-1} C_i)}{(1+r)^{n-1}} \quad \text{where } \sum_{i=1}^n C_i = 0 \rightarrow \sum_{i=1}^{n-1} C_i = -C_n \\ &= \sum_{i=1}^{n-1} \frac{C_i}{(1+r)^{i-1}} + \frac{C_n}{(1+r)^{n-1}} \\ &= \sum_{i=1}^n \frac{C_i}{(1+r)^{i-1}} \end{aligned}$$

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Section VII - Profit
Subsection B - DCF Models
7/1/2022

Section VII-B
Exhibit 1

TABLE B1: INTERNAL RATE OF RETURN (IRR) MODEL - PRESENT VALUE (PV) NOMINAL CASH FLOWS TO INVESTORS

TIME INTERVAL		POST TAX CASH FROM UW MINUS INVESTABLE RESERVES (3)	BOND INTEREST TAX DEDUCTION FOR INSURERS (4)	NET CASH FLOW FROM UNDERWRITING (5)	CASH POST-TAX INCOME (6)	NET FLOW FROM SURPLUS ACCOUNT (7)	SURPLUS POST-TAX INCOME (8)	CASH FLOWS TO INVESTORS (NOMINAL) (9)	CASH FLOWS TO INVESTORS (PV NOMINAL) (10)
FROM (1)	TO (2)								
04/01/44	06/30/44	0.00	0.00	0.01	0.20	0.40	0.10	0.71	0.15
07/01/44	09/30/44	0.00	0.00	0.01	0.20	0.43	0.10	0.73	0.15
10/01/44	12/31/44	0.00	0.00	0.01	0.19	0.43	0.10	0.73	0.15
01/01/45	03/31/45	0.00	0.00	0.01	0.19	0.43	0.10	0.72	0.14
04/01/45	06/30/45	0.00	0.00	0.01	0.19	0.43	0.10	0.71	0.14
07/01/45	09/30/45	0.00	0.00	0.01	0.18	0.43	0.09	0.71	0.14
10/01/45	12/31/45	0.00	0.00	0.01	0.18	0.43	0.09	0.71	0.13
01/01/46	03/31/46	0.00	0.00	0.01	0.18	0.43	0.09	0.70	0.13
04/01/46	06/30/46	0.00	0.00	0.01	0.17	0.43	0.09	0.69	0.13
07/01/46	09/30/46	0.00	0.00	0.01	0.17	0.43	0.09	0.69	0.12
10/01/46	12/31/46	0.00	0.00	0.01	0.16	0.43	0.08	0.68	0.12
01/01/47	03/31/47	0.00	0.00	0.01	0.16	0.43	0.08	0.68	0.12
04/01/47	06/30/47	0.00	0.00	0.01	0.16	0.43	0.08	0.67	0.11
07/01/47	09/30/47	0.00	0.00	0.01	0.15	0.43	0.08	0.67	0.11
10/01/47	12/31/47	0.00	0.00	0.01	0.15	0.43	0.08	0.66	0.11
01/01/48	03/31/48	0.00	0.00	0.01	0.15	0.43	0.07	0.65	0.11
04/01/48	06/30/48	0.00	0.00	0.01	0.14	0.43	0.07	0.65	0.10
07/01/48	09/30/48	0.00	0.00	0.01	0.14	0.43	0.07	0.64	0.10
10/01/48	12/31/48	0.00	0.00	0.01	0.14	0.43	0.07	0.64	0.10
01/01/49	03/31/49	0.00	0.00	0.01	0.13	0.43	0.07	0.63	0.09
04/01/49	06/30/49	0.00	0.00	0.00	0.13	0.43	0.07	0.62	0.09
07/01/49	09/30/49	0.00	0.00	0.00	0.12	0.43	0.06	0.62	0.09
10/01/49	12/31/49	0.00	0.00	0.00	0.12	0.43	0.06	0.62	0.09
01/01/50	03/31/50	0.00	0.00	0.00	0.12	0.43	0.06	0.61	0.09
04/01/50	06/30/50	0.00	0.00	0.00	0.11	0.43	0.06	0.60	0.08
07/01/50	09/30/50	0.00	0.00	0.00	0.11	0.43	0.06	0.60	0.08
10/01/50	12/31/50	0.00	0.00	0.00	0.11	0.43	0.05	0.59	0.08
01/01/51	03/31/51	0.00	0.00	0.00	0.10	0.43	0.05	0.59	0.08
04/01/51	06/30/51	0.00	0.00	0.00	0.10	0.43	0.05	0.58	0.07
07/01/51	09/30/51	0.00	0.00	0.00	0.10	0.43	0.05	0.58	0.07
10/01/51	12/31/51	0.00	0.00	0.00	0.09	0.43	0.05	0.57	0.07
01/01/52	03/31/52	0.00	0.00	0.00	0.09	0.43	0.04	0.56	0.07
04/01/52	06/30/52	0.00	0.00	0.00	0.08	0.43	0.04	0.56	0.07
07/01/52	09/30/52	0.00	0.00	0.00	0.08	0.43	0.04	0.55	0.07
10/01/52	12/31/52	0.00	0.00	0.00	0.08	0.43	0.04	0.55	0.06
01/01/53	03/31/53	0.00	0.00	0.00	0.07	0.43	0.04	0.54	0.06
04/01/53	06/30/53	0.00	0.00	0.00	0.07	0.43	0.04	0.53	0.06
07/01/53	09/30/53	0.00	0.00	0.00	0.07	0.43	0.03	0.53	0.06
10/01/53	12/31/53	0.00	0.00	0.00	0.06	0.43	0.03	0.53	0.06
01/01/54	03/31/54	0.00	0.00	0.00	0.06	0.43	0.03	0.52	0.06
04/01/54	06/30/54	0.00	0.00	0.00	0.05	0.43	0.03	0.51	0.05
07/01/54	09/30/54	0.00	0.00	0.00	0.05	0.43	0.03	0.51	0.05
10/01/54	12/31/54	0.00	0.00	0.00	0.05	0.43	0.02	0.51	0.05
01/01/55	03/31/55	0.00	0.00	0.00	0.04	0.43	0.02	0.50	0.05
04/01/55	06/30/55	0.00	0.00	0.00	0.04	0.43	0.02	0.49	0.05
07/01/55	09/30/55	0.00	0.00	0.00	0.04	0.43	0.02	0.49	0.05
10/01/55	12/31/55	0.00	0.00	0.00	0.03	0.43	0.02	0.48	0.05
01/01/56	03/31/56	0.00	0.00	0.00	0.03	0.43	0.01	0.47	0.04
04/01/56	06/30/56	0.00	0.00	0.00	0.03	0.43	0.01	0.47	0.04
07/01/56	09/30/56	0.00	0.00	0.00	0.02	0.43	0.01	0.46	0.04
10/01/56	12/31/56	0.00	0.00	0.00	0.02	0.43	0.01	0.46	0.04
01/01/57	03/31/57	0.00	0.00	0.00	0.01	0.43	0.01	0.45	0.04
04/01/57	06/30/57	0.00	0.00	0.00	0.01	0.43	0.01	0.44	0.04
07/01/57	09/30/57	0.00	0.00	0.00	0.01	0.37	0.00	0.38	0.03
10/01/57	12/31/57	0.00	0.00	0.00	0.00	0.28	0.00	0.28	0.02
01/01/58	03/31/58	(0.00)	0.00	0.00	0.00	0.16	0.00	0.16	0.01
04/01/58	06/30/58	0.00	0.00	0.00	0.00	0.05	0.00	0.05	0.00
TOTAL		32.62	1.01	33.63	47.68	0.00	28.28	109.59	0.00

Notes:

(3) = Table C1, (14) - [Table C3, (7), incremental]

(4) = Table B2, (5)

(5) = (3) + (4)

(6) = Table C3, (7)_{t-1} x { [1.0 + Table A1, (12)] ^ 0.25 - 1.0 }

(7) = -1.0 X Table D1, (7), incremental

(8) = Table D1, (7)_{t-1} x { [1.0 + Table A1, (12)] ^ 0.25 - 1.0 }

(9) = (5) + (6) + (7) + (8)

(10) = (9) x (1 + WACC)^{time in years}, based on the time interval with beginning date 07/01/21

WACC is the weighted average cost of capital from Section VII-E, Exhibit 1 which is equal to 7.14%.

The Total PV is equal to zero which implies that the profit provision derived from an investors prospective is equal to the profit provision derived from insurers prospective and is equal to 4.13% from Table A1, (14).

TABLE B2: INSURER CAPITAL COST (ICC) MODEL - PRESENT VALUE (PV) CASH FLOW TO INSURER

TIME INTERVAL		INVESTOR SUPPLIED	NET CAPITAL CHARGES			SOURCES TO PAY NET CAPITAL CHARGE				CASH FLOW TO INSURER (11)	PV CASH FLOW TO INSURER (12)
						INVESTOR SUPPLIED	POLICYHOLDER SUPPLIED				
							AFTER TAX INV INCOME ON INVESTOR SUPPLIED FUNDS (7)	POLICYHOLDER SUPPLIED INVESTABLE FUNDS (8)	AFTER TAX INV INCOME ON POLICYHOLDER SUPPLIED FUNDS (9)		
FROM (1)	TO (2)	CAPITAL NEEDED FROM INVESTORS (3)	INVESTOR REQUIRED RETURN CAPITAL CHARGE (4)	BOND INTEREST TAX DEDUCTION FOR INSURERS (5)	NET CAPITAL COST TO INSURERS (6)						
04/01/44	06/30/44	23.10	0.41	0.00	0.40	0.10	45.15	0.20	0.00	(0.10)	(0.02)
07/01/44	09/30/44	22.67	0.40	0.00	0.40	0.10	44.31	0.20	0.00	(0.10)	(0.02)
10/01/44	12/31/44	22.24	0.39	0.00	0.39	0.10	43.47	0.19	0.00	(0.10)	(0.02)
01/01/45	03/31/45	21.81	0.39	0.00	0.38	0.10	42.64	0.19	0.00	(0.09)	(0.02)
04/01/45	06/30/45	21.39	0.38	0.00	0.38	0.10	41.81	0.19	0.00	(0.09)	(0.02)
07/01/45	09/30/45	20.96	0.37	0.00	0.37	0.09	40.97	0.18	0.00	(0.09)	(0.02)
10/01/45	12/31/45	20.53	0.36	0.00	0.36	0.09	40.13	0.18	0.00	(0.09)	(0.02)
01/01/46	03/31/46	20.10	0.36	0.00	0.35	0.09	39.29	0.18	0.00	(0.09)	(0.02)
04/01/46	06/30/46	19.68	0.35	0.00	0.35	0.09	38.46	0.17	0.00	(0.08)	(0.02)
07/01/46	09/30/46	19.25	0.34	0.00	0.34	0.09	37.62	0.17	0.00	(0.08)	(0.01)
10/01/46	12/31/46	18.82	0.33	0.00	0.33	0.08	36.78	0.16	0.00	(0.08)	(0.01)
01/01/47	03/31/47	18.39	0.33	0.00	0.32	0.08	35.95	0.16	0.00	(0.08)	(0.01)
04/01/47	06/30/47	17.96	0.32	0.00	0.32	0.08	35.11	0.16	0.00	(0.08)	(0.01)
07/01/47	09/30/47	17.54	0.31	0.00	0.31	0.08	34.28	0.15	0.00	(0.07)	(0.01)
10/01/47	12/31/47	17.11	0.30	0.00	0.30	0.08	33.44	0.15	0.00	(0.07)	(0.01)
01/01/48	03/31/48	16.68	0.30	0.00	0.29	0.07	32.60	0.15	0.00	(0.07)	(0.01)
04/01/48	06/30/48	16.25	0.29	0.00	0.29	0.07	31.77	0.14	0.00	(0.07)	(0.01)
07/01/48	09/30/48	15.83	0.28	0.00	0.28	0.07	30.93	0.14	0.00	(0.07)	(0.01)
10/01/48	12/31/48	15.40	0.28	0.00	0.27	0.07	30.09	0.14	0.00	(0.07)	(0.01)
01/01/49	03/31/49	14.97	0.27	0.00	0.27	0.07	29.26	0.13	0.00	(0.06)	(0.01)
04/01/49	06/30/49	14.54	0.26	0.00	0.26	0.07	28.42	0.13	0.00	(0.06)	(0.01)
07/01/49	09/30/49	14.11	0.25	0.00	0.25	0.06	27.59	0.12	0.00	(0.06)	(0.01)
10/01/49	12/31/49	13.68	0.25	0.00	0.24	0.06	26.75	0.12	0.00	(0.06)	(0.01)
01/01/50	03/31/50	13.26	0.24	0.00	0.24	0.06	25.91	0.12	0.00	(0.06)	(0.01)
04/01/50	06/30/50	12.83	0.23	0.00	0.23	0.06	25.08	0.11	0.00	(0.05)	(0.01)
07/01/50	09/30/50	12.40	0.22	0.00	0.22	0.06	24.24	0.11	0.00	(0.05)	(0.01)
10/01/50	12/31/50	11.97	0.22	0.00	0.21	0.05	23.40	0.11	0.00	(0.05)	(0.01)
01/01/51	03/31/51	11.55	0.21	0.00	0.21	0.05	22.56	0.10	0.00	(0.05)	(0.01)
04/01/51	06/30/51	11.12	0.20	0.00	0.20	0.05	21.73	0.10	0.00	(0.05)	(0.01)
07/01/51	09/30/51	10.69	0.19	0.00	0.19	0.05	20.90	0.10	0.00	(0.05)	(0.01)
10/01/51	12/31/51	10.26	0.19	0.00	0.18	0.05	20.06	0.09	0.00	(0.04)	(0.01)
01/01/52	03/31/52	9.84	0.18	0.00	0.18	0.04	19.22	0.09	0.00	(0.04)	(0.01)
04/01/52	06/30/52	9.41	0.17	0.00	0.17	0.04	18.39	0.08	0.00	(0.04)	(0.00)
07/01/52	09/30/52	8.98	0.16	0.00	0.16	0.04	17.55	0.08	0.00	(0.04)	(0.00)
10/01/52	12/31/52	8.55	0.16	0.00	0.15	0.04	16.71	0.08	0.00	(0.04)	(0.00)
01/01/53	03/31/53	8.12	0.15	0.00	0.15	0.04	15.87	0.07	0.00	(0.03)	(0.00)
04/01/53	06/30/53	7.70	0.14	0.00	0.14	0.04	15.04	0.07	0.00	(0.03)	(0.00)
07/01/53	09/30/53	7.27	0.13	0.00	0.13	0.03	14.21	0.07	0.00	(0.03)	(0.00)
10/01/53	12/31/53	6.84	0.13	0.00	0.13	0.03	13.37	0.06	0.00	(0.03)	(0.00)
01/01/54	03/31/54	6.41	0.12	0.00	0.12	0.03	12.53	0.06	0.00	(0.03)	(0.00)
04/01/54	06/30/54	5.99	0.11	0.00	0.11	0.03	11.70	0.05	0.00	(0.03)	(0.00)
07/01/54	09/30/54	5.56	0.10	0.00	0.10	0.03	10.86	0.05	0.00	(0.02)	(0.00)
10/01/54	12/31/54	5.13	0.10	0.00	0.10	0.02	10.02	0.05	0.00	(0.02)	(0.00)
01/01/55	03/31/55	4.70	0.09	0.00	0.09	0.02	9.18	0.04	0.00	(0.02)	(0.00)
04/01/55	06/30/55	4.28	0.08	0.00	0.08	0.02	8.35	0.04	0.00	(0.02)	(0.00)
07/01/55	09/30/55	3.85	0.07	0.00	0.07	0.02	7.52	0.04	0.00	(0.02)	(0.00)
10/01/55	12/31/55	3.42	0.07	0.00	0.07	0.02	6.67	0.03	0.00	(0.01)	(0.00)
01/01/56	03/31/56	2.99	0.06	0.00	0.06	0.01	5.84	0.03	0.00	(0.01)	(0.00)
04/01/56	06/30/56	2.57	0.05	0.00	0.05	0.01	5.01	0.03	0.00	(0.01)	(0.00)
07/01/56	09/30/56	2.14	0.04	0.00	0.04	0.01	4.17	0.02	0.00	(0.01)	(0.00)
10/01/56	12/31/56	1.71	0.04	0.00	0.04	0.01	3.33	0.02	0.00	(0.01)	(0.00)
01/01/57	03/31/57	1.28	0.03	0.00	0.03	0.01	2.50	0.01	0.00	(0.01)	(0.00)
04/01/57	06/30/57	0.86	0.02	0.00	0.02	0.01	1.67	0.01	0.00	(0.01)	(0.00)
07/01/57	09/30/57	0.49	0.01	0.00	0.01	0.00	0.95	0.01	0.00	(0.00)	(0.00)
10/01/57	12/31/57	0.21	0.01	0.00	0.01	0.00	0.41	0.00	0.00	(0.00)	(0.00)
01/01/58	03/31/58	0.05	0.00	0.00	0.00	0.00	0.10	0.00	0.00	(0.00)	(0.00)
04/01/58	06/30/58	(0.00)	0.00	0.00	0.00	0.00	(0.00)	0.00	0.00	0.00	0.00
TOTAL		6,578.51	114.36	1.01	113.35	28.76	10,797.87	47.20	32.62	(4.77)	0.00

Notes:

- (3) = Table D1, (9)
- (4) = (3)_{t-1} x [(1.0 + WACC)^{0.25} - 1.0],
 where WACC is the weighted average cost of capital from Section VII-E, Exhibit 1 which is equal to 7.14%
- (5) = (3)_{t-1} x [(1.0 + Debt Capital Cost)^{0.25} - 1.0] x Debt Capital Share x 0.21,
 where Debt Capital Cost=1.37% and Debt Capital Share=22%, from Section VII-E, Exhibit 1.
- (6) = (4) - (5)
- (7) = (3)_{t-1} x [(1.0 + Table A1, (12))^{0.25} - 1.0]
- (8) = Table C3, (10)
- (9) = (8)_{t-1} x [(1.0 + Table A1, (12))^{0.25} - 1.0]
- (10) = Table C3, (9)
- (11) = -1.0 x [(6) - (7) - (9) - (10)]
- (12) = (11) x (1 + WACC)^{time in years}, based on the time interval with beginning date 07/01/21,
 where WACC is the weighted average cost of capital from Section VII-E, Exhibit 1 which is equal to 7.14%

TABLE C2_1: FEDERAL INCOME TAXES - TAXABLE PREMIUM REVENUE

TIME INTERVAL		WRITTEN PREMIUM NET (3)	UNEARNED PREMIUM RESERVES (4)	CHANGE IN UNEARNED PREMIUM RESERVES (5)	TAX DEDUCTIBLE CHANGE IN UNEARNED PREMIUM RESERVES (6)	NON TAX DEDUCTIBLE CHANGE IN UNEARNED PREMIUM RESERVES (7)	TAXABLE PREMIUM REVENUE (8)
FROM (1)	TO (2)						
01/01/21	12/31/21	0.00	0.00	0.00	0.00	0.00	0.00
01/01/22	12/31/22	434.66	316.40	316.40	253.12	63.28	181.54
01/01/23	12/31/23	510.55	113.40	(203.00)	(162.40)	(40.60)	672.95
01/01/24	12/31/24	0.00	0.00	(113.40)	(90.72)	(22.68)	90.72
01/01/25	12/31/25	0.00	0.00	0.00	0.00	0.00	0.00
01/01/26	12/31/26	0.00	0.00	0.00	0.00	0.00	0.00
01/01/27	12/31/27	0.00	0.00	0.00	0.00	0.00	0.00
01/01/28	12/31/28	0.00	0.00	0.00	0.00	0.00	0.00
01/01/29	12/31/29	0.00	0.00	0.00	0.00	0.00	0.00
01/01/30	12/31/30	0.00	0.00	0.00	0.00	0.00	0.00
01/01/31	12/31/31	0.00	0.00	0.00	0.00	0.00	0.00
01/01/32	12/31/32	0.00	0.00	0.00	0.00	0.00	0.00
01/01/33	12/31/33	0.00	0.00	0.00	0.00	0.00	0.00
01/01/34	12/31/34	0.00	0.00	0.00	0.00	0.00	0.00
01/01/35	12/31/35	0.00	0.00	0.00	0.00	0.00	0.00
01/01/36	12/31/36	0.00	0.00	0.00	0.00	0.00	0.00
01/01/37	12/31/37	0.00	0.00	0.00	0.00	0.00	0.00
01/01/38	12/31/38	0.00	0.00	0.00	0.00	0.00	0.00
01/01/39	12/31/39	0.00	0.00	0.00	0.00	0.00	0.00
01/01/40	12/31/40	0.00	0.00	0.00	0.00	0.00	0.00
01/01/41	12/31/41	0.00	0.00	0.00	0.00	0.00	0.00
01/01/42	12/31/42	0.00	0.00	0.00	0.00	0.00	0.00
01/01/43	12/31/43	0.00	0.00	0.00	0.00	0.00	0.00
01/01/44	12/31/44	0.00	0.00	0.00	0.00	0.00	0.00
01/01/45	12/31/45	0.00	0.00	0.00	0.00	0.00	0.00
01/01/46	12/31/46	0.00	0.00	0.00	0.00	0.00	0.00
01/01/47	12/31/47	0.00	0.00	0.00	0.00	0.00	0.00
01/01/48	12/31/48	0.00	0.00	0.00	0.00	0.00	0.00
01/01/49	12/31/49	0.00	0.00	0.00	0.00	0.00	0.00
01/01/50	12/31/50	0.00	0.00	0.00	0.00	0.00	0.00
01/01/51	12/31/51	0.00	0.00	0.00	0.00	0.00	0.00
01/01/52	12/31/52	0.00	0.00	0.00	0.00	0.00	0.00
01/01/53	12/31/53	0.00	0.00	0.00	0.00	0.00	0.00
01/01/54	12/31/54	0.00	0.00	0.00	0.00	0.00	0.00
01/01/55	12/31/55	0.00	0.00	0.00	0.00	0.00	0.00
01/01/56	12/31/56	0.00	0.00	0.00	0.00	0.00	0.00
01/01/57	12/31/57	0.00	0.00	0.00	0.00	0.00	0.00
01/01/58	12/31/58	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL		945.22	429.81	0.00	0.00	0.00	945.22

Notes:
 (3) = Table A1, (1b) x Percentage of Premium written in corresponding year
 (4) = Table A1, (1b) x Percentage of Unearned Premium in corresponding year
 (5) = (4), incremental
 (6) = 0.8 x (5)
 (7) = 0.2 x (5)
 (8) = (3) - (6)

TABLE C2_2: DERIVATION OF DISCOUNTED LOSS & LAE RESERVES

ACCIDENT YEAR 2022									
TIME INTERVAL		IRS DISCOUNT FACTOR	UNDISCOUNTED			DISCOUNTED			LOSS & LAE PAID DURING PERIOD
			LOSS & LAE UNPAID BEG OF PERIOD	LOSS & LAE UNPAID END OF PERIOD	CHANGE IN UNDISCOUNTED LOSS & LAE RESERVES	LOSS & LAE UNPAID BEG OF PERIOD	LOSS & LAE UNPAID END OF PERIOD	CHANGE IN DISCOUNTED LOSS & LAE RESERVES	
FROM (1)	TO (2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
01/01/21	12/31/21	0.8756	0.00	73.43	73.43	0.00	64.29	64.29	13.89
01/01/22	12/31/22	0.8600	73.43	50.52	(22.91)	64.29	43.45	(20.84)	22.91
01/01/23	12/31/23	0.8487	50.52	32.13	(18.40)	43.45	27.26	(16.19)	18.40
01/01/24	12/31/24	0.8332	32.13	21.03	(11.10)	27.26	17.52	(9.74)	11.10
01/01/25	12/31/25	0.8274	21.03	15.58	(5.45)	17.52	12.89	(4.63)	5.45
01/01/26	12/31/26	0.8219	15.58	12.85	(2.73)	12.89	10.56	(2.33)	2.73
01/01/27	12/31/27	0.8256	12.85	11.44	(1.41)	10.56	9.44	(1.12)	1.41
01/01/28	12/31/28	0.8344	11.44	10.48	(0.96)	9.44	8.74	(0.70)	0.96
01/01/29	12/31/29	0.8407	10.48	9.81	(0.67)	8.74	8.25	(0.50)	0.67
01/01/30	12/31/30	0.8602	9.81	9.27	(0.54)	8.25	7.97	(0.27)	0.54
01/01/31	12/31/31	0.8728	9.27	8.82	(0.45)	7.97	7.70	(0.27)	0.45
01/01/32	12/31/32	0.8856	8.82	8.42	(0.40)	7.70	7.46	(0.24)	0.40
01/01/33	12/31/33	0.8987	8.42	8.06	(0.36)	7.46	7.25	(0.21)	0.36
01/01/34	12/31/34	0.9121	8.06	7.75	(0.31)	7.25	7.07	(0.18)	0.31
01/01/35	12/31/35	0.9257	7.75	7.41	(0.34)	7.07	6.86	(0.21)	0.34
01/01/36	12/31/36	0.9395	7.41	7.12	(0.29)	6.86	6.69	(0.17)	0.29
01/01/37	12/31/37	0.9536	7.12	6.86	(0.26)	6.69	6.54	(0.15)	0.26
01/01/38	12/31/38	0.9679	6.86	6.60	(0.26)	6.54	6.38	(0.16)	0.26
01/01/39	12/31/39	0.9821	6.60	6.38	(0.21)	6.38	6.27	(0.11)	0.21
01/01/40	12/31/40	0.9848	6.38	6.13	(0.25)	6.27	6.04	(0.23)	0.25
01/01/41	12/31/41	0.9848	6.13	5.91	(0.22)	6.04	5.82	(0.21)	0.22
01/01/42	12/31/42	0.9848	5.91	5.57	(0.34)	5.82	5.49	(0.34)	0.34
01/01/43	12/31/43	0.9848	5.57	5.15	(0.42)	5.49	5.08	(0.41)	0.42
01/01/44	12/31/44	0.9848	5.15	4.74	(0.42)	5.08	4.66	(0.41)	0.42
01/01/45	12/31/45	0.9848	4.74	4.32	(0.42)	4.66	4.25	(0.41)	0.42
01/01/46	12/31/46	0.9848	4.32	3.90	(0.42)	4.25	3.84	(0.41)	0.42
01/01/47	12/31/47	0.9848	3.90	3.48	(0.42)	3.84	3.43	(0.41)	0.42
01/01/48	12/31/48	0.9848	3.48	3.06	(0.42)	3.43	3.02	(0.41)	0.42
01/01/49	12/31/49	0.9848	3.06	2.65	(0.42)	3.02	2.61	(0.41)	0.42
01/01/50	12/31/50	0.9848	2.65	2.23	(0.42)	2.61	2.19	(0.41)	0.42
01/01/51	12/31/51	0.9848	2.23	1.81	(0.42)	2.19	1.78	(0.41)	0.42
01/01/52	12/31/52	0.9848	1.81	1.39	(0.42)	1.78	1.37	(0.41)	0.42
01/01/53	12/31/53	0.9848	1.39	0.97	(0.42)	1.37	0.96	(0.41)	0.42
01/01/54	12/31/54	0.9848	0.97	0.55	(0.42)	0.96	0.55	(0.41)	0.42
01/01/55	12/31/55	0.9848	0.55	0.14	(0.42)	0.55	0.13	(0.41)	0.42
01/01/56	12/31/56	0.9848	0.14	0.00	(0.14)	0.13	0.00	(0.13)	0.14
01/01/57	12/31/57	0.9848	0.00	0.00	0.00	0.00	0.00	0.00	0.00
01/01/58	12/31/58	0.9848	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL			365.96	365.96	0.00	323.82	323.82	0.00	87.32

- Notes:
- (3): Discount factors specified in IRS Internal Revenue Bulletin 2020-49.
 - (4) = (5)_{t-1}
 - (5) = (10), Total - (10), cumulative
 - (6) = (5) - (4)
 - (7) = (8)_{t-1}
 - (8) = (3) x (5)
 - (9) = (8) - (7)
 - (10) = Table A1, (3) x Table A1, (1a) x Loss & LAE Flow (from Section VII-I, Exhibit 1) for each accident year

TABLE C2_3: DERIVATION OF DISCOUNTED LOSS & LAE RESERVES

ACCIDENT YEAR 2023									
TIME INTERVAL		IRS DISCOUNT FACTOR (3)	UNDISCOUNTED			DISCOUNTED			LOSS & LAE PAID DURING PERIOD (10)
FROM (1)	TO (2)		LOSS & LAE UNPAID BEG OF PERIOD (4)	LOSS & LAE UNPAID END OF PERIOD (5)	CHANGE IN UNDISCOUNTED LOSS & LAE RESERVES (6)	LOSS & LAE UNPAID BEG OF PERIOD (7)	LOSS & LAE UNPAID END OF PERIOD (8)	CHANGE IN DISCOUNTED LOSS & LAE RESERVES (9)	
01/01/21	12/31/21		0.00	0.00	0.00	0.00	0.00	0.00	
01/01/22	12/31/22								
01/01/23	12/31/23	0.8756	0.00	403.31	403.31	0.00	353.12	353.12	123.93
01/01/24	12/31/24	0.8600	403.31	258.38	(144.94)	353.12	222.19	(130.93)	144.94
01/01/25	12/31/25	0.8487	258.38	163.50	(94.88)	222.19	138.75	(83.44)	94.88
01/01/26	12/31/26	0.8332	163.50	109.70	(53.79)	138.75	91.40	(47.35)	53.79
01/01/27	12/31/27	0.8274	109.70	86.70	(23.00)	91.40	71.73	(19.67)	23.00
01/01/28	12/31/28	0.8219	86.70	73.30	(13.40)	71.73	60.24	(11.49)	13.40
01/01/29	12/31/29	0.8256	73.30	67.08	(6.22)	60.24	55.38	(4.86)	6.22
01/01/30	12/31/30	0.8344	67.08	61.44	(5.64)	55.38	51.26	(4.12)	5.64
01/01/31	12/31/31	0.8407	61.44	58.17	(3.26)	51.26	48.91	(2.36)	3.26
01/01/32	12/31/32	0.8602	58.17	54.90	(3.27)	48.91	47.23	(1.68)	3.27
01/01/33	12/31/33	0.8728	54.90	52.48	(2.42)	47.23	45.80	(1.42)	2.42
01/01/34	12/31/34	0.8856	52.48	50.10	(2.37)	45.80	44.37	(1.43)	2.37
01/01/35	12/31/35	0.8987	50.10	48.02	(2.08)	44.37	43.16	(1.21)	2.08
01/01/36	12/31/36	0.9121	48.02	46.23	(1.80)	43.16	42.16	(1.00)	1.80
01/01/37	12/31/37	0.9257	46.23	44.05	(2.18)	42.16	40.78	(1.39)	2.18
01/01/38	12/31/38	0.9395	44.05	42.49	(1.56)	40.78	39.92	(0.85)	1.56
01/01/39	12/31/39	0.9536	42.49	40.91	(1.58)	39.92	39.02	(0.91)	1.58
01/01/40	12/31/40	0.9679	40.91	39.31	(1.60)	39.02	38.05	(0.97)	1.60
01/01/41	12/31/41	0.9821	39.31	38.19	(1.12)	38.05	37.51	(0.54)	1.12
01/01/42	12/31/42	0.9848	38.19	36.47	(1.72)	37.51	35.92	(1.59)	1.72
01/01/43	12/31/43	0.9848	36.47	35.36	(1.11)	35.92	34.82	(1.10)	1.11
01/01/44	12/31/44	0.9848	35.36	32.84	(2.52)	34.82	32.34	(2.48)	2.52
01/01/45	12/31/45	0.9848	32.84	30.31	(2.53)	32.34	29.85	(2.49)	2.53
01/01/46	12/31/46	0.9848	30.31	27.79	(2.53)	29.85	27.37	(2.49)	2.53
01/01/47	12/31/47	0.9848	27.79	25.26	(2.53)	27.37	24.88	(2.49)	2.53
01/01/48	12/31/48	0.9848	25.26	22.74	(2.53)	24.88	22.39	(2.49)	2.53
01/01/49	12/31/49	0.9848	22.74	20.21	(2.53)	22.39	19.91	(2.49)	2.53
01/01/50	12/31/50	0.9848	20.21	17.69	(2.53)	19.91	17.42	(2.49)	2.53
01/01/51	12/31/51	0.9848	17.69	15.16	(2.53)	17.42	14.93	(2.49)	2.53
01/01/52	12/31/52	0.9848	15.16	12.64	(2.53)	14.93	12.44	(2.49)	2.53
01/01/53	12/31/53	0.9848	12.64	10.11	(2.53)	12.44	9.96	(2.49)	2.53
01/01/54	12/31/54	0.9848	10.11	7.59	(2.53)	9.96	7.47	(2.49)	2.53
01/01/55	12/31/55	0.9848	7.59	5.06	(2.53)	7.47	4.98	(2.49)	2.53
01/01/56	12/31/56	0.9848	5.06	2.54	(2.53)	4.98	2.50	(2.49)	2.53
01/01/57	12/31/57	0.9848	2.54	0.01	(2.53)	2.50	0.01	(2.49)	2.53
01/01/58	12/31/58	0.9848	0.01	0.00	(0.01)	0.01	0.00	(0.01)	0.01
TOTAL			2,040.03	2,040.03	0.00	1,808.19	1,808.19	(0.00)	527.24

Notes:

(3): Discount factors specified in IRS Internal Revenue Bulletin 2020-49.

(4) = (5)_{t-1}

(5) = (10), Total - (10), cumulative

(6) = (5) - (4)

(7) = (8)_{t-1}

(8) = (3) x (5)

(9) = (8) - (7)

(10) = Table A1, (3) x Table A1, (1a) x Loss & LAE Flow (from Section VII-I, Exhibit 1) for each accident year

TABLE C2_4: DERIVATION OF DISCOUNTED LOSS & LAE RESERVES

ACCIDENT YEAR 2024									
TIME INTERVAL		IRS DISCOUNT FACTOR (3)	UNDISCOUNTED			DISCOUNTED			LOSS & LAE PAID DURING PERIOD (10)
			LOSS & LAE UNPAID BEG OF PERIOD (4)	LOSS & LAE UNPAID END OF PERIOD (5)	CHANGE IN UNDISCOUNTED LOSS & LAE RESERVES (6)	LOSS & LAE UNPAID BEG OF PERIOD (7)	LOSS & LAE UNPAID END OF PERIOD (8)	CHANGE IN DISCOUNTED LOSS & LAE RESERVES (9)	
FROM (1)	TO (2)								
1/1/2021	12/31/2021		0.00	0.00	0.00	0.00	0.00	0.00	
1/1/2022	12/31/2022		0.00	0.00	0.00	0.00	0.00	0.00	
1/1/2023	12/31/2023		0.00	0.00	0.00	0.00	0.00	0.00	
1/1/2024	12/31/2024	0.8756	0.00	56.41	56.41	0.00	49.39	49.39	27.53
1/1/2025	12/31/2025	0.8600	56.41	36.00	(20.41)	49.39	30.96	(18.43)	20.41
1/1/2026	12/31/2026	0.8487	36.00	23.11	(12.89)	30.96	19.61	(11.34)	12.89
1/1/2027	12/31/2027	0.8332	23.11	16.21	(6.90)	19.61	13.51	(6.11)	6.90
1/1/2028	12/31/2028	0.8274	16.21	13.08	(3.14)	13.51	10.82	(2.69)	3.14
1/1/2029	12/31/2029	0.8219	13.08	11.33	(1.75)	10.82	9.31	(1.51)	1.75
1/1/2030	12/31/2030	0.8256	11.33	10.37	(0.96)	9.31	8.57	(0.75)	0.96
1/1/2031	12/31/2031	0.8344	10.37	9.60	(0.77)	8.57	8.01	(0.55)	0.77
1/1/2032	12/31/2032	0.8407	9.60	9.08	(0.52)	8.01	7.64	(0.38)	0.52
1/1/2033	12/31/2033	0.8602	9.08	8.61	(0.48)	7.64	7.41	(0.23)	0.48
1/1/2034	12/31/2034	0.8728	8.61	8.23	(0.38)	7.41	7.18	(0.23)	0.38
1/1/2035	12/31/2035	0.8856	8.23	7.86	(0.36)	7.18	6.96	(0.22)	0.36
1/1/2036	12/31/2036	0.8987	7.86	7.55	(0.32)	6.96	6.78	(0.18)	0.32
1/1/2037	12/31/2037	0.9121	7.55	7.24	(0.31)	6.78	6.61	(0.18)	0.31
1/1/2038	12/31/2038	0.9257	7.24	6.93	(0.31)	6.61	6.41	(0.19)	0.31
1/1/2039	12/31/2039	0.9395	6.93	6.68	(0.25)	6.41	6.28	(0.14)	0.25
1/1/2040	12/31/2040	0.9536	6.68	6.43	(0.25)	6.28	6.13	(0.15)	0.25
1/1/2041	12/31/2041	0.9679	6.43	6.20	(0.23)	6.13	6.00	(0.13)	0.23
1/1/2042	12/31/2042	0.9821	6.20	5.99	(0.21)	6.00	5.88	(0.12)	0.21
1/1/2043	12/31/2043	0.9848	5.99	5.75	(0.24)	5.88	5.66	(0.22)	0.24
1/1/2044	12/31/2044	0.9848	5.75	5.49	(0.25)	5.66	5.41	(0.25)	0.25
1/1/2045	12/31/2045	0.9848	5.49	5.09	(0.40)	5.41	5.01	(0.40)	0.40
1/1/2046	12/31/2046	0.9848	5.09	4.69	(0.40)	5.01	4.62	(0.40)	0.40
1/1/2047	12/31/2047	0.9848	4.69	4.29	(0.40)	4.62	4.22	(0.40)	0.40
1/1/2048	12/31/2048	0.9848	4.29	3.89	(0.40)	4.22	3.83	(0.40)	0.40
1/1/2049	12/31/2049	0.9848	3.89	3.48	(0.40)	3.83	3.43	(0.40)	0.40
1/1/2050	12/31/2050	0.9848	3.48	3.08	(0.40)	3.43	3.03	(0.40)	0.40
1/1/2051	12/31/2051	0.9848	3.08	2.68	(0.40)	3.03	2.64	(0.40)	0.40
1/1/2052	12/31/2052	0.9848	2.68	2.28	(0.40)	2.64	2.24	(0.40)	0.40
1/1/2053	12/31/2053	0.9848	2.28	1.88	(0.40)	2.24	1.85	(0.40)	0.40
1/1/2054	12/31/2054	0.9848	1.88	1.47	(0.40)	1.85	1.45	(0.40)	0.40
1/1/2055	12/31/2055	0.9848	1.47	1.07	(0.40)	1.45	1.06	(0.40)	0.40
1/1/2056	12/31/2056	0.9848	1.07	0.67	(0.40)	1.06	0.66	(0.40)	0.40
1/1/2057	12/31/2057	0.9848	0.67	0.27	(0.40)	0.66	0.26	(0.40)	0.40
1/1/2058	12/31/2058	0.9848	0.27	0.00	(0.27)	0.26	0.00	(0.26)	0.27
TOTAL			302.98	302.98	0.00	268.82	268.82	0.00	83.93

Notes:

(3): Discount factors specified in IRS Internal Revenue Bulletin 2020-49.

(4) = (5)_{t-1}

(5) = (10), Total - (10), cumulative

(6) = (5) - (4)

(7) = (8)_{t-1}

(8) = (3) x (5)

(9) = (8) - (7)

(10) = Table A1, (3) x Table A1, (1a) x Loss & LAE Flow (from Section VII-I, Exhibit 1) for each accident year

TABLE C2_5: FEDERAL INCOME TAXES - UNDERWRITING (UW) TAX DEDUCTIONS

TIME INTERVAL		LOSS & LAE PAID DURING PERIOD	CHANGE IN DISCOUNTED LOSS & LAE RESERVES	TAX DEDUCTIBLE LOSS & LAE	TAX DEDUCTIBLE UW EXPENSES	TOTAL UW TAX DEDUCTIONS
FROM (1)	TO (2)	(3)	(4)	(5)	(6)	(7)
01/01/21	12/31/21	0.00	0.00	0.00	0.00	0.00
01/01/22	12/31/22	13.89	64.29	78.18	56.70	134.87
01/01/23	12/31/23	146.83	332.28	479.12	132.97	612.08
01/01/24	12/31/24	190.86	(97.73)	93.13	14.68	107.82
01/01/25	12/31/25	126.39	(111.62)	14.77	1.09	15.86
01/01/26	12/31/26	72.13	(63.32)	8.81	0.00	8.81
01/01/27	12/31/27	32.63	(28.10)	4.53	0.00	4.53
01/01/28	12/31/28	17.95	(15.30)	2.65	0.00	2.65
01/01/29	12/31/29	8.93	(7.07)	1.86	0.00	1.86
01/01/30	12/31/30	7.26	(5.36)	1.90	0.00	1.90
01/01/31	12/31/31	4.58	(3.18)	1.39	0.00	1.39
01/01/32	12/31/32	4.24	(2.33)	1.91	0.00	1.91
01/01/33	12/31/33	3.29	(1.89)	1.40	0.00	1.40
01/01/34	12/31/34	3.12	(1.87)	1.25	0.00	1.25
01/01/35	12/31/35	2.75	(1.61)	1.15	0.00	1.15
01/01/36	12/31/36	2.45	(1.39)	1.06	0.00	1.06
01/01/37	12/31/37	2.78	(1.74)	1.04	0.00	1.04
01/01/38	12/31/38	2.13	(1.19)	0.94	0.00	0.94
01/01/39	12/31/39	2.09	(1.20)	0.89	0.00	0.89
01/01/40	12/31/40	2.07	(1.23)	0.84	0.00	0.84
01/01/41	12/31/41	1.60	(0.90)	0.70	0.00	0.70
01/01/42	12/31/42	2.15	(1.92)	0.23	0.00	0.23
01/01/43	12/31/43	1.70	(1.65)	0.04	0.00	0.04
01/01/44	12/31/44	3.19	(3.14)	0.05	0.00	0.05
01/01/45	12/31/45	3.35	(3.29)	0.05	0.00	0.05
01/01/46	12/31/46	3.35	(3.29)	0.05	0.00	0.05
01/01/47	12/31/47	3.35	(3.29)	0.05	0.00	0.05
01/01/48	12/31/48	3.35	(3.29)	0.05	0.00	0.05
01/01/49	12/31/49	3.35	(3.29)	0.05	0.00	0.05
01/01/50	12/31/50	3.35	(3.29)	0.05	0.00	0.05
01/01/51	12/31/51	3.35	(3.29)	0.05	0.00	0.05
01/01/52	12/31/52	3.35	(3.29)	0.05	0.00	0.05
01/01/53	12/31/53	3.35	(3.29)	0.05	0.00	0.05
01/01/54	12/31/54	3.35	(3.29)	0.05	0.00	0.05
01/01/55	12/31/55	3.35	(3.29)	0.05	0.00	0.05
01/01/56	12/31/56	3.35	(3.29)	0.05	0.00	0.05
01/01/57	12/31/57	3.06	(3.02)	0.05	0.00	0.05
01/01/58	12/31/58	0.28	(0.27)	0.00	0.00	0.00
TOTAL		698.49	(0.00)	698.49	205.44	903.93

Notes:

- (3) = Table C2_2, (10) + Table C2_3, (10) + Table C2_4, (10)
- (4) = Table C2_2, (9) + Table C2_3, (9) + Table C2_4, (9)
- (5) = (3) + (4)
- (6) = Table C1, (11) by tax year
- (7) = (5) + (6)

TABLE C2_6: FEDERAL INCOME TAX EXPENSE ON UNDERWRITING

TIME INTERVAL		TAXABLE PREMIUM REVENUE	TOTAL UW TAX DEDUCTIONS	TAX BASIS NET UW GAIN	FEDERAL INCOME TAX EXPENSE ON UW
FROM (1)	TO (2)	(3)	(4)	(5)	(6)
01/01/21	12/31/21	0.00	0.00	0.00	0.00
01/01/22	12/31/22	181.54	134.87	46.67	9.80
01/01/23	12/31/23	672.95	612.08	60.87	12.78
01/01/24	12/31/24	90.72	107.82	(17.09)	(3.59)
01/01/25	12/31/25	0.00	15.86	(15.86)	(3.33)
01/01/26	12/31/26	0.00	8.81	(8.81)	(1.85)
01/01/27	12/31/27	0.00	4.53	(4.53)	(0.95)
01/01/28	12/31/28	0.00	2.65	(2.65)	(0.56)
01/01/29	12/31/29	0.00	1.86	(1.86)	(0.39)
01/01/30	12/31/30	0.00	1.90	(1.90)	(0.40)
01/01/31	12/31/31	0.00	1.39	(1.39)	(0.29)
01/01/32	12/31/32	0.00	1.91	(1.91)	(0.40)
01/01/33	12/31/33	0.00	1.40	(1.40)	(0.29)
01/01/34	12/31/34	0.00	1.25	(1.25)	(0.26)
01/01/35	12/31/35	0.00	1.15	(1.15)	(0.24)
01/01/36	12/31/36	0.00	1.06	(1.06)	(0.22)
01/01/37	12/31/37	0.00	1.04	(1.04)	(0.22)
01/01/38	12/31/38	0.00	0.94	(0.94)	(0.20)
01/01/39	12/31/39	0.00	0.89	(0.89)	(0.19)
01/01/40	12/31/40	0.00	0.84	(0.84)	(0.18)
01/01/41	12/31/41	0.00	0.70	(0.70)	(0.15)
01/01/42	12/31/42	0.00	0.23	(0.23)	(0.05)
01/01/43	12/31/43	0.00	0.04	(0.04)	(0.01)
01/01/44	12/31/44	0.00	0.05	(0.05)	(0.01)
01/01/45	12/31/45	0.00	0.05	(0.05)	(0.01)
01/01/46	12/31/46	0.00	0.05	(0.05)	(0.01)
01/01/47	12/31/47	0.00	0.05	(0.05)	(0.01)
01/01/48	12/31/48	0.00	0.05	(0.05)	(0.01)
01/01/49	12/31/49	0.00	0.05	(0.05)	(0.01)
01/01/50	12/31/50	0.00	0.05	(0.05)	(0.01)
01/01/51	12/31/51	0.00	0.05	(0.05)	(0.01)
01/01/52	12/31/52	0.00	0.05	(0.05)	(0.01)
01/01/53	12/31/53	0.00	0.05	(0.05)	(0.01)
01/01/54	12/31/54	0.00	0.05	(0.05)	(0.01)
01/01/55	12/31/55	0.00	0.05	(0.05)	(0.01)
01/01/56	12/31/56	0.00	0.05	(0.05)	(0.01)
01/01/57	12/31/57	0.00	0.05	(0.05)	(0.01)
01/01/58	12/31/58	0.00	0.00	(0.00)	(0.00)
TOTAL		945.22	903.93	41.29	8.67

Notes:

(3) = Table C2_1, (8)

(4) = Table C2_5, (7)

(5) = (3) - (4)

(6) = 0.21 x (5), where 0.21 is the Federal income tax rate.

TABLE C2_7: ADMITTED PREPAID TAX (DEFERRED TAX ASSET - DTA)

TIME INTERVAL		AY 2022		AY 2023		AY 2024		DISCOUNT UNWOUND DURING PERIOD (9)	DTA ASSOCIATED WITH LOSS & LAE RESERVE (10)	UNEARNED PREMIUM RESERVE (11)	DTA ASSOCIATED WITH UNEARNED PREMIUM RESERVE (12)	ADMITTED PREPAID TAX (DTA) (13)
		CHANGE IN DISCOUNTED LOSS & LAE (3)	LOSS & LAE PAID DURING PERIOD (4)	CHANGE IN DISCOUNTED LOSS & LAE (5)	LOSS & LAE PAID DURING PERIOD (6)	CHANGE IN DISCOUNTED LOSS & LAE (7)	LOSS & LAE PAID DURING PERIOD (8)					
FROM (1)	TO (2)											
01/01/21	12/31/21							0.00	0.00			0.00
01/01/22	12/31/22							0.00	0.43	316.40	13.29	13.72
01/01/23	12/31/23	(20.84)	22.91					2.06	3.41	113.40	4.76	8.17
01/01/24	12/31/24	(16.19)	18.40	(130.93)	144.94			16.22	3.10	0.00	0.00	3.10
01/01/25	12/31/25	(9.74)	11.10	(83.44)	94.88	(18.43)	20.41	14.77	1.85	0.00	0.00	1.85
01/01/26	12/31/26	(4.63)	5.45	(47.35)	53.79	(11.34)	12.89	8.81	0.95	0.00	0.00	0.95
01/01/27	12/31/27	(2.33)	2.73	(19.67)	23.00	(6.11)	6.90	4.53	0.56	0.00	0.00	0.56
01/01/28	12/31/28	(1.12)	1.41	(11.49)	13.40	(2.69)	3.14	2.65	0.39	0.00	0.00	0.39
01/01/29	12/31/29	(0.70)	0.96	(4.86)	6.22	(1.51)	1.75	1.86	0.40	0.00	0.00	0.40
01/01/30	12/31/30	(0.50)	0.67	(4.12)	5.64	(0.75)	0.96	1.90	0.29	0.00	0.00	0.29
01/01/31	12/31/31	(0.27)	0.54	(2.36)	3.26	(0.55)	0.77	1.39	0.40	0.00	0.00	0.40
01/01/32	12/31/32	(0.27)	0.45	(1.68)	3.27	(0.38)	0.52	1.91	0.29	0.00	0.00	0.29
01/01/33	12/31/33	(0.24)	0.40	(1.42)	2.42	(0.23)	0.48	1.40	0.26	0.00	0.00	0.26
01/01/34	12/31/34	(0.21)	0.36	(1.43)	2.37	(0.23)	0.38	1.25	0.24	0.00	0.00	0.24
01/01/35	12/31/35	(0.18)	0.31	(1.21)	2.08	(0.22)	0.36	1.15	0.22	0.00	0.00	0.22
01/01/36	12/31/36	(0.21)	0.34	(1.00)	1.80	(0.18)	0.32	1.06	0.22	0.00	0.00	0.22
01/01/37	12/31/37	(0.17)	0.29	(1.39)	2.18	(0.18)	0.31	1.04	0.20	0.00	0.00	0.20
01/01/38	12/31/38	(0.15)	0.26	(0.85)	1.56	(0.19)	0.31	0.94	0.19	0.00	0.00	0.19
01/01/39	12/31/39	(0.16)	0.26	(0.91)	1.58	(0.14)	0.25	0.89	0.18	0.00	0.00	0.18
01/01/40	12/31/40	(0.11)	0.21	(0.97)	1.60	(0.15)	0.25	0.84	0.15	0.00	0.00	0.15
01/01/41	12/31/41	(0.23)	0.25	(0.54)	1.12	(0.13)	0.23	0.70	0.05	0.00	0.00	0.05
01/01/42	12/31/42	(0.21)	0.22	(1.59)	1.72	(0.12)	0.21	0.23	0.01	0.00	0.00	0.01
01/01/43	12/31/43	(0.34)	0.34	(1.10)	1.11	(0.22)	0.24	0.04	0.01	0.00	0.00	0.01
01/01/44	12/31/44	(0.41)	0.42	(2.48)	2.52	(0.25)	0.25	0.05	0.01	0.00	0.00	0.01
01/01/45	12/31/45	(0.41)	0.42	(2.49)	2.53	(0.40)	0.40	0.05	0.01	0.00	0.00	0.01
01/01/46	12/31/46	(0.41)	0.42	(2.49)	2.53	(0.40)	0.40	0.05	0.01	0.00	0.00	0.01
01/01/47	12/31/47	(0.41)	0.42	(2.49)	2.53	(0.40)	0.40	0.05	0.01	0.00	0.00	0.01
01/01/48	12/31/48	(0.41)	0.42	(2.49)	2.53	(0.40)	0.40	0.05	0.01	0.00	0.00	0.01
01/01/49	12/31/49	(0.41)	0.42	(2.49)	2.53	(0.40)	0.40	0.05	0.01	0.00	0.00	0.01
01/01/50	12/31/50	(0.41)	0.42	(2.49)	2.53	(0.40)	0.40	0.05	0.01	0.00	0.00	0.01
01/01/51	12/31/51	(0.41)	0.42	(2.49)	2.53	(0.40)	0.40	0.05	0.01	0.00	0.00	0.01
01/01/52	12/31/52	(0.41)	0.42	(2.49)	2.53	(0.40)	0.40	0.05	0.01	0.00	0.00	0.01
01/01/53	12/31/53	(0.41)	0.42	(2.49)	2.53	(0.40)	0.40	0.05	0.01	0.00	0.00	0.01
01/01/54	12/31/54	(0.41)	0.42	(2.49)	2.53	(0.40)	0.40	0.05	0.01	0.00	0.00	0.01
01/01/55	12/31/55	(0.41)	0.42	(2.49)	2.53	(0.40)	0.40	0.05	0.01	0.00	0.00	0.01
01/01/56	12/31/56	(0.41)	0.42	(2.49)	2.53	(0.40)	0.40	0.05	0.01	0.00	0.00	0.01
01/01/57	12/31/57	(0.13)	0.14	(2.49)	2.53	(0.40)	0.40	0.05	0.00	0.00	0.00	0.00
01/01/58	12/31/58	0.00	0.00	(0.01)	0.01	(0.26)	0.27	0.00	0.00	0.00	0.00	0.00

Notes:
 (3) = Table C2_2, (9), the initial value is not relevant in calculating the discount unwound during period.
 (4) = Table C2_2, (10)
 (5) = Table C2_3, (9), the initial value is not relevant in calculating the discount unwound during period.
 (6) = Table C2_3, (10)
 (7) = Table C2_4, (9), the initial value is not relevant in calculating the discount unwound during period.
 (8) = Table C2_4, (10)
 (9) = (3) + (4) + (5) + (6) + (7) + (8)
 (10) = 0.21 x (9)_{t+1}, where 0.21 is the Federal income tax rate.
 (11) = Table C2_1, (4)
 (12) = 0.2 x 0.21 x (11), 0.21 is the Federal income tax rate and 20% of unearned premiums is taxable.
 (13) = (10) + (12)

TABLE C3: POLICYHOLDER SUPPLIED INVESTABLE FUNDS

TIME INTERVAL		UNEARNED PREMIUM RESERVES (3)	LOSS & LAE RESERVES (4)	ADMITTED PREMIUM RECEIVABLES (5)	ADMITTED PREPAID TAX (DTA) (6)	INVESTABLE RESERVES (7)	CUMULATIVE POST TAX CASH FLOW FROM UW (8)	POST TAX CASH FROM UW AVAILABLE TO INVESTORS (9)	POLICYHOLDER SUPPLIED INVESTABLE FUNDS (10)	RESERVES FUNDED BY INVESTORS (11)
FROM (1)	TO (2)									
01/01/43	03/31/43	0.00	47.96	0.00	0.01	47.95	80.42	0.00	47.95	0.00
04/01/43	06/30/43	0.00	47.57	0.00	0.01	47.56	80.04	0.00	47.56	0.00
07/01/43	09/30/43	0.00	47.14	0.00	0.01	47.13	79.61	0.00	47.13	0.00
10/01/43	12/31/43	0.00	46.60	0.00	0.01	46.59	79.07	0.00	46.59	0.00
01/01/44	03/31/44	0.00	45.94	0.00	0.01	45.93	78.41	0.00	45.93	0.00
04/01/44	06/30/44	0.00	45.16	0.00	0.01	45.15	77.64	0.00	45.15	0.00
07/01/44	09/30/44	0.00	44.32	0.00	0.01	44.31	76.80	0.00	44.31	0.00
10/01/44	12/31/44	0.00	43.48	0.00	0.01	43.47	75.96	0.00	43.47	0.00
01/01/45	03/31/45	0.00	42.65	0.00	0.01	42.64	75.13	0.00	42.64	0.00
04/01/45	06/30/45	0.00	41.82	0.00	0.01	41.81	74.30	0.00	41.81	0.00
07/01/45	09/30/45	0.00	40.98	0.00	0.01	40.97	73.47	0.00	40.97	0.00
10/01/45	12/31/45	0.00	40.14	0.00	0.01	40.13	72.63	0.00	40.13	0.00
01/01/46	03/31/46	0.00	39.30	0.00	0.01	39.29	71.80	0.00	39.29	0.00
04/01/46	06/30/46	0.00	38.47	0.00	0.01	38.46	70.97	0.00	38.46	0.00
07/01/46	09/30/46	0.00	37.63	0.00	0.01	37.62	70.13	0.00	37.62	0.00
10/01/46	12/31/46	0.00	36.79	0.00	0.01	36.78	69.30	0.00	36.78	0.00
01/01/47	03/31/47	0.00	35.96	0.00	0.01	35.95	68.46	0.00	35.95	0.00
04/01/47	06/30/47	0.00	35.13	0.00	0.01	35.11	67.63	0.00	35.11	0.00
07/01/47	09/30/47	0.00	34.29	0.00	0.01	34.28	66.80	0.00	34.28	0.00
10/01/47	12/31/47	0.00	33.45	0.00	0.01	33.44	65.96	0.00	33.44	0.00
01/01/48	03/31/48	0.00	32.61	0.00	0.01	32.60	65.13	0.00	32.60	0.00
04/01/48	06/30/48	0.00	31.78	0.00	0.01	31.77	64.30	0.00	31.77	0.00
07/01/48	09/30/48	0.00	30.94	0.00	0.01	30.93	63.46	0.00	30.93	0.00
10/01/48	12/31/48	0.00	30.10	0.00	0.01	30.09	62.63	0.00	30.09	0.00
01/01/49	03/31/49	0.00	29.27	0.00	0.01	29.26	61.79	0.00	29.26	0.00
04/01/49	06/30/49	0.00	28.43	0.00	0.01	28.42	60.96	0.00	28.42	0.00
07/01/49	09/30/49	0.00	27.60	0.00	0.01	27.59	60.13	0.00	27.59	0.00
10/01/49	12/31/49	0.00	26.76	0.00	0.01	26.75	59.29	0.00	26.75	0.00
01/01/50	03/31/50	0.00	25.92	0.00	0.01	25.91	58.46	0.00	25.91	0.00
04/01/50	06/30/50	0.00	25.09	0.00	0.01	25.08	57.63	0.00	25.08	0.00
07/01/50	09/30/50	0.00	24.25	0.00	0.01	24.24	56.79	0.00	24.24	0.00
10/01/50	12/31/50	0.00	23.41	0.00	0.01	23.40	55.96	0.00	23.40	0.00
01/01/51	03/31/51	0.00	22.58	0.00	0.01	22.56	55.12	0.00	22.56	0.00
04/01/51	06/30/51	0.00	21.74	0.00	0.01	21.73	54.29	0.00	21.73	0.00
07/01/51	09/30/51	0.00	20.91	0.00	0.01	20.90	53.46	0.00	20.90	0.00
10/01/51	12/31/51	0.00	20.07	0.00	0.01	20.06	52.62	0.00	20.06	0.00
01/01/52	03/31/52	0.00	19.23	0.00	0.01	19.22	51.79	0.00	19.22	0.00
04/01/52	06/30/52	0.00	18.40	0.00	0.01	18.39	50.96	0.00	18.39	0.00
07/01/52	09/30/52	0.00	17.56	0.00	0.01	17.55	50.13	0.00	17.55	0.00
10/01/52	12/31/52	0.00	16.72	0.00	0.01	16.71	49.29	0.00	16.71	0.00
01/01/53	03/31/53	0.00	15.88	0.00	0.01	15.87	48.45	0.00	15.87	0.00
04/01/53	06/30/53	0.00	15.05	0.00	0.01	15.04	47.62	0.00	15.04	0.00
07/01/53	09/30/53	0.00	14.22	0.00	0.01	14.21	46.79	0.00	14.21	0.00
10/01/53	12/31/53	0.00	13.38	0.00	0.01	13.37	45.95	0.00	13.37	0.00
01/01/54	03/31/54	0.00	12.54	0.00	0.01	12.53	45.12	0.00	12.53	0.00
04/01/54	06/30/54	0.00	11.71	0.00	0.01	11.70	44.29	0.00	11.70	0.00
07/01/54	09/30/54	0.00	10.87	0.00	0.01	10.86	43.46	0.00	10.86	0.00
10/01/54	12/31/54	0.00	10.03	0.00	0.01	10.02	42.62	0.00	10.02	0.00
01/01/55	03/31/55	0.00	9.19	0.00	0.01	9.18	41.78	0.00	9.18	0.00
04/01/55	06/30/55	0.00	8.36	0.00	0.01	8.35	40.95	0.00	8.35	0.00
07/01/55	09/30/55	0.00	7.53	0.00	0.01	7.52	40.12	0.00	7.52	0.00
10/01/55	12/31/55	0.00	6.69	0.00	0.01	6.67	39.28	0.00	6.67	0.00
01/01/56	03/31/56	0.00	5.85	0.00	0.01	5.84	38.45	0.00	5.84	0.00
04/01/56	06/30/56	0.00	5.02	0.00	0.01	5.01	37.62	0.00	5.01	0.00
07/01/56	09/30/56	0.00	4.18	0.00	0.01	4.17	36.79	0.00	4.17	0.00
10/01/56	12/31/56	0.00	3.34	0.00	0.01	3.33	35.95	0.00	3.33	0.00
01/01/57	03/31/57	0.00	2.50	0.00	0.01	2.50	35.11	0.00	2.50	0.00
04/01/57	06/30/57	0.00	1.67	0.00	0.01	1.67	34.29	0.00	1.67	0.00
07/01/57	09/30/57	0.00	0.95	0.00	0.00	0.95	33.57	0.00	0.95	0.00
10/01/57	12/31/57	0.00	0.41	0.00	0.00	0.41	33.03	0.00	0.41	0.00
01/01/58	03/31/58	0.00	0.10	0.00	0.00	0.10	32.72	0.00	0.10	0.00
04/01/58	06/30/58	0.00	(0.00)	0.00	0.00	(0.00)	32.62	0.00	(0.00)	0.00
TOTAL		1,848.29	10,798.93	1,621.41	117.65	10,908.17	15,096.36	32.62	10,797.87	110.30

Notes:

- (3) = Table A1, (1b) x [Table C5_2, (6) - Table C5_2, (7)]
- (4) = Table A1, (1a) x Table A1, (3) x [Table C5_2, (8) - Table C5_1, (13)]
- (5) = Table C4, (7)
- (6) = Table C2_7, (13), DTA allocated to the model time periods.
- (7) = (3) + (4) - (5) - (6)
- (8) = Table C1, (14), cumulative
- (9) = [(8) - (10)] - (9)_{t-1}, cumulative
- (10) = min [max (0, (8)), (7)]
- (11) = (7) - (10)

TABLE C4: ADMITTED PREMIUM RECEIVABLES

TIME INTERVAL		CUMULATIVE		COLLECTED PREMIUM MINUS PRIOR PERIOD EARNED PREMIUM (5)	NONADMITTED PREMIUM RECEIVABLES (6)	ADMITTED PREMIUM RECEIVABLES (7)
		EARNED PREMIUM NET (3)	COLLECTED PREMIUM NET (4)			
FROM (1)	TO (2)					
07/01/21	09/30/21	0.00	0.00	0.00	0.00	0.00
10/01/21	12/31/21	0.00	0.00	0.00	0.00	0.00
01/01/22	03/31/22	0.00	0.00	0.00	0.00	0.00
04/01/22	06/30/22	0.00	5.58	5.58	0.00	(5.58)
07/01/22	09/30/22	32.52	61.41	61.41	0.00	172.86
10/01/22	12/31/22	116.47	178.75	146.23	0.00	255.91
01/01/23	03/31/23	266.51	359.30	242.83	0.00	350.96
04/01/23	06/30/23	472.85	557.48	290.97	0.00	387.73
07/01/23	09/30/23	676.64	720.87	248.02	0.00	224.35
10/01/23	12/31/23	830.26	818.75	142.12	0.00	126.46
01/01/24	03/31/24	916.52	870.98	40.72	0.00	74.24
04/01/24	06/30/24	945.22	899.18	(17.34)	15.63	30.41
07/01/24	09/30/24	945.22	920.03	(25.19)	22.70	2.49
10/01/24	12/31/24	945.22	934.20	(11.02)	9.93	1.09
01/01/25	03/31/25	945.22	941.24	(3.98)	3.58	0.39
04/01/25	06/30/25	945.22	944.32	(0.90)	0.81	0.09
07/01/25	09/30/25	945.22	945.22	0.00	0.00	0.00
10/01/25	12/31/25	945.22	945.22	0.00	0.00	0.00
01/01/26	03/31/26	945.22	945.22	0.00	0.00	0.00
04/01/26	06/30/26	945.22	945.22	0.00	0.00	0.00
07/01/26	09/30/26	945.22	945.22	0.00	0.00	0.00
10/01/26	12/31/26	945.22	945.22	0.00	0.00	0.00
01/01/27	03/31/27	945.22	945.22	0.00	0.00	0.00
04/01/27	06/30/27	945.22	945.22	0.00	0.00	0.00
07/01/27	09/30/27	945.22	945.22	0.00	0.00	0.00
10/01/27	12/31/27	945.22	945.22	0.00	0.00	0.00
01/01/28	03/31/28	945.22	945.22	0.00	0.00	0.00
04/01/28	06/30/28	945.22	945.22	0.00	0.00	0.00
07/01/28	09/30/28	945.22	945.22	0.00	0.00	0.00
10/01/28	12/31/28	945.22	945.22	0.00	0.00	0.00
01/01/29	03/31/29	945.22	945.22	0.00	0.00	0.00
04/01/29	06/30/29	945.22	945.22	0.00	0.00	0.00
07/01/29	09/30/29	945.22	945.22	0.00	0.00	0.00
10/01/29	12/31/29	945.22	945.22	0.00	0.00	0.00
01/01/30	03/31/30	945.22	945.22	0.00	0.00	0.00
04/01/30	06/30/30	945.22	945.22	0.00	0.00	0.00
07/01/30	09/30/30	945.22	945.22	0.00	0.00	0.00
10/01/30	12/31/30	945.22	945.22	0.00	0.00	0.00
01/01/31	03/31/31	945.22	945.22	0.00	0.00	0.00
04/01/31	06/30/31	945.22	945.22	0.00	0.00	0.00
07/01/31	09/30/31	945.22	945.22	0.00	0.00	0.00
10/01/31	12/31/31	945.22	945.22	0.00	0.00	0.00
01/01/32	03/31/32	945.22	945.22	0.00	0.00	0.00
04/01/32	06/30/32	945.22	945.22	0.00	0.00	0.00
07/01/32	09/30/32	945.22	945.22	0.00	0.00	0.00
10/01/32	12/31/32	945.22	945.22	0.00	0.00	0.00
01/01/33	03/31/33	945.22	945.22	0.00	0.00	0.00
04/01/33	06/30/33	945.22	945.22	0.00	0.00	0.00
07/01/33	09/30/33	945.22	945.22	0.00	0.00	0.00
10/01/33	12/31/33	945.22	945.22	0.00	0.00	0.00
01/01/34	03/31/34	945.22	945.22	0.00	0.00	0.00
04/01/34	06/30/34	945.22	945.22	0.00	0.00	0.00
07/01/34	09/30/34	945.22	945.22	0.00	0.00	0.00
10/01/34	12/31/34	945.22	945.22	0.00	0.00	0.00
01/01/35	03/31/35	945.22	945.22	0.00	0.00	0.00
04/01/35	06/30/35	945.22	945.22	0.00	0.00	0.00
07/01/35	09/30/35	945.22	945.22	0.00	0.00	0.00
10/01/35	12/31/35	945.22	945.22	0.00	0.00	0.00
01/01/36	03/31/36	945.22	945.22	0.00	0.00	0.00
04/01/36	06/30/36	945.22	945.22	0.00	0.00	0.00
07/01/36	09/30/36	945.22	945.22	0.00	0.00	0.00
10/01/36	12/31/36	945.22	945.22	0.00	0.00	0.00
01/01/37	03/31/37	945.22	945.22	0.00	0.00	0.00
04/01/37	06/30/37	945.22	945.22	0.00	0.00	0.00
07/01/37	09/30/37	945.22	945.22	0.00	0.00	0.00
10/01/37	12/31/37	945.22	945.22	0.00	0.00	0.00
01/01/38	03/31/38	945.22	945.22	0.00	0.00	0.00
04/01/38	06/30/38	945.22	945.22	0.00	0.00	0.00
07/01/38	09/30/38	945.22	945.22	0.00	0.00	0.00
10/01/38	12/31/38	945.22	945.22	0.00	0.00	0.00
01/01/39	03/31/39	945.22	945.22	0.00	0.00	0.00
04/01/39	06/30/39	945.22	945.22	0.00	0.00	0.00
07/01/39	09/30/39	945.22	945.22	0.00	0.00	0.00
10/01/39	12/31/39	945.22	945.22	0.00	0.00	0.00
01/01/40	03/31/40	945.22	945.22	0.00	0.00	0.00
04/01/40	06/30/40	945.22	945.22	0.00	0.00	0.00
07/01/40	09/30/40	945.22	945.22	0.00	0.00	0.00
10/01/40	12/31/40	945.22	945.22	0.00	0.00	0.00
01/01/41	03/31/41	945.22	945.22	0.00	0.00	0.00
04/01/41	06/30/41	945.22	945.22	0.00	0.00	0.00
07/01/41	09/30/41	945.22	945.22	0.00	0.00	0.00
10/01/41	12/31/41	945.22	945.22	0.00	0.00	0.00
01/01/42	03/31/42	945.22	945.22	0.00	0.00	0.00
04/01/42	06/30/42	945.22	945.22	0.00	0.00	0.00
07/01/42	09/30/42	945.22	945.22	0.00	0.00	0.00

TABLE C4: ADMITTED PREMIUM RECEIVABLES

TIME INTERVAL		CUMULATIVE		COLLECTED PREMIUM MINUS PRIOR PERIOD EARNED PREMIUM (5)	NONADMITTED PREMIUM RECEIVABLES (6)	ADMITTED PREMIUM RECEIVABLES (7)
		EARNED PREMIUM NET (3)	COLLECTED PREMIUM NET (4)			
FROM (1)	TO (2)					
10/01/42	12/31/42	945.22	945.22	0.00	0.00	0.00
01/01/43	03/31/43	945.22	945.22	0.00	0.00	0.00
04/01/43	06/30/43	945.22	945.22	0.00	0.00	0.00
07/01/43	09/30/43	945.22	945.22	0.00	0.00	0.00
10/01/43	12/31/43	945.22	945.22	0.00	0.00	0.00
01/01/44	03/31/44	945.22	945.22	0.00	0.00	0.00
04/01/44	06/30/44	945.22	945.22	0.00	0.00	0.00
07/01/44	09/30/44	945.22	945.22	0.00	0.00	0.00
10/01/44	12/31/44	945.22	945.22	0.00	0.00	0.00
01/01/45	03/31/45	945.22	945.22	0.00	0.00	0.00
04/01/45	06/30/45	945.22	945.22	0.00	0.00	0.00
07/01/45	09/30/45	945.22	945.22	0.00	0.00	0.00
10/01/45	12/31/45	945.22	945.22	0.00	0.00	0.00
01/01/46	03/31/46	945.22	945.22	0.00	0.00	0.00
04/01/46	06/30/46	945.22	945.22	0.00	0.00	0.00
07/01/46	09/30/46	945.22	945.22	0.00	0.00	0.00
10/01/46	12/31/46	945.22	945.22	0.00	0.00	0.00
01/01/47	03/31/47	945.22	945.22	0.00	0.00	0.00
04/01/47	06/30/47	945.22	945.22	0.00	0.00	0.00
07/01/47	09/30/47	945.22	945.22	0.00	0.00	0.00
10/01/47	12/31/47	945.22	945.22	0.00	0.00	0.00
01/01/48	03/31/48	945.22	945.22	0.00	0.00	0.00
04/01/48	06/30/48	945.22	945.22	0.00	0.00	0.00
07/01/48	09/30/48	945.22	945.22	0.00	0.00	0.00
10/01/48	12/31/48	945.22	945.22	0.00	0.00	0.00
01/01/49	03/31/49	945.22	945.22	0.00	0.00	0.00
04/01/49	06/30/49	945.22	945.22	0.00	0.00	0.00
07/01/49	09/30/49	945.22	945.22	0.00	0.00	0.00
10/01/49	12/31/49	945.22	945.22	0.00	0.00	0.00
01/01/50	03/31/50	945.22	945.22	0.00	0.00	0.00
04/01/50	06/30/50	945.22	945.22	0.00	0.00	0.00
07/01/50	09/30/50	945.22	945.22	0.00	0.00	0.00
10/01/50	12/31/50	945.22	945.22	0.00	0.00	0.00
01/01/51	03/31/51	945.22	945.22	0.00	0.00	0.00
04/01/51	06/30/51	945.22	945.22	0.00	0.00	0.00
07/01/51	09/30/51	945.22	945.22	0.00	0.00	0.00
10/01/51	12/31/51	945.22	945.22	0.00	0.00	0.00
01/01/52	03/31/52	945.22	945.22	0.00	0.00	0.00
04/01/52	06/30/52	945.22	945.22	0.00	0.00	0.00
07/01/52	09/30/52	945.22	945.22	0.00	0.00	0.00
10/01/52	12/31/52	945.22	945.22	0.00	0.00	0.00
01/01/53	03/31/53	945.22	945.22	0.00	0.00	0.00
04/01/53	06/30/53	945.22	945.22	0.00	0.00	0.00
07/01/53	09/30/53	945.22	945.22	0.00	0.00	0.00
10/01/53	12/31/53	945.22	945.22	0.00	0.00	0.00
01/01/54	03/31/54	945.22	945.22	0.00	0.00	0.00
04/01/54	06/30/54	945.22	945.22	0.00	0.00	0.00
07/01/54	09/30/54	945.22	945.22	0.00	0.00	0.00
10/01/54	12/31/54	945.22	945.22	0.00	0.00	0.00
01/01/55	03/31/55	945.22	945.22	0.00	0.00	0.00
04/01/55	06/30/55	945.22	945.22	0.00	0.00	0.00
07/01/55	09/30/55	945.22	945.22	0.00	0.00	0.00
10/01/55	12/31/55	945.22	945.22	0.00	0.00	0.00
01/01/56	03/31/56	945.22	945.22	0.00	0.00	0.00
04/01/56	06/30/56	945.22	945.22	0.00	0.00	0.00
07/01/56	09/30/56	945.22	945.22	0.00	0.00	0.00
10/01/56	12/31/56	945.22	945.22	0.00	0.00	0.00
01/01/57	03/31/57	945.22	945.22	0.00	0.00	0.00
04/01/57	06/30/57	945.22	945.22	0.00	0.00	0.00
07/01/57	09/30/57	945.22	945.22	0.00	0.00	0.00
10/01/57	12/31/57	945.22	945.22	0.00	0.00	0.00
01/01/58	03/31/58	945.22	945.22	0.00	0.00	0.00
04/01/58	06/30/58	945.22	945.22	0.00	0.00	0.00

Notes:

- (3) = Table A1, (1b) x Table C5_2, (7)
- (4) = Table A1, (1b) x Table C5_1, (12)
- (5) = (4) - (3)_{t-1}, t-1 implies that is nonadmitted if not received in 90 days.
- (6) = max{ 0, -(5) x [1.0 - Table A1, (4) x Table A1, (1a) / Table A1, (1b)] }
- (7) = Table A1, (1b) x [Table C5_2, (6) - Table C5_1, (12)] - (6)

TABLE C5_2: ADDITIONAL PREMIUM AND LOSS PATTERNS

TIME INTERVAL		WRITTEN PREMIUM (3)	EARNED PREMIUM (4)	LOSS & LAE INCURRED (5)	CUMULATIVE		
FROM (1)	TO (2)				WRITTEN PREMIUM (6)	EARNED PREMIUM (7)	LOSS & LAE INCURRED (8)
07/01/21	09/30/21		0.00%	0.00%	0.00%	0.00%	0.00%
10/01/21	12/31/21		0.00%	0.00%	0.00%	0.00%	0.00%
01/01/22	03/31/22		0.00%	0.00%	0.00%	0.00%	0.00%
04/01/22	06/30/22		0.00%	0.00%	0.00%	0.00%	0.00%
07/01/22	09/30/22	24.78%	3.44%	3.44%	24.78%	3.44%	3.44%
10/01/22	12/31/22	21.20%	8.88%	8.88%	45.99%	12.32%	12.32%
01/01/23	03/31/23	29.16%	15.87%	15.87%	75.14%	28.20%	28.20%
04/01/23	06/30/23	24.86%	21.83%	21.83%	100.00%	50.03%	50.03%
07/01/23	09/30/23		21.56%	21.56%	100.00%	71.59%	71.59%
10/01/23	12/31/23		16.25%	16.25%	100.00%	87.84%	87.84%
01/01/24	03/31/24		9.13%	9.13%	100.00%	96.96%	96.96%
04/01/24	06/30/24		3.04%	3.04%	100.00%	100.00%	100.00%
07/01/24	09/30/24		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/24	12/31/24		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/25	03/31/25		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/25	06/30/25		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/25	09/30/25		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/25	12/31/25		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/26	03/31/26		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/26	06/30/26		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/26	09/30/26		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/26	12/31/26		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/27	03/31/27		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/27	06/30/27		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/27	09/30/27		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/27	12/31/27		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/28	03/31/28		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/28	06/30/28		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/28	09/30/28		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/28	12/31/28		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/29	03/31/29		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/29	06/30/29		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/29	09/30/29		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/29	12/31/29		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/30	03/31/30		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/30	06/30/30		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/30	09/30/30		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/30	12/31/30		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/31	03/31/31		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/31	06/30/31		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/31	09/30/31		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/31	12/31/31		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/32	03/31/32		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/32	06/30/32		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/32	09/30/32		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/32	12/31/32		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/33	03/31/33		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/33	06/30/33		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/33	09/30/33		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/33	12/31/33		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/34	03/31/34		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/34	06/30/34		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/34	09/30/34		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/34	12/31/34		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/35	03/31/35		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/35	06/30/35		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/35	09/30/35		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/35	12/31/35		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/36	03/31/36		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/36	06/30/36		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/36	09/30/36		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/36	12/31/36		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/37	03/31/37		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/37	06/30/37		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/37	09/30/37		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/37	12/31/37		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/38	03/31/38		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/38	06/30/38		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/38	09/30/38		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/38	12/31/38		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/39	03/31/39		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/39	06/30/39		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/39	09/30/39		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/39	12/31/39		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/40	03/31/40		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/40	06/30/40		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/40	09/30/40		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/40	12/31/40		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/41	03/31/41		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/41	06/30/41		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/41	09/30/41		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/41	12/31/41		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/42	03/31/42		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/42	06/30/42		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/42	09/30/42		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/42	12/31/42		0.00%	0.00%	100.00%	100.00%	100.00%

TABLE C5_2: ADDITIONAL PREMIUM AND LOSS PATTERNS

TIME INTERVAL		WRITTEN PREMIUM (3)	EARNED PREMIUM (4)	LOSS & LAE INCURRED (5)	CUMULATIVE		
FROM (1)	TO (2)				WRITTEN PREMIUM (6)	EARNED PREMIUM (7)	LOSS & LAE INCURRED (8)
01/01/43	03/31/43		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/43	06/30/43		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/43	09/30/43		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/43	12/31/43		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/44	03/31/44		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/44	06/30/44		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/44	09/30/44		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/44	12/31/44		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/45	03/31/45		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/45	06/30/45		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/45	09/30/45		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/45	12/31/45		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/46	03/31/46		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/46	06/30/46		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/46	09/30/46		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/46	12/31/46		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/47	03/31/47		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/47	06/30/47		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/47	09/30/47		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/47	12/31/47		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/48	03/31/48		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/48	06/30/48		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/48	09/30/48		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/48	12/31/48		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/49	03/31/49		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/49	06/30/49		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/49	09/30/49		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/49	12/31/49		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/50	03/31/50		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/50	06/30/50		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/50	09/30/50		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/50	12/31/50		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/51	03/31/51		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/51	06/30/51		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/51	09/30/51		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/51	12/31/51		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/52	03/31/52		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/52	06/30/52		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/52	09/30/52		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/52	12/31/52		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/53	03/31/53		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/53	06/30/53		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/53	09/30/53		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/53	12/31/53		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/54	03/31/54		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/54	06/30/54		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/54	09/30/54		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/54	12/31/54		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/55	03/31/55		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/55	06/30/55		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/55	09/30/55		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/55	12/31/55		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/56	03/31/56		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/56	06/30/56		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/56	09/30/56		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/56	12/31/56		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/57	03/31/57		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/57	06/30/57		0.00%	0.00%	100.00%	100.00%	100.00%
07/01/57	09/30/57		0.00%	0.00%	100.00%	100.00%	100.00%
10/01/57	12/31/57		0.00%	0.00%	100.00%	100.00%	100.00%
01/01/58	03/31/58		0.00%	0.00%	100.00%	100.00%	100.00%
04/01/58	06/30/58		0.00%	0.00%	100.00%	100.00%	100.00%
TOTAL		100.00%	100.00%	100.00%			

Notes:

- (3): Based on Unit Statistical Plan Data.
- (4): Single policy earned premium is earned uniformly through the one year policy term and then converted to a policy year basis.
- (5): We assume that the loss & LAE incurred pattern coincides with the earned premium pattern.
- (6) = (3), cumulative
- (7) = (4), cumulative
- (8) = (5), cumulative

TABLE D1: CAPITAL NEEDED FROM INVESTORS

TIME INTERVAL		UNEARNED PREMIUM RESERVES (3)	LOSS & LAE RESERVES (4)	TOTAL RESERVES (5)	RESERVES TO SURPLUS RATIO (6)	IMPLIED SURPLUS (7)	RESERVES FUNDED BY INVESTORS (8)	CAPITAL NEEDED FROM INVESTORS (9)
FROM (1)	TO (2)							
01/01/43	03/31/43	0.00	47.96	47.96	1.96	24.53	0.00	24.53
04/01/43	06/30/43	0.00	47.57	47.57	1.96	24.33	0.00	24.33
07/01/43	09/30/43	0.00	47.14	47.14	1.96	24.11	0.00	24.11
10/01/43	12/31/43	0.00	46.60	46.60	1.96	23.83	0.00	23.83
01/01/44	03/31/44	0.00	45.94	45.94	1.96	23.49	0.00	23.49
04/01/44	06/30/44	0.00	45.16	45.16	1.96	23.10	0.00	23.10
07/01/44	09/30/44	0.00	44.32	44.32	1.96	22.67	0.00	22.67
10/01/44	12/31/44	0.00	43.48	43.48	1.96	22.24	0.00	22.24
01/01/45	03/31/45	0.00	42.65	42.65	1.96	21.81	0.00	21.81
04/01/45	06/30/45	0.00	41.82	41.82	1.96	21.39	0.00	21.39
07/01/45	09/30/45	0.00	40.98	40.98	1.96	20.96	0.00	20.96
10/01/45	12/31/45	0.00	40.14	40.14	1.96	20.53	0.00	20.53
01/01/46	03/31/46	0.00	39.30	39.30	1.96	20.10	0.00	20.10
04/01/46	06/30/46	0.00	38.47	38.47	1.96	19.68	0.00	19.68
07/01/46	09/30/46	0.00	37.63	37.63	1.96	19.25	0.00	19.25
10/01/46	12/31/46	0.00	36.79	36.79	1.96	18.82	0.00	18.82
01/01/47	03/31/47	0.00	35.96	35.96	1.96	18.39	0.00	18.39
04/01/47	06/30/47	0.00	35.13	35.13	1.96	17.96	0.00	17.96
07/01/47	09/30/47	0.00	34.29	34.29	1.96	17.54	0.00	17.54
10/01/47	12/31/47	0.00	33.45	33.45	1.96	17.11	0.00	17.11
01/01/48	03/31/48	0.00	32.61	32.61	1.96	16.68	0.00	16.68
04/01/48	06/30/48	0.00	31.78	31.78	1.96	16.25	0.00	16.25
07/01/48	09/30/48	0.00	30.94	30.94	1.96	15.83	0.00	15.83
10/01/48	12/31/48	0.00	30.10	30.10	1.96	15.40	0.00	15.40
01/01/49	03/31/49	0.00	29.27	29.27	1.96	14.97	0.00	14.97
04/01/49	06/30/49	0.00	28.43	28.43	1.96	14.54	0.00	14.54
07/01/49	09/30/49	0.00	27.60	27.60	1.96	14.11	0.00	14.11
10/01/49	12/31/49	0.00	26.76	26.76	1.96	13.68	0.00	13.68
01/01/50	03/31/50	0.00	25.92	25.92	1.96	13.26	0.00	13.26
04/01/50	06/30/50	0.00	25.09	25.09	1.96	12.83	0.00	12.83
07/01/50	09/30/50	0.00	24.25	24.25	1.96	12.40	0.00	12.40
10/01/50	12/31/50	0.00	23.41	23.41	1.96	11.97	0.00	11.97
01/01/51	03/31/51	0.00	22.58	22.58	1.96	11.55	0.00	11.55
04/01/51	06/30/51	0.00	21.74	21.74	1.96	11.12	0.00	11.12
07/01/51	09/30/51	0.00	20.91	20.91	1.96	10.69	0.00	10.69
10/01/51	12/31/51	0.00	20.07	20.07	1.96	10.26	0.00	10.26
01/01/52	03/31/52	0.00	19.23	19.23	1.96	9.84	0.00	9.84
04/01/52	06/30/52	0.00	18.40	18.40	1.96	9.41	0.00	9.41
07/01/52	09/30/52	0.00	17.56	17.56	1.96	8.98	0.00	8.98
10/01/52	12/31/52	0.00	16.72	16.72	1.96	8.55	0.00	8.55
01/01/53	03/31/53	0.00	15.88	15.88	1.96	8.12	0.00	8.12
04/01/53	06/30/53	0.00	15.05	15.05	1.96	7.70	0.00	7.70
07/01/53	09/30/53	0.00	14.22	14.22	1.96	7.27	0.00	7.27
10/01/53	12/31/53	0.00	13.38	13.38	1.96	6.84	0.00	6.84
01/01/54	03/31/54	0.00	12.54	12.54	1.96	6.41	0.00	6.41
04/01/54	06/30/54	0.00	11.71	11.71	1.96	5.99	0.00	5.99
07/01/54	09/30/54	0.00	10.87	10.87	1.96	5.56	0.00	5.56
10/01/54	12/31/54	0.00	10.03	10.03	1.96	5.13	0.00	5.13
01/01/55	03/31/55	0.00	9.19	9.19	1.96	4.70	0.00	4.70
04/01/55	06/30/55	0.00	8.36	8.36	1.96	4.28	0.00	4.28
07/01/55	09/30/55	0.00	7.53	7.53	1.96	3.85	0.00	3.85
10/01/55	12/31/55	0.00	6.69	6.69	1.96	3.42	0.00	3.42
01/01/56	03/31/56	0.00	5.85	5.85	1.96	2.99	0.00	2.99
04/01/56	06/30/56	0.00	5.02	5.02	1.96	2.57	0.00	2.57
07/01/56	09/30/56	0.00	4.18	4.18	1.96	2.14	0.00	2.14
10/01/56	12/31/56	0.00	3.34	3.34	1.96	1.71	0.00	1.71
01/01/57	03/31/57	0.00	2.50	2.50	1.96	1.28	0.00	1.28
04/01/57	06/30/57	0.00	1.67	1.67	1.96	0.86	0.00	0.86
07/01/57	09/30/57	0.00	0.95	0.95	1.96	0.49	0.00	0.49
10/01/57	12/31/57	0.00	0.41	0.41	1.96	0.21	0.00	0.21
01/01/58	03/31/58	0.00	0.10	0.10	1.96	0.05	0.00	0.05
04/01/58	06/30/58	0.00	0.00	0.00	1.96	0.00	0.00	0.00
TOTAL		1,848.29	10,798.93	12,647.23		6,468.21	110.30	6,578.51

Notes:

- (3) = Table A1, (1b) x [Table C5_2, (6) - Table C5_2, (7)]
- (4) = Table A1, (1a) x Table A1, (3) x [Table C5_2, (8) - Table C5_1, (13)]
- (5) = (3) + (4)
- (6) = Table A1, (13)
- (7) = (5) / (6)
- (8) = Table C3, (11)
- (9) = (7) + (8)

COST OF CAPITAL

The first step in setting an underwriting profit factor under a rate of return standard is to determine the fair and reasonable return that should be allowed for bearing the risk of underwriting workers' compensation insurance in Massachusetts. In the context of insurance ratemaking, a "fair and reasonable return" has traditionally been interpreted to mean the cost of the equity capital required to support insurance operations.¹ However, in the Decision on 2003 rates, the Commissioner endorsed the use of a weighted average cost of capital that includes the impact of debt capital at the insurance holding company level.² To narrow the debate again this year, the WCRIBMA has used a weighted average cost of capital in its derivation of the profit provision.

Calculating the weighted average cost of capital is simply a matter of separately calculating the cost of equity capital and the cost of debt capital, and then using appropriate weights to combine the two estimates.

Equity Cost of Capital

Several methods have been used to estimate the cost of equity capital for a regulated firm or industry. However, it is widely agreed that methods that rely on market data are preferred, on both a theoretical and pragmatic basis, to those that are based on accounting data. Indeed, it is market requirements that suggest use of the term "cost of

¹ Insurance operating companies typically carry no debt on their balance sheets; that is, the capital of the operating companies is all equity capital.

² See, for example, page 52: "We agree that estimates of the cost of capital should reflect debt/equity financing at the holding company level."

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capital," as the phrase refers to the cost to the firm of attracting investment funds in capital markets.

As in the past, the WCRIBMA has relied on the two most prominent market based methodologies to estimate the cost of equity capital for the WCRIBMA: the Discounted Cash Flow (DCF) model and the traditional, single factor Capital Asset Pricing Model (CAPM). These two methods have been widely recognized as the leading approaches for estimating the cost of equity capital in the US economy, and as a result, each method has explicitly been given equal weight in the estimation process. Since the 2016 filing the WCRIBMA has been using a three-stage dividend growth model in place of the one-stage model used in prior filings. In contrast with the previous approach, in which a single growth rate persists in perpetuity, the three stage model reflects the assumption that in the long run, the insurance industry's growth rate will decline to a level consistent with the long term growth of the economy at large.

To apply the CAPM and DCF models in the context of insurance regulation, a sample of firms that investors would view as representative of the risks and required returns need to be selected. In the 2020 filing the WCRIBMA relied exclusively on Value Line sample of companies. The sample included data from Value Line Investment Survey, Part 3 – The Ratings and Report and from Value Line Investment Survey, Mid Cap Edition. In this filing, the WCRIBMA uses individual group companies that write workers' compensation in Massachusetts. This is consistent with the sample of companies used for the calculation of the leverage ratio and the asset distribution. This method provides a better assessment of the risk and required returns associated with the capital that is actually supporting the business of workers compensation in Massachusetts, since industry

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composites may be affected by carriers that are serving other lines or geographic areas. The sample is taken from A.M. Best's Global Insurance Database using BestLink. Of the 79 insurance groups that write workers' compensation in Massachusetts, 40 are connected to private holding companies, and the remaining 39 are owned by public companies. We use financial data for the 39 publicly traded companies in the cost of capital calculation. These data are from the Value Line Investment Survey, Part 3 – The Ratings and Report, from Value Line Investment Survey, Mid Cap Edition and from Yahoo Finance.

Based on these data, the cost of equity capital was calculated for the sample of 39 publicly traded companies that own subsidiaries that write workers' compensation in Massachusetts. This calculation provides an estimate of the fair rate of return for the average risk activity in which these companies are engaged. Based on the average of the DCF and CAPM results, investors currently require a return on equity of at least 8.72% for bearing the risk of underwriting workers' compensation insurance, as shown below.

DCF	7.99%
CAPM	9.45%
Average	8.72%

Given these results, the WCRIBMA has used a cost of equity capital of 8.72% as the best estimate of the required equity return for equity supporting workers compensation insurance in Massachusetts.

Debt Cost of Capital

To conform to the 2003 Commissioner's decision, the WCRIBMA estimates the cost of debt capital for the sample of companies, as well as the share of debt in their capital structure. Prior to the 2020 filing, the WCRIBMA relied on the long term corporate bonds, the 30 year High Quality Market yield from the US Department of Treasury, as a proxy for the debt cost of capital. In the 2020 filing and in this filing, to be consistent with the CAPM analysis, we are using a three horizon yield rate instead. The result, 1.37%, is shown in Section VII-E, Exhibit 1. In calculating the debt/equity proportion, consistent with the filings since 2014, the WCRIBMA uses the book value of capital (as opposed to market value).³ For the group of 39 insurers, the share of non-equity capital in the corporate capital structure is 22%, as shown in Section VII – E, Exhibit 4. This is calculated as a weighed average using Massachusetts workers compensation direct premiums written for the weights. Thus, the weighted average cost of capital is 7.14%, as shown below:

$$(22\% \times 1.37\%) + (78\% \times 8.72\%) = 7.14\%$$

The results of the analysis for the sample of group companies that write workers' compensation in Massachusetts are contained in exhibits to this section, and a more detailed explanation of the models is contained in the accompanying appendix.

³ The WCRIBMA believes that market value capital weights are also appropriate for estimating a weighted average cost of capital. However, in this rate filing we adopted the method suggested by the Commissioner in the 9/1/2012 decision on rates and use book value capital weights.

APPENDIX: COST OF CAPITAL

INTRODUCTION

This appendix is intended to provide a more detailed description of the cost of capital methods selected by the WCRIBMA to derive the estimated cost of capital that is required to determine the underwriting profit provision in this filing.

The generally recognized standards for determining a fair rate of return for a regulated enterprise were articulated in two cases before the U.S. Supreme Court - Bluefield Waterworks and Hope Natural Gas. In Bluefield, the Court stated:

A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties

Bluefield Waterworks & Improvement Company v. Public Service Commission of West Virginia, 262 U.S. 679, 692-693 (1923). In Hope, the Court further stated:

From the investor or company point of view, it is important that there be enough revenue not only for operating expenses, but also for the capital costs of the business. These include service on the debt and dividends on

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the stock. By that standard the return to the equity owner should be commensurate with the returns on investments in other enterprises having corresponding risks. That return, moreover, should be sufficient to assure confidence in the financial integrity of the enterprise, so as to maintain its credit and to attract capital.

Federal Power Commission v. Hope Natural Gas Co., 320 U.S. 591, 603 (1944).

These decisions set forth the two basic standards of fairness under which regulated industries must operate: first, the rate of return to the equity holder should equal that which can be expected to be earned by investors in businesses of similar risk; and second, the rate of return must be sufficient to assure the continued attraction of capital. In essence these criteria, when reasonably applied, balance the interests of consumers of the regulated product or service, and investors, who provide the capital needed to operate the enterprise.

There are several methods that have been used to estimate the fair rate of return, or cost of capital, for a regulated firm or industry. However, it is widely agreed that methods that rely on market data are preferred, on both a theoretical and pragmatic basis, to those that are based on accounting data. Indeed, it is market requirements that suggest use of the term "cost of capital," as the phrase refers to the cost to the firm of attracting investment funds in capital markets. That cost, of course, is the return that the firm must pay and investors expect to earn as a result of placing their capital at risk in the enterprise. For this reason, the WCRIBMA used the two most prominent market-based

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methodologies to derive the cost of capital estimates for this filing. The first of these is known as the DCF model (sometimes called the Gordon growth model or the dividend valuation model), and the second is a specific form of Risk Premium Analysis known as CAPM.

DCF and CAPM approaches were used to obtain independent estimates of the cost of capital, so as not to place undue reliance on any single methodology. Moreover, we used these two models because economic and financial theory strongly support the use of market data to determine required rates of return, and these are the most prominent market-based methods currently available. Reliance on market data is critical for three reasons.

1. Such information reflects the consensus of all investors regarding the risk and required returns on different securities. Thus, the potential for the biases and perceptions of the analyst to overstate or understate the fair rate of return is minimized.
2. The alternative to market data is to use historical accounting data to estimate the cost of capital. This procedure is seriously flawed because it is not prospective and does not necessarily reflect the returns that are of ultimate concern to investors – those that can be earned in the market.
3. The use of market-based models is consistent with the dictates of Hope, in the sense that Hope instructs us to consider investor requirements when determining the fair and reasonable rate of return. (For example, "the return to the equity owner

should be commensurate with the returns on investments in other enterprises having corresponding risks.")

In effect, these market based models provide an initial estimate of the "opportunity cost" of placing capital at risk in support of workers' compensation insurance in Massachusetts. Opportunity cost is among the most basic concepts in economics. It refers to the fact that resources have a variety of potential uses, and by using a resource in a particular endeavor an investor forgoes the returns that are available in other, alternative activities. Thus, the opportunity cost of capital (otherwise termed the cost of capital) is the return available from employing that capital in its next best alternative use. This is, of course, the return that investors have forgone by using their capital in support of Massachusetts workers' compensation insurance activities.

METHODOLOGY

The DCF model and a specific form of RPA known as the CAPM were used to estimate the cost of capital. These are the most widely recognized methods for estimating the cost of capital in regulatory proceedings. The DCF analysis is the leading model used by practitioners to estimate the required rate of return in regulatory rate proceedings, while RPA analysis is the leading approach used by academics, both for estimating the cost of capital and explaining capital market behavior. Each one provides a reasonable basis for estimating the cost of capital, and each should be accorded equal weight in the process.

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Turning to the DCF model first, the DCF is based upon the presumption that the cost of an investment, typically the price of a stock, must equal the present value of the cash flows from the investment. The logic of this assumption is as follows: investors are willing to pay the current price for a share of stock only if the present value of the expected cash flows emanating from that investment are equal to that price. If the present value of the cash flows were greater (less) than the current price, investors would bid the price up (down).

The cash flows arising from the purchase of a share of stock are the dividend payments and capital gains the investor expects to receive in the future.

If the security is expected to be held in perpetuity, then the stock price can be expressed as the sum of the discounted dividends:

$$V_0 = [D_1/(1+k)] + [D_2/(1+k)^2] + [D_3/(1+k)^3] + \dots$$

where V_0 is the price of the stock, D_i is the dividend in period i , and k is the investor's implicit discount rate, or cost of capital.

In this filing, consistent with filings since 2016, the WCRIBMA implemented a three-stage DCF model, which assumes varying rates of dividend growth at different times in the future. The first stage is a five year period of short-term dividend growth, with the rate of growth calculated in the same manner as the dividend growth rate in prior filings. The calculation of this is shown in Section VII-E, Exhibit 2, Page 4.

The second stage, beginning in year six, is a five year period where the dividend growth rate declines (in a linear fashion) to a level consistent with the expected long term

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growth in the US economy. Then, starting in year 10 (stage 3), the rate of growth is assumed to be remain equal to the long-term rate of growth of the economy (based on the economy's real long-term growth potential and current inflationary expectations). The calculation of this is shown in Section VII-E, Exhibit 2, Page 2. A mathematical presentation of the three-stage dividend growth rate follows:

$$V_0 = D_0 \sum_{t=1}^{\infty} \left(\frac{1 + g_t}{1 + k} \right)^t = D_1 \sum_{t=1}^{\infty} \frac{(1 + g_t)^{t-1}}{(1 + k)^t}$$

$$\frac{D_1}{V_0} = \sum_{t=1}^5 \frac{(1 + g_{ST})^{t-1}}{(1 + k)^t} + (1 + g_{ST})^4 \sum_{t=6}^9 \frac{\prod_{i=1}^{t-5} (1 + g_{IT_i})}{(1 + k)^t}$$

$$+ (1 + g_{ST})^4 (1 + g_{IT_1})(1 + g_{IT_2})(1 + g_{IT_3})(1 + g_{IT_4}) \sum_{t=10}^{\infty} \frac{(1 + g_{LT})^{t-9}}{(1 + k)^t}$$

$$\frac{D_1}{V_0} = \left[\frac{1}{k - g_{ST}} \left(1 - \left(\frac{1 + g_{ST}}{1 + k} \right)^5 \right) + \frac{(1 + g_{ST})^4 (1 + g_{IT_1})}{(1 + k)^6} + \frac{(1 + g_{ST})^4 (1 + g_{IT_1})(1 + g_{IT_2})}{(1 + k)^7} \right.$$

$$+ \frac{(1 + g_{ST})^4 (1 + g_{IT_1})(1 + g_{IT_2})(1 + g_{IT_3})}{(1 + k)^8}$$

$$+ \frac{(1 + g_{ST})^4 (1 + g_{IT_1})(1 + g_{IT_2})(1 + g_{IT_3})(1 + g_{IT_4})}{(1 + k)^9}$$

$$\left. + \frac{(1 + g_{ST})^4 (1 + g_{IT_1})(1 + g_{IT_2})(1 + g_{IT_3})(1 + g_{IT_4})(1 + g_{LT})}{(k - g_{LT})} \frac{1}{(1 + k)^9} \right]$$

Where:

V_0 = Present Value of a stock

D_t = Dividend Paid at the end of period t

g_t = Dividend Growth Rate at time t ,

if $t \leq 5 \rightarrow$ Short Term Stage (ST)

if $5 < t < 10 \rightarrow$ Intermediate Term Stage (IT_t)

if $t \geq 10 \rightarrow$ Long Term Stage (LT)

g_{ST} = Short – Term Dividend Growth Rate

g_{IT_t} = Intermediate – Term Dividend Growth Rate,

Linearly Interpolated between time 5 and 10

g_{LT} = Long – Term Dividend Growth Rate

k = Cost of Capital

$\frac{D_1}{V_0}$ = Dividend Payable in the coming 12 months divided by the current price

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Turning to the second model used to calculate the cost of capital, the specific form of RPA known as the CAPM, it should be noted that RPA is a technique which attempts to estimate the cost of capital by calculating the incremental return investors require to hold a particular security, as opposed to another, less risky asset. While the DCF estimates the cost of capital directly, by looking at expected cash flows and market prices, RPA estimates required returns by evaluating the relative risk of alternative investments. Obviously, those investments with greater risk require greater returns.

The single factor version of the CAPM is one specific form of RPA, which begins with the assumption that there is a risk-free asset, which is typically taken to be a U.S. Treasury security. It then estimates the relative risk of alternative securities to measure the "risk premium" investors require to hold these risky assets. In the classical application of the CAPM, the relative risk of a particular security is measured by a value known as the "beta for market risk" (otherwise known as simply beta) which is an estimate of the relative volatility of that security's returns (or price) compared with the volatility of the entire market (usually proxied by the New York Stock Exchange index or the S&P 500). The information on the beta is used in the following manner to estimate investors' required rate of return:

$$K = r_f + (\beta \times r_D)$$

where r_f is the risk-free yield, β is the beta for market risk, and r_D is the market risk premium.

As noted above, the beta coefficient is a measure of the relative volatility, or riskiness, of an investment, compared with the market average. If an individual stock has

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a beta of 1.5, for example, the stock has a tendency to be 50% more volatile than the market as a whole. This implies that if the market as a whole goes up (or down) by 10% this stock has a tendency to go up (or down) by 15%.

The market risk premium is the average difference between the returns on the market portfolio and the returns on the riskless asset. For example, over the period 1926 - 2020 a diversified portfolio of common stocks earned an annual return which averaged 8.82 percentage points higher than the return on U.S. Treasury bills. Therefore, an individual security of exactly average risk (i.e., with a beta of 1) would be expected to earn 8.82 percentage points more than a T-bill. In addition to the T-bill, however, it is also reasonable to consider alternative-term securities, and to measure the risk premium relative to them. In fact, this type of procedure is frequently recommended when the time horizon of the investment is relatively long, as is often the case with an investment in insurance.

RESULTS

In estimating the cost of capital the WCRIBMA relied on financial data for a sample of publicly traded companies that are involved in writing workers' compensation in Massachusetts. The sample is taken from A.M. Best's Global Insurance Database using BestLink. The financial data for the publicly traded sample of companies, a total of 39 companies, are drawn from the Value Line Investment Survey and Yahoo Finance. Value Line Investment Survey is an independent investment advisory service that provides weekly reports on approximately 1,700 publicly traded stocks. In addition, it provides in depth quarterly reports on each of the firms it covers, which contain a wealth of historical

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and forecast information on each security. In terms of numbers of subscribers and annual revenues Value Line is the largest such service in the world. In addition, Value Line is the data source most widely relied upon by experts estimating the cost of capital in regulatory proceedings.

The DCF model requires an estimate of the current dividend yield and the expected growth rate in dividends.

To estimate the dividend yield, the WCRIBMA utilized estimates for the expected first year dividend yield provided by Value Line and Yahoo Finance. Since the annual DCF model requires an estimate of the dividends payable during the first year of the investment, and Value Line's expected first year dividend yield is defined as the estimated dividends payable in the coming year divided by the current share price of the stock, it is precisely the correct value to use in the DCF model. However, for the companies from the Value Line Investment Survey, Small and Mid Cap Edition, the dividend yield is defined as the current annual dividend divided by the current share price, not the coming year's dividend as is required in the model. As a consequence, for those companies, an additional adjustment has been made: to estimate the dividends payable during the first year of the investment the current annual dividends are multiplied by $1.0 + 0.5 \times \text{Dividend Growth Rate}$ (derived in Section VII-E Exhibit 2, Page 4)⁴.

To estimate the short-term dividend growth rate, the WCRIBMA averaged the results from two different techniques, one called the "growth forecast" method, and the other termed "fundamental analysis". The first, "growth forecast" method, relies on

⁴ Stock dividends are generally paid quarterly but increased only once a year; thus, depending on the timing, a company's dividend may be increased in the current quarter, or up to four quarters in the future. The growth rate is multiplied by 0.5 year to account for the fact that on average, across a large sample of companies, dividends will be increased approximately one half year in the future.

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estimates of growth based on historical earnings and dividend data along with analysts' forecasts of growth in these variables. The second, "fundamental analysis" relies on estimating a firm's sustainable growth based on the rate at which it retains and reinvests earnings. For each of these approaches, the WCRIBMA relied on long term (i.e., ten-year) and short term (five-year) historical information, along with Value Line analysts' forecasts and Yahoo forecasts. When calculating the expected growth rate, we averaged the results based on these three data sources.

It is appropriate to assume that when evaluating future growth prospects, investors will consider all available information in forming their estimates. This suggests that historical growth in dividends and earnings per share will be of some significance in forming expectations about future growth. At the same time, analysts are an important source of information for investors, and their estimates of future growth are followed closely by the investment community.

As regards fundamental analysis, the premise is that sustainable growth in the future can arise from two sources: retained earnings and issuance of new stock at prices different than book value. In the first case, retained earnings can be reinvested to produce earnings, which will be used to pay higher dividends in the future. In the second case, the proceeds from the sale of stock at prices above book value can also be used for new investment, and the profits ultimately will be used to pay higher dividends in the future. Thus, the fundamental analysis computes the expected growth rate as the sum of the earnings retained as a percentage of common equity and a stock issuance adjustment factor, as follows:

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$$g = (b \times r) + (s \times v)$$

where: b = retention ratio (retained earnings/profit)

r = return on equity

s = fraction of shares to be issued

v = (market/book) - 1.

The results of the DCF analysis calculating the short-term dividend growth rate for the sample of Massachusetts workers' compensation insurers are contained in summary form in section VII-E, Exhibit 2, Page 4 of the filing, with the details of the calculations contained in Exhibit 2, Page 5.

The long-term dividend growth rate that applies in perpetuity starting in year 10 is calculated in two steps. Using data from Bureau of Economic Analysis, we first estimated the growth rate in real gross domestic product (real GDP) for the period 1929-2020. Second, we multiplied this by the rate of expected inflation, calculated by the spread between the yield on 10-year treasury notes and 10-year treasury inflation indexed securities. The resultant long-term rate of dividend growth equals 5.49% as shown in Section VII-E, Exhibit 2, Page 2.

Stage 2 is applied to years 6 through 9 and is a linear interpolation between dividend growth rates in stage 1 and stage 3. Using a dividend yield of 2.43%, the required rate of return (k) in this three-stage DCF model is equal to 7.99%.

The three-stage dividend growth model produces a lower cost of equity and as a result a lower indicated underwriting profit than the one-stage model used in prior filings. Had we used the one-stage dividend growth model, the DCF cost of capital would have

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been 0.5% higher, which would have resulted in a 0.25% higher profit provision, and a 0.34% higher rate than is indicated in this filing.

Turning now to the CAPM, the model begins with the assumption that there is a risk-free asset, which is typically taken to be a U.S. Treasury security. It then estimates the relative risk of alternative securities, measured by their “beta,” to measure the “risk premium” investors require to hold the risky assets. This information is used in the following manner to estimate investors' required rate of return:

$$K = r_f + (\beta \times r_d)$$

where r_f is the risk-free yield, β is the beta coefficient, and r_d is the market risk premium. In this case, we relied on an average of three CAPM estimates, where the different estimates arise from the choices of short-, intermediate- or long-term Treasuries as the risk-free rate.

As regards the estimate of the beta coefficient for the representative sample of 39 publicly traded companies involved in writing workers' compensation in Massachusetts, the beta coefficient for this sample of companies ranges from 0.52 to 1.64, and averages 1.07. This is shown on Section VII-E, Exhibit 3, Page 2.

The WCRIBMA relied on three estimates of the risk-free yield, based on the yields on one-month US Treasury bills, 5-year US Treasury notes and 20-year US Treasury bonds, the standard choices for the riskless security used in practical applications of the CAPM. In implementing this model, we chose to average the yields on these securities for the period from July through September 2021. This procedure obtains a representative estimate of current interest rates, and avoids any anomalous results that

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might arise due to unusual interest rate volatility. During this period the yields on one-month Treasury bills averaged 0.05%, while the yields on 5-year and 20-year Treasuries averaged 0.8% and 1.86% respectively.

Combining the information concerning the recent yields on U.S. Treasury securities, beta coefficients for the Massachusetts workers' compensation insurers, and the historical differential between risk-free and equity investments, our best estimate of investors' required return on equity is 9.45% as shown in Section VII-E, Exhibit 3, Page 1. To illustrate this calculation, consider the results for the short term CAPM below:

$$K = r_f + (\beta \times r_d), \text{ or}$$

$$9.51\% = 0.05\% + (1.07 \times 8.82\%)$$

Each of the other calculations (i.e., the intermediate and long horizon CAPM's) is performed identically. The results from these three models are averaged to produce a 9.45% CAPM cost of capital.

Based on all this information, our single best estimate of the cost of equity capital for Massachusetts workers' compensation insurers is 8.72%, which is the average of the results from the DCF and CAPM analyses.

Finally, consistent with the 2003 Commissioner's decision, the WCRIBMA estimated the share of debt and equity in insurer capital structures, and estimate the cost of debt, so as to calculate a weighted average cost of capital for use in ratemaking.⁵ The details of these calculations are contained in Section VII-E, Exhibit 4 and Section VII-E,

⁵ It is typical in insurance regulation to use the cost of equity capital alone as the target return in ratemaking. Since the cost of debt is lower than the cost of equity, the weighted average cost of capital will be lower than the cost of equity alone, and hence the rate indication is lower as well.

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Exhibit 1. As these exhibits show, debt accounts for approximately 22% of insurer capital, while common equity accounts for 78% of capital.

Given the equity cost, as shown above, of 8.72%, and the debt cost of 1.37%, the weighted average cost of capital is 7.14%, as shown below:

$$(22\% \times 1.37\%) + (78\% \times 8.72\%) = 7.14\%$$

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Exhibit 1

Cost of Capital: Summary Exhibit

(1) Discounted Cash Flow	7.99%
(2) Capital Asset Pricing Model	9.45%
(3) Equity Capital Cost	8.72%
(4) Debt Capital Cost	1.37%
(5) Capital Structure	
(a) Equity Capital Share	78%
(b) Debt Capital Share	22%
(6) Weighted Average Cost of Capital (WACC)	7.14%

Notes:

(1): Exhibit 2, page 1

(2): Exhibit 3, page 1

(3) = [(1) + (2)] / 2.0

(4): Average of three-horizons yields:

Short-Term = 0.08%, the average yield on 1-month Commercial Paper (line (1)' of Section VII-J, Exhibit 2, page 3)

Intermediate-Term = 1.19%, the average yield on 5-year HQM yield (line (15) of Section VII-J, Exhibit 2, page 3)

Long-Term = 2.84%, the average yield on 20-year industrial yield (Section VII-J, Exhibit 2, page 2)

(5): Exhibit 4

(6) = [(3) x (5a)] + [(4) x (5b)]

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Cost of Capital Estimate Using Discounted Cash Flow (DCF) Analysis

$$V_0 = D_0 \sum_{t=1}^{\infty} \left(\frac{1 + g_t}{1 + k} \right)^t = D_1 \sum_{t=1}^{\infty} \frac{(1 + g_t)^{t-1}}{(1 + k)^t}$$

$$\frac{1}{\frac{D_1}{V_0}} = \sum_{t=1}^5 \frac{(1 + g_{ST})^{t-1}}{(1 + k)^t} + (1 + g_{ST})^4 \sum_{t=6}^9 \frac{\prod_{i=1}^{t-5} (1 + g_{IT_i})}{(1 + k)^t}$$

$$+ (1 + g_{ST})^4 (1 + g_{IT_1})(1 + g_{IT_2})(1 + g_{IT_3})(1 + g_{IT_4}) \sum_{t=10}^{\infty} \frac{(1 + g_{LT})^{t-9}}{(1 + k)^t}$$

	Time (t) (1)	Dividend Growth Rate (g) (2)	Discounted Dividends (3)
Stage 1	1	6.07%	
	2	6.07%	
	3	6.07%	
	4	6.07%	
	5	6.07%	4.47
Stage 2	6	5.95%	0.85
	7	5.84%	0.83
	8	5.72%	0.81
	9	5.60%	0.79
Stage 3	≥10	5.49%	33.47
(4) Total Discounted Dividends			41.21
(5) Dividend Yield Rate (D_1/V_0)			2.43%
(6) Cost of Capital (k)			7.99%

Notes:

(2): Stage 1 dividend growth rate is the short-term rate from Page 4.

Stage 2 dividend growth rate is a linear interpolation between dividend growth rate of stage 1 and stage 3.

Stage 3 dividend growth rate is the long-term rate from Page 2.

(3): Stage 1 = $(1.0 - [(1.0 + g_{ST}) / (1.0+k)]^5) / (k-g_{ST})$

Stage 2, Time 6 = $[(1.0 + g_{ST})^4 \times (1.0 + g_{IT1})] / (1.0 + k)^6$

Stage 2, Time 7 = $[(1.0 + g_{ST})^4 \times (1.0 + g_{IT1}) \times (1.0 + g_{IT2})] / (1.0 + k)^7$

Stage 2, Time 8 = $[(1.0 + g_{ST})^4 \times (1.0 + g_{IT1}) \times (1.0 + g_{IT2}) \times (1.0 + g_{IT3})] / (1.0 + k)^8$

Stage 2, Time 9 = $[(1.0 + g_{ST})^4 \times (1.0 + g_{IT1}) \times (1.0 + g_{IT2}) \times (1.0 + g_{IT3}) \times (1.0 + g_{IT4})] / (1.0 + k)^9$

Stage 3 = $[(1.0 + g_{ST})^4 \times (1.0 + g_{IT1}) \times (1.0 + g_{IT2}) \times (1.0 + g_{IT3}) \times (1.0 + g_{IT4}) \times (1.0 + g_{LT})] / [(k-g_{LT}) \times (1.0 + k)^9]$

(5): Page 5

(6): Cost of Capital is calculated using excel function so that $[1.0 / (5)] - (4) = 0$.

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 Exhibit 2
 Page 2

Discounted Cash Flow (DCF) Analysis: Long-Term Dividend Growth Rate

Years (1)	Real Gross Domestic Product (2)	Real Gross Domestic Product Percent Change (3)
1929	1,110.2	
1930	1,015.8	-8.50%
1931	950.7	-6.41%
1932	828.1	-12.90%
1933	817.8	-1.24%
1934	906.2	10.81%
1935	986.9	8.91%
1936	1,114.1	12.89%
1937	1,171.1	5.12%
1938	1,132.3	-3.31%
1939	1,223.2	8.03%
1940	1,331.1	8.82%
1941	1,566.8	17.71%
1942	1,862.8	18.89%
1943	2,179.9	17.02%
1944	2,353.2	7.95%
1945	2,330.2	-0.98%
1946	2,059.8	-11.60%
1947	2,036.2	-1.15%
1948	2,120.0	4.12%
1949	2,108.0	-0.57%
1950	2,291.1	8.69%
1951	2,475.4	8.04%
1952	2,576.7	4.09%
1953	2,697.5	4.69%
1954	2,681.9	-0.58%
1955	2,873.2	7.13%
1956	2,934.4	2.13%
1957	2,996.2	2.11%
1958	2,974.0	-0.74%
1959	3,180.2	6.93%
1960	3,262.1	2.58%
1961	3,345.7	2.56%
1962	3,550.7	6.13%
1963	3,705.3	4.35%
1964	3,918.8	5.76%
1965	4,173.4	6.50%
1966	4,448.7	6.60%
1967	4,570.7	2.74%
1968	4,795.4	4.92%
1969	4,945.2	3.12%
1970	4,954.4	0.19%
1971	5,117.6	3.29%
1972	5,386.7	5.26%
1973	5,690.9	5.65%
1974	5,660.1	-0.54%
1975	5,648.5	-0.20%
1976	5,952.8	5.39%
1977	6,228.1	4.62%
1978	6,572.8	5.53%
1979	6,780.9	3.17%
1980	6,763.5	-0.26%
1981	6,935.2	2.54%
1982	6,810.1	-1.80%
1983	7,122.3	4.58%
1984	7,637.7	7.24%
1985	7,956.2	4.17%

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 Exhibit 2
 Page 2

Discounted Cash Flow (DCF) Analysis: Long-Term Dividend Growth Rate

Years (1)	Real Gross Domestic Product (2)	Real Gross Domestic Product Percent Change (3)
1986	8,231.7	3.46%
1987	8,516.4	3.46%
1988	8,872.2	4.18%
1989	9,198.0	3.67%
1990	9,371.5	1.89%
1991	9,361.3	-0.11%
1992	9,691.1	3.52%
1993	9,957.7	2.75%
1994	10,358.9	4.03%
1995	10,637.0	2.68%
1996	11,038.3	3.77%
1997	11,529.2	4.45%
1998	12,045.8	4.48%
1999	12,623.4	4.80%
2000	13,138.0	4.08%
2001	13,263.4	0.95%
2002	13,488.4	1.70%
2003	13,865.5	2.80%
2004	14,399.7	3.85%
2005	14,901.3	3.48%
2006	15,315.9	2.78%
2007	15,623.9	2.01%
2008	15,643.0	0.12%
2009	15,236.3	-2.60%
2010	15,649.0	2.71%
2011	15,891.5	1.55%
2012	16,254.0	2.28%
2013	16,553.3	1.84%
2014	16,932.1	2.29%
2015	17,390.3	2.71%
2016	17,680.3	1.67%
2017	18,079.1	2.26%
2018	18,606.8	2.92%
2019	19,032.7	2.29%
2020	18,384.7	-3.40%
(4) Average		3.25%
(5) Rate of Expected Inflation		2.17%
(6) Long-Term Dividend Growth Rate		5.49%

Notes:

(2): Bureau of Economic Analysis, Table 1.1.6.

(3) = $[(2)_t / (2)_{t-1}] - 1.0$

(5): Page 3

(6) = $\{ [1.0 + (4)] \times [1.0 + (5)] \} - 1.0$

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Page 3

Discounted Cash Flow (DCF) Analysis: Long-Term Dividend Growth Rate Rate of Expected Inflation

Time Period (1)	Market yield on U.S. Treasury Securities at 10-year Constant Maturity (2)	Inflation Indexed Market yield on U.S. Treasury Securities at 10-year Constant Maturity (3)	Rate of Expected Inflation (4) = (2) - (3)
2020-10	0.79	-0.92	1.71
2020-11	0.87	-0.84	1.71
2020-12	0.93	-0.98	1.91
2021-01	1.08	-1.00	2.08
2021-02	1.26	-0.92	2.18
2021-03	1.61	-0.66	2.27
2021-04	1.64	-0.71	2.35
2021-05	1.62	-0.85	2.47
2021-06	1.52	-0.82	2.34
2021-07	1.32	-1.01	2.33
2021-08	1.28	-1.07	2.35
2021-09	1.37	-0.97	2.34
Average			2.17%

Source: Federal Reserve Statistical Release, H.15.

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Discounted Cash Flow (DCF) Analysis: Short-Term Dividend Growth Rate

(1) Growth Forecast { = [(a) + (b)] / 2.0 }	5.30
(a) Dividend Component	6.39
(b) Earnings Component	4.21
(2) Fundamental Analysis [= (a) + (b)]	6.84
(a) Retention to book	6.78
(b) Stock issuance factor	0.06
(3) Short-Term Dividend Growth Rate { = [(1) + (2)] / 2.0 }	6.07

Notes:

- (1a): Page 5, average of columns (3) through (5)
- (1b): Page 5, average of columns (6) through (8)
- (2a): Page 5, average of columns (9) through (11)
- (2b): Page 5, column (15)

Discounted Cash Flow (DCF) Analysis: Parameter Estimation

Companies (1)	Dividend Yield (2)	Average Dividend Growth Rate			Average Earnings Growth Rate			Average Earnings Retention Rates Retained Earnings as a Percent of Common Equity			Stock Issuance Adjustment Factor			
		Annual Rate of Change			Annual Rate of Change			Past 10 Years (9)	Past 5 Years (10)	Forecast (11)	2021 Shares (12)	2024 - 2026 Shares (13)	2024 - 2026 Market/ Book (14)	Stock Issuance Adjustment Factor (15)
		Past 10 Years (3)	Past 5 Years (4)	Forecast (5)	Past 10 Years (6)	Past 5 Years (7)	Forecast (8)							
ALLIANZ US PC INSURANCE COMPANIES	4.8	NA	NA	NA	NA	NA	0.00	NA	NA	NA	0.00	0.00	0.00	NA
AMERICAN FINANCIAL GROUP INC	1.5	12.00	12.50	8.00	7.50	12.00	6.50	8.42	9.90	9.00	85.00	85.00	1.34	0.00
AMERICAN INTERNATIONAL GROUP	2.7	NA	20.50	7.00	NA	-17.00	31.50	4.52	3.30	6.50	860.00	750.00	1.03	-0.10
AMERICAN NATIONAL GROUP	3.2	NA	1.00	NA	NA	10.50	NA	4.48	5.16	NA	0.00	0.00	0.00	NA
AMERISAFE INC	2.1	NA	16.00	NA	NA	8.00	10.00	5.11	0.85	NA	0.00	0.00	0.00	NA
AMERITRUST GROUP	2.5	NA	NA	NA	NA	NA	0.00	NA	NA	NA	0.00	0.00	0.00	NA
ARCH CAPITAL GROUP LTD	0.0	NA	NA	0.00	5.50	5.00	16.00	9.36	7.58	11.50	395.00	395.00	1.49	0.00
ARGO GROUP	2.4	NA	18.00	4.00	NA	NA	NMF	6.23	4.10	7.50	34.50	32.00	0.97	0.06
BERKLEY (W R) CORP	0.7	10.00	8.50	7.00	4.50	3.50	14.50	7.45	6.78	11.50	180.00	180.00	1.55	0.00
BERKSHIRE HATHAWAY	0.0	NA	NA	0.00	6.00	12.00	6.00	6.94	6.08	6.50	2450.00	2450.00	1.20	0.00
CHUBB LTD	1.7	9.50	4.00	4.00	1.50	-1.50	12.50	6.78	5.46	8.50	430.00	400.00	1.40	-0.72
CINCINNATI FINANCIAL CORP	2.0	3.50	3.50	5.50	8.00	3.50	17.50	2.60	2.24	7.50	161.00	160.00	2.36	-0.21
CNA FINANCIAL CORP	3.5	NA	8.50	4.00	2.00	1.00	13.50	4.18	4.26	8.50	272.00	275.00	1.70	0.19
EMPLOYERS HOLDINGS INC	2.5	NA	30.00	NA	NA	10.00	10.00	11.11	9.90	NA	0.00	0.00	0.00	NA
EVEREST RE GROUP	2.5	11.50	13.00	2.50	2.50	-10.00	11.00	8.89	6.05	6.50	40.00	42.00	0.80	-0.25
EXXON MOBIL	6.3	7.50	5.00	1.00	-17.00	-31.00	NMF	9.66	2.05	4.00	4233.00	4233.00	NA	NA
FAIRFAX FINANCIAL (USA) GROUP	2.5	NA	NA	NA	NA	NA	0.00	NA	NA	NA	0.00	0.00	0.00	NA
GENERAL ELECTRIC	0.3	-15.00	-29.00	5.00	-10.00	-22.00	15.00	6.19	6.08	14.50	1100.00	1100.00	NA	NA
HANOVER INSURANCE GROUP INC	2.0	13.00	10.00	6.50	9.00	8.00	10.00	6.20	6.04	8.00	36.00	36.00	1.26	0.00
HARTFORD FINANCIAL	2.3	3.50	13.00	8.00	8.50	9.00	8.50	7.02	7.88	8.00	340.00	325.00	0.80	0.22
HDI/TALANX US PC GROUP	3.6	NA	NA	NA	NA	NA	0.00	NA	NA	NA	0.00	0.00	0.00	NA
INTACT US INSURANCE GROUP	2.0	NA	NA	NA	NA	NA	0.00	NA	NA	NA	0.00	0.00	0.00	NA
JAMES RIVER GROUP	3.2	NA	30.50	2.50	NA	-7.00	22.50	4.48	3.80	7.50	31.00	31.00	1.69	0.00
MARKEL CORP	0.0	NA	NA	0.00	9.00	19.50	6.50	5.66	6.90	6.50	14.00	14.00	1.29	0.00
MS&AD US INSURANCE GROUP	4.5	NA	NA	NA	NA	NA	0.00	NA	NA	NA	0.00	0.00	0.00	NA
NATIONAL HEALTHCARE	3.2	NA	8.50	NA	NA	1.50	NA	4.78	3.56	NA	0.00	0.00	0.00	NA
OLD REPUBLIC INTL CORP	3.3	1.50	2.00	7.00	NA	12.00	12.50	4.48	5.18	8.50	305.00	310.00	1.75	0.31
PROASSURANCE CORP	0.8	NA	-3.50	NA	NA	NA	27.30	7.15	2.20	NA	0.00	0.00	0.00	NA
QBE NORTH AMERICA INSURANCE GROUP	1.2	NA	NA	NA	NA	NA	0.00	NA	NA	NA	0.00	0.00	0.00	NA
RLI CORP	0.9	5.50	5.00	4.00	-0.50	-1.50	12.00	8.16	6.52	8.00	45.00	45.00	2.35	0.00
SAMSUNG F & M INSURANCE CO	3.7	NA	NA	NA	NA	NA	0.00	NA	NA	NA	0.00	0.00	0.00	NA
SELECTIVE INS GROUP INC	1.2	5.00	9.00	10.00	11.50	13.50	12.00	7.39	8.88	11.00	60.00	65.00	1.78	1.58
SOMPO HOLDINGS US GROUP	3.8	NA	NA	NA	NA	NA	0.00	NA	NA	NA	0.00	0.00	0.00	NA
STATE AUTO FINANCIAL CORP	0.8	NA	NA	NA	NA	-13.50	8.00	5.56	3.90	NA	0.00	0.00	0.00	NA
TOKIO MARINE US PC GROUP	4.2	NA	NA	NA	NA	NA	0.00	NA	NA	NA	0.00	0.00	0.00	NA
TRAVELERS COS INC	2.2	9.50	8.00	2.50	5.00	-1.50	8.00	7.91	6.94	7.00	250.00	250.00	1.40	0.00
TREAN INSURANCE GROUP	0.0	NA	NA	NA	NA	NA	0.00	NA	NA	NA	0.00	0.00	0.00	NA
XL REINSURANCE AMERICA GROUP	5.9	NA	NA	NA	NA	NA	0.00	NA	NA	NA	0.00	0.00	0.00	NA
ZURICH INSURANCE US PC GROUP	4.9	NA	NA	NA	NA	NA	0.00	NA	NA	NA	0.00	0.00	0.00	NA
Average	2.43	5.92	8.82	4.43	3.31	1.00	8.32	6.57	5.45	8.33				0.06

Notes:

Sources: Value Line Investment Survey, Part 3, The Ratings & Reports (VL)
 Value Line Investment Survey, Part 2, Small and Mid Cap Edition (VLSM)
<http://finance.yahoo.com> (data available in September 2021)

(2): The dividend yields needed for the DCF Analysis relate dividends at time 1, D₁, to stock prices at time 0, P₀. Dividend yields from VLIS, Small and Mid Cap Edition, must be adjusted because they are derived from the ratio of dividends at time 0, D₀, to stock price at time zero, P₀. D₁ is estimated from D₀ as follows:

$$D_1 = D_0 \times [1.0 + (0.5 \times \text{Dividend Growth Rate})] \quad \text{where Dividend Growth Rate} = 6.07\% \text{ from Page 4.}$$

(3) - (10): Data available only at Value Line Investment Surveys.

(11) - (14): Data available only at Value Line Investment Survey, Part 3.

(12), (13): in millions.

(15) = [(14) - 1.0] x { [(13) / (12)]^t - 1.0 } x 100, where t is 0.25 for the years between midyear 2022 and midyear 2026.

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Section VII - Profit
Subsection E - Cost of Capital
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Section VII - E
Exhibit 3
Page 1

Cost of Capital Estimate Using Capital Asset Pricing Model Analysis

$$\text{Cost of Capital: } K = r_f + (\beta \times r_d)$$

Time Horizon (1)	Risk-Free Yield (r_f) (2)	Market Risk Premium (r_d) (3)	Beta Coefficient (β) (4)	Estimated Cost of Capital (K) (5)
Short-Term	0.05	8.82	1.07	9.51
Intermediate-Term	0.80	7.83	1.07	9.20
Long-Term	1.86	7.25	1.07	9.64
Average	0.90	7.97	1.07	9.45

Notes:

(2): Section VII-J, Exhibit 2, page 3

Short-Term = average yield on 1-month U.S. Treasury Constant Maturities (line (2))

Intermediate-Term = average yield on 5-year U.S. Treasury (line (8))

Long-Term = average yield on 20-year U.S. Treasury (line (11))

(3): Section VII-J, Exhibit 4

Short-Term = S&P 500 total returns minus U.S. Treasury Bill total returns

Intermediate-Term = S&P 500 total returns minus Intermediate-Term Government Bonds income returns

Long-Term = S&P 500 total returns minus Long-Term Government Bonds income returns

(4): Average Beta Coefficient (Page 2).

(5) = (2) + [(4) x (3)]

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Exhibit 3
Page 2

Capital Asset Pricing Model - Beta Coefficient

<u>Companies</u>	<u>Beta Coefficients</u>
ALLIANZ US PC INSURANCE COMPANIES	1.3
AMERICAN FINANCIAL GROUP INC	1.4
AMERICAN INTERNATIONAL GROUP	1.5
AMERICAN NATIONAL GROUP	1.2
AMERISAFE INC	0.8
AMERITRUST GROUP	1.0
ARCH CAPITAL GROUP LTD	1.3
ARGO GROUP	1.0
BERKLEY (W R) CORP	1.1
BERKSHIRE HATHAWAY	1.0
CHUBB LTD	1.1
CINCINNATI FINANCIAL CORP	1.2
CNA FINANCIAL CORP	1.2
EMPLOYERS HOLDINGS INC	0.8
EVEREST RE GROUP	1.0
EXXON MOBIL	1.2
FAIRFAX FINANCIAL (USA) GROUP	1.1
GENERAL ELECTRIC	1.3
HANOVER INSURANCE GROUP INC	1.0
HARTFORD FINANCIAL	1.2
HDI/TALANX US PC GROUP	1.1
INTACT US INSURANCE GROUP	0.7
JAMES RIVER GROUP	0.9
MARKEL CORP	1.2
MS&AD US INSURANCE GROUP	0.6
NATIONAL HEALTHCARE	0.7
OLD REPUBLIC INTL CORP	1.2
PROASSURANCE CORP	0.7
QBE NORTH AMERICA INSURANCE GROUP	1.2
RLI CORP	0.8
SAMSUNG F & M INSURANCE CO	0.7
SELECTIVE INS GROUP INC	0.9
SOMPO HOLDINGS US GROUP	0.6
STATE AUTO FINANCIAL CORP	0.7
TOKIO MARINE US PC GROUP	0.5
TRAVELERS COS INC	1.0
TREAN INSURANCE GROUP	NA
XL REINSURANCE AMERICA GROUP	1.6
ZURICH INSURANCE US PC GROUP	0.7
Weighted Average	1.07

Notes:

Sources: Value Line Investment Survey, Part 3, The Ratings & Reports (VL)
Value Line Investment Survey, Part 2, Small and Mid Cap Edition (VLSM)
<http://finance.yahoo.com> (data available in September 2021)

Weighted by direct premiums written.

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Section VII - Profit
Subsection E - Cost of Capital
7/1/2022

Section VII - E
Exhibit 4

Capital Structure Ratios of Property-Casualty Insurance Companies

Companies (1)	Total Debt \$ in millions (2)	Preferred Stock \$ in millions (3)	Total Debt Capital =(2) + (3) (4)	Common Equity \$ in millions (5)	Equity Capital Share (6)	Debt Capital Share (7)
ALLIANZ US PC INSURANCE COMPANIES	35,524.0	0.0	35,524.0	79,949.2	0.69	0.31
AMERICAN FINANCIAL GROUP INC	1,963.0	0.0	1,963.0	11,329.4	0.85	0.15
AMERICAN INTERNATIONAL GROUP	35,600.0	0.0	35,600.0	46,791.0	0.57	0.43
AMERICAN NATIONAL GROUP	153.7	0.0	153.7	5,128.7	0.97	0.03
AMERISAFE INC	0.0	0.0	0.0	1,082.1	1.00	0.00
AMERITRUST GROUP	250,871.8	0.0	250,871.8	82,479.5	0.25	0.75
ARCH CAPITAL GROUP LTD	3,017.4	1,280.0	4,297.4	15,680.0	0.78	0.22
ARGO GROUP	458.3	0.0	458.3	1,795.7	0.80	0.20
BERKLEY (W R) CORP	2,919.1	0.0	2,919.1	12,987.4	0.82	0.18
BERKSHIRE HATHAWAY	116,895.0	0.0	116,895.0	500,485.2	0.81	0.19
CHUBB LTD	14,954.0	308.0	15,262.0	79,305.6	0.84	0.16
CINCINNATI FINANCIAL CORP	907.0	0.0	907.0	19,102.4	0.95	0.05
CNA FINANCIAL CORP	2,777.0	0.0	2,777.0	11,698.3	0.81	0.19
EMPLOYERS HOLDINGS INC	20.0	0.0	20.0	1,138.5	0.98	0.02
EVEREST RE GROUP	1,910.6	0.0	1,910.6	10,297.5	0.84	0.16
EXXON MOBIL	60,612.0	0.0	60,612.0	233,677.9	0.79	0.21
FAIRFAX FINANCIAL (USA) GROUP	10,266.1	0.0	10,266.1	11,640.8	0.53	0.47
GENERAL ELECTRIC	71,400.0	6.0	71,406.0	112,614.6	0.61	0.39
HANOVER INSURANCE GROUP INC	781.2	0.0	781.2	4,821.5	0.86	0.14
HARTFORD FINANCIAL	4,353.0	0.0	4,353.0	24,613.9	0.85	0.15
HDI/TALANX US PC GROUP	6,188.0	0.0	6,188.0	9,619.5	0.61	0.39
INTACT US INSURANCE GROUP	3,488.0	0.0	3,488.0	23,937.4	0.87	0.13
JAMES RIVER GROUP	366.4	0.0	366.4	1,071.8	0.75	0.25
MARKEL CORP	4,160.2	0.0	4,160.2	16,955.6	0.80	0.20
MS&AD US INSURANCE GROUP	809,093.0	0.0	809,093.0	19,190.8	0.02	0.98
NATIONAL HEALTHCARE	15.0	0.0	15.0	1,085.6	0.99	0.01
OLD REPUBLIC INTL CORP	1,590.1	0.0	1,590.1	7,409.6	0.82	0.18
PROASSURANCE CORP	284.7	0.0	284.7	1,302.3	0.82	0.18
QBE NORTH AMERICA INSURANCE GROUP	3,386.0	0.0	3,386.0	17,332.3	0.84	0.16
RLI CORP	149.6	0.0	149.6	4,739.3	0.97	0.03
SAMSUNG F & M INSURANCE CO	0.0	1.7	1.7	8,631,161.0	1.00	0.00
SELECTIVE INS GROUP INC	550.9	0.0	550.9	4,814.5	0.90	0.10
SOMPO HOLDINGS US GROUP	529,591.0	0.0	529,591.0	16,200.9	0.03	0.97
STATE AUTO FINANCIAL CORP	122.1	0.0	122.1	2,232.8	0.95	0.05
TOKIO MARINE US PC GROUP	230,597.0	0.0	230,597.0	36,299.9	0.14	0.86
TRAVELERS COS INC	7,290.0	0.0	7,290.0	39,207.8	0.84	0.16
TREAN INSURANCE GROUP	38.5	0.0	38.5	525.0	0.93	0.07
XL REINSURANCE AMERICA GROUP	28,403.0	0.0	28,403.0	66,038.1	0.70	0.30
ZURICH INSURANCE US PC GROUP	15,997.0	0.0	15,997.0	63,398.8	0.80	0.20
(8) Weighed Average					0.78	0.22

Notes:

Sources: Value Line Investment Survey, Part 3, The Ratings & Reports (VL), September 3, 2021
Value Line Investment Survey, Part 2, Small and Mid Cap Edition (VLSM), August 27, 2021
If no information for a specific company in the above sources, use 'Yahoo Finance'.

(5) = (outstanding shares) * (one month average share price)
One month (Aug 30, 2021 - Sep 27, 2021) average share price from 'Yahoo Finance'

Value Line doesn't have debt information for Berkshire Hathaway. 'Yahoo Finance' used instead.

(6) = (5) / [(4) + (5)]

(7) = 1.0 - (6)

(8): Weighted by direct premiums written.

Loss & LAE and Unearned Premium Reserves to Surplus Ratio

Company	Loss & LAE and Unearned Premium Reserves (\$000)					Surplus (\$000)					Leverage Ratio				
	2020	2019	2018	2017	2016	2020	2019	2018	2017	2016	2020	2019	2018	2017	2016
(1)	(2)					(3)					(4) = (2) / (3)				
018674 Travelers Group (G)	56,497	53,741	51,786	50,125	48,359	21,558	20,680	20,207	19,903	20,249	2.62	2.60	2.56	2.52	2.39
018555 A.I.M. Mutual Insurance Companies (G)	365	351	336	332	325	319	295	258	237	215	1.14	1.19	1.30	1.40	1.51
000048 Hartford Insurance Group (G)	30,110	28,987	28,001	27,005	25,877	13,998	13,383	11,253	12,516	15,317	2.15	2.17	2.49	2.16	1.69
000060 Liberty Mutual Insurance Companies (G)	64,670	59,095	56,051	54,344	48,802	22,841	20,556	19,813	17,570	20,200	2.83	2.87	2.83	3.09	2.42
018498 Chubb INA Group (G)	40,278	35,571	34,027	30,970	32,596	17,722	17,646	18,647	17,691	17,837	2.27	2.02	1.82	1.75	1.83
018540 American International Group (G)	35,391	38,572	42,359	49,829	58,115	18,467	17,855	17,908	22,078	22,501	1.92	2.16	2.37	2.26	2.58
018549 Zurich Insurance US PC Group (G)	16,269	16,495	17,696	18,429	18,558	6,958	7,406	6,873	7,272	7,872	2.34	2.23	2.57	2.53	2.36
000811 Berkshire Hathaway Insurance Group (G)	93,002	86,021	78,905	72,444	61,701	237,308	216,255	160,938	171,554	137,180	0.39	0.40	0.49	0.42	0.45
018396 Charter Insurance Group (G)	100	98	107	117	124	84	81	69	68	65	1.20	1.22	1.56	1.74	1.92
000734 Old Republic Insurance Group (G)	6,858	6,621	6,593	6,438	6,434	4,079	4,120	3,713	3,766	3,581	1.68	1.61	1.78	1.71	1.80
018252 W. R. Berkley Insurance Group (G)	14,287	12,999	12,351	12,102	11,810	6,186	6,010	5,590	5,482	5,495	2.31	2.16	2.21	2.21	2.15
018313 CNA Insurance Companies (G)	33,334	32,312	32,209	32,250	32,449	10,704	10,775	10,392	10,700	10,748	3.11	3.00	3.10	3.01	3.02
018533 AmTrust Group (G)	5,098	5,123	5,117	4,638	3,665	2,210	2,128	2,164	2,092	2,076	2.31	2.41	2.36	2.22	1.77
004861 Hanover Ins Group Prop & Cas Cos (G)	6,830	6,453	6,103	5,748	5,304	2,589	2,470	2,171	2,074	2,173	2.64	2.61	2.81	2.77	2.44
018524 MEMIC Group (G)	949	912	904	828	749	488	470	424	439	415	1.95	1.94	2.13	1.89	1.80
018220 Arbella Insurance Group (G)	868	886	879	864	870	837	736	651	622	559	1.04	1.20	1.35	1.39	1.56
004202 Utica National Insurance Group (G)	2,121	1,968	1,849	1,764	1,673	1,257	1,139	1,021	990	924	1.69	1.73	1.81	1.78	1.81
003926 Selective Insurance Group (G)	5,129	4,855	4,610	4,364	4,179	2,125	1,932	1,768	1,673	1,584	2.41	2.51	2.61	2.61	2.64
005658 QBE North America Insurance Group (G)	3,650	3,394	3,128	2,831	2,822	1,625	1,718	1,741	1,640	1,844	2.25	1.98	1.80	1.73	1.53
018484 Arch Insurance Group (G)	5,213	3,918	3,183	2,186	3,581	1,978	1,779	1,975	2,923	2,769	2.64	2.20	1.61	0.75	1.29
000086 Sentry Insurance Group (G)	5,119	4,815	4,510	4,271	4,109	6,533	6,001	5,450	5,174	4,752	0.78	0.80	0.83	0.83	0.86
018132 Ameritrust Group (G)	1,277	1,222	1,231	1,261	1,273	673	633	580	564	508	1.90	1.93	2.12	2.24	2.50
003116 Fairfax Financial (USA) Group (G)	15,700	14,180	13,098	12,179	11,793	7,469	7,037	6,650	6,921	6,853	2.10	2.01	1.97	1.76	1.72
004284 Federated Mutual Group (G)	3,398	2,948	2,636	2,345	2,184	3,975	3,778	3,404	3,307	3,114	0.85	0.78	0.77	0.71	0.70
018756 Starr International Group (G)	3,998	3,554	3,033	2,792	2,368	2,379	2,187	2,024	1,875	1,922	1.68	1.63	1.50	1.49	1.23
000706 Norfolk & Dedham Group Pool (G)	318	310	299	272	240	406	362	316	322	296	0.78	0.86	0.95	0.84	0.81
018943 AU Holding Company Group (G)	716	700	665	569	428	953	926	874	960	826	0.75	0.76	0.76	0.59	0.52
005686 Protective Insurance Corporation Group (S)	716	645	540	410	338	346	371	395	420	398	2.07	1.74	1.37	0.97	0.85
002947 American National Prop & Cas Group (G)	1,656	1,596	1,532	1,433	1,352	1,463	1,330	1,184	1,163	1,075	1.13	1.20	1.29	1.23	1.26
000346 EMC Insurance Companies (G)	3,182	2,898	2,795	2,669	2,567	1,566	1,575	1,662	1,713	1,633	2.03	1.84	1.68	1.56	1.57
018733 Tokio Marine US PC Group (G)	18,192	16,934	15,617	14,682	13,459	9,351	8,923	8,635	8,041	7,661	1.95	1.90	1.81	1.83	1.76
000174 Arrow Mutual Liability Insurance Company	10	10	11	12	12	32	32	31	30	30	0.33	0.32	0.37	0.39	0.41
005696 Everest Re U.S. Group (G)	9,752	7,814	7,012	4,971	4,741	5,276	3,739	3,651	3,392	3,635	1.85	2.09	1.92	1.47	1.30
000124 American Family Insurance Group (G)	12,975	12,480	11,519	10,200	9,684	7,489	7,007	7,739	8,490	8,755	1.73	1.78	1.49	1.20	1.11
018602 Employers Insurance Group (G)	1,842	1,970	2,017	2,031	2,016	1,046	1,021	928	892	829	1.76	1.93	2.17	2.28	2.43
018717 Skyward Specialty Insurance Group (G)	533	509	416	388	424	342	338	264	266	266	1.56	1.51	1.57	1.46	1.60
018949 GE Capital PC Group (G)	718	783	828	874	873	402	410	420	507	549	1.78	1.91	1.97	1.72	1.59
018468 Market Corporation Group (G)	8,497	7,593	6,191	5,805	5,353	4,187	3,726	3,203	3,492	3,224	2.03	2.04	1.93	1.66	1.66
018557 XL Reinsurance America Group (G)	8,200	7,056	6,984	5,718	4,777	2,869	2,462	2,512	2,480	2,480	2.86	2.87	2.78	2.31	1.93
018385 Service Insurance Group (G)	157	146	157	163	161	156	145	132	130	125	1.01	1.01	1.19	1.25	1.29
004835 Great American P & C Insurance Group (G)	8,966	8,468	8,038	7,646	7,050	3,643	3,342	2,865	2,725	2,941	2.46	2.53	2.81	2.81	2.40
000590 Merchants Insurance Group (G)	506	456	420	408	393	267	244	225	203	190	1.89	1.87	1.87	2.00	2.06
018878 Sompo Holdings US Group (G)	5,044	3,722	3,187	2,340	2,030	2,423	2,028	2,127	1,840	1,733	2.08	1.84	1.50	1.27	1.17
000246 Central Insurance Companies (G)	976	918	863	790	756	893	897	809	822	743	1.09	1.02	1.07	0.96	1.02
000419 ProSight Specialty Group (G)	1,782	1,712	1,545	1,286	961	668	569	474	434	355	2.67	3.01	3.26	2.96	2.70
004019 Argo Group (G)	2,326	2,061	1,784	1,565	1,421	1,072	1,051	1,005	993	887	2.17	1.96	1.78	1.58	1.60
018680 AF Group (G)	2,768	2,596	2,387	2,237	1,936	1,213	1,087	937	995	897	2.28	2.39	2.55	2.25	2.16
018458 Intact US Insurance Group (G)	1,745	1,557	1,546	1,398	1,388	823	961	819	808	805	2.12	1.62	1.89	1.73	1.72
013103 Work First Casualty Company	43	40	37	31	28	25	21	18	15	13	1.75	1.93	2.06	2.07	2.24
004294 The Cincinnati Insurance Companies (G)	9,013	8,225	7,906	7,418	7,003	5,838	5,620	4,919	5,094	4,686	1.54	1.46	1.61	1.46	1.49
018922 Benchmark Insurance Group (G)	172	137	121	103	83	186	148	129	114	102	0.93	0.93	0.94	0.91	0.81

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Loss & LAE and Unearned Premium Reserves to Surplus Ratio

Company	Loss & LAE and Unearned Premium Reserves (\$000)					Surplus (\$000)					Leverage Ratio				
	2020	2019	2018	2017	2016	2020	2019	2018	2017	2016	2020	2019	2018	2017	2016
(1)	(2)					(3)					(4) = (2) / (3)				
005987 Nationwide Group (G)	24,332	23,567	23,992	24,855	24,183	16,484	15,749	14,478	14,741	15,538	1.48	1.50	1.66	1.69	1.56
018887 Church Mutual Insurance Group (G)	1,263	1,170	1,118	947	887	743	679	619	704	695	1.70	1.72	1.80	1.35	1.28
018780 Core Specialty Insurance Group (G)	657	564	382	191	215	791	192	156	145	109	0.83	2.94	2.45	1.32	1.97
018782 MS&AD US Insurance Group (G)	750	740	729	713	698	1,489	1,144	559	545	498	0.50	0.65	1.30	1.31	1.40
000856 State Auto Insurance Companies (G)	2,686	2,619	2,664	2,878	2,773	1,210	1,247	1,138	1,133	1,166	2.22	2.10	2.34	2.54	2.38
018429 Allianz US PC Insurance Companies (G)	5,905	6,467	5,833	6,134	6,599	2,831	2,798	3,094	2,669	2,751	2.09	2.31	1.89	2.30	2.40
018923 Pharmacists Mutual Insurance Group (G)	215	187	167	159	159	172	176	138	131	115	1.25	1.07	1.22	1.21	1.38
004071 Amerisure Companies (G)	1,830	1,843	1,787	1,754	1,691	1,080	1,008	984	983	938	1.69	1.83	1.82	1.79	1.80
018626 James River Group (G)	435	432	361	297	240	286	267	242	219	185	1.52	1.62	1.49	1.35	1.30
003918 GuideOne Insurance Companies (G)	948	838	870	963	914	442	456	433	442	516	2.15	1.84	2.01	2.18	1.77
012124 Premier Group Insurance Company	18	17	17	17	17	36	39	40	39	35	0.51	0.45	0.43	0.43	0.48
000221 Brotherhood Mutual Insurance Company	474	436	397	314	294	298	280	241	266	245	1.59	1.56	1.65	1.18	1.20
018437 Quincy Mutual Group (G)	547	497	481	391	334	1,297	1,235	1,109	1,191	1,080	0.42	0.40	0.43	0.33	0.31
003883 RLI Group (G)	1,779	1,636	1,522	1,363	1,233	1,122	1,030	830	865	860	1.59	1.59	1.83	1.58	1.43
012138 Cherokee Insurance Company	399	374	345	322	290	289	227	186	198	181	1.38	1.65	1.85	1.63	1.61
002967 ICW Pool (G)	2,390	2,050	1,785	1,617	1,427	1,290	1,301	1,109	1,034	905	1.85	1.58	1.61	1.56	1.58
018211 AMERISAFE Insurance Group (G)	784	818	840	844	827	366	360	384	382	394	2.15	2.27	2.19	2.21	2.10
018559 ProAssurance Group (G)	3,214	3,024	2,668	2,682	2,742	1,421	1,488	1,778	1,906	2,229	2.26	2.03	1.50	1.41	1.23
018894 WCF Insurance Group (G)	1,233	1,170	1,142	1,117	1,095	1,074	1,041	946	935	882	1.15	1.12	1.21	1.20	1.24
000769 Petroleum Casualty Company	7	7	7	9	10	22	23	24	23	24	0.33	0.31	0.30	0.40	0.40
018067 American Contractors Insurance Group (G)	325	323	295	284	279	181	174	160	153	143	1.79	1.86	1.85	1.85	1.94
000088 State Farm Group (G)	66,417	64,820	65,737	66,649	62,758	126,077	116,308	100,887	97,134	87,695	0.53	0.56	0.65	0.69	0.72
011021 Samsung F & M Insurance Co, Ltd USB	63	78	108	126	163	78	73	68	58	72	0.80	1.07	1.58	2.19	2.28
018940 MAG Mutual Companies (G)	941	817	787	775	741	847	925	877	944	1,015	1.11	0.88	0.90	0.82	0.73
018392 The Gray Insurance Group (G)	209	210	186	175	168	152	133	128	119	113	1.38	1.58	1.46	1.47	1.49
000964 West Bend Mutual Insurance Company	1,814	1,672	1,577	1,498	1,423	1,401	1,231	1,138	1,041	947	1.30	1.36	1.39	1.44	1.50
000766 Penn National Insurance Companies (G)	1,061	1,041	1,056	1,043	1,007	718	664	591	587	624	1.48	1.57	1.79	1.78	1.61
018907 HDI/Talanx US PC Group (G)	728	521	252	37	36	246	227	216	188	139	2.97	2.30	1.17	0.19	0.26
018392 Gray Insurance Group (G)	214	189	178	172	182	133	128	119	113	105	1.61	1.48	1.50	1.52	1.73
											2020	2019	2018	2017	2016
(5): Premium Weighted Leverage Ratio											1.95	1.94	2.03	1.98	1.89
(6): Selected Leverage Ratio															1.96

Notes:
 Source: A.M. Best's Global Insurance Database for all Massachusetts Workers' Compensation Group Companies.
 (5): Premium Weighted Leverage Ratio use Direct Premiums Written from Section VII - J, Exhibit 5.
 (6): Selected Leverage Ratio is equal to five year average.

Single Policy
 Determination of Selected Premium Flow From Premium Collection Special Call

Time Interval		Net Premium Ranges									Weighted Average Selected Collection Pattern (12)
		0 - 9,999			10,000 - 199,999			200,000 +			
		Actual Premium Collection Pattern		Weight (5)	Actual Premium Collection Pattern		Weight (8)	Actual Premium Collection Pattern		Weight (11)	
From (1)	To (2)	Actual (3)	Selected (4)		Actual (6)	Selected (7)		Actual (9)	Selected (10)		
07/01/21	09/30/21	0.0%	0.0%	23.9%	0.1%	0.0%	50.2%	0.0%	0.0%	25.9%	0.0%
10/01/21	12/31/21	0.0%	0.0%	23.9%	0.0%	0.0%	50.2%	0.2%	0.0%	25.9%	0.0%
01/01/22	03/31/22	0.1%	0.0%	23.9%	0.1%	0.0%	50.2%	0.0%	0.0%	25.9%	0.0%
04/01/22	06/30/22	11.2%	11.2%	23.9%	2.7%	2.7%	50.2%	1.1%	1.0%	25.9%	4.3%
07/01/22	09/30/22	38.1%	38.1%	23.9%	34.5%	34.5%	50.2%	37.8%	37.8%	25.9%	36.2%
10/01/22	12/31/22	22.6%	22.6%	23.9%	26.0%	26.0%	50.2%	22.4%	22.4%	25.9%	24.3%
01/01/23	03/31/23	15.4%	15.4%	23.9%	20.5%	20.5%	50.2%	20.1%	20.1%	25.9%	19.2%
04/01/23	06/30/23	4.0%	4.0%	23.9%	5.7%	5.7%	50.2%	7.4%	7.5%	25.9%	5.8%
07/01/23	09/30/23	2.2%	2.2%	23.9%	1.8%	1.8%	50.2%	3.1%	3.0%	25.9%	2.2%
10/01/23	12/31/23	2.8%	2.8%	23.9%	4.0%	4.0%	50.2%	5.6%	5.6%	25.9%	4.1%
01/01/24	03/31/24	1.9%	1.9%	23.9%	2.2%	2.2%	50.2%	1.9%	1.9%	25.9%	2.1%
04/01/24	06/30/24	1.1%	1.1%	23.9%	1.2%	1.5%	50.2%	0.2%	0.5%	25.9%	1.1%
07/01/24	09/30/24	0.1%	0.7%	23.9%	0.2%	1.1%	50.2%	0.0%	0.2%	25.9%	0.8%
10/01/24	12/31/24	0.0%	0.0%	23.9%	0.1%	0.0%	50.2%	0.1%	0.0%	25.9%	0.0%
01/01/25	03/31/25	0.0%	0.0%	23.9%	0.0%	0.0%	50.2%	0.1%	0.0%	25.9%	0.0%
04/01/25	06/30/25	0.0%	0.0%	23.9%	0.0%	0.0%	50.2%	0.0%	0.0%	25.9%	0.0%
07/01/25	09/30/25	0.2%	0.0%	23.9%	0.2%	0.0%	50.2%	0.0%	0.0%	25.9%	0.0%
10/01/25	12/31/25	0.2%	0.0%	23.9%	0.4%	0.0%	50.2%	0.0%	0.0%	25.9%	0.0%
01/01/26	03/31/26	0.1%	0.0%	23.9%	0.3%	0.0%	50.2%	0.0%	0.0%	25.9%	0.0%
Total											100.0%

Notes:

(5), (8), (11) are calculated using Unit Statistical Plan data for PY 2018.

(3), (6), (9) are from the premium collection special call.

(12) = [(4) x (5)] + [(7) x (8)] + [(10) x (11)]

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Section VII - Profit
Subsection H - Expense Weights
7/1/2022

Section VII - H
Exhibit 1

Cash Flow Weights

Item of Expense Allowance (% of Standard Premium plus ARAP)	Policy Year		Average
	2017	2018	
(1) Expected Losses	60.86%	60.04%	60.45%
(2) Expected Loss Adjustment Expense (LAE):	11.36%	11.21%	11.28%
(a) Defense and Cost Containment Expense	5.17%	5.10%	5.14%
(b) Adjusting and Other Expense	6.19%	6.11%	6.15%
(3) Expected Losses + Expected LAE [= (1) + (2)]	72.22%	71.25%	71.73%
(4) Fixed Expenses	5.86%	5.83%	5.85%
(a) General Expenses	5.54%	5.51%	5.53%
(b) Miscellaneous and Other Taxes	0.32%	0.32%	0.32%
(5) Variable Expenses [= (5a) + (5b) + (5c)]	20.33%	20.33%	20.33%
(a) Total Acquisition	12.70%	12.70%	12.70%
(i) Commissions	9.34%	9.34%	9.34%
(ii) Other Acquisition	2.36%	2.36%	2.36%
(iii) Reinsurance Expenses	1.00%	1.00%	1.00%
(iv) Incidental Income and Earned but Uncollected Premium	0.00%	0.00%	0.00%
(b) Premium Tax	2.16%	2.16%	2.16%
(c) Premium Discount	5.48%	5.48%	5.48%
(6) Total Expenses [= (4) + (5)]	26.19%	26.16%	26.18%

Notes:

- (1): Policy Year 2017 and Policy Year 2018 Expected Losses are based on the loss ratios projected to the prospective policy period adjusted by the factor to remove the residual market subsidy associated with large deductible policies from Section I-B, Exhibit 1.
- (2): Expected LAE = Expected Losses x 0.187 where 0.187 is the LAE ratio calculated in VI-H, Exhibit 1.
- (2a), (2b): Loss Adjustment Expense split between DCC and AO is $0.455 = 0.085 / 0.187$ and $0.545 = 1 - 0.455$ where 0.085 is three year average ratio of DCC to loss from Section VI-H, Exhibit 1, line (4) and LAE ratio = 0.187 from Section VI-H, Exhibit 1, line (6).
- (4): Section VI-B, Exhibit 1 times the factor to reflect the impact of large deductible policies, from Section I-D, Exhibit 1, Page 1.
- (4a), (4b): Policy Year 2017 Fixed Expenses split between General Expenses and Other Taxes based on \$37,185,866 General Expenses and \$2,133,135 Other Taxes. Policy Year 2018 General Expenses split based on \$39,170,189 General Expenses and \$2,246,964 Other Taxes. See VI-B, Exhibit 1, columns (12) & (13).
- (5a): Section VI-G, Exhibit 1.
- (5b), (5c): Section VI-A, Exhibit 1.

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Section VII - Profit
 Subsection I - Loss & LAE Flow
 7/1/2022

Section VII - I
 Exhibit 1

Single Policy
 Loss & Loss Adjustment Expense (LAE) Flow

Time Interval		Earned Premium (3)	Loss Flow (4)	DCC Flow (5) = (4)	AO Flow (6) = [(3) + (4)] / 2.0	Loss & LAE Payout (7)
From (1)	To (2)					
07/01/21	09/30/21	0.0000	0.0000	0.0000	0.0000	0.0000
10/01/21	12/31/21	0.0000	0.0000	0.0000	0.0000	0.0000
01/01/22	03/31/22	0.0000	0.0000	0.0000	0.0000	0.0000
04/01/22	06/30/22	0.0000	0.0000	0.0000	0.0000	0.0000
07/01/22	09/30/22	0.2500	0.0505	0.0505	0.1502	0.0590
10/01/22	12/31/22	0.2500	0.0505	0.0505	0.1502	0.0590
01/01/23	03/31/23	0.2500	0.0505	0.0505	0.1502	0.0590
04/01/23	06/30/23	0.2500	0.0505	0.0505	0.1502	0.0590
07/01/23	09/30/23	0.0000	0.0718	0.0718	0.0359	0.0688
10/01/23	12/31/23	0.0000	0.0718	0.0718	0.0359	0.0688
01/01/24	03/31/24	0.0000	0.0718	0.0718	0.0359	0.0688
04/01/24	06/30/24	0.0000	0.0718	0.0718	0.0359	0.0688
07/01/24	09/30/24	0.0000	0.0469	0.0469	0.0235	0.0449
10/01/24	12/31/24	0.0000	0.0469	0.0469	0.0235	0.0449
01/01/25	03/31/25	0.0000	0.0469	0.0469	0.0235	0.0449
04/01/25	06/30/25	0.0000	0.0469	0.0469	0.0235	0.0449
07/01/25	09/30/25	0.0000	0.0266	0.0266	0.0133	0.0254
10/01/25	12/31/25	0.0000	0.0266	0.0266	0.0133	0.0254
01/01/26	03/31/26	0.0000	0.0266	0.0266	0.0133	0.0254
04/01/26	06/30/26	0.0000	0.0266	0.0266	0.0133	0.0254
07/01/26	09/30/26	0.0000	0.0113	0.0113	0.0057	0.0108
10/01/26	12/31/26	0.0000	0.0113	0.0113	0.0057	0.0108
01/01/27	03/31/27	0.0000	0.0113	0.0113	0.0057	0.0108
04/01/27	06/30/27	0.0000	0.0113	0.0113	0.0057	0.0108
07/01/27	09/30/27	0.0000	0.0066	0.0066	0.0033	0.0063
10/01/27	12/31/27	0.0000	0.0066	0.0066	0.0033	0.0063
01/01/28	03/31/28	0.0000	0.0066	0.0066	0.0033	0.0063
04/01/28	06/30/28	0.0000	0.0066	0.0066	0.0033	0.0063
07/01/28	09/30/28	0.0000	0.0031	0.0031	0.0015	0.0029
10/01/28	12/31/28	0.0000	0.0031	0.0031	0.0015	0.0029
01/01/29	03/31/29	0.0000	0.0031	0.0031	0.0015	0.0029
04/01/29	06/30/29	0.0000	0.0031	0.0031	0.0015	0.0029
07/01/29	09/30/29	0.0000	0.0028	0.0028	0.0014	0.0027
10/01/29	12/31/29	0.0000	0.0028	0.0028	0.0014	0.0027
01/01/30	03/31/30	0.0000	0.0028	0.0028	0.0014	0.0027
04/01/30	06/30/30	0.0000	0.0028	0.0028	0.0014	0.0027
07/01/30	09/30/30	0.0000	0.0016	0.0016	0.0008	0.0015
10/01/30	12/31/30	0.0000	0.0016	0.0016	0.0008	0.0015
01/01/31	03/31/31	0.0000	0.0016	0.0016	0.0008	0.0015
04/01/31	06/30/31	0.0000	0.0016	0.0016	0.0008	0.0015
07/01/31	09/30/31	0.0000	0.0016	0.0016	0.0008	0.0016
10/01/31	12/31/31	0.0000	0.0016	0.0016	0.0008	0.0016
01/01/32	03/31/32	0.0000	0.0016	0.0016	0.0008	0.0016
04/01/32	06/30/32	0.0000	0.0016	0.0016	0.0008	0.0016
07/01/32	09/30/32	0.0000	0.0012	0.0012	0.0006	0.0011
10/01/32	12/31/32	0.0000	0.0012	0.0012	0.0006	0.0011
01/01/33	03/31/33	0.0000	0.0012	0.0012	0.0006	0.0011
04/01/33	06/30/33	0.0000	0.0012	0.0012	0.0006	0.0011
07/01/33	09/30/33	0.0000	0.0012	0.0012	0.0006	0.0011
10/01/33	12/31/33	0.0000	0.0012	0.0012	0.0006	0.0011
01/01/34	03/31/34	0.0000	0.0012	0.0012	0.0006	0.0011
04/01/34	06/30/34	0.0000	0.0012	0.0012	0.0006	0.0011
07/01/34	09/30/34	0.0000	0.0010	0.0010	0.0005	0.0010
10/01/34	12/31/34	0.0000	0.0010	0.0010	0.0005	0.0010
01/01/35	03/31/35	0.0000	0.0010	0.0010	0.0005	0.0010
04/01/35	06/30/35	0.0000	0.0010	0.0010	0.0005	0.0010
07/01/35	09/30/35	0.0000	0.0009	0.0009	0.0004	0.0009
10/01/35	12/31/35	0.0000	0.0009	0.0009	0.0004	0.0009
01/01/36	03/31/36	0.0000	0.0009	0.0009	0.0004	0.0009
04/01/36	06/30/36	0.0000	0.0009	0.0009	0.0004	0.0009
07/01/36	09/30/36	0.0000	0.0011	0.0011	0.0005	0.0010
10/01/36	12/31/36	0.0000	0.0011	0.0011	0.0005	0.0010
01/01/37	03/31/37	0.0000	0.0011	0.0011	0.0005	0.0010
04/01/37	06/30/37	0.0000	0.0011	0.0011	0.0005	0.0010
07/01/37	09/30/37	0.0000	0.0008	0.0008	0.0004	0.0007
10/01/37	12/31/37	0.0000	0.0008	0.0008	0.0004	0.0007
01/01/38	03/31/38	0.0000	0.0008	0.0008	0.0004	0.0007
04/01/38	06/30/38	0.0000	0.0008	0.0008	0.0004	0.0007
07/01/38	09/30/38	0.0000	0.0008	0.0008	0.0004	0.0007
10/01/38	12/31/38	0.0000	0.0008	0.0008	0.0004	0.0007
01/01/39	03/31/39	0.0000	0.0008	0.0008	0.0004	0.0007
04/01/39	06/30/39	0.0000	0.0008	0.0008	0.0004	0.0007
07/01/39	09/30/39	0.0000	0.0008	0.0008	0.0004	0.0008
10/01/39	12/31/39	0.0000	0.0008	0.0008	0.0004	0.0008
01/01/40	03/31/40	0.0000	0.0008	0.0008	0.0004	0.0008
04/01/40	06/30/40	0.0000	0.0008	0.0008	0.0004	0.0008
07/01/40	09/30/40	0.0000	0.0006	0.0006	0.0003	0.0005
10/01/40	12/31/40	0.0000	0.0006	0.0006	0.0003	0.0005
01/01/41	03/31/41	0.0000	0.0006	0.0006	0.0003	0.0005
04/01/41	06/30/41	0.0000	0.0006	0.0006	0.0003	0.0005
07/01/41	09/30/41	0.0000	0.0009	0.0009	0.0004	0.0008
10/01/41	12/31/41	0.0000	0.0009	0.0009	0.0004	0.0008
01/01/42	03/31/42	0.0000	0.0009	0.0009	0.0004	0.0008

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Section VII - Profit
 Subsection I - Loss & LAE Flow
 7/1/2022

Section VII - I
 Exhibit 1

Single Policy
 Loss & Loss Adjustment Expense (LAE) Flow

Time Interval		Earned Premium (3)	Loss Flow (4)	DCC Flow (5) = (4)	AO Flow (6) = [(3) + (4)] / 2.0	Loss & LAE Payout (7)
From (1)	To (2)					
04/01/42	06/30/42	0.0000	0.0009	0.0009	0.0004	0.0008
07/01/42	09/30/42	0.0000	0.0006	0.0006	0.0003	0.0005
10/01/42	12/31/42	0.0000	0.0006	0.0006	0.0003	0.0005
01/01/43	03/31/43	0.0000	0.0006	0.0006	0.0003	0.0005
04/01/43	06/30/43	0.0000	0.0006	0.0006	0.0003	0.0005
07/01/43	09/30/43	0.0000	0.0013	0.0013	0.0006	0.0012
10/01/43	12/31/43	0.0000	0.0013	0.0013	0.0006	0.0012
01/01/44	03/31/44	0.0000	0.0013	0.0013	0.0006	0.0012
04/01/44	06/30/44	0.0000	0.0013	0.0013	0.0006	0.0012
07/01/44	09/30/44	0.0000	0.0013	0.0013	0.0006	0.0012
10/01/44	12/31/44	0.0000	0.0013	0.0013	0.0006	0.0012
01/01/45	03/31/45	0.0000	0.0013	0.0013	0.0006	0.0012
04/01/45	06/30/45	0.0000	0.0013	0.0013	0.0006	0.0012
07/01/45	09/30/45	0.0000	0.0013	0.0013	0.0006	0.0012
10/01/45	12/31/45	0.0000	0.0013	0.0013	0.0006	0.0012
01/01/46	03/31/46	0.0000	0.0013	0.0013	0.0006	0.0012
04/01/46	06/30/46	0.0000	0.0013	0.0013	0.0006	0.0012
07/01/46	09/30/46	0.0000	0.0013	0.0013	0.0006	0.0012
10/01/46	12/31/46	0.0000	0.0013	0.0013	0.0006	0.0012
01/01/47	03/31/47	0.0000	0.0013	0.0013	0.0006	0.0012
04/01/47	06/30/47	0.0000	0.0013	0.0013	0.0006	0.0012
07/01/47	09/30/47	0.0000	0.0013	0.0013	0.0006	0.0012
10/01/47	12/31/47	0.0000	0.0013	0.0013	0.0006	0.0012
01/01/48	03/31/48	0.0000	0.0013	0.0013	0.0006	0.0012
04/01/48	06/30/48	0.0000	0.0013	0.0013	0.0006	0.0012
07/01/48	09/30/48	0.0000	0.0013	0.0013	0.0006	0.0012
10/01/48	12/31/48	0.0000	0.0013	0.0013	0.0006	0.0012
01/01/49	03/31/49	0.0000	0.0013	0.0013	0.0006	0.0012
04/01/49	06/30/49	0.0000	0.0013	0.0013	0.0006	0.0012
07/01/49	09/30/49	0.0000	0.0013	0.0013	0.0006	0.0012
10/01/49	12/31/49	0.0000	0.0013	0.0013	0.0006	0.0012
01/01/50	03/31/50	0.0000	0.0013	0.0013	0.0006	0.0012
04/01/50	06/30/50	0.0000	0.0013	0.0013	0.0006	0.0012
07/01/50	09/30/50	0.0000	0.0013	0.0013	0.0006	0.0012
10/01/50	12/31/50	0.0000	0.0013	0.0013	0.0006	0.0012
01/01/51	03/31/51	0.0000	0.0013	0.0013	0.0006	0.0012
04/01/51	06/30/51	0.0000	0.0013	0.0013	0.0006	0.0012
07/01/51	09/30/51	0.0000	0.0013	0.0013	0.0006	0.0012
10/01/51	12/31/51	0.0000	0.0013	0.0013	0.0006	0.0012
01/01/52	03/31/52	0.0000	0.0013	0.0013	0.0006	0.0012
04/01/52	06/30/52	0.0000	0.0013	0.0013	0.0006	0.0012
07/01/52	09/30/52	0.0000	0.0013	0.0013	0.0006	0.0012
10/01/52	12/31/52	0.0000	0.0013	0.0013	0.0006	0.0012
01/01/53	03/31/53	0.0000	0.0013	0.0013	0.0006	0.0012
04/01/53	06/30/53	0.0000	0.0013	0.0013	0.0006	0.0012
07/01/53	09/30/53	0.0000	0.0013	0.0013	0.0006	0.0012
10/01/53	12/31/53	0.0000	0.0013	0.0013	0.0006	0.0012
01/01/54	03/31/54	0.0000	0.0013	0.0013	0.0006	0.0012
04/01/54	06/30/54	0.0000	0.0013	0.0013	0.0006	0.0012
07/01/54	09/30/54	0.0000	0.0013	0.0013	0.0006	0.0012
10/01/54	12/31/54	0.0000	0.0013	0.0013	0.0006	0.0012
01/01/55	03/31/55	0.0000	0.0013	0.0013	0.0006	0.0012
04/01/55	06/30/55	0.0000	0.0013	0.0013	0.0006	0.0012
07/01/55	09/30/55	0.0000	0.0013	0.0013	0.0006	0.0012
10/01/55	12/31/55	0.0000	0.0013	0.0013	0.0006	0.0012
01/01/56	03/31/56	0.0000	0.0013	0.0013	0.0006	0.0012
04/01/56	06/30/56	0.0000	0.0013	0.0013	0.0006	0.0012
07/01/56	09/30/56	0.0000	0.0013	0.0013	0.0006	0.0012
10/01/56	12/31/56	0.0000	0.0013	0.0013	0.0006	0.0012
01/01/57	03/31/57	0.0000	0.0013	0.0013	0.0006	0.0012
04/01/57	06/30/57	0.0000	0.0013	0.0013	0.0006	0.0012
(8) Relative Weights			1.0000	0.0850	0.1017	

Notes:
 (3): Single policy earned premium is earned uniformly through the one year policy term.
 (4): Exhibit 2, (8). Annual values divided by 4.0.
 (7): Loss & LAE Payout = (1.000 x (4) + 0.085 x (5) + 0.1017 x (6)) / (1.000 + 0.085 + 0.1017)
 (8): DCC relative weight = 1.000 x 0.187 x 0.455; AO relative weight = 1.000 x 0.187 x 0.545
 where 0.187 is the LAE factor calculated in Section VI-H, Exhibit 1 and 0.455, 0.545
 are the DCC and AO relative weights from Section VI-H, Exhibit 1.

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Section VII - Profit
 Subsection I - Loss & LAE Flow
 7/1/2022

Section VII - I
 Exhibit 2

Loss Payment Pattern

Age In Months (1)	Indemnity Unadjusted LDF to Ult (2)	Indemnity % Paid =1.0 / (2) (3)	Indemnity Incremental % Paid (3) - 1st Diff (4)	Medical LDF to Ult (5)	Medical %Paid =1.0 / (5) (6)	Medical Incremental % Paid (6) - 1st Diff (7)	Indemnity & Medical Incremental % Paid (8)
12	7.337	13.63%	13.63%	2.996	33.38%	33.38%	20.18%
24	2.458	40.68%	27.05%	1.526	65.52%	32.14%	28.74%
36	1.564	63.93%	23.26%	1.329	75.22%	9.71%	18.76%
48	1.285	77.82%	13.88%	1.261	79.29%	4.07%	10.63%
60	1.196	83.59%	5.77%	1.230	81.33%	2.04%	4.53%
72	1.151	86.92%	3.33%	1.211	82.61%	1.28%	2.65%
84	1.131	88.41%	1.50%	1.201	83.29%	0.68%	1.23%
96	1.117	89.53%	1.12%	1.185	84.40%	1.11%	1.12%
108	1.110	90.09%	0.56%	1.173	85.22%	0.82%	0.65%
120	1.102	90.73%	0.64%	1.164	85.90%	0.67%	0.65%
132	1.096	91.21%	0.48%	1.158	86.38%	0.48%	0.48%
144	1.092	91.54%	0.33%	1.148	87.13%	0.75%	0.47%
156	1.090	91.75%	0.22%	1.137	87.93%	0.80%	0.41%
168	1.087	92.01%	0.26%	1.130	88.49%	0.56%	0.36%
180	1.083	92.32%	0.31%	1.121	89.17%	0.68%	0.43%
192	1.081	92.50%	0.18%	1.115	89.72%	0.56%	0.31%
204	1.079	92.67%	0.17%	1.107	90.33%	0.60%	0.31%
216	1.077	92.81%	0.14%	1.099	91.01%	0.68%	0.32%
228	1.077	92.84%	0.04%	1.092	91.61%	0.60%	0.22%
240	1.076	92.96%	0.11%	1.082	92.41%	0.80%	0.34%
252	1.074	93.08%	0.12%	1.077	92.83%	0.42%	0.22%
264			0.49%			0.51%	0.50%
276			0.49%			0.51%	0.50%
288			0.49%			0.51%	0.50%
300			0.49%			0.51%	0.50%
312			0.49%			0.51%	0.50%
324			0.49%			0.51%	0.50%
336			0.49%			0.51%	0.50%
348			0.49%			0.51%	0.50%
360			0.49%			0.51%	0.50%
372			0.49%			0.51%	0.50%
384			0.49%			0.51%	0.50%
396			0.49%			0.51%	0.50%
408			0.49%			0.51%	0.50%
420			0.49%			0.51%	0.50%
Total			100.00%			100.00%	100.00%

Notes:

(2), (5): Section II - E, Exhibit 1, Page 1.

(8) = (4) x 66.82% + (7) x 33.18%, where 66.82% and 33.18% are indemnity and medical estimated ultimate losses respectively, from Section II - A, Exhibit 1, Page 2.

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Section VII - Profit
 Subsection J - Portfolio Rate of Return
 7/1/2022

Section VII - J
 Exhibit 1
 Page 1

Calculation of Portfolio Rate of Return

Asset Class (1)	Proportion (2)	Pre-tax Return (3)	Tax Rate (4)	After-tax Return (5)
Cash and Short-term Investments	5.45%	0.05%	21.00%	0.04%
Governments	10.85%	0.36%	21.00%	0.28%
States & Territories	6.50%	0.72%	5.25%	0.68%
Special Revenue	17.29%	0.87%	5.25%	0.82%
Industrials	38.60%	1.14%	21.00%	0.90%
Common Stocks	11.50%	8.87%	14.92%	7.54%
Real Estate	0.90%	6.89%	21.00%	5.44%
Mortgage Loans	1.87%	2.17%	21.00%	1.71%
Preferred Stocks	0.31%	4.61%	13.13%	4.01%
Other Invested Assets	6.73%	6.79%	13.13%	5.89%
(6) Total	100.00%	2.27%	15.27%	1.93%
(7) Investment Expenses		0.21%	21.00%	0.17%
(8) Portfolio Rate of Return		2.06%		1.76%

Notes:

(2): Page 2

(3): Pretax bond returns are from Exhibit 2, page 1.

Cash and short term investments: using short horizon CAPM with beta=0.00. Exhibit 2, Page 3, line (2).

Pretax return for Common Stock: $r_f + b \times \text{MRP}$ with $b=1.00$ and three horizons. MRP from Exhibit 4 and r_f from Exhibit 2,

Page 3, line (2) for short-term, line (8) for intermediate-term and line (11) for long-term horizon.

8.87% = average (8.82% + 0.05%, 7.83% + 0.8%, 7.25% + 1.86%)

Pretax return for Real Estate is the WACC for the REIT sector as calculated using data on capital structure, beta, and cost of debt from Damodaran Online, where cost of equity capital = 10.51%, using CAPM three horizon methodology from Section VII-E, Exhibit 3, page 1 with beta = 1.21, as reported in Demodaran Online for REIT sector.

Pretax return for Mortgage Loans: calculated using data for 15-year fixed rate mortgages from FRED. Exhibit 2, Page 3, line (23).

Pretax return for Preferred Stocks: calculated using data from yahoo finance.

Pretax return for Other Invested Assets from Exhibit 2, Page 4.

(4): Governments and Other taxable bonds taxed at Federal Tax Rate of 0.21.

Tax rate for Tax Exempt Bonds = 0.25×0.21

Tax rate for Preferred stock = $(0.50 \times 0.21) + (0.50 \times 0.25 \times 0.21)$

Tax rate for Common Stocks from Exhibit 6, page 1.

Tax rate for Other Assets = Tax rate for Preferred stock = $(0.50 \times 0.21) + (0.50 \times 0.25 \times 0.21)$

(5) = (3) x [1.0 - (4)]

(7): Exhibit 5, page 1.

(8) = (6) - (7)

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Section VII - Profit
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Section VII - J
Exhibit 1
Page 2

Asset Distribution for MA Workers' Compensation Group Companies

Asset Class (1)	Proportion (2)
Cash and Short Term Investments	5.45%
Bonds:	73.24%
Governments	10.85%
States & Territories	6.50%
Special Revenue	17.29%
Industrials	38.60%
Common Stocks	11.50%
Real Estate	0.90%
Mortgage Loans	1.87%
Preferred Stocks	0.31%
Other Invested Assets	6.73%

(3) Total 100.00%

Notes:

Proportion of each asset class is from page 3. The Bond share in total is 73.24%.

This is allocated to the following subcategories:

Governments, States & Territories, Special Revenue and Industrials

by multiplying 73.24% by the adjusted bond weights from Exhibit 3, page 1.

Asset Distribution for MA Workers' Compensation Group Companies

Companies	Bonds	Preferred Stocks	Common Stocks	Real Estate	Mortgage Loans	Cash and Short Term Investments	Other Invested Assets	Total Cash and Invested Assets	% Bonds	% Preferred Stocks	% Common Stocks	% Real Estate	% Mortgage Loans	% Cash and Short Term Investments	% Other Invested Assets
(1)	(\$000) (2)	(\$000) (3)	(\$000) (4)	(\$000) (5)	(\$000) (6)	(\$000) (7)	(\$000) (8)	(\$000) (9)	= (2) / (9) (10)	= (3) / (9) (11)	= (4) / (9) (12)	= (5) / (9) (13)	= (6) / (9) (14)	= (7) / (9) (15)	= (8) / (9) (16)
Pharmacists Mutual Insurance Group (G)	256	0	31	23	0	12	0	323	79.37%	0.00%	9.65%	7.04%	0.00%	3.79%	0.14%
Amerisure Companies (G)	2,045	24	210	13	0	110	248	2,648	77.20%	0.90%	7.91%	0.47%	0.00%	4.15%	9.37%
James River Group (G)	413	54	20	0	0	983	4	1,473	28.01%	3.63%	1.36%	0.00%	0.00%	66.71%	0.28%
GuideOne Insurance Companies (G)	891	0	53	12	44	115	60	1,176	75.79%	0.00%	4.51%	1.04%	3.77%	9.78%	5.11%
Premier Group Insurance Company	51	0	0	0	0	6	0	57	89.44%	0.00%	0.00%	0.00%	0.00%	10.56%	0.00%
Brotherhood Mutual Insurance Company	366	1	180	43	0	18	49	656	55.75%	0.10%	27.41%	6.51%	0.00%	2.73%	7.50%
Quincy Mutual Group (G)	693	7	581	18	0	74	406	1,779	38.98%	0.37%	32.68%	1.02%	0.00%	4.16%	22.80%
RLI Group (G)	1,999	0	808	31	0	60	51	2,949	67.79%	0.00%	27.39%	1.05%	0.00%	2.04%	1.73%
Cherokee Insurance Company	251	77	179	0	0	32	90	629	39.82%	12.30%	28.50%	0.00%	0.00%	5.12%	14.26%
ICW Pool (G)	2,452	21	608	32	10	227	23	3,372	72.71%	0.63%	18.03%	0.95%	0.28%	6.73%	0.67%
AMERISAFE Insurance Group (G)	965	0	32	5	0	74	0	1,076	89.73%	0.00%	2.97%	0.43%	0.00%	6.88%	0.00%
ProAssurance Group (G)	3,369	7	333	0	0	345	341	4,397	76.63%	0.17%	7.58%	0.00%	0.00%	7.86%	7.77%
WCF Insurance Group (G)	1,656	0	236	92	138	47	116	2,285	72.48%	0.00%	10.34%	4.03%	6.02%	2.05%	5.08%
Petroleum Casualty Company	0	0	0	0	0	18	0	18	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%
American Contractors Insurance Group (G)	322	0	69	0	0	10	117	518	62.15%	0.00%	13.27%	0.00%	0.00%	1.92%	22.66%
State Farm Group (G)	108,724	281	88,956	378	331	5,442	8,676	212,787	51.10%	0.13%	41.81%	0.18%	0.16%	2.56%	4.08%
Samsung F & M Insurance Co, Ltd USB	87	0	0	0	0	12	0	100	87.50%	0.00%	0.00%	0.00%	0.00%	12.50%	0.00%
MAG Mutual Companies (G)	1,213	0	356	0	0	275	86	1,930	62.87%	0.00%	18.44%	0.00%	0.00%	14.23%	4.46%
The Gray Insurance Group (G)	112	0	155	17	0	5	42	331	33.87%	0.00%	46.79%	5.26%	0.00%	1.42%	12.66%
West Bend Mutual Insurance Company	2,021	20	309	55	0	249	296	2,951	68.49%	0.68%	10.47%	1.87%	0.00%	8.44%	10.04%
Penn National Insurance Companies (G)	1,355	1	188	0	15	55	0	1,615	83.92%	0.05%	11.67%	0.00%	0.92%	3.44%	0.00%
HDI/Talanx US PC Group (G)	788	0	11	1	0	77	0	877	89.89%	0.00%	1.28%	0.06%	0.00%	8.75%	0.02%

	% Bonds	% Preferred Stocks	% Common Stocks	% Real Estate	% Mortgage Loans	% Cash and Short Term Investments	% Other Invested Assets
(17): Premium Weighted Asset Distribution	73.24%	0.31%	11.50%	0.90%	1.87%	5.45%	6.73%

Notes:
 Source: A.M. Best's Global Insurance Database for all Massachusetts Workers' Compensation Group Companies, 2020 Exhibit of Assets.
 (5): Real estate is the sum of: properties occupied by the company, properties held for the production of income and properties held for sale.
 (6): Mortgage Loans is the sum of: mortgage loans first liens and mortgage loans other than first.
 (9) = (2) + (3) + (4) + (5) + (6) + (7) + (8)
 (17): Premium Weighted Asset Distribution use Direct Premiums Written from Exhibit 5, page 2.

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Section VII - Profit
 Subsection J - Portfolio Rate of Return
 7/1/2022

Section VII - J
 Exhibit 2
 Page 1

Calculation of Pretax Returns on Bonds

% of Bonds (adjusted for removal of Other Bonds category) by Class, by Maturity				
Term to Maturity in years	Governments	States and Territories	Special Revenue	Industrials
0.5	8.03%	0.78%	3.35%	6.20%
3	4.59%	2.80%	9.43%	24.96%
7	1.42%	2.15%	5.61%	17.47%
15	0.35%	2.92%	3.37%	2.55%
25	0.42%	0.23%	1.84%	1.52%
Total	14.82%	8.88%	23.61%	52.70%

As of	Term to Maturity in years	Yield Data			
		Governments	States and Territories	Special Revenue	Industrials
Jul-21	0.5	0.05%	0.08%	0.05%	0.13%
	3	0.40%	0.30%	0.41%	0.70%
	7	1.07%	0.76%	1.11%	1.67%
	15	1.60%	1.10%	1.69%	2.56%
	25	1.91%	1.33%	2.07%	2.89%
Aug-21	0.5	0.06%	0.07%	0.04%	0.14%
	3	0.42%	0.32%	0.43%	0.74%
	7	1.06%	0.79%	1.11%	1.69%
	15	1.56%	1.12%	1.68%	2.55%
	25	1.88%	1.38%	2.11%	2.89%
Sep-21	0.5	0.05%	0.08%	0.05%	0.14%
	3	0.47%	0.38%	0.49%	0.78%
	7	1.16%	0.89%	1.22%	1.79%
	15	1.62%	1.20%	1.76%	2.59%
	25	1.91%	1.47%	2.14%	2.88%
		Weighted Yields			
Jul-21	All	0.35%	0.68%	0.84%	1.11%
Aug-21	All	0.35%	0.70%	0.84%	1.13%
Sep-21	All	0.38%	0.78%	0.91%	1.19%
	Average	0.36%	0.72%	0.87%	1.14%

Notes:

% of Bonds by Class and by Maturity for MA WC Group Companies are from Exhibit 3, page 1.
 Yield Data are from Page 2.

Example of Weighted Yield calculation for Jul-21, States and Territories:

$$0.68 = (0.08 \times 0.78 + 0.3 \times 2.8 + 0.76 \times 2.15 + 1.1 \times 2.92 + 1.33 \times 0.23) / 8.88$$

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Section VII - Profit
 Subsection J - Portfolio Rate of Return
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 Exhibit 2
 Page 2

Calculation of Yield Data

Term to Maturity in Years	Jul-21	Aug-21	Sep-21	Formulas used to derive the yields (reference to data on page 3)
Governments				
0.5	0.05%	0.06%	0.05%	=(4)
3	0.40%	0.42%	0.47%	=(7)
7	1.07%	1.06%	1.16%	=(9)
10	1.32%	1.28%	1.37%	=(10)
20	1.87%	1.83%	1.87%	=(11)
30	1.94%	1.92%	1.94%	=(12)
States and Territories				
0.5	0.08%	0.07%	0.08%	=(4) + 9.5/9.0 x [(20) - (5)] - 0.5/9.0 x [(21) - (10)]
3	0.30%	0.32%	0.38%	=(7) + 7.0/9.0 x [(20) - (5)] + 2.0/9.0 x [(21) - (10)]
7	0.76%	0.79%	0.89%	=(9) + 1.0/3.0 x [(20) - (5)] + 2.0/3.0 x [(21) - (10)]
10	0.86%	0.88%	0.96%	=(21)
20	1.33%	1.37%	1.44%	=(11) + 0.5 x [(21) - (10)] + 0.5 x [(22) - (12)]
30	1.33%	1.40%	1.50%	=(22)
Special Revenue				
0.5	0.05%	0.04%	0.05%	=(4) + 29.5/29.0 x [(20) - (5)] - 0.5/29.0 x [(19) - (12)]
3	0.41%	0.43%	0.49%	=(7) + 27.0/29.0 x [(20) - (5)] + 2.0/29.0 x [(19) - (12)]
7	1.11%	1.11%	1.22%	=(9) + 23.0/29.0 x [(20) - (5)] + 6.0/29.0 x [(19) - (12)]
10	1.38%	1.36%	1.46%	=(10) + 20.0/29.0 x [(20) - (5)] + 9.0/29.0 x [(19) - (12)]
20	2.00%	2.01%	2.06%	=(11) + 10.0/29.0 x [(20) - (5)] + 19.0/29.0 x [(19) - (12)]
30	2.14%	2.20%	2.23%	=(19)
Industrial				
0.5	0.13%	0.14%	0.14%	=(4) + 18.0/21.0 x [(1) - (3)] + 3.0/21.0 x [(14) - (6)]
3	0.70%	0.74%	0.78%	=(7) + 2.0/3.0 x [(14) - (6)] + 1.0/3.0 x [(15) - (8)]
7	1.67%	1.69%	1.79%	=(9) + 3.0/5.0 x [(15) - (8)] + 2.0/5.0 x [(16) - (10)]
10	2.27%	2.26%	2.34%	=(16)
20	2.84%	2.83%	2.85%	=(11) + 1.0/2.0 x [(16) - (10)] + 1.0/2.0 x [(17) - (12)]
30	2.93%	2.94%	2.92%	=(17)

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Section VII - Profit
 Subsection J - Portfolio Rate of Return
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Section VII - J
 Exhibit 2
 Page 3

Yield Data

	Jul-21	Aug-21	Sep-21	Average
FEDERAL RESERVE STATISTICAL RELEASE				
Commercial Paper				
(1) 1-month	0.08%	0.08%	0.08%	0.08%
(1) 3-month	0.10%	0.10%	0.10%	0.10%
U.S. Govt Securities - Secondary Market				
Treasury Constant Maturities				
(2) 1-month	0.05%	0.04%	0.05%	0.05%
(3) 3-month	0.05%	0.05%	0.04%	0.05%
(4) 6-month	0.05%	0.06%	0.05%	0.05%
(5) 1-year	0.08%	0.07%	0.08%	0.08%
(6) 2-year	0.22%	0.22%	0.24%	0.23%
(7) 3-year	0.40%	0.42%	0.47%	0.43%
(8) 5-year	0.76%	0.77%	0.86%	0.80%
(9) 7-year	1.07%	1.06%	1.16%	1.10%
(10) 10-year	1.32%	1.28%	1.37%	1.32%
(11) 20-year	1.87%	1.83%	1.87%	1.86%
(12) 30-year	1.94%	1.92%	1.94%	1.93%
YAHOO				
(13) Preferred Stock	4.60%	4.63%	4.61%	4.61%
US DEPARTMENT OF THE TREASURY				
HQM Corporate Bond Yield Curve Par Yields				
(14) 2-year	0.48%	0.50%	0.51%	0.50%
(15) 5-year	1.13%	1.17%	1.26%	1.19%
(16) 10-year	2.27%	2.26%	2.34%	2.29%
(17) 30-year	2.93%	2.94%	2.92%	2.93%
VALUE LINE INVESTMENT SURVEY (Part II)				
Bond Buyer Indexes				
(18) 20-Bond Index (GOs)	2.06%	2.10%	2.15%	2.10%
(19) Calculated 30-Bond Index (= (18) x [(12) / (11)])	2.14%	2.20%	2.23%	2.19%
General Obligation Bonds (GOs)				
(20) 1-year Aaa	0.08%	0.06%	0.09%	0.07%
(21) 10-year Aaa	0.86%	0.88%	0.96%	0.90%
(22) 25/30-year Aaa	1.33%	1.40%	1.50%	1.41%
FEDERAL RESERVE ECONOMIC DATA				
(23) 15-Year Fixed Rate Mortgage	2.18%	2.15%	2.18%	2.17%

Note:

Sources: Federal Reserve Statistical Release, H.15 ,Yahoo Finance, US Department of the Treasury, FRED and various issues of Value Line Investment Survey, Part II.

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Section VII - Profit
Subsection J - Portfolio Rate of Return
7/1/2022

Section VII - J
Exhibit 2
Page 4

Calculation of Pretax Return on Other Assets

Other Asset Type (1)	Allocation by Other Asset Type (2)	Investment Categories				Subtotal (7)
		Hedge Fund (3)	Private Equity (4)	Fixed Income (5)	Real Estate (6)	
Joint Venture, LLCs: Other	2.745690%	1				
Joint Venture, LLCs: Common Stock	1.189460%		1			
Other Assets	1.122650%					
Joint Venture, LLCs: Real Estate	0.945823%				1	
Noncollateral Loans	0.293147%			1		
Collateral Loans	0.278198%			1		
Joint Venture, LLCs: Fixed Income, NAIC Designation Not Assigned by SVO	0.114598%			1		
Surplus Debentures	0.081542%			1		
Nonguaranteed Federal Low-Income Housing Tax Credit	0.045082%				1	
Joint Venture, LLCs: Mortgage Loans	0.033648%			1		
Non-Registered Private Funds: Other Fixed Income	0.032661%			1		
Non-Registered Private Funds: Bonds, NAIC Designation Not Assigned by SVO	0.029367%			1		
Joint Venture, LLCs: Fixed Income, NAIC Designation Assigned by SVO	0.027536%			1		
Non-Registered Private Funds: Mortgage Loans	0.019187%			1		
Non-Guaranteed State Low-Income Housing Tax Credit	0.014044%				1	
Long-term Bond, Issuer Obligations	0.009370%			1		
Oil and Gas Production	0.004640%		1			
Non-Registered Private Funds: Bonds, NAIC Designation Assigned by SVO	0.004610%			1		
Mineral Rights	0.000407%		1			
Common Stock	0.000398%		1			
Other Low-Income Housing Tax Credit	0.000158%				1	
Uncategorized	0.000041%					
Guaranteed Federal Low-Income Housing Tax Credit	0.000019%				1	
Transportation Equipment	0.000014%		1			
Guaranteed State Low-Income Housing Tax Credit	0.000001%				1	
Total	6.99%	2.75%	1.19%	0.92%	1.01%	5.87%

(8) Adjusted Total (remove Other Assets and Uncategorized)	3.27%	1.42%	1.10%	1.20%	6.99%
(9) Allocation by Category	46.78%	20.36%	15.74%	17.12%	100.00%

(10) Projected Return	5.77%	12.15%	2.73%	6.89%
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(11) Pretax Return on Other Assets	6.79%
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Notes:

- (1): Source SNL Financial. List of Schedule BA investments held by Massachusetts Workers Compensation underwriters.
(2): Direct Premium Written weighted average asset allocation for each of the investment types covered by Schedule BA.
(3) - (6): Used the NAIC assignments and classified the various investment types into 4 major categories.
(8): Investment Category Allocation, Total x (2), Total x (7), Total
(9) = (8) / (8), Total
(10): Hedge Fund (HF) return is equal to equity market return plus spread between Credit Suisse Hedge Fund Index and S&P 500 total return from 12/31/1993 to 9/30/2021.
HF = 5.77% = 8.87% + (7.37% - 10.47%), where 8.87% is the Common Stock pretax return from Section VII-J, Exhibit 1, page 1,
7.37% is the Credit Suisse Hedge Fund average return and 10.47% is the S&P 500 total return from Yahoo Finance.
Private Equity (PE) return is equal to equity market return plus spread between US Private Equity Index and S&P 500 total return from 12/31/1994 to 6/31/2021.
PE = 12.15% = 8.87% + (14.19% - 10.91%), where 8.87% is the Common Stock pretax return from Section VII-J, Exhibit 1, page 1,
14.19% is the US Private Equity Index average return from Cambridge Associates and 10.91% is the S&P 500 total return from Yahoo Finance.
Fixed Income (FI) return is the three month average yield on the high yield corporate bond ETF, the investment grade bond ETF and the 30 yr mortgage rate.
FI = 2.73% = average (3.86% , 2.17% , 2.17%), where 3.86% , is the three month (July-Sep 2021) average return of High Yield Corporate Bond ETF (HYG),
2.17% is the Investment Grade Corporate Bond ETF (LQD) from Yahoo Finance and 2.17% is the 15-Year Fixed Rate Mortgage, 3 month average from FRED.
Real Estate (RE) return is the WACC for the REIT sector as calculated using data on capital structure, beta, and cost of debt from Damodaran Online,
and cost of equity capital = 10.51%, using CAPM three horizon methodology from Section VII-E, Exhibit 3, page 1 with beta = 1.21,
as reported in Demodaran Online for REIT sector.
(11) = Sum [(9) x (10)]

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Section VII - Profit
 Subsection J - Portfolio Rate of Return
 7/1/2022

Section VII - J
 Exhibit 3
 Page 1

Premium Weighted Bond Distribution for MA Workers' Compensation Group Companies by Class and by Maturity

Term to Maturity in Years	Governments	States & Territories	Special Revenue	Industrials	Other Bonds	Total Bonds
0.5	7.95%	0.77%	3.32%	6.14%	0.32%	18.50%
3	4.54%	2.77%	9.34%	24.72%	0.43%	41.80%
7.5	1.41%	2.13%	5.55%	17.30%	0.08%	26.46%
15	0.35%	2.89%	3.34%	2.52%	0.01%	9.12%
25	0.41%	0.23%	1.82%	1.50%	0.15%	4.12%
Total	14.67%	8.79%	23.37%	52.17%	1.00%	100.00%

% of Bonds (adjusted for removal of Other Bonds category) by Class, by Maturity

Term to Maturity in Years	Governments	States & Territories	Special Revenue	Industrials	Total Bonds
0.5	8.03%	0.78%	3.35%	6.20%	18.37%
3	4.59%	2.80%	9.43%	24.96%	41.78%
7.5	1.42%	2.15%	5.61%	17.47%	26.65%
15	0.35%	2.92%	3.37%	2.55%	9.19%
25	0.42%	0.23%	1.84%	1.52%	4.01%
Total	14.82%	8.88%	23.61%	52.70%	100.00%

Notes:

- Bond Distribution from pages 2 and 3.
- Premium Weighted Bond Distribution use Direct Premiums Written from Exhibit 5, page 2.

Bond Distribution for MA Workers' Compensation Group Companies by Class and by Maturity

Companies (1)	Governments					States & Territories					Special Revenue				
	0.5	3	7.5	15	25	0.5	3	7.5	15	25	0.5	3	7.5	15	25
	(2)					(3)					(4)				
Travelers Group (G)	1.99%	2.79%	0.95%	0.17%	0.00%	0.89%	3.37%	5.58%	20.16%	0.39%	1.40%	3.18%	3.81%	10.95%	1.72%
A.I.M. Mutual Insurance Companies (G)	0.10%	1.07%	0.57%	0.30%	0.00%	0.95%	1.78%	0.76%	0.94%	0.00%	9.16%	19.48%	6.37%	1.62%	0.90%
Hartford Insurance Group (G)	1.03%	4.31%	1.47%	0.71%	1.20%	0.14%	0.29%	0.38%	0.92%	0.80%	1.14%	3.56%	3.29%	5.17%	9.84%
Liberty Mutual Insurance Companies (G)	1.71%	9.07%	3.15%	0.30%	0.42%	0.25%	2.49%	6.30%	0.65%	0.14%	1.58%	6.91%	7.94%	2.63%	0.61%
Chubb INA Group (G)	2.20%	2.43%	1.12%	1.04%	0.67%	1.69%	4.05%	0.35%	0.16%	0.15%	5.39%	18.57%	9.06%	2.68%	1.06%
American International Group (G)	1.06%	1.48%	0.85%	0.22%	0.72%	1.14%	2.49%	0.56%	0.41%	0.03%	3.91%	10.54%	3.03%	0.96%	0.39%
Zurich Insurance US PC Group (G)	5.81%	17.55%	4.72%	0.56%	2.14%	0.06%	1.59%	1.81%	0.26%	0.46%	1.58%	6.46%	6.25%	3.33%	4.33%
Berkshire Hathaway Insurance Group (G)	88.90%	1.55%	0.04%	0.03%	0.07%	0.04%	0.03%	0.00%	0.00%	0.00%	0.08%	0.15%	0.05%	0.02%	0.00%
Charter Insurance Group (G)	13.87%	0.00%	0.45%	0.00%	0.00%	3.63%	13.16%	1.85%	0.92%	0.61%	3.35%	10.38%	3.19%	1.92%	0.54%
Old Republic Insurance Group (G)	0.99%	8.10%	2.61%	0.00%	0.00%	0.20%	6.02%	1.80%	0.00%	0.00%	1.03%	5.15%	3.00%	0.00%	0.00%
W. R. Berkley Insurance Group (G)	0.70%	6.57%	0.33%	0.05%	0.00%	0.49%	2.33%	1.96%	0.50%	0.00%	5.09%	13.17%	8.53%	1.60%	0.71%
CNA Insurance Companies (G)	2.96%	1.17%	0.32%	0.00%	0.09%	0.72%	1.98%	2.48%	1.58%	0.89%	3.28%	10.87%	8.87%	2.69%	0.99%
AmTrust Group (G)	2.79%	3.82%	0.28%	0.00%	0.00%	0.06%	0.60%	0.44%	0.00%	0.00%	3.02%	6.90%	2.63%	0.61%	0.02%
Hanover Ins Group Prop & Cas Cos (G)	0.29%	1.17%	1.48%	0.19%	0.26%	0.59%	1.18%	1.25%	2.33%	0.00%	3.57%	7.68%	6.21%	6.18%	1.73%
MEMIC Group (G)	0.66%	1.66%	1.37%	0.53%	0.00%	0.99%	1.58%	4.96%	1.74%	0.41%	8.69%	12.00%	8.81%	2.76%	2.88%
Arbella Insurance Group (G)	0.16%	3.50%	1.05%	0.34%	0.00%	0.11%	0.66%	7.01%	1.41%	0.00%	2.40%	13.03%	19.23%	2.88%	0.00%
Utica National Insurance Group (G)	0.39%	2.22%	0.66%	0.12%	0.14%	0.31%	0.47%	0.38%	0.04%	0.00%	4.94%	14.61%	6.63%	1.24%	0.07%
Selective Insurance Group (G)	0.93%	0.72%	0.31%	0.03%	0.09%	0.66%	2.90%	0.68%	0.03%	0.10%	4.71%	16.14%	11.45%	0.99%	0.32%
QBE North America Insurance Group (G)	20.21%	4.17%	0.25%	0.00%	0.00%	0.24%	1.83%	1.17%	0.00%	0.00%	1.87%	1.75%	1.06%	0.24%	0.00%
Arch Insurance Group (G)	2.02%	25.82%	1.26%	0.04%	0.00%	0.01%	0.17%	0.33%	0.01%	0.00%	0.51%	1.83%	2.63%	0.34%	0.04%
Sentry Insurance Group (G)	0.92%	4.19%	3.95%	4.59%	0.46%	0.21%	2.01%	3.04%	0.34%	0.00%	1.18%	8.04%	11.92%	6.51%	0.88%
AmeriTrust Group (G)	1.89%	0.67%	0.02%	0.00%	0.00%	0.39%	0.74%	0.00%	0.00%	0.00%	1.63%	3.50%	0.83%	0.18%	0.00%
Fairfax Financial (USA) Group (G)	49.73%	5.41%	0.30%	0.07%	0.05%	0.00%	0.44%	0.00%	0.00%	0.00%	0.00%	0.61%	0.01%	1.07%	0.02%
Federated Mutual Group (G)	0.31%	1.32%	0.68%	0.16%	0.00%	2.34%	8.14%	2.82%	0.05%	0.00%	2.36%	13.77%	4.91%	0.91%	0.07%
Starr International Group (G)	15.20%	2.08%	1.21%	0.00%	0.00%	1.73%	5.36%	0.48%	0.25%	0.00%	2.37%	12.85%	2.91%	0.00%	0.00%
Norfolk & Dedham Group Pool (G)	0.48%	2.24%	0.53%	0.00%	0.00%	0.00%	1.52%	0.00%	0.00%	0.00%	5.55%	28.58%	21.26%	2.15%	0.03%
AU Holding Company Group (G)	77.11%	4.58%	0.00%	0.00%	0.00%	0.03%	0.18%	0.13%	0.03%	0.02%	1.69%	9.47%	3.78%	1.39%	0.05%
Protective Insurance Corporation Group (SG)	8.47%	10.29%	5.97%	0.00%	0.00%	0.94%	0.96%	0.33%	0.00%	0.00%	2.10%	8.24%	3.93%	0.76%	0.08%
American National Prop & Cas Group (G)	0.36%	0.26%	0.00%	0.00%	0.20%	0.40%	8.64%	8.47%	1.08%	0.00%	0.22%	3.01%	3.15%	0.55%	0.00%
EMC Insurance Companies (G)	1.57%	3.52%	2.38%	0.95%	0.57%	0.29%	5.96%	2.28%	0.32%	0.00%	7.69%	6.06%	8.64%	12.61%	0.44%
Tokio Marine US PC Group (G)	0.40%	1.09%	0.82%	0.79%	0.24%	0.59%	2.78%	2.64%	2.60%	0.89%	3.73%	12.02%	11.44%	7.32%	5.78%
Arrow Mutual Liability Insurance Company	25.58%	35.12%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Everest Re U.S. Group (G)	6.85%	7.64%	4.23%	0.33%	0.01%	0.01%	0.23%	0.20%	0.35%	0.03%	1.74%	6.31%	2.74%	2.45%	1.26%
American Family Insurance Group (G)	1.91%	5.75%	2.34%	0.05%	0.01%	1.20%	4.74%	4.50%	0.30%	0.00%	4.55%	20.78%	15.15%	1.29%	0.21%
Employers Insurance Group (G)	0.84%	2.56%	0.97%	0.43%	0.00%	0.33%	4.63%	1.71%	0.12%	0.00%	5.10%	17.98%	6.13%	1.27%	1.26%
Skyward Specialty Insurance Group (G)	8.00%	15.45%	1.35%	0.38%	0.03%	0.34%	0.72%	2.29%	1.18%	0.00%	2.94%	8.40%	8.07%	3.45%	0.18%
GE Capital PC Group (G)	2.99%	3.89%	1.03%	0.00%	0.00%	0.33%	0.03%	0.00%	0.00%	0.00%	1.67%	2.07%	1.25%	0.23%	0.02%
Markel Corporation Group (G)	7.37%	7.06%	6.35%	0.35%	0.00%	1.33%	15.29%	9.92%	3.22%	0.00%	1.47%	17.66%	14.99%	5.01%	0.85%
XL Reinsurance America Group (G)	10.61%	12.42%	3.87%	0.46%	4.54%	0.01%	0.40%	1.06%	1.59%	0.12%	0.10%	11.47%	6.10%	9.87%	1.76%
Service Insurance Group (G)	2.54%	6.99%	1.15%	0.00%	0.00%	0.15%	0.11%	1.76%	0.00%	0.00%	1.27%	5.66%	9.84%	0.31%	0.01%
Great American P & C Insurance Group (G)	0.59%	4.25%	0.02%	0.01%	0.01%	0.55%	1.68%	0.30%	0.00%	0.00%	2.53%	8.93%	9.94%	0.93%	2.20%
Merchants Insurance Group (G)	0.84%	4.56%	0.70%	0.05%	0.00%	0.97%	3.50%	1.87%	2.66%	1.18%	7.53%	16.63%	5.73%	6.32%	7.37%
Sompo Holdings US Group (G)	5.43%	12.23%	3.16%	0.14%	0.01%	0.00%	0.89%	0.08%	0.05%	0.05%	4.41%	12.31%	5.91%	1.42%	0.18%
Central Insurance Companies (G)	0.41%	2.73%	0.76%	0.05%	1.27%	0.99%	5.53%	2.73%	0.97%	0.00%	2.64%	9.53%	5.94%	1.92%	1.06%
ProSight Specialty Group (G)	0.83%	2.15%	0.50%	0.09%	0.19%	0.00%	0.38%	0.61%	0.91%	0.21%	1.88%	3.73%	3.44%	3.43%	2.51%
Argo Group (G)	5.06%	4.56%	4.03%	0.24%	0.10%	0.35%	1.00%	0.27%	0.00%	0.00%	2.96%	9.25%	3.34%	0.90%	0.10%
AF Group (G)	3.99%	15.18%	6.75%	0.98%	5.56%	0.00%	0.00%	0.00%	0.00%	0.00%	4.66%	10.14%	6.80%	3.71%	1.73%
Intact US Insurance Group (G)	6.18%	10.32%	11.10%	2.25%	0.54%	0.00%	0.00%	0.00%	0.00%	0.00%	1.07%	4.03%	4.19%	0.50%	0.04%

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Bond Distribution for MA Workers' Compensation Group Companies by Class and by Maturity

Companies (1)	Governments					States & Territories					Special Revenue				
	0.5	3	7.5	15	25	0.5	3	7.5	15	25	0.5	3	7.5	15	25
	(2)					(3)					(4)				
Work First Casualty Company	0.02%	4.49%	0.00%	0.00%	0.52%	0.34%	0.00%	4.58%	0.00%	1.28%	0.19%	1.10%	3.29%	1.66%	0.00%
The Cincinnati Insurance Companies (G)	0.16%	0.81%	0.05%	0.00%	0.00%	2.00%	16.20%	13.56%	0.07%	0.00%	0.78%	8.87%	13.75%	0.32%	0.07%
Benchmark Insurance Group (G)	5.26%	2.56%	0.17%	0.01%	0.00%	1.13%	4.18%	2.48%	1.59%	0.44%	5.63%	14.80%	12.56%	6.54%	2.33%
Nationwide Group (G)	0.59%	4.32%	7.78%	0.29%	2.28%	0.64%	1.04%	1.72%	0.44%	0.00%	1.62%	4.94%	6.31%	3.41%	0.44%
Church Mutual Insurance Group (G)	5.44%	7.27%	2.31%	0.25%	0.17%	0.23%	2.72%	3.72%	0.49%	0.00%	4.30%	13.28%	12.34%	4.14%	1.05%
Core Specialty Insurance Group (G)	2.32%	21.52%	4.92%	1.14%	0.16%	0.00%	0.15%	0.12%	0.00%	0.00%	2.68%	7.66%	3.61%	0.98%	0.13%
MS&AD US Insurance Group (G)	6.15%	12.84%	7.47%	0.39%	0.00%	0.03%	1.30%	1.68%	0.02%	0.00%	1.79%	5.06%	6.24%	1.88%	1.02%
State Auto Insurance Companies (G)	3.24%	7.70%	4.43%	2.31%	1.04%	0.11%	2.93%	3.60%	0.00%	0.00%	7.01%	24.86%	9.55%	4.81%	2.54%
Allianz US PC Insurance Companies (G)	2.32%	11.26%	4.55%	0.21%	1.10%	0.41%	0.77%	0.09%	0.07%	0.02%	4.13%	7.53%	3.30%	1.92%	2.12%
Pharmacists Mutual Insurance Group (G)	0.65%	6.75%	2.25%	2.05%	0.02%	0.88%	2.23%	4.38%	0.00%	0.00%	3.78%	15.08%	22.82%	3.73%	0.02%
Amerisure Companies (G)	2.46%	6.58%	3.00%	1.57%	3.79%	0.00%	2.63%	1.50%	0.72%	0.00%	2.92%	7.87%	4.87%	1.58%	0.05%
James River Group (G)	3.97%	7.77%	0.19%	0.01%	0.00%	0.14%	1.94%	4.06%	0.05%	0.00%	3.86%	10.26%	11.42%	3.41%	0.41%
GuideOne Insurance Companies (G)	1.48%	1.27%	1.63%	0.14%	0.00%	1.02%	2.58%	8.01%	0.43%	0.00%	2.97%	7.47%	7.67%	0.43%	0.07%
Premier Group Insurance Company	5.12%	7.15%	11.66%	0.00%	0.00%	0.00%	2.74%	1.43%	0.00%	0.00%	2.56%	7.78%	2.89%	0.26%	0.00%
Brotherhood Mutual Insurance Company	0.87%	0.41%	0.00%	0.00%	0.00%	0.62%	14.52%	7.49%	0.00%	0.00%	2.82%	20.73%	22.73%	1.46%	0.10%
Quincy Mutual Group (G)	1.02%	4.30%	3.41%	0.03%	4.39%	0.29%	0.70%	0.77%	0.00%	0.20%	5.30%	12.74%	11.81%	0.90%	0.53%
RLI Group (G)	2.56%	5.24%	4.47%	1.72%	0.00%	0.70%	2.69%	0.18%	0.00%	0.00%	4.43%	9.60%	10.40%	5.88%	2.43%
Cherokee Insurance Company	0.41%	3.31%	1.66%	0.00%	0.00%	0.79%	1.97%	1.02%	1.31%	0.04%	9.56%	19.85%	13.34%	7.68%	8.96%
ICW Pool (G)	5.15%	33.97%	6.05%	0.38%	0.00%	0.66%	9.06%	8.67%	1.50%	0.29%	0.06%	0.42%	1.26%	0.38%	0.10%
AMERISAFE Insurance Group (G)	5.38%	2.35%	0.57%	0.19%	0.02%	3.19%	12.47%	9.61%	1.47%	0.06%	3.22%	17.15%	24.85%	3.91%	0.00%
ProAssurance Group (G)	1.03%	3.80%	2.98%	0.17%	0.09%	0.29%	1.04%	1.40%	0.04%	0.00%	4.34%	12.33%	7.70%	1.38%	0.07%
WCF Insurance Group (G)	4.18%	10.55%	4.90%	2.51%	0.43%	0.83%	3.91%	5.77%	5.82%	0.00%	2.78%	5.86%	8.76%	6.17%	0.00%
Petroleum Casualty Company	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
American Contractors Insurance Group (G)	1.25%	5.65%	0.51%	0.02%	0.00%	1.16%	1.91%	1.11%	0.00%	0.00%	5.78%	14.79%	12.50%	0.85%	0.02%
State Farm Group (G)	2.25%	8.56%	2.85%	0.40%	0.03%	1.60%	15.53%	15.36%	1.11%	0.01%	1.19%	10.23%	15.02%	0.66%	0.09%
Samsung F & M Insurance Co, Ltd USB	10.88%	16.51%	1.27%	0.00%	0.00%	0.02%	0.10%	0.00%	0.00%	0.00%	0.67%	2.82%	0.55%	0.00%	0.00%
MAG Mutual Companies (G)	15.34%	12.30%	2.05%	0.22%	0.07%	0.12%	1.42%	1.08%	0.28%	0.00%	1.18%	5.63%	3.70%	2.15%	1.37%
The Gray Insurance Group (G)	65.31%	6.77%	0.28%	0.00%	0.00%	0.00%	3.50%	0.00%	0.00%	0.00%	0.04%	5.06%	0.00%	0.00%	0.00%
West Bend Mutual Insurance Company	2.81%	3.08%	3.52%	0.37%	0.86%	0.25%	1.15%	1.65%	0.25%	0.00%	2.04%	8.77%	8.85%	1.78%	0.63%
Penn National Insurance Companies (G)	0.18%	1.04%	0.27%	0.00%	0.00%	0.00%	0.79%	1.22%	0.43%	0.00%	5.61%	9.07%	6.43%	2.37%	0.87%
HDI/Talanx US PC Group (G)	1.62%	11.12%	1.25%	0.05%	0.00%	0.02%	0.22%	1.34%	0.59%	0.10%	0.78%	3.45%	2.59%	2.06%	1.64%

Notes:
 Source: A.M. Best's Global Insurance Database for all Massachusetts Workers' Compensation Group Companies, 2020 Schedule D, Part 1A.

VII 000103

Bond Distribution for MA Workers' Compensation Group Companies by Class and by Maturity

Companies (1)	Industrials (2)					Other Bonds (3)				
	0.5	3	7.5	15	25	0.5	3	7.5	15	25
Travelers Group (G)	8.55%	16.88%	16.21%	0.77%	0.23%	0.00%	0.00%	0.00%	0.00%	0.00%
A.I.M. Mutual Insurance Companies (G)	1.85%	27.08%	23.72%	2.27%	1.09%	0.00%	0.00%	0.00%	0.00%	0.00%
Hartford Insurance Group (G)	10.98%	26.65%	17.67%	5.66%	4.02%	0.00%	0.00%	0.03%	0.00%	0.74%
Liberty Mutual Insurance Companies (G)	2.90%	28.32%	19.58%	3.47%	1.59%	0.00%	0.00%	0.00%	0.00%	0.00%
Chubb INA Group (G)	5.26%	22.42%	17.38%	2.18%	2.05%	0.00%	0.00%	0.00%	0.00%	0.11%
American International Group (G)	10.95%	34.43%	15.41%	3.05%	3.53%	0.89%	3.72%	0.09%	0.05%	0.07%
Zurich Insurance US PC Group (G)	4.09%	20.60%	15.03%	2.60%	0.67%	0.00%	0.00%	0.00%	0.06%	0.05%
Berkshire Hathaway Insurance Group (G)	0.52%	1.14%	0.31%	0.47%	0.05%	4.76%	1.77%	0.00%	0.00%	0.01%
Charter Insurance Group (G)	9.43%	23.18%	12.21%	0.91%	0.00%	0.00%	0.00%	0.00%	0.00%	0.38%
Old Republic Insurance Group (G)	8.13%	37.73%	23.79%	1.28%	0.00%	0.00%	0.19%	0.00%	0.00%	0.00%
W. R. Berkley Insurance Group (G)	15.37%	26.49%	10.83%	2.05%	0.14%	0.40%	0.87%	0.39%	0.00%	1.42%
CNA Insurance Companies (G)	2.77%	18.35%	22.93%	9.05%	6.65%	0.03%	0.34%	0.65%	0.27%	0.06%
AmTrust Group (G)	4.09%	48.45%	24.16%	0.71%	0.13%	0.00%	0.79%	0.30%	0.00%	0.19%
Hanover Ins Group Prop & Cas Cos (G)	4.18%	24.70%	33.87%	2.51%	0.60%	0.00%	0.00%	0.00%	0.00%	0.02%
MEMIC Group (G)	2.30%	21.49%	18.64%	4.41%	3.92%	0.00%	0.00%	0.00%	0.00%	0.20%
Arbella Insurance Group (G)	7.31%	23.58%	17.34%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Utica National Insurance Group (G)	5.43%	29.93%	25.28%	3.64%	3.39%	0.00%	0.00%	0.11%	0.00%	0.00%
Selective Insurance Group (G)	7.05%	29.38%	16.84%	2.88%	1.96%	0.01%	0.95%	0.44%	0.01%	0.41%
QBE North America Insurance Group (G)	8.30%	53.19%	5.69%	0.00%	0.02%	0.00%	0.00%	0.00%	0.00%	0.00%
Arch Insurance Group (G)	4.78%	36.69%	22.06%	1.22%	0.22%	0.00%	0.00%	0.00%	0.00%	0.00%
Sentry Insurance Group (G)	3.77%	27.77%	17.18%	2.43%	0.61%	0.00%	0.00%	0.00%	0.00%	0.00%
AmeriTrust Group (G)	9.27%	45.71%	31.76%	2.64%	0.79%	0.00%	0.00%	0.00%	0.00%	0.00%
Fairfax Financial (USA) Group (G)	3.78%	29.04%	2.53%	0.74%	3.03%	0.00%	0.96%	2.21%	0.00%	0.00%
Federated Mutual Group (G)	4.57%	21.30%	17.21%	17.17%	1.90%	0.00%	0.00%	0.00%	0.00%	0.00%
Starr International Group (G)	4.83%	14.07%	34.64%	1.10%	0.04%	0.06%	0.57%	0.13%	0.00%	0.12%
Norfolk & Dedham Group Pool (G)	4.46%	21.77%	11.07%	0.38%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
AU Holding Company Group (G)	0.21%	0.78%	0.28%	0.05%	0.07%	0.00%	0.09%	0.04%	0.00%	0.01%
Protective Insurance Corporation Group (SG)	6.80%	32.88%	16.67%	1.15%	0.43%	0.00%	0.00%	0.00%	0.00%	0.00%
American National Prop & Cas Group (G)	7.20%	32.65%	30.61%	2.35%	0.85%	0.00%	0.00%	0.00%	0.00%	0.00%
EMC Insurance Companies (G)	5.70%	25.29%	13.15%	2.37%	0.07%	0.00%	0.03%	0.11%	0.00%	0.00%
Tokio Marine US PC Group (G)	2.90%	18.96%	14.87%	3.69%	5.37%	0.09%	0.59%	0.21%	0.09%	0.09%
Arrow Mutual Liability Insurance Company	5.85%	27.04%	6.42%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

VII 000104

Bond Distribution for MA Workers' Compensation Group Companies by Class and by Maturity

Companies (1)	Industrials (2)					Other Bonds (3)				
	0.5	3	7.5	15	25	0.5	3	7.5	15	25
Everest Re U.S. Group (G)	5.30%	22.93%	28.01%	5.34%	0.88%	0.00%	0.01%	3.03%	0.00%	0.12%
American Family Insurance Group (G)	4.15%	19.69%	10.60%	2.08%	0.68%	0.00%	0.00%	0.03%	0.01%	0.00%
Employers Insurance Group (G)	5.75%	23.61%	24.75%	1.44%	1.12%	0.00%	0.00%	0.00%	0.00%	0.00%
Skyward Specialty Insurance Group (G)	5.80%	29.86%	10.79%	0.49%	0.29%	0.00%	0.00%	0.00%	0.00%	0.00%
GE Capital PC Group (G)	7.39%	57.30%	20.99%	0.47%	0.35%	0.00%	0.00%	0.00%	0.00%	0.00%
Markel Corporation Group (G)	0.47%	3.12%	4.50%	0.98%	0.05%	0.00%	0.00%	0.00%	0.00%	0.00%
XL Reinsurance America Group (G)	4.27%	17.11%	11.63%	2.24%	0.38%	0.00%	0.00%	0.00%	0.01%	0.00%
Service Insurance Group (G)	7.05%	37.95%	23.87%	0.96%	0.13%	0.00%	0.00%	0.27%	0.00%	0.00%
Great American P & C Insurance Group (G)	14.07%	38.92%	10.13%	3.59%	1.22%	0.00%	0.06%	0.00%	0.00%	0.08%
Merchants Insurance Group (G)	3.14%	12.18%	11.93%	0.85%	8.75%	0.00%	1.98%	1.26%	0.00%	0.00%
Sompo Holdings US Group (G)	7.20%	33.15%	11.70%	1.00%	0.64%	0.00%	0.01%	0.01%	0.00%	0.01%
Central Insurance Companies (G)	3.78%	26.05%	25.26%	1.05%	7.30%	0.00%	0.01%	0.04%	0.00%	0.00%
ProSight Specialty Group (G)	6.54%	33.16%	30.93%	2.59%	4.90%	0.05%	0.69%	0.24%	0.00%	0.02%
Argo Group (G)	9.03%	40.46%	17.39%	0.49%	0.47%	0.00%	0.00%	0.00%	0.00%	0.00%
AF Group (G)	5.33%	14.52%	11.45%	3.61%	5.61%	0.00%	0.00%	0.00%	0.00%	0.00%
Intact US Insurance Group (G)	4.00%	27.04%	13.95%	10.88%	3.91%	0.00%	0.00%	0.00%	0.00%	0.00%
Work First Casualty Company	9.11%	25.53%	27.34%	12.20%	8.35%	0.00%	0.00%	0.00%	0.00%	0.00%
The Cincinnati Insurance Companies (G)	5.00%	23.79%	14.06%	0.45%	0.06%	0.00%	0.00%	0.00%	0.00%	0.00%
Benchmark Insurance Group (G)	5.37%	26.03%	8.46%	0.00%	0.37%	0.06%	0.03%	0.00%	0.00%	0.00%
Nationwide Group (G)	7.57%	30.69%	21.04%	3.21%	1.64%	0.00%	0.00%	0.00%	0.00%	0.01%
Church Mutual Insurance Group (G)	5.03%	20.22%	13.97%	2.41%	0.66%	0.00%	0.00%	0.00%	0.00%	0.00%
Core Specialty Insurance Group (G)	2.12%	28.94%	22.37%	1.19%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
MS&AD US Insurance Group (G)	2.28%	24.69%	25.82%	0.05%	1.29%	0.00%	0.00%	0.00%	0.00%	0.00%
State Auto Insurance Companies (G)	2.94%	18.20%	4.40%	0.30%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%
Allianz US PC Insurance Companies (G)	6.81%	27.06%	21.46%	2.09%	2.77%	0.00%	0.00%	0.00%	0.00%	0.00%
Pharmacists Mutual Insurance Group (G)	1.58%	9.82%	16.39%	4.11%	3.48%	0.00%	0.00%	0.00%	0.00%	0.00%
Amerisure Companies (G)	5.90%	28.13%	14.56%	9.27%	2.62%	0.00%	0.00%	0.00%	0.00%	0.00%
James River Group (G)	3.47%	21.20%	23.99%	0.23%	0.88%	0.23%	1.37%	0.00%	0.00%	1.13%
GuideOne Insurance Companies (G)	12.40%	34.64%	15.97%	1.49%	0.33%	0.00%	0.00%	0.00%	0.00%	0.00%
Premier Group Insurance Company	14.77%	31.33%	11.94%	0.19%	0.17%	0.00%	0.00%	0.00%	0.00%	0.00%
Brotherhood Mutual Insurance Company	2.22%	14.52%	10.99%	0.40%	0.08%	0.00%	0.06%	0.00%	0.00%	0.00%
Quincy Mutual Group (G)	4.72%	29.08%	16.30%	1.10%	2.27%	0.14%	0.00%	0.00%	0.00%	0.00%

VII 000105

Bond Distribution for MA Workers' Compensation Group Companies by Class and by Maturity

Companies (1)	Industrials (2)					Other Bonds (3)				
	0.5	3	7.5	15	25	0.5	3	7.5	15	25
RLI Group (G)	4.23%	20.28%	17.70%	5.02%	2.47%	0.00%	0.00%	0.00%	0.00%	0.00%
Cherokee Insurance Company	0.99%	24.25%	1.94%	2.18%	0.75%	0.00%	0.00%	0.00%	0.00%	0.00%
ICW Pool (G)	2.95%	14.13%	8.80%	1.22%	2.54%	1.27%	0.51%	0.30%	0.00%	0.33%
AMERISAFE Insurance Group (G)	5.27%	8.94%	1.23%	0.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
ProAssurance Group (G)	8.52%	32.74%	19.21%	2.09%	0.59%	0.00%	0.02%	0.00%	0.06%	0.12%
WCF Insurance Group (G)	2.17%	14.80%	13.63%	2.97%	3.96%	0.00%	0.00%	0.00%	0.00%	0.00%
Petroleum Casualty Company	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
American Contractors Insurance Group (G)	12.49%	26.27%	14.97%	0.60%	0.00%	0.00%	0.00%	0.13%	0.00%	0.00%
State Farm Group (G)	1.28%	8.76%	14.51%	0.55%	0.00%	0.00%	0.01%	0.00%	0.00%	0.01%
Samsung F & M Insurance Co, Ltd USB	2.49%	32.69%	29.66%	1.95%	0.38%	0.00%	0.00%	0.00%	0.00%	0.00%
MAG Mutual Companies (G)	7.64%	26.20%	15.81%	2.69%	0.74%	0.00%	0.00%	0.00%	0.00%	0.00%
The Gray Insurance Group (G)	2.86%	6.13%	0.00%	0.00%	10.03%	0.00%	0.00%	0.00%	0.00%	0.00%
West Bend Mutual Insurance Company	11.32%	29.60%	20.50%	2.23%	0.34%	0.00%	0.00%	0.00%	0.00%	0.00%
Penn National Insurance Companies (G)	5.23%	30.52%	28.66%	4.38%	2.85%	0.07%	0.00%	0.00%	0.00%	0.00%
HDI/Talanx US PC Group (G)	4.17%	25.78%	32.62%	7.34%	2.53%	0.00%	0.20%	0.33%	0.00%	0.23%

Notes:

Source: A.M. Best's Global Insurance Database for all Massachusetts Workers' Compensation Group Companies, 2020 Schedule D, Part 1A.

VII 000106

Market Risk Premium

Year (1)	Large Company Stocks Total Returns (2)	Long-Term Government Bonds Income Returns (3)	Intermediate-Term Government Bonds Income Returns (4)	Short-Term Total Returns (5)	Long-Term Market Risk Premium = (2) - (3) (6)	Intermediate-Term Market Risk Premium = (2) - (4) (7)	Short-Term Market Risk Premium = (2) - (5) (8)
1926	11.62	3.73	3.78	3.27	7.89	7.84	8.35
1927	37.49	3.41	3.49	3.12	34.08	34.00	34.37
1928	43.61	3.22	3.64	3.56	40.39	39.97	40.05
1929	-8.42	3.47	4.07	4.75	-11.89	-12.49	-13.17
1930	-24.90	3.32	3.30	2.41	-28.22	-28.20	-27.31
1931	-43.34	3.33	3.16	1.07	-46.67	-46.50	-44.41
1932	-8.19	3.69	3.63	0.96	-11.88	-11.82	-9.15
1933	53.99	3.12	2.83	0.30	50.87	51.16	53.69
1934	-1.44	3.18	2.93	0.16	-4.62	-4.37	-1.60
1935	47.67	2.81	2.02	0.17	44.86	45.65	47.50
1936	33.92	2.77	1.44	0.18	31.15	32.48	33.74
1937	-35.03	2.66	1.48	0.31	-37.69	-36.51	-35.34
1938	31.12	2.64	1.82	-0.02	28.48	29.30	31.14
1939	-0.41	2.40	1.31	0.02	-2.81	-1.72	-0.43
1940	-9.78	2.23	0.90	0.00	-12.01	-10.68	-9.78
1941	-11.59	1.94	0.67	0.06	-13.53	-12.26	-11.65
1942	20.34	2.46	0.76	0.27	17.88	19.58	20.07
1943	25.90	2.44	1.56	0.35	23.46	24.34	25.55
1944	19.75	2.46	1.44	0.33	17.29	18.31	19.42
1945	36.44	2.34	1.19	0.33	34.10	35.25	36.11
1946	-8.07	2.04	1.08	0.35	-10.11	-9.15	-8.42
1947	5.71	2.13	1.21	0.50	3.58	4.50	5.21
1948	5.50	2.40	1.56	0.81	3.10	3.94	4.69
1949	18.79	2.25	1.36	1.10	16.54	17.43	17.69
1950	31.71	2.12	1.39	1.20	29.59	30.32	30.51
1951	24.02	2.38	1.98	1.49	21.64	22.04	22.53
1952	18.37	2.66	2.19	1.66	15.71	16.18	16.71
1953	-0.99	2.84	2.55	1.82	-3.83	-3.54	-2.81
1954	52.62	2.79	1.60	0.86	49.83	51.02	51.76
1955	31.56	2.75	2.45	1.57	28.81	29.11	29.99
1956	6.56	2.99	3.05	2.46	3.57	3.51	4.10
1957	-10.78	3.44	3.59	3.14	-14.22	-14.37	-13.92
1958	43.36	3.27	2.93	1.54	40.09	40.43	41.82
1959	11.96	4.01	4.18	2.95	7.95	7.78	9.01
1960	0.47	4.26	4.15	2.66	-3.79	-3.68	-2.19
1961	26.89	3.83	3.54	2.13	23.06	23.35	24.76
1962	-8.73	4.00	3.73	2.73	-12.73	-12.46	-11.46
1963	22.80	3.89	3.71	3.12	18.91	19.09	19.68
1964	16.48	4.15	4.00	3.54	12.33	12.48	12.94
1965	12.45	4.19	4.15	3.93	8.26	8.30	8.52
1966	-10.06	4.49	4.93	4.76	-14.55	-14.99	-14.82
1967	23.98	4.59	4.88	4.21	19.39	19.10	19.77
1968	11.06	5.50	5.49	5.21	5.56	5.57	5.85
1969	-8.50	5.95	6.65	6.58	-14.45	-15.15	-15.08
1970	3.86	6.74	7.49	6.52	-2.88	-3.63	-2.66
1971	14.30	6.32	5.75	4.39	7.98	8.55	9.91
1972	19.00	5.87	5.75	3.84	13.13	13.25	15.16
1973	-14.69	6.51	6.58	6.93	-21.20	-21.27	-21.62
1974	-26.47	7.27	7.24	8.00	-33.74	-33.71	-34.47
1975	37.23	7.99	7.35	5.80	29.24	29.88	31.43
1976	23.93	7.89	7.10	5.08	16.04	16.83	18.85
1977	-7.16	7.14	6.49	5.12	-14.30	-13.65	-12.28
1978	6.57	7.90	7.83	7.18	-1.33	-1.26	-0.61
1979	18.61	8.86	9.04	10.38	9.75	9.57	8.23
1980	32.50	9.97	10.55	11.24	22.53	21.95	21.26
1981	-4.92	11.55	12.97	14.71	-16.47	-17.89	-19.63
1982	21.55	13.50	12.81	10.54	8.05	8.74	11.01
1983	22.56	10.38	10.35	8.80	12.18	12.21	13.76
1984	6.27	11.74	11.68	9.85	-5.47	-5.41	-3.58

VII 000107

Market Risk Premium

Year (1)	Large Company Stocks Total Returns (2)	Long-Term Government Bonds Income Returns (3)	Intermediate-Term Government Bonds Income Returns (4)	Short-Term Total Returns (5)	Long-Term Market Risk Premium = (2) - (3) (6)	Intermediate-Term Market Risk Premium = (2) - (4) (7)	Short-Term Market Risk Premium = (2) - (5) (8)
1985	31.73	11.25	10.29	7.72	20.48	21.44	24.01
1986	18.67	8.98	7.72	6.16	9.69	10.95	12.51
1987	5.25	7.92	7.47	5.47	-2.67	-2.22	-0.22
1988	16.61	8.97	8.24	6.35	7.64	8.37	10.26
1989	31.69	8.81	8.46	8.37	22.88	23.23	23.32
1990	-3.10	8.19	8.15	7.81	-11.29	-11.25	-10.91
1991	30.47	8.22	7.43	5.60	22.25	23.04	24.87
1992	7.62	7.26	6.27	3.51	0.36	1.35	4.11
1993	10.08	7.17	5.53	2.90	2.91	4.55	7.18
1994	1.32	6.59	6.07	3.90	-5.27	-4.75	-2.58
1995	37.58	7.60	6.69	5.60	29.98	30.89	31.98
1996	22.96	6.18	5.82	5.21	16.78	17.14	17.75
1997	33.36	6.64	6.14	5.26	26.72	27.22	28.10
1998	28.58	5.83	5.29	4.86	22.75	23.29	23.72
1999	21.04	5.57	5.30	4.68	15.47	15.74	16.36
2000	-9.10	6.50	6.19	5.89	-15.60	-15.29	-14.99
2001	-11.89	5.53	4.27	3.83	-17.42	-16.16	-15.72
2002	-22.10	5.59	3.98	1.65	-27.69	-26.08	-23.75
2003	28.68	4.80	2.85	1.02	23.88	25.83	27.66
2004	10.88	5.02	3.28	1.20	5.86	7.60	9.68
2005	4.91	4.69	3.92	2.98	0.22	0.99	1.93
2006	15.79	4.68	4.54	4.80	11.11	11.25	10.99
2007	5.49	4.86	4.44	4.66	0.63	1.05	0.83
2008	-37.00	4.45	2.96	1.60	-41.45	-39.96	-38.60
2009	26.46	3.47	2.01	0.10	22.99	24.45	26.36
2010	15.06	4.25	1.92	0.12	10.81	13.14	14.94
2011	2.11	3.82	1.64	0.04	-1.71	0.47	2.07
2012	16.00	2.46	0.73	0.06	13.54	15.27	15.94
2013	32.39	2.88	1.02	0.02	29.51	31.37	32.37
2014	13.69	3.41	1.63	0.02	10.28	12.06	13.67
2015	1.38	2.47	1.51	0.02	-1.09	-0.13	1.36
2016	11.96	2.30	1.36	0.20	9.66	10.60	11.76
2017	21.83	2.67	1.93	0.80	19.16	19.90	21.03
2018	-4.38	2.82	2.65	1.81	-7.20	-7.03	-6.19
2019	31.49	2.55	2.08	2.14	28.94	29.41	29.35
2020	18.40	1.42	0.66	0.44	16.98	17.74	17.96
Average	12.16	4.91	4.33	3.34	7.25	7.83	8.82

Notes:

Source: 2021 SBBI Yearbook.

(2):Appendix A-1: Large-Capitalization Stocks, Total Returns.

(3): Appendix A-7: Long Term Government Bonds: Income Returns.

(4):Appendix A-11: Intermediate Term Government Bonds: Income Returns.

(5):Appendix A-14: U.S. Treasury Bills, Total Returns.

Investment Expense to Invested Assets Ratio

Companies	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011
Travelers Group (G)	0.22%	0.22%	0.23%	0.22%	0.22%	0.23%	0.22%	0.23%	0.20%	0.21%
A.I.M. Mutual Insurance Companies (G)	0.14%	0.14%	0.14%	0.13%	0.14%	0.15%	0.16%	0.16%	0.16%	0.23%
Hartford Insurance Group (G)	0.20%	0.24%	0.25%	0.24%	0.20%	0.19%	0.19%	0.18%	0.19%	0.19%
Liberty Mutual Insurance Companies (G)	0.30%	0.31%	0.29%	0.27%	0.25%	0.26%	0.26%	0.26%	0.25%	0.31%
Chubb INA Group (G)	0.14%	0.14%	0.13%	0.13%	0.16%	0.16%	0.18%	0.17%	0.14%	0.15%
American International Group (G)	0.17%	0.16%	0.17%	0.19%	0.15%	0.16%	0.13%	0.15%	0.16%	0.16%
Zurich Insurance US PC Group (G)	0.40%	0.40%	0.30%	0.25%	0.24%	0.14%	0.15%	0.09%	0.09%	0.10%
Berkshire Hathaway Insurance Group (G)	0.10%	0.11%	0.13%	0.09%	0.12%	0.12%	0.12%	0.06%	0.08%	0.08%
Charter Insurance Group (G)	0.31%	0.30%	0.28%	0.27%	0.24%	0.26%	0.25%	0.25%	0.26%	0.22%
Old Republic Insurance Group (G)	0.07%	0.08%	0.08%	0.07%	0.09%	0.12%	0.12%	0.13%	0.15%	0.18%
W. R. Berkley Insurance Group (G)	0.28%	0.25%	0.23%	0.25%	0.29%	0.30%	0.26%	0.26%	0.28%	0.30%
CNA Insurance Companies (G)	0.15%	0.15%	0.14%	0.14%	0.15%	0.23%	0.20%	0.19%	0.20%	0.19%
AmTrust Group (G)	0.05%	0.08%	0.11%	0.25%	0.18%	0.16%	0.16%	0.18%	0.22%	0.25%
Hanover Ins Group Prop & Cas Cos (G)	0.20%	0.20%	0.21%	0.24%	0.25%	0.26%	0.15%	0.15%	0.16%	0.14%
MEMIC Group (G)	0.18%	0.18%	0.18%	0.19%	0.19%	0.19%	0.22%	0.22%	0.23%	0.23%
Arbella Insurance Group (G)	0.11%	0.11%	0.11%	0.11%	0.11%	0.10%	0.11%	0.24%	0.23%	0.21%
Utica National Insurance Group (G)	0.23%	0.26%	0.27%	0.27%	0.26%	0.29%	0.30%	0.28%	0.30%	0.29%
Selective Insurance Group (G)	0.23%	0.21%	0.20%	0.22%	0.18%	0.19%	0.19%	0.18%	0.20%	0.19%
QBE North America Insurance Group (G)	0.25%	0.27%	0.28%	0.29%	0.25%	0.33%	0.29%	0.29%	0.30%	0.32%
Arch Insurance Group (G)	0.22%	0.22%	0.22%	0.21%	0.15%	0.14%	0.11%	0.10%	0.11%	0.10%
Sentry Insurance Group (G)	0.32%	0.33%	0.29%	0.25%	0.25%	0.25%	0.25%	0.25%	0.27%	0.26%
AmeriTrust Group (G)	0.24%	0.26%	0.29%	0.12%	0.14%	0.16%	0.13%	0.12%	0.11%	0.12%
Fairfax Financial (USA) Group (G)	0.47%	0.50%	0.46%	0.40%	0.62%	0.62%	0.77%	0.97%	1.10%	0.97%
Federated Mutual Group (G)	0.22%	0.23%	0.23%	0.21%	0.20%	0.18%	0.18%	0.20%	0.19%	0.18%
Starr International Group (G)	0.09%	0.11%	0.12%	0.14%	0.13%	0.13%	0.11%	0.10%	0.14%	0.48%
Norfolk & Dedham Group Pool (G)	0.55%	0.57%	0.63%	0.58%	0.60%	0.58%	0.61%	0.50%	0.54%	0.52%
AU Holding Company Group (G)	0.08%	0.03%	0.02%	0.02%	0.01%	0.01%	0.02%	0.02%	0.10%	0.06%
Protective Insurance Corporation Group (SG)	0.41%	0.48%	0.53%	0.51%	0.56%	0.62%	0.54%	0.46%	0.29%	0.27%
American National Prop & Cas Group (G)	0.11%	0.13%	0.13%	0.14%	0.15%	0.13%	0.13%	0.15%	0.13%	0.14%
EMC Insurance Companies (G)	0.64%	0.82%	0.79%	0.67%	0.69%	0.63%	0.58%	0.56%	0.52%	0.51%
Tokio Marine US PC Group (G)	0.45%	0.40%	0.40%	0.40%	0.29%	0.25%	0.19%	0.17%	0.16%	0.17%
Arrow Mutual Liability Insurance Company	0.35%	0.20%	0.31%	0.33%	0.31%	0.31%	0.41%	0.32%	0.31%	0.36%
Everest Re U.S. Group (G)	0.13%	0.12%	0.09%	0.11%	0.10%	0.09%	0.10%	0.11%	0.09%	0.07%
American Family Insurance Group (G)	0.49%	0.56%	0.56%	0.54%	0.49%	0.48%	0.46%	0.46%	0.59%	0.63%

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Investment Expense to Invested Assets Ratio

Companies	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011
Employers Insurance Group (G)	0.15%	0.16%	0.10%	0.10%	0.10%	0.10%	0.10%	0.11%	0.11%	0.12%
Skyward Specialty Insurance Group (G)	0.36%	0.48%	0.66%	0.39%	0.24%	0.17%	0.13%	0.19%	0.24%	0.16%
GE Capital PC Group (G)	0.43%	0.41%	0.42%	0.43%	0.37%	0.36%	0.35%	0.34%	0.33%	0.30%
Markel Corporation Group (G)	0.38%	0.43%	0.47%	0.43%	0.42%	0.43%	0.39%	0.37%	0.36%	0.31%
XL Reinsurance America Group (G)	0.23%	0.25%	0.22%	0.24%	0.23%	0.25%	0.25%	0.25%	0.25%	0.25%
Service Insurance Group (G)	0.49%	0.78%	0.59%	0.38%	0.50%	0.42%	0.41%	0.39%	0.43%	0.38%
Great American P & C Insurance Group (G)	0.20%	0.28%	0.30%	0.29%	0.32%	0.32%	0.34%	0.41%	0.39%	0.40%
Merchants Insurance Group (G)	0.15%	0.16%	0.15%	0.12%	0.12%	0.14%	0.14%	0.13%	0.15%	0.16%
Sompo Holdings US Group (G)	0.14%	0.10%	0.12%	0.12%	0.14%	0.17%	0.15%	0.17%	0.17%	0.17%
Central Insurance Companies (G)	0.36%	0.43%	0.38%	0.28%	0.26%	0.27%	0.28%	0.29%	0.28%	0.28%
ProSight Specialty Group (G)	0.12%	0.11%	0.12%	0.12%	0.14%	0.14%	0.14%	0.16%	0.13%	0.11%
Argo Group (G)	0.31%	0.42%	0.51%	0.49%	0.39%	0.41%	0.42%	0.37%	0.36%	0.34%
AF Group (G)	0.19%	0.15%	0.20%	0.12%	0.12%	0.15%	0.13%	0.12%	0.12%	0.16%
Intact US Insurance Group (G)	0.22%	0.39%	0.32%	0.18%	0.19%	0.20%	0.38%	0.38%	0.04%	0.14%
Work First Casualty Company	0.41%	0.41%	0.48%	0.54%	0.82%	0.42%	0.44%	0.53%	0.57%	0.65%
The Cincinnati Insurance Companies (G)	0.06%	0.06%	0.06%	0.06%	0.05%	0.07%	0.06%	0.07%	0.06%	0.06%
Benchmark Insurance Group (G)	0.84%	0.94%	0.92%	0.54%	0.64%	0.75%	0.82%	0.76%	0.68%	0.43%
Nationwide Group (G)	0.30%	0.36%	0.37%	0.35%	0.35%	0.25%	0.35%	0.37%	0.33%	0.41%
Church Mutual Insurance Group (G)	0.24%	0.25%	0.27%	0.31%	0.32%	0.28%	0.29%	0.30%	0.33%	0.36%
Core Specialty Insurance Group (G)	0.43%	0.49%	0.22%	0.30%	0.21%	0.17%	0.28%	0.69%	0.65%	0.84%
MS&AD US Insurance Group (G)	0.36%	0.24%	0.35%	0.35%	0.41%	0.36%	0.36%	0.35%	0.35%	0.37%
State Auto Insurance Companies (G)	0.40%	0.38%	0.40%	0.40%	0.42%	0.49%	0.48%	0.49%	0.73%	0.74%
Allianz US PC Insurance Companies (G)	0.07%	0.06%	0.08%	0.09%	0.09%	0.06%	0.07%	0.06%	0.06%	0.08%
Pharmacists Mutual Insurance Group (G)	0.58%	0.71%	0.52%	0.52%	0.45%	0.54%	0.66%	0.66%	0.61%	0.62%
Amerisure Companies (G)	0.18%	0.16%	0.14%	0.15%	0.15%	0.14%	0.16%	0.17%	0.19%	0.18%
James River Group (G)	0.11%	0.09%	0.30%	0.31%	0.37%	0.41%	0.39%	0.36%	0.33%	0.29%
GuideOne Insurance Companies (G)	0.65%	0.76%	0.69%	0.63%	0.56%	0.53%	0.53%	0.49%	0.55%	0.56%
Premier Group Insurance Company	0.22%	0.24%	0.26%	0.29%	0.29%	0.29%	0.32%	0.26%	0.31%	0.31%
Brotherhood Mutual Insurance Company	0.63%	0.69%	0.77%	0.78%	0.83%	0.90%	0.98%	0.82%	0.86%	0.93%
Quincy Mutual Group (G)	0.74%	0.55%	0.44%	0.91%	0.70%	0.39%	0.54%	0.43%	0.41%	0.40%
RLI Group (G)	0.30%	0.30%	0.30%	0.31%	0.32%	0.32%	0.33%	0.32%	0.32%	0.22%
Cherokee Insurance Company	0.06%	0.07%	0.07%	0.07%	0.07%	0.08%	0.09%	0.08%	0.11%	0.11%
ICW Pool (G)	0.68%	0.63%	0.50%	0.80%	0.65%	0.69%	0.30%	0.24%	0.37%	0.35%
AMERISAFE Insurance Group (G)	0.15%	0.15%	0.14%	0.14%	0.16%	0.16%	0.19%	0.20%	0.21%	0.24%

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Investment Expense to Invested Assets Ratio

Companies	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011
ProAssurance Group (G)	0.28%	0.35%	0.32%	0.37%	0.31%	0.29%	0.35%	0.34%	0.34%	0.28%
WCF Insurance Group (G)	0.33%	0.34%	0.31%	0.31%	0.30%	0.27%	0.28%	0.26%	0.24%	0.31%
Petroleum Casualty Company	0.13%	0.09%	0.07%	0.08%	0.08%	0.09%	0.11%	0.10%	0.10%	0.11%
American Contractors Insurance Group (G)	0.22%	0.21%	0.22%	0.27%	0.29%	0.33%	0.33%	0.33%	0.44%	0.41%
State Farm Group (G)	0.13%	0.13%	0.14%	0.15%	0.20%	0.28%	0.19%	0.24%	0.28%	0.27%
Samsung F & M Insurance Co, Ltd USB	0.13%	0.13%	0.33%	0.57%	0.18%	0.31%	0.25%	0.34%	0.39%	0.49%
MAG Mutual Companies (G)	0.21%	0.26%	0.29%	0.29%	0.32%	0.32%	0.37%	0.35%	0.35%	0.37%
The Gray Insurance Group (G)	0.42%	0.56%	0.53%	0.53%	0.44%	0.46%	0.37%	0.11%	0.11%	0.10%
West Bend Mutual Insurance Company	0.47%	0.57%	0.55%	0.60%	0.60%	0.65%	0.72%	0.81%	0.80%	0.67%
Penn National Insurance Companies (G)	0.23%	0.16%	0.19%	0.18%	0.17%	0.18%	0.20%	0.21%	0.19%	0.18%
HDI/Talanx US PC Group (G)	0.13%	0.15%	0.10%	0.12%	0.14%	0.11%	0.12%	0.13%	0.09%	0.10%

	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011
Premium Weighted Investment Expense to Asset Ratio	0.22%	0.22%	0.22%	0.21%	0.20%	0.20%	0.20%	0.20%	0.20%	0.22%

Selected Ratio	0.21%
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Notes:

Source: A.M. Best's Global Insurance Database for all Massachusetts Workers' Compensation Group Companies.

- Investment Expenses is the sum of Total Investment Expenses Incurred and Investment Tax, Licences & Fees and Aggregate Write Ins, from Exhibit of Net Investment Income.
- Total Cash and Invested Assets from Exhibit of Assets.
- Premium Weighted Investment Expense to Asset Ratio use Direct Premiums Written from page 2.
- Selected Ratio is equal to ten year average.

Direct Premiums Written for MA Workers' Compensation Group Companies

Companies	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011
Travelers Group (G)	143,085	155,681	165,699	165,917	170,238	159,479	151,076	142,948	124,857	106,025
A.I.M. Mutual Insurance Companies (G)	141,670	158,738	155,688	158,179	156,921	149,530	144,469	138,172	122,474	104,109
Hartford Insurance Group (G)	107,771	122,647	116,964	115,136	106,794	100,625	95,680	93,792	92,384	86,307
Liberty Mutual Insurance Companies (G)	96,008	103,593	106,490	100,744	93,621	96,358	93,316	108,341	109,499	105,520
Chubb INA Group (G)	91,942	95,010	93,797	88,015	85,214	70,148	62,298	56,332	43,831	64,397
American International Group (G)	84,792	103,726	93,630	84,054	91,871	106,329	105,983	99,753	192,817	155,996
Zurich Insurance US PC Group (G)	70,523	60,369	61,930	60,851	63,002	61,220	53,484	43,096	39,237	32,940
Berkshire Hathaway Insurance Group (G)	62,947	70,797	70,331	64,812	63,215	54,174	41,941	28,225	27,891	24,354
Charter Insurance Group (G)	57,464	60,082	60,790	64,004	61,617	58,394	57,349	53,707	48,975	43,363
Old Republic Insurance Group (G)	35,383	29,096	25,785	26,755	21,483	19,474	21,366	20,020	13,221	9,924
W. R. Berkley Insurance Group (G)	34,183	33,269	42,470	46,425	41,191	35,083	33,183	30,140	33,958	27,722
CNA Insurance Companies (G)	24,741	21,232	21,127	20,840	18,238	16,003	15,858	15,740	16,328	19,077
AmTrust Group (G)	23,632	25,794	32,669	36,819	40,042	36,955	30,874	28,174	23,387	21,076
Hanover Ins Group Prop & Cas Cos (G)	22,909	20,803	21,394	20,360	17,429	16,309	12,945	12,871	12,258	11,761
MEMIC Group (G)	16,705	15,237	11,239	9,658	8,147	6,500	6,470	6,535	6,472	6,273
Arbella Insurance Group (G)	14,155	14,180	14,367	15,091	14,935	13,905	13,389	13,312	10,894	10,856
Utica National Insurance Group (G)	11,936	12,186	11,778	10,704	9,921	9,731	9,239	8,962	7,759	7,410
Selective Insurance Group (G)	10,335	9,480	8,189	7,060	6,254	5,646	5,225	4,938	5,061	3,777
QBE North America Insurance Group (G)	9,753	4,219	4,218	6,333	5,862	3,483	2,990	2,924	1,987	1,445
Arch Insurance Group (G)	9,698	6,883	6,148	5,889	6,417	4,136	5,364	5,021	4,588	2,717
Sentry Insurance Group (G)	8,949	9,080	8,263	7,293	7,197	5,974	7,166	7,496	7,191	6,979
AmeriTrust Group (G)	8,928	7,021	7,717	9,674	12,187	9,267	9,227	12,037	12,170	7,452
Fairfax Financial (USA) Group (G)	8,287	11,917	12,424	11,527	10,596	9,840	7,808	5,967	7,094	5,561
Federated Mutual Group (G)	8,170	6,820	6,117	5,898	5,082	3,335	3,071	2,381	2,182	2,125
Starr International Group (G)	7,945	7,043	7,458	4,833	4,455	4,196	2,914	1,759	102	0
Norfolk & Dedham Group Pool (G)	7,445	9,599	8,552	8,692	8,848	7,859	7,323	7,235	7,207	6,888
AU Holding Company Group (G)	7,343	7,096	9,344	12,208	12,165	12,229	11,285	10,812	9,070	6,622
Protective Insurance Corporation Group (SG)	5,922	5,560	3,499	3,560	2,387	2,337	2,074	1,341	1,493	1,266
American National Prop & Cas Group (G)	5,854	6,093	6,612	6,545	6,400	6,034	5,677	5,296	5,299	5,384
EMC Insurance Companies (G)	5,832	6,209	6,326	4,285	4,012	3,246	1,095	593	495	237

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Direct Premiums Written for MA Workers' Compensation Group Companies

Companies	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011
Tokio Marine US PC Group (G)	5,798	4,928	5,089	4,708	4,273	3,783	2,686	2,518	2,395	1,950
Arrow Mutual Liability Insurance Company	5,525	6,211	6,671	5,757	5,180	5,589	5,414	5,419	4,588	4,999
Everest Re U.S. Group (G)	5,279	3,240	1,727	1,759	616	489	799	709	422	345
American Family Insurance Group (G)	5,194	6,214	6,426	6,652	7,607	6,649	5,855	5,874	5,970	5,614
Employers Insurance Group (G)	4,285	4,757	3,125	1,583	110	0	0	0	0	0
Skyward Specialty Insurance Group (G)	4,263	2,208	634	195	34	41	62	11	3	41
GE Capital PC Group (G)	3,805	3,289	4,451	3,278	4,408	4,164	3,850	4,097	4,240	4,131
Markel Corporation Group (G)	3,694	6,312	7,294	5,507	1,455	1,319	1,314	1,074	1,734	2,126
XL Reinsurance America Group (G)	3,311	3,802	3,765	4,457	3,265	1,356	1,304	2,650	1,178	1,520
Service Insurance Group (G)	3,157	6	0	0	0	0	0	0	0	0
Great American P & C Insurance Group (G)	3,050	5,850	4,819	5,786	4,303	3,896	3,493	2,674	3,247	3,825
Merchants Insurance Group (G)	2,767	2,709	2,603	2,602	2,345	2,058	1,946	1,560	1,460	1,248
Sompo Holdings US Group (G)	2,493	2,171	2,301	1,406	899	585	579	415	578	555
Central Insurance Companies (G)	2,422	1,856	2,116	1,914	2,029	2,334	2,006	1,819	2,009	2,630
ProSight Specialty Group (G)	2,170	3,646	2,976	2,056	1,681	1,047	730	387	171	63
Argo Group (G)	1,984	1,808	2,766	2,854	2,870	2,732	3,120	3,328	3,107	5,286
AF Group (G)	1,574	2,781	980	421	361	179	111	139	161	132
Intact US Insurance Group (G)	1,441	1,431	1,298	1,306	1,352	1,515	1,632	1,903	226	0
Work First Casualty Company	1,414	1,984	1,414	900	0	0	0	0	0	0
The Cincinnati Insurance Companies (G)	1,406	619	367	252	227	294	313	279	271	170
Benchmark Insurance Group (G)	1,350	302	26	92	31	0	0	0	0	0
Nationwide Group (G)	1,348	1,564	2,072	2,462	2,506	3,402	3,282	3,222	2,304	2,138
Church Mutual Insurance Group (G)	1,318	1,419	1,363	1,287	1,175	1,006	925	919	806	660
Core Specialty Insurance Group (G)	1,044	1,135	997	641	0	0	0	0	0	0
MS&AD US Insurance Group (G)	998	1,063	1,284	1,315	2,075	1,706	1,628	1,999	1,860	1,157
State Auto Insurance Companies (G)	985	791	612	663	623	505	321	198	195	32
Allianz US PC Insurance Companies (G)	734	816	1,065	1,034	581	397	457	446	1,210	1,623
Pharmacists Mutual Insurance Group (G)	616	549	650	573	536	342	409	364	570	549
Amerisure Companies (G)	457	503	804	708	777	1,059	550	306	494	245
James River Group (G)	394	257	126	4	0	0	0	0	0	0

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Direct Premiums Written for MA Workers' Compensation Group Companies

Companies	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011
GuideOne Insurance Companies (G)	386	385	477	557	509	316	59	49	51	58
Premier Group Insurance Company	360	356	367	382	347	322	317	384	341	358
Brotherhood Mutual Insurance Company	178	180	139	66	36	5	0	0	0	0
Quincy Mutual Group (G)	172	668	690	731	735	785	770	810	765	756
RLI Group (G)	151	137	114	111	88	62	45	19	0	0
Cherokee Insurance Company	135	118	109	118	117	99	81	79	91	81
ICW Pool (G)	133	145	44	329	490	65	2	0	0	0
AMERISAFE Insurance Group (G)	100	176	60	103	125	45	50	111	91	53
ProAssurance Group (G)	64	321	12	0	0	0	0	0	0	0
WCF Insurance Group (G)	48	56	55	65	30	25	18	18	23	88
Petroleum Casualty Company	42	4	6	4	-24	21	3	3	-8	5
American Contractors Insurance Group (G)	30	55	187	80	47	3	-10	-12	63	30
State Farm Group (G)	19	32	35	35	24	50	19	30	43	41
Samsung F & M Insurance Co, Ltd USB	11	12	16	36	31	42	17	14	0	0
MAG Mutual Companies (G)	8	0	0	0	0	0	0	0	0	0
The Gray Insurance Group (G)	6	1	1	0	0	0	0	0	0	0
West Bend Mutual Insurance Company	4	0	0	0	0	0	0	0	0	0
Penn National Insurance Companies (G)	3	2	2	3	1	6	3	2	1	7
HDI/Talanx US PC Group (G)	1	1,481	2,716	5,579	8,710	6,821	5,300	4,242	2,161	1,099

Notes:

Source: A.M. Best's Global Insurance Database for all Massachusetts Workers' Compensation Group Companies.

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Calculation of Common Stock Total Return Tax Rate

Year (1)	Income Returns (2)	Capital Appreciation Returns (3)
1926	5.41	5.72
1927	5.71	30.91
1928	4.81	37.88
1929	3.98	-11.91
1930	4.57	-28.48
1931	5.35	-47.07
1932	6.16	-15.15
1933	6.39	46.59
1934	4.46	-5.94
1935	4.95	41.37
1936	5.36	27.92
1937	4.66	-38.59
1938	4.83	25.21
1939	4.69	-5.45
1940	5.36	-15.29
1941	6.71	-17.86
1942	6.79	12.43
1943	6.24	19.45
1944	5.48	13.80
1945	4.97	30.72
1946	4.09	-11.87
1947	5.49	0.00
1948	6.08	-0.65
1949	7.50	10.26
1950	8.77	21.78
1951	6.91	16.46
1952	5.93	11.78
1953	5.46	-6.62
1954	6.21	45.02
1955	4.56	26.40
1956	3.83	2.62
1957	3.84	-14.31
1958	4.38	38.06
1959	3.31	8.48
1960	3.26	-2.97
1961	3.48	23.13
1962	2.98	-11.81
1963	3.61	18.89
1964	3.33	12.97
1965	3.21	9.06
1966	3.11	-13.09
1967	3.64	20.09
1968	3.18	7.66
1969	2.98	-11.36
1970	3.33	0.10
1971	3.49	10.63
1972	2.95	15.79
1973	2.86	-17.37
1974	3.69	-29.72
1975	5.37	31.55
1976	4.49	19.15
1977	4.35	-11.50
1978	5.33	1.06
1979	5.88	12.31
1980	5.74	25.77
1981	4.88	-9.73
1982	5.61	14.76
1983	5.04	17.27

Calculation of Common Stock Total Return Tax Rate

Year (1)	Income Returns (2)	Capital Appreciation Returns (3)
1984	4.57	1.40
1985	4.72	26.33
1986	3.92	14.62
1987	3.64	2.03
1988	3.99	12.40
1989	4.03	27.25
1990	3.43	-6.56
1991	3.76	26.31
1992	2.98	4.46
1993	2.91	7.06
1994	2.83	-1.54
1995	3.04	34.11
1996	2.43	20.26
1997	2.10	31.01
1998	1.67	26.67
1999	1.36	19.53
2000	1.11	-10.14
2001	1.18	-13.04
2002	1.39	-23.37
2003	1.99	26.38
2004	1.76	8.99
2005	1.84	3.00
2006	2.01	13.62
2007	1.96	3.53
2008	1.92	-38.49
2009	2.48	23.45
2010	2.02	12.78
2011	2.13	0.00
2012	2.50	13.41
2013	2.47	29.60
2014	2.16	11.39
2015	2.10	-0.73
2016	2.26	9.54
2017	2.21	19.42
2018	2.01	-6.24
2019	2.34	28.88
2020	1.80	16.26
Average	3.92	8.00

	Dividend	Capital Gains
(4) Weights	32.87%	67.13%
(5) Tax Rate	13.13%	15.79%
(6) Common Stock Tax Rate		14.92%

Notes:

Source: 2021 SBBI Yearbook.

(2):Appendix A-2: Large-Capitalization Stocks, Income Returns.

(3):Appendix A-3: Large-Capitalization Stocks, Capital Appreciation Returns.

(5) = Dividend Tax Rate = $0.5 \times 0.21 + 0.5 \times 0.21 \times 0.25$

Capital Gains Tax Rate is from page 2.

Calculation of Capital Gains Tax Rate

(1) Turnover Rate	36.00%
(2) Weighted Average Cost of Capital	7.14%
(3) Marginal Tax Rate	21.00%
(4) Annual Expected Capital Gains Rate	8.00%

Year (5)	Investment Basis (6) _{t-1} x [1.0 - (1)] (6)	Investment Value		Investment Sold (8) x (1) (9)	Realized Capital Gains [(8) - (6)] x (1) (10)	Taxes Paid (10) x (3) (11)	Present Value of the Taxes (12)
		Beg of Year (8) _{t-1} - (9) _{t-1} (7)	End of Year (7) x [1.0 + (4)] (8)				
0	1,000,000.00	1,000,000.00	1,079,988.42	388,795.83	28,795.83	6,047.12	5,842.24
1	640,000.00	691,192.59	746,479.99	268,732.80	38,332.80	8,049.89	7,259.06
2	409,600.00	477,747.20	515,961.44	185,746.12	38,290.12	8,040.92	6,767.94
3	262,144.00	330,215.32	356,628.72	128,386.34	34,014.50	7,143.05	5,611.70
4	167,772.16	228,242.38	246,499.13	88,739.69	28,341.71	5,951.76	4,364.32
5	107,374.18	157,759.44	170,378.37	61,336.21	22,681.51	4,763.12	3,260.04
6	68,719.48	109,042.16	117,764.27	42,395.14	17,656.13	3,707.79	2,368.68
7	43,980.47	75,369.13	81,397.79	29,303.20	13,470.24	2,828.75	1,686.73
8	28,147.50	52,094.59	56,261.55	20,254.16	10,121.06	2,125.42	1,182.92
9	18,014.40	36,007.39	38,887.57	13,999.52	7,514.34	1,578.01	819.75
10	11,529.22	24,888.04	26,878.80	9,676.37	5,525.85	1,160.43	562.67
11	7,378.70	17,202.43	18,578.43	6,688.23	4,031.90	846.70	383.20
12	4,722.37	11,890.19	12,841.27	4,622.86	2,922.81	613.79	259.28
13	3,022.31	8,218.41	8,875.79	3,195.28	2,107.25	442.52	174.48
14	1,934.28	5,680.51	6,134.88	2,208.56	1,512.22	317.57	116.87
15	1,237.94	3,926.32	4,240.38	1,526.54	1,080.88	226.98	77.97
16	792.28	2,713.85	2,930.92	1,055.13	769.91	161.68	51.84
17	507.06	1,875.79	2,025.83	729.30	546.76	114.82	34.36
18	324.52	1,296.53	1,400.24	504.09	387.26	81.32	22.72
19	207.69	896.15	967.84	348.42	273.65	57.47	14.98
20	132.92	619.41	668.96	668.96	536.04	112.57	27.39
Total					258,912.75	54,371.68	40,889.13

(13) Implied Tax Rate on Capital Gains 15.79%

Notes:

- (1): Turnover Rate is based on AIB Stock Turnover Study of 1988 transactions. (2001 AIB Profit Filing, R2000-10, 100H-3, Exhibits 15 and 16)
- (2): Interest Rate is the weighted average cost of capital, Section VII - E, Exhibit 1.
- (4): Page 1.
- (10) Year 20 : All remaining capital gains are assumed realized in year 20.
- (12) = (11) x { [1.0 + (2)]ⁿ - [(5) + 0.5] }
- (13) = (12) Total / (10) Total

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Calculation of Common Stock Tax Rate for Different Discount Rates and Turnover Rates

		Discount Rate											
		4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%
Turnover Rate	0.10	12.36%	11.39%	10.57%	9.87%	9.28%	8.76%	8.32%	7.94%	7.61%	7.32%	7.07%	6.84%
	0.15	13.35%	12.49%	11.75%	11.10%	10.53%	10.04%	9.60%	9.21%	8.86%	8.55%	8.28%	8.03%
	0.20	14.27%	13.53%	12.87%	12.29%	11.76%	11.29%	10.87%	10.49%	10.14%	9.83%	9.54%	9.28%
	0.25	15.05%	14.42%	13.84%	13.32%	12.85%	12.41%	12.02%	11.65%	11.32%	11.01%	10.73%	10.46%
	0.30	15.67%	15.13%	14.63%	14.17%	13.75%	13.35%	12.99%	12.65%	12.34%	12.04%	11.77%	11.51%
	0.35	16.15%	15.68%	15.25%	14.85%	14.47%	14.12%	13.79%	13.48%	13.19%	12.92%	12.66%	12.41%
	0.40	16.52%	16.12%	15.75%	15.39%	15.06%	14.74%	14.45%	14.17%	13.90%	13.65%	13.41%	13.18%
	0.45	16.81%	16.47%	16.14%	15.83%	15.54%	15.26%	14.99%	14.74%	14.50%	14.27%	14.05%	13.84%
	0.50	17.05%	16.75%	16.47%	16.19%	15.93%	15.69%	15.45%	15.22%	15.00%	14.79%	14.59%	14.40%
	0.55	17.25%	16.99%	16.74%	16.50%	16.27%	16.05%	15.83%	15.63%	15.43%	15.25%	15.06%	14.89%
	0.60	17.41%	17.18%	16.96%	16.75%	16.55%	16.36%	16.17%	15.99%	15.81%	15.64%	15.48%	15.32%
	0.65	17.55%	17.35%	17.16%	16.98%	16.80%	16.62%	16.46%	16.30%	16.14%	15.99%	15.84%	15.70%
	0.70	17.67%	17.50%	17.33%	17.17%	17.01%	16.86%	16.71%	16.57%	16.43%	16.29%	16.16%	16.03%

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MASSACHUSETTS WORKERS' COMPENSATION

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F-CLASS RATE RECOMMENDATION

Background and Summary

The United States Longshore and Harbor Workers Compensation (USL&HW) Act is a federal law that offers benefits to longshoremen, harbor workers, and other employees engaged in loading, unloading, repairing and building a vessel while working on the vessel or any adjoining navigable waters. F-Classes were created for risks that have considerable USL&HW exposure. Since the benefit provisions for F-Classes are different than those prescribed by Massachusetts workers' compensation law, rates for these classifications are calculated separately from Massachusetts state class codes.

To allow movement toward the levels indicated by the data, while acknowledging that F-Class historical data is not fully credible due to its more limited volume, this section of the filing recommends that average rates for F-Class classifications be decreased by 3.4% for the policy period beginning July 1, 2022.

Indicated Rate Change

The ratemaking methodology used for F-Classes is similar to that used in the statewide rate indication: we compare an indicated loss, LAE, loss based assessment, and fixed expense ratio to a permissible loss, LAE, loss based assessment, and fixed expense ratio. The F-Class indication is derived using five years of Unit Statistical Plan data, policy years 2014-2018. This is consistent with the WCRIBMA's overall approach regarding COVID-19 era data as described in Section I. Premium and losses are adjusted

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for the effects of trend, development, changes in benefits, and changes in rates. The resulting indicated adjusted loss ratio is loaded for loss adjustment expenses, loss based assessments associated with the USL&HW Act Special Fund (“Special Fund Assessment”), and fixed expenses. The expense provisions, with the exception of the Special Fund Assessment, are taken from Section I. The Special Fund Assessment is currently calculated by the NCCI as 11.3% of incurred indemnity losses covered under the USL&HW Act.

Complement of Credibility

Due to the limited amount of F-Class experience, the rate change derived from the historical experience is not fully credible. As recommended by the Attorney General’s Office in the 2012 rate hearing the WCRIBMA has, since 2014, used a credibility-weighted formula to derive the F-Class rate revision. The credibility assigned to the historical data is calculated as:

$$Z = \text{square root (number of claims in experience base / full credibility standard)}$$

Using a full credibility standard of 4,000.¹

The complement of credibility calculation shown in Section VIII-A Exhibit 2 adjusts the current rates forward for net loss trend, accounts for changes in benefits and Special Funds Assessments since the last revision, and incorporates the expense and profit provisions used in the general rate revision.

¹ Credibility formula and full credibility standard from 2012 AG filing page 22.

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Calculation of Adjusted Standard Earned Premium

To derive an indicated loss ratio, the premiums for policy years 2014-2018 must be projected to the level expected to prevail during the prospective effective period. This is done by first extending the reported exposures using the currently effective rates. Since the reported exposures may be subject to further development as a consequence of delayed premium audits, premium development factors are applied. Next, factors are applied to reflect the expected impacts of experience rating, merit rating and ARAP. Note that no wage trend adjustment is made to premiums because the trend applied in the calculation of adjusted losses is net of the impact of estimated wage trend.

In Section VIII-B, each policy year's premium is adjusted to the prevailing level and then all five years are summed to a five year total. This total will be used with the five year total of adjusted losses calculated in Section VIII-C to calculate the indicated loss ratio in Section VIII-A.

Calculation of Adjusted Total Losses

Within Section VIII-C, the losses from policy years 2014-2018 are converted to the level expected to prevail during the prospective effective period. Given the differences in benefits and the applicability of the Special Fund Assessment, claims associated with the USL&HW Act and claims associated with the Massachusetts workers' compensation law are adjusted separately. Indemnity and medical loss data are also adjusted separately because of differences in loss development and trend. Losses are adjusted for changes in benefit levels, loss development to ultimate, and trend (in excess of expected wage

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trend). Factors are also applied for the loading of loss adjustment expenses and the Special Fund Assessment resulting in estimates of the sum of loss, LAE and loss based assessments. Note that the conversion factors used to adjust F-Class losses related to the state workers compensation law are the same ones used in the development of class rates in Section IX.

Calculation of Law Amendment Factors

Injured workers in the F-Classes can receive benefits paid under either state law or federal law. Therefore, law amendment factors for both are needed in the derivation of the conversion factors used in Section VIII-C. Law amendment factors related to the USL&HW Act are taken from Section IV–F. These factors are derived from the estimated effects of federal law amendments reported in NCCI’s Annual Statistical Bulletin. The law amendment factors related to state workers compensation benefits (and reflected in the conversion factors taken from Section IX) are derived in Section IV-A.

Calculation of Loss Development Factors

The reported losses used in the indication include losses paid and payable under the state workers compensation law and under the USL&HW Act. Since the differing benefit levels can affect development patterns, the losses related to the state workers compensation law are developed separately from losses related to the USL&HW Act. For USL&HW Act claims, NCCI loss development factors were utilized in Section VIII-E. For

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state workers compensation claims, the development factors are consistent with those used in Section IX.

Calculation of Trend Factors

Trend factors adjust for changes in wage levels, claim frequency, and average claim size between the historical period and the prospective effective period. The trend factors used in developing the F-Class indication are consistent with the premium and loss trends selected in Section IX-B, Exhibit 3.

Calculation of Class Rates

There are 14 F-Classes in Massachusetts for which we update class pure premium relativities in a manner similar to that used in Section IX.

The Massachusetts indicated pure premiums are derived from five years of Unit Statistical Plan loss and payroll data. This is the same loss data that underlies the F-Class indication in Subsection A. The losses are adjusted for the appropriate law level changes, development to ultimate, the proposed 18.7% loss adjustment expense factor, and the Special Federal Fund Assessment. These adjustment factors are shown in Section VIII-E.

The countrywide relativities are calculated using the same countrywide data set used in Section IX. Pitch Factors are used to adjust the countrywide data to the same law level, LAE and Special Federal Fund Assessment level as the Massachusetts indicated pure premiums. The calculation of Pitch Factors is described in Section IX-A.

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The relativities underlying present rates are calculated from the pure premiums underlying the last revision, adjusted to reflect the impact of benefit changes and trend to the prospective effective period. These adjustment factors are shown on Exhibit 2 of Subsection F.

This section uses the same classical credibility method and parameters used in Section IX. The Massachusetts full credibility standards come from Section IX-D and are expected losses of \$28,050,000 and \$6,400,000 for indemnity and medical losses respectively. The countrywide full credibility standards also come from Section IX-D and correspond to countrywide claim counts of 1,150 and 1,000 for indemnity and medical losses respectively.

After the formula pure premium relativity is calculated, the proposed manual rates are calculated. Proposed manual rates are subject to swing limits of $\pm 20\%$ surrounding the targeted industry group change (see Section VIII-H). This is the method used for Massachusetts state classes, as outlined in Section IX-H.

Proposed F-Class Rates and Rating Values

Minimum Premium, Expected Loss Rates and D-Ratios are calculated using the methodology and factors from Section IX and X.

Pricing Example

Section VIII-I contains a sample rate calculation for Class 6824, Boat Building or Repairing & Drivers: US Act. Exhibit 1 of Section VIII-I details the calculation of the

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Massachusetts indicated pure premium relativity. Exhibit 2 of Section VIII-I details the calculation of the countrywide relativity. Exhibit 3 of Section VIII-I shows the calculation of the credibilities and the formula relativities. Exhibit 4 of Section VIII-I shows the derivation of the proposed average rate, manual rate and rating values.

USL&HW Coverage Percentage

The USL&HW Coverage Percentage is a factor applied to classification rates which do not anticipate operations subject to the USL&HW Act. If operations under such classifications involve some employees subject to the USL&HW Act, the manual rate and minimum premium are increased by the USL&HW Coverage Percentage for Manual Rates and the Expected Loss Rate is increased by the USL&HW Coverage Percentage for Expected Loss Rates.

The calculation of the proposed USL&HW Coverage Percentages are shown in Section VIII-J. The “Differential in Benefits” from the 7/1/2020 USL&HW Coverage Percentage is the starting point. Using the state and federal benefit level changes which have occurred since then and the projected benefit level changes from Section IV-A and IV-F, the revised differential in benefits is calculated on line (4) of Section VIII-J. The impact of the differential in benefits is then combined with the impact of the Special Fund Assessment to derive the USL&HW Coverage Percentage for Manual Rates on line (10) of Section VIII-J. The USL&HW Coverage Percentage for Expected Loss Rates does not include the impact of the Special Funds Assessment.

VIII 000008

Section VIII – Rate Recommendation
Subsection A – F-Class Rate Recommendation
7/1/2022

Section VIII-A
Page 8

Federal Tax Multiplier

The Federal Tax Multiplier is to be used in retrospective rating for those classes subject to the USL&HW Act. A Federal Tax Multiplier is needed to reflect the impact of the Special Fund Assessment applicable to indemnity losses paid under the USL&HW Act. This filing recommends a Federal Tax Multiplier of 1.075. The calculation is shown in Section VIII-K.

VIII 000009

Section VIII - F-Class Recommendation
Subsection A - Indicated Rate Change
7/1/2022

Section VIII-A
Exhibit 1

F-Class Rate Review Overall Indicated Rate Change

(1)	5-Year Adjusted Standard Plus ARAP Earned Premium	6,847,551
(2)	5-Year Adjusted Losses, LAE, and LBA	3,412,940
(3)	5-Year Adjusted Loss, LAE, and LBA Ratio = (2) / (1)	49.8%
(4)	Fixed Expense Ratio	5.8%
(5)	Factor to Remove the Large Deductible Contribution to the Residual Market Subsidy	1.000
(6)	Indicated Policy Year 7/1/2022 Loss, LAE, Fixed Expense Ratio = [(3) + (4)] x (5)	55.7%
(7)	Variable Expense Ratio	20.3%
(8)	Profit and Contingencies	4.1%
(9)	Permissible Loss, LAE, LBA, and Fixed Expense Ratio = 1.000 - [(7) + (8)]	75.5%
(10)	Indicated Average Rate Change = [(6) / (9)] - 1.000	-26.3%
(11)	Rate Changed based on Trended On-Level Expected Loss Ratio	2.2%
(12)	5-Year Total Claim Count	154
(13)	Credibility of the Indicated Average Rate Change = [(12) / 4,000] ^{0.5}	19.6%
(14)	Credibility Weighted Average Rate Change = [(10) x (13)] + { (11) x [100% - (13)] }	-3.4%

Notes:

- (1): Section VIII-B, Exhibit 1.
- (2): Section VIII-C, Exhibit 1, Page 2 and 4.
- (4), (7): Section VI-A, Exhibit 1.
- (5): Section I-E, Exhibit 1, Page 1.
- (8): Section VII-A, Exhibit 1.
- (11): Exhibit 2.
- (12): Unit Statistical Plan Data.

VIII 000010

Section VIII - F-Class Recommendation
 Subsection A - Indicated Rate Change
 7/1/2022

Section VIII-A
 Exhibit 2

F-Class Rate Review Complement of Credibility based on Trended On-Level Expected Loss Ratio

(1)	State Class Expected Loss and LAE Ratio from Prior Revision		75.7%
(2)	Loss Adjustment Expense Ratio from Prior Revision		0.187
(3)	Special Fund Assessment Rate as a % of Federal Indemnity Losses from Prior Revision		12.0%
		<u>Indemnity</u>	<u>Medical</u>
(4)	Federal Indemnity/Medical Losses as % of Total Federal Losses	52.9%	47.1%
(5)	F-Class Expected Loss Ratio from Prior Revision		60.5%
	= (1) / {(4) for Indemnity x [1.000 + (2) + (3)] + (4) for Medical x [1.000 + (2)] }		
(6)	Benefit Level Change Factor	1.006	1.000
(7)	Net Indemnity/Medical Trend	-2.9%	-2.9%
(8)	Years since Prior Revision	2.0	2.0
(9)	Trended On-Level Loss Ratio	30.4%	26.9%
	= (4) x (5) x (6) x [1.000 + (7)] ^ (8)		
(10)	Special Fund Assessment Rate as a % of Federal Indemnity Losses		11.3%
(11)	Loss Adjustment Expense Factor		1.187
(12)	Trended Loss, LAE and LBA Ratio		71.3%
	= [(9) for indemnity x (10)] + [(9) Total x (11)]		
(13)	Fixed Expense Ratio		5.8%
(14)	Trended Loss, LAE and Fixed Expense Ratio		77.2%
	= (12) + (13)		
(15)	Variable Expense Ratio		20.3%
(16)	Underwriting Profit Provision		4.1%
(17)	Permissible Loss, LAE, LBA, and Fixed Expense Ratio		75.5%
	= 1.000 - [(15) + (16)]		
(18)	Rate Changed based on Trended On-Level Expected Loss Ratio from Prior Revision		2.2%
	= [(14) / (17)] - 1.000		

Notes:

- (1): Section VI-J, Exhibit 1 of 07/01/2020 Stipulation.
 (2), (3), (4): Section VIII-J, Exhibit 1 of 07/01/2020 Stipulation.
 (6): Section VIII-F, Exhibit 2.
 (7): Section V-A, Exhibit 1.
 (10): Section VIII-E, Exhibit 1, Page 2.
 (11), (15),(16): Section VI-J, Exhibit 1.
 (13): Section VI-A, Exhibit 1.

VIII 000011

Section VIII - F-Class Recommendation
Subsection B - Adjusted Premium
7/1/2022

Section VIII-B
Exhibit 1

5 Year Adjusted Standard Plus ARAP Earned Premium

Policy Year (1)	Manual Premium (2)	Premium Development Factor (3)	Experience & Merit Rating Adjustment (4)	ARAP Adjustment (5)	Total Adj Standard Plus ARAP Premium (6)
2014	1,204,911	1.000	0.997	1.053	1,264,965
2015	1,467,580	1.000	0.997	1.053	1,540,334
2016	1,391,495	1.000	0.997	1.053	1,460,392
2017	1,218,812	1.000	0.997	1.053	1,278,921
2018	1,240,410	1.001	0.997	1.053	1,302,939
Total	6,523,207				6,847,551

Notes:

(2): Section VIII-F, Exhibit 1, Page 3.

(3): Section V-E, Exhibit 1.

(4): The offset for Merit Rating and Average Experience Modification from the 07/01/2020 Stipulation.

(5): The offset for ARAP from the 07/01/2020 Stipulation.

(6) = (2) x (3) x (4) x (5)

VIII 000012

Section VIII - F-Class Recommendation
 Subsection C - Adjusted Losses
 7/1/2022

Section VIII-C
 Exhibit 1
 Page 1

Calculation of Adjusted Indemnity and Medical Losses Federal Losses

(A). Unit Statistical Plan Limited Reported Losses

Indemnity	Policy Year				
	2014	2015	2016	2017	2018
Fatal	0	0	0	0	0
Permanent Total	0	0	0	0	0
Permanent Partial	442,169	198,279	275,158	4,957	6,897
Temporary Total	63,404	124,666	22,205	69,150	103,697
Medical					
Fatal	0	0	0	0	0
Permanent Total	0	0	0	0	0
Permanent Partial	169,276	117,974	75,852	6,272	1,974
Temporary Total	105,758	184,015	61,332	45,649	77,550
Medical Only	26,300	21,360	28,610	17,445	8,377

(B). Unit Statistical Plan Converted Unlimited Losses

Converted unlimited Losses are Limited Losses after the application of Primary, Excess and Secondary Conversion Factors.

Indemnity	Policy Year				
	2014	2015	2016	2017	2018
Fatal	0	0	0	0	0
Permanent Total	0	0	0	0	0
Permanent Partial	562,237	300,022	405,904	8,526	17,132
Temporary Total	83,678	178,435	33,576	126,064	288,383
Medical					
Fatal	0	0	0	0	0
Permanent Total	0	0	0	0	0
Permanent Partial	245,683	208,054	126,611	9,652	4,051
Temporary Total	138,320	273,975	85,253	77,974	152,667
Medical Only	29,793	24,609	35,182	22,438	11,913

Note:

(B): Section VIII-G.

VIII 000013

Section VIII - F-Class Recommendation
 Subsection C - Adjusted Losses
 7/1/2022

Section VIII-C
 Exhibit 1
 Page 2

Calculation of Adjusted Indemnity and Medical Losses Federal Losses

(C). Investment Income Offset Factor

The impact from this factor needs to be removed from the Federal Conversion Factors.

Indemnity	Investment Income Offset Factor
Fatal	0.955
Permanent Total	0.942
Permanent Partial	1.010
Temporary Total	1.012
Medical	
Fatal	1.000
Permanent Total	0.944
Permanent Partial	1.011
Temporary Total	1.013
Medical Only	1.000

(D). Adjusted Losses

Indemnity	Policy Year				
	2014	2015	2016	2017	2018
Fatal	0	0	0	0	0
Permanent Total	0	0	0	0	0
Permanent Partial	556,720	297,079	401,921	8,442	16,964
Temporary Total	82,698	176,347	33,183	124,589	285,009
Medical					
Fatal	0	0	0	0	0
Permanent Total	0	0	0	0	0
Permanent Partial	242,930	205,723	125,193	9,544	4,006
Temporary Total	136,509	270,388	84,137	76,954	150,669
Medical Only	29,793	24,609	35,182	22,438	11,913
Adjusted Losses, LAE, LBA	3,412,940				

Notes:

(C): Section IX-B, Exhibit 4.

(D) = (B) / (C)

VIII 000014

Section VIII - F-Class Recommendation
 Subsection C - Adjusted Losses
 7/1/2022

Section VIII-C
 Exhibit 1
 Page 3

Calculation of Adjusted Indemnity and Medical Losses State Losses

(A). Unit Statistical Plan Limited Reported Losses

Indemnity	Policy Year				
	2014	2015	2016	2017	2018
Fatal	0	0	0	0	0
Permanent Total	0	0	0	0	0
Permanent Partial	0	0	0	0	0
Temporary Total	0	0	0	0	0
Medical					
Fatal	0	0	0	0	0
Permanent Total	0	0	0	0	0
Permanent Partial	0	0	0	0	0
Temporary Total	0	0	0	0	0
Medical Only	0	0	0	0	0

(B). Unit Statistical Plan Converted Unlimited Losses

Unlimited Losses are Limited Losses after the application of Primary, Excess and Secondary Conversion Factors.

Indemnity	Policy Year				
	2014	2015	2016	2017	2018
Fatal	0	0	0	0	0
Permanent Total	0	0	0	0	0
Permanent Partial	0	0	0	0	0
Temporary Total	0	0	0	0	0
Medical					
Fatal	0	0	0	0	0
Permanent Total	0	0	0	0	0
Permanent Partial	0	0	0	0	0
Temporary Total	0	0	0	0	0
Medical Only	0	0	0	0	0

Notes:

(B): Section VIII-G.

VIII 000015

Section VIII - F-Class Recommendation
 Subsection C - Adjusted Losses
 7/1/2022

Section VIII-C
 Exhibit 1
 Page 4

Calculation of Adjusted Indemnity and Medical Losses State Losses

(C). Investment Income Offset Factor

The impact from this factor needs to be removed from the State Conversion Factors.

Indemnity	Investment Income Offset Factor
Fatal	0.955
Permanent Total	0.942
Permanent Partial	1.010
Temporary Total	1.012
Medical	
Fatal	1.000
Permanent Total	0.944
Permanent Partial	1.011
Temporary Total	1.013
Medical Only	1.000

(D). Adjusted Losses

Indemnity	Policy Year				
	2014	2015	2016	2017	2018
Fatal	0	0	0	0	0
Permanent Total	0	0	0	0	0
Permanent Partial	0	0	0	0	0
Temporary Total	0	0	0	0	0
Medical					
Fatal	0	0	0	0	0
Permanent Total	0	0	0	0	0
Permanent Partial	0	0	0	0	0
Temporary Total	0	0	0	0	0
Medical Only	0	0	0	0	0
Adjusted Losses, LAE	0				

Notes:

(C): Section IX-B, Exhibit 4.

(D) = (B) / (C)

VIII 000016

Section VIII - F-Class Recommendation
Subsection D - Proposed Rates
7/1/2022

Section VIII-D
Exhibit 1

Proposed Rates and Rating Values to be Effective 7/1/2022

Class Code (1)	Manual Rate (2)	Minimum Premium (3)	Loss Constant (4)	Expected Loss Rate (5)	D-Ratio (6)
6801	6.36	473	0	2.56	0.18
6824	8.75	500	0	3.39	0.20
6826	5.26	343	0	2.12	0.18
6843	11.84	500	0	4.47	0.18
6872	16.54	500	0	6.24	0.19
6874	18.04	500	0	6.81	0.18
7309	10.86	500	0	4.10	0.19
7313	15.01	500	0	5.67	0.15
7317	18.32	500	0	6.91	0.19
7327	23.82	500	0	8.99	0.19
7350	18.06	500	0	6.98	0.17
8709	5.67	357	0	2.14	0.19
8726	4.17	305	0	1.68	0.20
9077	6.42	475	0	2.82	0.23

Notes:

(2),(3): Calculated as per Section VIII-I, Exhibit 4.

(4): F-Classes have no loss constant.

(5),(6): Calculated as per Section X.

VIII 000017

Section VIII - F-Class Recommendation
 Subsection E - Conversion/Excess Loss Factors
 7/1/2022

Section VIII-E
 Exhibit 1
 Page 1

Calculation of Indemnity and Medical Conversion Factors Federal Losses

(A). Benefit Level Adjustment Factors

The following factors are used to bring MA Unit Statistical Plan losses to the benefit level of the proposed effective policy year period.

Indemnity	Policy Year				
	2014	2015	2016	2017	2018
Fatal	1.043	1.039	1.035	1.030	1.025
Permanent Total	1.034	1.031	1.028	1.024	1.020
Permanent Partial	1.016	1.015	1.014	1.012	1.010
Temporary Total	1.034	1.031	1.028	1.024	1.020
Medical					
All Injury Types	1.000	1.000	1.000	1.000	1.000

(B). Loss Development Factors

The following factors are used to bring MA Unit Statistical Plan losses from first through fifth report to an ultimate basis.

Indemnity	Policy Year				
	2014	2015	2016	2017	2018
Likely	1.088	1.113	1.281	1.481	2.325
Not Likely	1.040	1.054	1.109	1.254	1.810
Medical					
Likely	1.134	1.176	1.250	1.316	1.527
Not Likely	1.024	1.023	1.024	1.060	1.135

(C). Trend Factors

The following factors trend the MA Unit Statistical Plan losses from the reported period to the proposed effective period for new rates.

Indemnity	Policy Year				
	2014	2015	2016	2017	2018
All Injury Types	0.749	0.812	0.845	0.846	0.875
Medical					
Lost Time Medical	0.755	0.842	0.866	0.862	0.886
Medical Only	0.710	0.742	0.785	0.778	0.802

(D). Primary Conversion Factors (PCF)

Indemnity	Policy Year				
	2014	2015	2016	2017	2018
Fatal - LD	0.850	0.939	1.120	1.290	2.084
Fatal - NLD	0.813	0.889	0.969	1.092	1.622
Permanent Total	0.843	0.931	1.112	1.282	2.074
Permanent Partial - LD	0.828	0.916	1.097	1.267	2.053
Permanent Partial - NLD	0.792	0.868	0.949	1.073	1.599
Temporary Total - LD	0.843	0.931	1.112	1.282	2.074
Temporary Total - NLD	0.806	0.882	0.963	1.086	1.614
Medical					
Lost Time Medical -LD	0.856	0.990	1.082	1.134	1.353
Lost Time Medical -NLD	0.773	0.861	0.887	0.913	1.006
Medical - NLD	0.727	0.759	0.804	0.825	0.911

Notes:

- (A): Section IV-F, Exhibit 1.
- (B): NCCI.
- (C): Section IX-B, Exhibit 1, Page 1.
- (D) = (A) x (B) x (C)

VIII 000018

Section VIII - F-Class Recommendation
Subsection E - Conversion/Excess Loss Factors
7/1/2022

Section VIII-E
Exhibit 1
Page 2

Calculation of Indemnity and Medical Conversion Factors Federal Losses

(A). Loss Adjustment Expense Factor

The following factor is applied to include the proposed loss adjustment expense.

	Indemnity	Medical
Loss Adjustment Expense Factor	1.187	1.187

(B). Loss Based Assessments (Special Fund Assessment)

	Indemnity	Medical
Loss Based Assessments	0.113	0.000

(C). Investment Income Offset Factor

The following factor is applied to adjust for investment income.

Indemnity	Investment Income Offset Factor
Fatal	0.955
Permanent Total	0.942
Permanent Partial	1.010
Temporary Total	1.012
Medical	
Fatal	1.000
Permanent Total	0.944
Permanent Partial	1.011
Temporary Total	1.013
Medical Only	1.000

(D). Secondary Conversion Factors (SCF)

Indemnity	
Fatal	1.241
Permanent Total	1.225
Permanent Partial	1.313
Temporary Total	1.315
Medical	
Fatal	1.187
Permanent Total	1.120
Permanent Partial	1.200
Temporary Total	1.202
Medical Only	1.187

Notes:

(A): 1.000 + Loss Adjustment Expense (as a percent of losses) from Section VI-A, Exhibit 1.

(B): NCCI Tax and Assessment Directory.

(C): Section IX-B, Exhibit 4.

(D) = [(A) + (B)] x (C)

VIII 000019

Section VIII - F-Class Recommendation
 Subsection E - Conversion/Excess Loss Factors
 7/1/2022

Section VIII-E
 Exhibit 1
 Page 3

Calculation of Indemnity and Medical Conversion Factors State Losses

The MA Indicated Pure Premium Relativities are calculated from exposure and loss data for the latest available 5 policy years of Unit Statistical Plan data.

Below are adjustment factors used to put the losses at the level proposed in this filing.

(A). Primary State Conversion Factors

Remainder of Industry	Policy Year				
	2014	2015	2016	2017	2018
Indemnity					
Fatal - LD	0.818	0.889	0.974	1.101	1.710
Fatal - NLD	0.812	0.889	0.967	1.082	1.505
Permanent Total	0.822	0.899	0.983	1.111	1.722
Permanent Partial - LD	0.854	0.930	1.014	1.141	1.761
Permanent Partial - NLD	0.849	0.929	1.007	1.121	1.550
Temporary Total - LD	0.804	0.881	0.966	1.094	1.700
Temporary Total - NLD	0.798	0.880	0.959	1.075	1.497
Medical					
Lost Time Medical - LD	0.705	0.779	0.804	0.822	0.894
Lost Time Medical - NLD	0.750	0.833	0.861	0.857	0.899
Medical - NLD	0.705	0.735	0.780	0.774	0.814

(B). Secondary State Conversion Factors

Indemnity	
Fatal	1.134
Permanent Total	1.118
Permanent Partial	1.199
Temporary Total	1.201
Medical	
Fatal	1.187
Permanent Total	1.120
Permanent Partial	1.200
Temporary Total	1.203
Medical Only	1.187

Notes:

(A): Section IX-B, Exhibit 1, Page 2.

(B): Section IX-B, Exhibit 1, Page 3.

Calculation of Converted Limited Losses by Indemnity Likely/Not-Likely and Medical Likely/Not-Likely
 Federal Industry Group
 All Classes

Policy Year (1)	Injury Type (2)	Limited Losses					Converted Limited Losses				
		Indemnity		Medical		Total (7)	Indemnity		Medical		Total (12)
		Likely (3)	Not Likely (4)	Likely (5)	Not Likely (6)		Likely (8)	Not Likely (9)	Likely (10)	Not Likely (11)	
2014	1	0	0	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0	0	0
	9	0	442,169	0	169,276	611,445	0	350,085	0	130,914	480,999
	5	16,736	46,668	23,125	82,633	169,162	14,112	37,616	19,805	63,906	135,439
	6	0	0	0	26,300	26,300	0	0	0	19,117	19,117
2015	1	0	0	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0	0	0
	9	55,426	142,853	19,430	98,544	316,253	50,797	123,983	19,230	84,843	278,853
	5	22,912	101,754	30,115	153,900	308,681	21,334	89,724	29,806	132,502	273,366
	6	0	0	0	21,360	21,360	0	0	0	16,215	16,215
2016	1	0	0	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0	0	0
	9	0	275,158	0	75,852	351,010	0	261,225	0	67,255	328,480
	5	0	22,205	0	61,332	83,537	0	21,375	0	54,380	75,755
	6	0	0	0	28,610	28,610	0	0	0	22,995	22,995
2017	1	0	0	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0	0	0
	9	0	4,957	0	6,272	11,229	0	5,320	0	5,729	11,049
	5	0	69,150	0	45,649	114,799	0	75,091	0	41,699	116,790
	6	0	0	0	17,445	17,445	0	0	0	14,393	14,393
2018	1	0	0	0	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0	0	0	0
	9	0	6,897	0	1,974	8,871	0	11,025	0	1,985	13,010
	5	0	103,697	0	77,550	181,247	0	167,408	0	77,996	245,404
	6	0	0	0	8,377	8,377	0	0	0	7,628	7,628
All Years, All Injury		95,074	1,215,508	72,670	875,074	2,258,326	86,243	1,142,852	68,841	741,557	2,039,493

Notes:
 (3),(4),(5),(6): Unit Statistical Plan data, excluding Large Deductibles.
 (8), (9), (10), (11): Limited Incurred Losses x Primary Conversion Factors from Section VIII-E, Exhibit 1, Page 1.
 (12) = (8) + (9) + (10) + (11)

VIII 000020

Calculation of Converted Unlimited Losses by Indemnity Likely/Not-Likely and Medical Likely/Not-Likely
 Federal Industry Group
 All Classes

Policy Year (1)	Injury Type (2)	Adjusted Excess Losses					Converted Unlimited Losses					Exposure (13)
		Indemnity		Medical		Total (7)	Indemnity		Medical		Total (12)	
		Likely (3)	Not Likely (4)	Likely (5)	Not Likely (6)		Likely (8)	Not Likely (9)	Likely (10)	Not Likely (11)		
2014	1	0	0	0	0	0	0	0	0	0	0	166,923
	2	0	0	0	0	0	0	0	0	0	0	
	9	0	78,269	0	73,801	152,070	0	562,237	0	245,683	807,920	
	5	2,594	9,307	6,313	25,010	43,224	21,971	61,707	31,406	106,914	221,998	
	6	0	0	0	5,989	5,989	0	0	0	29,793	29,793	
2015	1	0	0	0	0	0	0	0	0	0	0	196,085
	2	0	0	0	0	0	0	0	0	0	0	
	9	9,338	44,461	9,053	60,235	123,087	78,931	221,091	33,943	174,111	508,076	
	5	5,410	19,217	18,539	47,006	90,172	35,170	143,265	58,130	215,844	452,409	
	6	0	0	0	4,523	4,523	0	0	0	24,609	24,609	
2016	1	0	0	0	0	0	0	0	0	0	0	193,244
	2	0	0	0	0	0	0	0	0	0	0	
	9	0	48,023	0	38,244	86,267	0	405,904	0	126,611	532,515	
	5	0	4,157	0	16,521	20,678	0	33,576	0	85,253	118,829	
	6	0	0	0	6,653	6,653	0	0	0	35,182	35,182	
2017	1	0	0	0	0	0	0	0	0	0	0	171,747
	2	0	0	0	0	0	0	0	0	0	0	
	9	0	1,176	0	2,313	3,489	0	8,526	0	9,652	18,178	
	5	0	20,770	0	23,149	43,919	0	126,064	0	77,974	204,038	
	6	0	0	0	4,516	4,516	0	0	0	22,438	22,438	
2018	1	0	0	0	0	0	0	0	0	0	0	178,410
	2	0	0	0	0	0	0	0	0	0	0	
	9	0	2,027	0	1,390	3,417	0	17,132	0	4,051	21,183	
	5	0	51,885	0	48,971	100,856	0	288,383	0	152,667	441,050	
	6	0	0	0	2,410	2,410	0	0	0	11,913	11,913	
(14) All Years and Injury Types		17,342	279,292	33,905	360,731	691,270	136,072	1,867,885	123,479	1,322,695	3,450,131	906,409
(15) Pure Premium							0.150	2.061	0.136	1.459	3.806	

Notes:
 (3), (4) = 0.7 x [Excess Factor - 1.0] x Indemnity Converted Limited Losses. Excess Factor from Section IX-B, Exhibit 5 and Indemnity Converted Limited Losses from Page 1, Columns (8) and (9).
 (5), (6) = [Excess Factor - 1.0] x Medical Converted Limited Losses + 0.3 x [Excess Factor - 1.0] x Indemnity Converted Limited Losses. Excess Factor from Section IX-B, Exhibit 5 and Medical Converted Limited Losses from Page 1, Columns (10) and (11).
 (7) = (3) + (4) + (5) + (6)
 (8), (9), (10), (11): (Converted Limited Losses from Page 1 + Adjusted Excess Losses) x Secondary Conversion Factors from Section VIII-E, Exhibit 1, Page 2.
 (12) = (8) + (9) + (10) + (11)
 (13): From Page 3.
 (15): Pure Premium calculated as the All Years, All Injury Types Adjusted Converted Losses divided by the All Years, All Injury Types Exposure.

VIII 000021

Calculation of Manual Premium by Extension of Exposures
 Federal Industry Group
 All Classes

Class Code (1)	Exposure By Policy Year						Current Rate (8)	Manual Premium					
	2014	2015	2016	2017	2018	Total		2014	2015	2016	2017	2018	Total
	(2)	(3)	(4)	(5)	(6)	(7)		= (2) x (8) (9)	= (3) x (8) (10)	= (4) x (8) (11)	= (5) x (8) (12)	= (6) x (8) (13)	= (7) x (8) (14)
6801	0	0	0	0	0	0	6.81	0	0	0	0	0	0
6824	51,022	52,497	45,902	36,701	34,164	220,286	10.30	525,527	540,719	472,791	378,020	351,889	2,268,946
6826	100	0	19,475	0	3	19,578	5.74	574	0	111,787	0	17	112,378
6843	100	18,335	6,497	7,410	2,665	35,007	10.05	1,005	184,267	65,295	74,471	26,783	351,820
6872	7,107	7,445	8,885	11,081	11,281	45,799	14.08	100,067	104,826	125,101	156,020	158,836	644,850
6874	94	10	10	0	0	114	15.39	1,447	154	154	0	0	1,754
7309	7,342	12,589	13,523	11,775	20,945	66,174	10.52	77,238	132,436	142,262	123,873	220,341	696,150
7313	0	0	0	0	0	0	12.75	0	0	0	0	0	0
7317	5,260	4,441	4,059	3,162	655	17,577	16.69	87,789	74,120	67,745	52,774	10,932	293,360
7327	126	88	157	91	494	956	23.78	2,996	2,093	3,733	2,164	11,747	22,734
7350	0	0	0	0	0	0	19.75	0	0	0	0	0	0
8709	1,820	1,581	0	0	0	3,401	4.93	8,973	7,794	0	0	0	16,767
8726	93,952	99,099	94,736	101,527	108,203	497,517	4.25	399,296	421,171	402,628	431,490	459,863	2,114,447
9077	0	0	0	0	0	0	5.45	0	0	0	0	0	0
Total	166,923	196,085	193,244	171,747	178,410	906,409		1,204,911	1,467,580	1,391,495	1,218,812	1,240,410	6,523,207

Notes:
 (2) - (7): Unit Statistical Plan data.
 (8): Section VIII-D, Exhibit 1 of the 7/1/2020 Stipulation.

VIII 000022

Calculation of Pure Premium Underlying Present Rate Factor

Industry Group (1)	Injury Type (2)	Uncapped Rate Level Factor (3)	Industry Group Pure Premium From Previous Revision (4)	Percent of Pure Premium = $(4) / [\text{Total of (4)}]$ (5)	Expected Loss and LAE Ratio (6)	Loss Based Assessment Change Factor (7)	Federal Losses as a % of Total Losses (8)	Benefit Level Change Factor (9)	Trend (10)	Pure Premium Underlying Present Rate Factor = $(3) \times (5) \times (6) \times (7) \times (9) \times (10)$ (11)
Federal	Indemnity	7.672	2.386	0.537	0.757	0.997	1.000	1.006	0.942	2.950
	Medical	7.672	2.054	0.463	0.757	0.997	1.000	1.000	0.943	2.526
	Total		4.440							

Notes:

- (3): Section VIII-H, Exhibit 1 of the 7/1/2020 Stipulation.
- (4): Section VIII-G of the 7/1/2020 Stipulation.
- (6): Section VI-J, Exhibit 1 of the 7/1/2020 Stipulation.
- (7): Change in load from Section VIII-K, Exhibit 1 and the 7/1/2020 Stipulation.
- (8): Based on ratio of Federal losses to sum of Federal and State losses from Section VIII-C, Exhibit 1, Pages 1 & 3.
- (9): Weighted average of Section IV-A, Exhibit 1 and Section IV-F, Exhibit 1, using weights from Column (8).
- (10): Section V-A, Exhibit 1.

VIII 000023

VIII 000024

Section VIII - F-Class Recommendation
Subsection F - Proposed Pure Premium Relativities
7/1/2022

Section VIII-F
Exhibit 3

Calculation of Pure Premiums Underlying Present Rate Federal Industry Group

Class Code	Adopted Relativities		Pure Premiums Underlying Present Rate		
	Indemnity	Medical	Indemnity	Medical	Total = (4) + (5) (6)
(1)	(2)	(3)	(4)	(5)	(6)
6801	1.224	0.733	3.612	1.852	5.464
6824	1.325	1.515	3.908	3.827	7.735
6826	0.881	0.680	2.598	1.719	4.317
6843	1.610	1.112	4.750	2.808	7.558
6872	2.202	1.619	6.497	4.090	10.587
6874	2.653	1.482	7.827	3.744	11.571
7309	1.688	1.160	4.980	2.929	7.909
7313	2.514	0.863	7.416	2.179	9.595
7317	2.838	1.933	8.371	4.884	13.255
7327	3.696	2.759	10.904	6.969	17.872
7350	3.627	1.719	10.701	4.341	15.042
8709	0.750	0.592	2.211	1.496	3.707
8726	0.531	0.643	1.567	1.624	3.191
9077	0.889	1.874	2.623	4.733	7.356

Notes:

(2), (3): Section VIII-H, Exhibit 2 of the 07/01/2020 Stipulation.

(4), (5) = (2),(3) x Pure Premium Underlying Present Rate Factors from Exhibit 2.

VIII 000025

Section VIII - F-Class Recommendation
 Subsection G - Class Relativities
 7/1/2022

Section VIII - G
 Exhibit 1

Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Federal Class Codes		
6801 BOAT BUILDING - WOOD - NOC & DRIVERS: US ACT											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	0	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	0	0	0	0	0	0	0	0			

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.000	0.000	.
(15) Countrywide Pure Premium:	0.438	0.238	0.676
(16) Countrywide Indicated Relativity:	0.205	0.167	.
(17) Countrywide Credibility:	0.120	0.130	.
(18) Countrywide Lost-Time Claims:	6.000	.	.
(19) Pure Premium Underlying Present Rate:	3.612	1.852	5.464
(20) Relativity to Underlying Present Rate:	1.235	0.742	.
(21) Credibility to Underlying Relativity:	0.880	0.870	.
(22) Industry Group Converted Pure Premium:	2.211	1.596	3.806
(23) Formula Relativity:	1.112	0.667	.
(24) Balanced Formula Relativity:	1.065	0.632	0.884

Class(es):		Effective: 7/1/2022							Federal Class Codes		
6824 BOAT BUILDING OR REPAIRING & DRIVERS: US ACT											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	51.022	0	7	0	455.984	0	212.767	668.751	8.937	4.170	13.107
2015	52.497	0	7	0	95.373	0	120.592	215.965	1.817	2.297	4.114
2016	45.902	0	5	0	3.481	0	21.525	25.007	0.076	0.469	0.545
2017	36.701	0	7	0	57.880	0	62.601	120.482	1.577	1.706	3.283
2018	34.164	0	9	0	41.125	0	17.745	58.870	1.204	0.519	1.723
MA Total:	220.287	0	35	0	653.843	0	435.231	1,089.074	2.968	1.976	4.944

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.343	1.238	.
(14) Massachusetts Credibility:	0.250	0.440	.
(15) Countrywide Pure Premium:	1.862	2.124	3.986
(16) Countrywide Indicated Relativity:	0.872	1.489	.
(17) Countrywide Credibility:	0.310	0.280	.
(18) Countrywide Lost-Time Claims:	61.000	.	.
(19) Pure Premium Underlying Present Rate:	3.908	3.827	7.735
(20) Relativity to Underlying Present Rate:	1.337	1.533	.
(21) Credibility to Underlying Relativity:	0.440	0.280	.
(22) Industry Group Converted Pure Premium:	2.211	1.596	3.806
(23) Formula Relativity:	1.194	1.391	.
(24) Balanced Formula Relativity:	1.144	1.318	1.217

VIII 000026

Section VIII - F-Class Recommendation
 Subsection G - Class Relativities
 7/1/2022

Section VIII - G
 Exhibit 2

Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Federal Class Codes		
6826 MARINA & DRIVERS: US ACT											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	100	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	19.475	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	3	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	19.578	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.080	0.120	.
(15) Countrywide Pure Premium:	2.396	1.180	3.576
(16) Countrywide Indicated Relativity:	1.122	0.827	.
(17) Countrywide Credibility:	0.190	0.200	.
(18) Countrywide Lost-Time Claims:	17.000	.	.
(19) Pure Premium Underlying Present Rate:	2.598	1.719	4.317
(20) Relativity to Underlying Present Rate:	0.888	0.689	.
(21) Credibility to Underlying Relativity:	0.730	0.680	.
(22) Industry Group Converted Pure Premium:	2.211	1.596	3.806
(23) Formula Relativity:	0.862	0.634	.
(24) Balanced Formula Relativity:	0.826	0.600	0.731

Class(es):		Effective: 7/1/2022							Federal Class Codes		
6843 SHIP BUILDING-IRON OR STEEL-NOC & DRIVERS: US ACT											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	100	0	9	0	37.920	0	15.642	53.562	379.20	156.42	535.62
2015	18.335	1	3	13.554	4.666	56.214	2.526	76.959	0.994	3.204	4.197
2016	6.497	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	7.410	0	3	0	0	0	808	808	0.000	0.109	0.109
2018	2.665	0	2	0	178.761	0	54.795	233.557	67.084	20.563	87.648
MA Total:	35.007	1	17	13.554	221.347	56.214	73.771	364.886	6.710	3.713	10.423

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.035	2.327	.
(14) Massachusetts Credibility:	0.130	0.190	.
(15) Countrywide Pure Premium:	8.071	3.727	11.797
(16) Countrywide Indicated Relativity:	3.779	2.613	.
(17) Countrywide Credibility:	0.410	0.410	.
(18) Countrywide Lost-Time Claims:	122.00	.	.
(19) Pure Premium Underlying Present Rate:	4.750	2.808	7.558
(20) Relativity to Underlying Present Rate:	1.624	1.125	.
(21) Credibility to Underlying Relativity:	0.460	0.400	.
(22) Industry Group Converted Pure Premium:	2.211	1.596	3.806
(23) Formula Relativity:	2.691	1.964	.
(24) Balanced Formula Relativity:	2.579	1.860	2.277

VIII 000027

Section VIII - F-Class Recommendation
 Subsection G - Class Relativities
 7/1/2022

Section VIII - G
 Exhibit 3

Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Federal Class Codes		
6872 SHIP REPAIR CONVERSION- ALL OP & DR: US ACT											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	7,107	0	4	0	10,403	0	18,180	28,583	1,464	2,558	4,022
2015	7,445	0	1	0	0	0	257	257	0,000	0,034	0,034
2016	8,885	0	1	0	641	0	885	1,526	0,072	0,100	0,172
2017	11,081	0	2	0	53,031	0	19,668	72,699	4,786	1,775	6,561
2018	11,281	0	1	0	0	0	937	937	0,000	0,083	0,083
MA Total:	45,798	0	9	0	64,075	0	39,926	104,001	1,399	0,872	2,271

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.633	0.546	.
(14) Massachusetts Credibility:	0.160	0.240	.
(15) Countrywide Pure Premium:	7,928	5,271	13,199
(16) Countrywide Indicated Relativity:	3.712	3.696	.
(17) Countrywide Credibility:	0.420	0.380	.
(18) Countrywide Lost-Time Claims:	193.00	.	.
(19) Pure Premium Underlying Present Rate:	6.497	4.090	10,587
(20) Relativity to Underlying Present Rate:	2.222	1.639	.
(21) Credibility to Underlying Relativity:	0.420	0.380	.
(22) Industry Group Converted Pure Premium:	2,211	1,596	3,806
(23) Formula Relativity:	2.593	2.158	.
(24) Balanced Formula Relativity:	2.485	2.044	2,300

Class(es):		Effective: 7/1/2022							Federal Class Codes		
6874 PAINTING: SHIP HULLS - US ACT											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	94	0	0	0	0	0	0	0	0,000	0,000	0,000
2015	10	0	0	0	0	0	0	0	0,000	0,000	0,000
2016	10	0	0	0	0	0	0	0	0,000	0,000	0,000
2017	0	0	0	0	0	0	0	0	0,000	0,000	0,000
2018	0	0	0	0	0	0	0	0	0,000	0,000	0,000
MA Total:	114	0	0	0	0	0	0	0	0,000	0,000	0,000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.020	0.020	.
(15) Countrywide Pure Premium:	11,099	6,149	17,248
(16) Countrywide Indicated Relativity:	5.197	4.311	.
(17) Countrywide Credibility:	0.180	0.190	.
(18) Countrywide Lost-Time Claims:	16,000	.	.
(19) Pure Premium Underlying Present Rate:	7.827	3.744	11,571
(20) Relativity to Underlying Present Rate:	2.677	1.500	.
(21) Credibility to Underlying Relativity:	0.800	0.790	.
(22) Industry Group Converted Pure Premium:	2,211	1,596	3,806
(23) Formula Relativity:	3.077	2.004	.
(24) Balanced Formula Relativity:	2.948	1.898	2,508

VIII 000028

Section VIII - F-Class Recommendation
 Subsection G - Class Relativities
 7/1/2022

Section VIII - G
 Exhibit 4

Calculation of Class Relativities

Class(es): 7309 STEVEDORING: NOC - US ACT		Effective: 7/1/2022							Federal Class Codes		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	7,342	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	12,589	0	2	0	42,491	0	27,643	70,134	3,375	2,196	5,571
2016	13,523	0	1	0	692	0	1,534	2,226	0,051	0,113	0,165
2017	11,775	0	1	0	0	0	688	688	0.000	0.058	0.058
2018	20,945	0	1	0	0	0	84	84	0.000	0.004	0.004
MA Total:	66,174	0	5	0	43,183	0	29,949	73,132	0.653	0.453	1.105

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.295	0.284	.
(14) Massachusetts Credibility:	0.170	0.250	.
(15) Countrywide Pure Premium:	5.137	3.196	8.334
(16) Countrywide Indicated Relativity:	2.405	2.241	.
(17) Countrywide Credibility:	0.400	0.380	.
(18) Countrywide Lost-Time Claims:	117.00	.	.
(19) Pure Premium Underlying Present Rate:	4.980	2.929	7.909
(20) Relativity to Underlying Present Rate:	1.703	1.174	.
(21) Credibility to Underlying Relativity:	0.430	0.370	.
(22) Industry Group Converted Pure Premium:	2.211	1.596	3.806
(23) Formula Relativity:	1.745	1.357	.
(24) Balanced Formula Relativity:	1.672	1.285	1.510

Class(es): 7313 COAL DOCK OPERATION & STEVEDORING: US ACT		Effective: 7/1/2022							Federal Class Codes		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	0	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	0	0	0	0	0	0	0	0			

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.000	0.000	.
(15) Countrywide Pure Premium:	113.98	12.142	126.12
(16) Countrywide Indicated Relativity:	53.367	8.513	.
(17) Countrywide Credibility:	0.250	0.270	.
(18) Countrywide Lost-Time Claims:	37.000	.	.
(19) Pure Premium Underlying Present Rate:	7.416	2.179	9.595
(20) Relativity to Underlying Present Rate:	2.536	0.873	.
(21) Credibility to Underlying Relativity:	0.750	0.730	.
(22) Industry Group Converted Pure Premium:	2.211	1.596	3.806
(23) Formula Relativity:	15.244	2.936	.
(24) Balanced Formula Relativity:	14.607	2.781	9.650

VIII 000029

Section VIII - F-Class Recommendation
 Subsection G - Class Relativities
 7/1/2022

Section VIII - G
 Exhibit 5

Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Federal Class Codes			
7317 STEVEDORING: BY HAND OR HAND TRUCKS: US ACT												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2014	5,260	0	1	0	3,665	0	4,412	8,077	0.697	0.839	1,535	
2015	4,441	0	1	0	154,499	0	117,179	271,678	34.788	26.385	61,173	
2016	4,059	0	0	0	0	0	0	0	0.000	0.000	0.000	
2017	3,162	0	0	0	0	0	0	0	0.000	0.000	0.000	
2018	655	0	1	0	4,835	0	4,271	9,106	7.385	6.524	13,909	
MA Total:	17,577	0	3	0	162,999	0	125,862	288,861	9.274	7.161	16,434	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	4.195	4.488	.
(14) Massachusetts Credibility:	0.120	0.180	.
(15) Countrywide Pure Premium:	5.399	2.518	7.916
(16) Countrywide Indicated Relativity:	2.528	1.765	.
(17) Countrywide Credibility:	0.350	0.370	.
(18) Countrywide Lost-Time Claims:	82.000	.	.
(19) Pure Premium Underlying Present Rate:	8.371	4.884	13.255
(20) Relativity to Underlying Present Rate:	2.862	1.957	.
(21) Credibility to Underlying Relativity:	0.530	0.450	.
(22) Industry Group Converted Pure Premium:	2.211	1.596	3.806
(23) Formula Relativity:	2.905	2.342	.
(24) Balanced Formula Relativity:	2.784	2.218	2.547

Class(es):		Effective: 7/1/2022							Federal Class Codes			
7327 STEVEDORING: CONTAINERIZED FREIGHT & DRIVERS: US ACT												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2014	126	0	0	0	0	0	0	0	0.000	0.000	0.000	
2015	88	0	0	0	0	0	0	0	0.000	0.000	0.000	
2016	157	0	0	0	0	0	0	0	0.000	0.000	0.000	
2017	91	0	0	0	0	0	0	0	0.000	0.000	0.000	
2018	494	0	0	0	0	0	0	0	0.000	0.000	0.000	
MA Total:	956	0	0	0	0	0	0	0	0.000	0.000	0.000	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.040	0.060	.
(15) Countrywide Pure Premium:	13.359	8.455	21.813
(16) Countrywide Indicated Relativity:	6.255	5.928	.
(17) Countrywide Credibility:	0.100	0.110	.
(18) Countrywide Lost-Time Claims:	4.000	.	.
(19) Pure Premium Underlying Present Rate:	10.904	6.969	17.872
(20) Relativity to Underlying Present Rate:	3.729	2.792	.
(21) Credibility to Underlying Relativity:	0.860	0.830	.
(22) Industry Group Converted Pure Premium:	2.211	1.596	3.806
(23) Formula Relativity:	3.832	2.970	.
(24) Balanced Formula Relativity:	3.672	2.813	3.312

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Section VIII - F-Class Recommendation
 Subsection G - Class Relativities
 7/1/2022

Section VIII - G
 Exhibit 6

Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Federal Class Codes		
7350 FREIGHT HANDLING NOC: US ACT											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	0	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	0	0	0	0	0	0	0	0			

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.000	0.000	.
(15) Countrywide Pure Premium:	4.905	2.602	7.506
(16) Countrywide Indicated Relativity:	2.296	1.824	.
(17) Countrywide Credibility:	0.300	0.320	.
(18) Countrywide Lost-Time Claims:	59.000	.	.
(19) Pure Premium Underlying Present Rate:	10.701	4.341	15.042
(20) Relativity to Underlying Present Rate:	3.659	1.740	.
(21) Credibility to Underlying Relativity:	0.700	0.680	.
(22) Industry Group Converted Pure Premium:	2.211	1.596	3.806
(23) Formula Relativity:	3.250	1.767	.
(24) Balanced Formula Relativity:	3.115	1.673	2.510

Class(es):		Effective: 7/1/2022							Federal Class Codes		
8709 STEVEDORING:TALLIERS & CHECKING CLERKS: US ACT											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	1.820	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	1.581	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	0	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	3.401	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.040	0.060	.
(15) Countrywide Pure Premium:	3.783	2.133	5.916
(16) Countrywide Indicated Relativity:	1.771	1.495	.
(17) Countrywide Credibility:	0.170	0.180	.
(18) Countrywide Lost-Time Claims:	14.000	.	.
(19) Pure Premium Underlying Present Rate:	2.211	1.496	3.707
(20) Relativity to Underlying Present Rate:	0.756	0.599	.
(21) Credibility to Underlying Relativity:	0.790	0.760	.
(22) Industry Group Converted Pure Premium:	2.211	1.596	3.806
(23) Formula Relativity:	0.898	0.725	.
(24) Balanced Formula Relativity:	0.861	0.686	0.788

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Section VIII - F-Class Recommendation
 Subsection G - Class Relativities
 7/1/2022

Section VIII - G
 Exhibit 7

Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Federal Class Codes			
8726 STEAMSHIP LINE OR AGENCY-PORT EMP: SPRVSR, CAPTNS, ENGRS, STWR												
Converted Unlimited Losses												
Amount												
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2014	93.952	1	24	21.971	115.972	31.406	131.389	300.738	1.468	1.733	3.201	
2015	99.099	2	17	100.548	67.326	35.860	146.368	350.102	1.694	1.839	3.533	
2016	94.736	0	14	0	434.666	0	223.102	657.768	4.588	2.355	6.943	
2017	101.527	0	12	0	23.678	0	26.300	49.978	0.233	0.259	0.492	
2018	108.203	0	14	0	80.794	0	90.799	171.594	0.747	0.839	1.586	
MA Total:	497.518	3	81	122.519	722.438	67.265	617.959	1,530.180	1.698	1.377	3.076	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.768	0.863	.
(14) Massachusetts Credibility:	0.240	0.440	.
(15) Countrywide Pure Premium:	0.747	0.318	1.064
(16) Countrywide Indicated Relativity:	0.350	0.223	.
(17) Countrywide Credibility:	0.160	0.170	.
(18) Countrywide Lost-Time Claims:	12.000	.	.
(19) Pure Premium Underlying Present Rate:	1.567	1.624	3.191
(20) Relativity to Underlying Present Rate:	0.536	0.651	.
(21) Credibility to Underlying Relativity:	0.600	0.390	.
(22) Industry Group Converted Pure Premium:	2.211	1.596	3.806
(23) Formula Relativity:	0.562	0.671	.
(24) Balanced Formula Relativity:	0.538	0.636	0.579

Class(es):		Effective: 7/1/2022							Federal Class Codes			
9077 UNITED STATES ARMED SERVICE RISK-ALL EMPLOYEES & DRIVERS												
Converted Unlimited Losses												
Amount												
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2014	0	0	0	0	0	0	0	0	0.000	0.000	0.000	
2015	0	0	0	0	0	0	0	0	0.000	0.000	0.000	
2016	0	0	0	0	0	0	0	0	0.000	0.000	0.000	
2017	0	0	0	0	0	0	0	0	0.000	0.000	0.000	
2018	0	0	0	0	0	0	0	0	0.000	0.000	0.000	
MA Total:	0	0	0	0	0	0	0	0				

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.000	0.000	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	0.897	1.896	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	2.623	4.733	7.356
(20) Relativity to Underlying Present Rate:	0.897	1.896	.
(21) Credibility to Underlying Relativity:	1.000	1.000	.
(22) Industry Group Converted Pure Premium:	2.211	1.596	3.806
(23) Formula Relativity:	0.897	1.896	.
(24) Balanced Formula Relativity:	0.859	1.796	1.252

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Section VIII - F-Class Recommendation
Subsection H - Proposed Rates
7/1/2022

Section VIII-H
Exhibit 1

Calculation of Federal Industry Group Rate Change and Limits

(1) Industry Group Differential	1.000
(2) Experience and Benefit Level Change - Overall	-3.4%
(3) Target Rate Change = (1) x [1.000 + (2)] - 1.000	-3.4%
(4) Maximum Rate Change = (3) + 20.0%	16.6%
(5) Minimum Rate Change = (3) - 20.0%	-23.4%
(6) Present Average Rate	7.594
(7) Uncapped Rate Level Factor = [1.000 + (3)] x (6)	7.336
(8) Capped Rate Level Factor	7.519

In addition, the WCRIBMA is limiting the increase in average rates for any class to \$15 and no average rate shall exceed \$90 per \$100 of payroll.

Notes:

- (1): Federal Industry Group is the only group being evaluated.
- (2): Selected Rate Change, from Section VIII-A, Exhibit 1.
- (6): Rates by class consistent with the 07/01/20 stipulation, weighted by five years of exposure.
- (8): Proposed average uncapped rates are capped by an iterative process using rate levels to determine if the required change is achieved.

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Section VIII - F-Class Recommendation
 Subsection H - Proposed Rates
 7/1/2022

Section VIII-H
 Exhibit 2

Calculation of Average Uncapped Rates

Class Code	Balanced Formula Relativity			Uncapped Rate Level Factor	Proposed Average Uncapped Rate = (4) x (5)
	Indemnity	Medical	Total		
(1)	(2)	(3)	(4)	(5)	(6)
6801	1.065	0.632	0.884	7.336	6.48
6824	1.144	1.318	1.217	7.336	8.93
6826	0.826	0.600	0.731	7.336	5.36
6843	2.579	1.860	2.277	7.336	16.71
6872	2.485	2.044	2.300	7.336	16.87
6874	2.948	1.898	2.508	7.336	18.40
7309	1.672	1.285	1.510	7.336	11.07
7313	14.607	2.781	9.650	7.336	70.79
7317	2.784	2.218	2.547	7.336	18.68
7327	3.672	2.813	3.312	7.336	24.29
7350	3.115	1.673	2.510	7.336	18.42
8709	0.861	0.686	0.788	7.336	5.78
8726	0.538	0.636	0.579	7.336	4.25
9077	0.859	1.796	1.252	7.336	9.18

Notes:

(2),(3),(4): Section VIII-G.

(5): Exhibit 1.

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Section VIII - F-Class Recommendation
Subsection H - Proposed Rates
7/1/2022

Section VIII-H
Exhibit 3

Comparison of Average Rates

Class Code (1)	Present Average Capped Rate (2)	Proposed Average Uncapped Rate (3)	Proposed Average Capped Rate (4)
6801	7.19	6.48	6.64
6824	10.87	8.93	9.15
6826	6.06	5.36	5.50
6843	10.61	16.71	12.37
6872	14.87	16.87	17.30
6874	16.24	18.40	18.86
7309	11.10	11.07	11.35
7313	13.46	70.79	15.70
7317	17.61	18.68	19.15
7327	25.10	24.29	24.90
7350	20.85	18.42	18.88
8709	5.21	5.78	5.92
8726	4.48	4.25	4.36
9077	5.75	9.18	6.71

Notes:

(2): from Section VIII-H, Exhibit 3 of the 07/01/20 Stipulation.

(3): Exhibit 2.

(4) = Total Balanced Formula Relativity (Section VIII-G) x Capped Rate Level Factor Subject to maximum and minimum caps (Exhibit 1).

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Section VIII - F-Class Recommendation
Subsection H - Proposed Rates
7/1/2022

Section VIII-H
Exhibit 4

Summary of Proposed Premium Change

Industry Group (1)	Present Premium (2)	Proposed Premium (3)	Proposed Change (4)	Target Change (5)	Capped Rate Level Factor (6)
Federal	6,883,109	6,649,080	-3.4%	-3.4%	7.52

Notes:

(2): Exposure x Present Average Rates, from Exhibit 3.

(3): Exposure x Proposed Average Rates, from Exhibit 3.

(4) = [(3) - (2)] / (2)

(5), (6): Exhibit 1.

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Section VIII - F-Class Recommendation
Subsection H - Proposed Rates
7/1/2022

Section VIII-H
Exhibit 5

Calculation of Pure Premium Underlying Proposed Rate Factor

Industry Group (1)	Injury Type (2)	Uncapped Rate Level Factor (3)	Industry Group Pure Premium (4)	Percent of Pure Premium =(4) / [Total of (4)] (5)	Expected Loss and LAE Ratio (6)	Pure Premium Underlying Proposed Rate Factor = (3) x (5) x (6) (7)
Federal	Indemnity	7.336	2.211	0.581	0.698	2.976
	Medical	7.336	1.595	0.419	0.698	2.148
	Total		3.806			

Notes:

(3): Section VIII - H, Exhibit 1.

(4): Section VIII - F, Exhibit 1, page 2.

(6): Section VI - J, Exhibit 1.

VIII 000037

Pricing Example for Class 6824
 BOAT BUILDING OR REPAIRING & DRIVERS: US ACT

Calculation of MA Indicated Relativity:

		(A). Federal Benefits - Limited Losses (Unit Statistical Plan data, Excluding Large Deductibles)							
Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only	
	LD	NLD		LD	NLD	LD	NLD		
Indemnity	2014	0	0	0	0	357,084	0	2,218	
	2015	0	0	0	0	0	0	67,358	
	2016	0	0	0	0	0	0	2,252	
	2017	0	0	0	0	4,957	0	28,304	
	2018	0	0	0	0	0	0	15,864	
Medical	2014	0	0	0	0	142,916	0	2,059	2,965
	2015	0	0	0	0	0	0	81,594	2,263
	2016	0	0	0	0	0	0	2,322	14,360
	2017	0	0	0	0	6,272	0	27,059	8,028
	2018	0	0	0	0	0	0	7,423	2,121

		(B). Federal Benefits Primary Conversion Factors (Section VIII-E, Exhibit 1, Page 1)							
Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only	
	LD	NLD		LD	NLD	LD	NLD		
Indemnity	2014	0.850	0.813	0.843	0.828	0.792	0.843	0.806	
	2015	0.939	0.889	0.931	0.916	0.868	0.931	0.882	
	2016	1.120	0.969	1.112	1.097	0.949	1.112	0.963	
	2017	1.290	1.092	1.282	1.267	1.073	1.282	1.086	
	2018	2.084	1.622	2.074	2.053	1.599	2.074	1.614	
Medical	2014	0.856	0.773	0.856	0.856	0.773	0.856	0.773	0.727
	2015	0.990	0.861	0.990	0.990	0.861	0.990	0.861	0.759
	2016	1.082	0.887	1.082	1.082	0.887	1.082	0.887	0.804
	2017	1.134	0.913	1.134	1.134	0.913	1.134	0.913	0.825
	2018	1.353	1.006	1.353	1.353	1.006	1.353	1.006	0.911

		(C). Federal Converted Limited Losses [(A) x (B)]							
Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only	
	LD	NLD		LD	NLD	LD	NLD		
Indemnity	2014	0	0	0	0	282,719	0	1,788	
	2015	0	0	0	0	0	0	59,395	
	2016	0	0	0	0	0	0	2,168	
	2017	0	0	0	0	5,320	0	30,736	
	2018	0	0	0	0	0	0	25,611	
Medical	2014	0	0	0	0	110,528	0	1,592	2,155
	2015	0	0	0	0	0	0	70,250	1,718
	2016	0	0	0	0	0	0	2,059	11,542
	2017	0	0	0	0	5,729	0	24,718	6,623
	2018	0	0	0	0	0	0	7,466	1,931

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Section VIII - F-Class Recommendation
 Subsection I - Pricing Example
 7/1/2022

Section VIII-I
 Exhibit 1
 Page 2

Pricing Example for Class 6824
 BOAT BUILDING OR REPAIRING & DRIVERS: US ACT

Calculation of MA Indicated Relativity (cont.):

		(D). Federal Unadjusted Excess Losses [(Excess Factor - 1.0) x (C)]							
Policy Year		Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2014	0	0	0	0	89,280	0	565	
	2015	0	0	0	0	0	0	18,756	
	2016	0	0	0	0	0	0	685	
	2017	0	0	0	0	1,680	0	9,706	
	2018	0	0	0	0	0	0	8,088	
Medical	2014	0	0	0	0	34,903	0	503	681
	2015	0	0	0	0	0	0	22,184	542
	2016	0	0	0	0	0	0	650	3,645
	2017	0	0	0	0	1,809	0	7,806	2,092
	2018	0	0	0	0	0	0	2,358	610

		(E). Federal Adjusted Excess Losses							
Policy Year		Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2014	0	0	0	0	62,496	0	395	
	2015	0	0	0	0	0	0	13,129	
	2016	0	0	0	0	0	0	479	
	2017	0	0	0	0	1,176	0	6,794	
	2018	0	0	0	0	0	0	5,661	
Medical	2014	0	0	0	0	61,687	0	672	681
	2015	0	0	0	0	0	0	27,811	542
	2016	0	0	0	0	0	0	856	3,645
	2017	0	0	0	0	2,313	0	10,717	2,092
	2018	0	0	0	0	0	0	4,784	610

		(F). Federal Secondary Conversion Factors				
		Fatal	Permanent Total	Permanent Partial	Temporary Total	Medical Only
		Indemnity	1.241	1.225	1.313	1.315
Medical	1.187	1.120	1.200	1.202	1.187	

		(G). Federal Converted Unlimited Losses							
Policy Year		Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2014	0	0	0	0	453,113	0	2,871	
	2015	0	0	0	0	0	0	95,373	
	2016	0	0	0	0	0	0	3,481	
	2017	0	0	0	0	8,526	0	49,354	
	2018	0	0	0	0	0	0	41,125	
Medical	2014	0	0	0	0	206,679	0	2,723	3,365
	2015	0	0	0	0	0	0	117,910	2,682
	2016	0	0	0	0	0	0	3,504	18,021
	2017	0	0	0	0	9,652	0	42,608	10,342
	2018	0	0	0	0	0	0	14,729	3,016

		(H). Total Federal Converted Unlimited Losses			
Policy Year		Indemnity		Medical	
		LD	NLD	LD	NLD
2014		0	455,983	0	212,767
2015		0	95,373	0	120,592
2016		0	3,481	0	21,525
2017		0	57,880	0	62,601
2018		0	41,125	0	17,745
Total		0	653,843	0	435,231

Notes:

(E): Indemnity Adjusted Excess Losses = Indemnity Unadjusted Excess Losses x 0.7

Medical Adjusted Excess Losses = Medical Unadjusted Excess Losses + 0.3 x Indemnity Unadjusted Excess Losses

(F): Section VIII-E, Exhibit 1, Page 2.

(G) = [(C) + (E)] x (F)

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Section VIII - F-Class Recommendation
 Subsection I - Pricing Example
 7/1/2022

Section VIII-I
 Exhibit 1
 Page 4

Pricing Example for Class 6824
 BOAT BUILDING OR REPAIRING & DRIVERS: US ACT

Calculation of MA Indicated Relativity (cont.):

		(D). State Unadjusted Excess Losses [(Excess Factor -1.0) x (C)]							
Policy Year		Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2014	0	0	0	0	0	0	0	
	2015	0	0	0	0	0	0	0	
	2016	0	0	0	0	0	0	0	
	2017	0	0	0	0	0	0	0	
	2018	0	0	0	0	0	0	0	
Medical	2014	0	0	0	0	0	0	0	0
	2015	0	0	0	0	0	0	0	0
	2016	0	0	0	0	0	0	0	0
	2017	0	0	0	0	0	0	0	0
	2018	0	0	0	0	0	0	0	0

		(E). State Adjusted Excess Losses							
Policy Year		Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2014	0	0	0	0	0	0	0	
	2015	0	0	0	0	0	0	0	
	2016	0	0	0	0	0	0	0	
	2017	0	0	0	0	0	0	0	
	2018	0	0	0	0	0	0	0	
Medical	2014	0	0	0	0	0	0	0	0
	2015	0	0	0	0	0	0	0	0
	2016	0	0	0	0	0	0	0	0
	2017	0	0	0	0	0	0	0	0
	2018	0	0	0	0	0	0	0	0

		(F). State Secondary Conversion Factors				
		Fatal	Permanent Total	Permanent Partial	Temporary Total	Medical Only
		Indemnity	1.134	1.118	1.199	1.201
Medical	1.187	1.120	1.200	1.203	1.187	

		(G). State Converted Unlimited Losses							
Policy Year		Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2014	0	0	0	0	0	0	0	
	2015	0	0	0	0	0	0	0	
	2016	0	0	0	0	0	0	0	
	2017	0	0	0	0	0	0	0	
	2018	0	0	0	0	0	0	0	
Medical	2014	0	0	0	0	0	0	0	0
	2015	0	0	0	0	0	0	0	0
	2016	0	0	0	0	0	0	0	0
	2017	0	0	0	0	0	0	0	0
	2018	0	0	0	0	0	0	0	0

		(H). Total State Converted Unlimited Losses			
Policy Year		Indemnity		Medical	
		LD	NLD	LD	NLD
2014		0	0	0	0
2015		0	0	0	0
2016		0	0	0	0
2017		0	0	0	0
2018		0	0	0	0
Total		0	0	0	0

Notes:

(E): Indemnity Adjusted Excess Losses = Indemnity Unadjusted Excess Losses x 0.7

Medical Adjusted Excess Losses = Medical Unadjusted Excess Losses + 0.3 x Indemnity Unadjusted Excess Losses

(F): Section IX-B, Exhibit 1, Page 3.

(G) = [(C) + (E)] x (F)

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Section VIII - F-Class Recommendation
Subsection I - Pricing Example
7/1/2022

Section VIII-I
Exhibit 1
Page 5

Pricing Example for Class 6824 BOAT BUILDING OR REPAIRING & DRIVERS: US ACT

Calculation of MA Indicated Relativity (cont.):

Exposure, Converted Unlimited Losses (Both Federal & State)			
Policy Year (1)	Exposure (2)	Indemnity (3)	Medical (4)
2014	51,022	455,983	212,767
2015	52,497	95,373	120,592
2016	45,902	3,481	21,525
2017	36,701	57,880	62,601
2018	34,164	41,125	17,745
Total	220,286	653,843	435,231
(5)	Indicated Pure Premium	2.968	1.976
(6)	Federal Class Codes Industry Group Pure Premium	2.211	1.595
(7)	MA Indicated Relativity	1.343	1.238

Notes:

- (2): Unit Statistical Plan data, excluding Large Deductibles
- (3), (4): Converted Unlimited Losses from Pages 2 & 4.
- (5): Totals of (3) and (4), divided by Total of (2), respectively.
- (6): Section VIII-F, Exhibit 1, Page 2.
- (7) = (5) / (6)

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Pricing Example for Class 6824
 BOAT BUILDING OR REPAIRING & DRIVERS: US ACT

Calculation of Countrywide Relativity

State (1)	State Code (2)	Losses				Lost-Time Claims		Payroll (9)
		Indemnity		Medical		Likely (7)	Not Likely (8)	
		Likely (3)	Not Likely (4)	Likely (5)	Not Likely (6)			
Alabama	1	0	5,233	0	11,173	0	1	3,306,634
Arizona	2	0	0	0	0	0	0	41,404
Arkansas	3	0	0	0	0	0	0	21,360
Colorado	5	0	0	0	0	0	0	4,829
Connecticut	6	0	37,959	0	47,140	0	1	1,199,942
D.C.	8	0	0	0	0	0	0	0
Florida	9	52,035	57,537	60,583	238,500	2	7	12,119,387
Georgia	10	0	0	0	0	0	0	434,437
Idaho	11	0	0	0	0	0	0	1,506
Illinois	12	0	0	0	1,960	0	0	809,993
Indiana	13	0	0	0	0	0	0	6,672
Iowa	14	0	8,138	0	12,986	0	1	1,173,072
Kansas	15	0	0	0	0	0	0	0
Kentucky	16	0	0	0	882	0	0	633,691
Louisiana	17	0	41,949	0	184,577	0	5	5,931,615
Maine	18	0	18,787	0	54,160	0	7	13,837,677
Maryland	19	0	0	0	1,382	0	0	570,315
Michigan	21	0	0	0	0	0	0	0
Minnesota	22	0	0	0	0	0	0	0
Mississippi	23	0	76,791	0	488,343	0	8	22,040,063
Missouri	24	0	0	0	0	0	0	66,877
Montana	25	0	0	0	0	0	0	0
Nebraska	26	0	0	0	0	0	0	819
Nevada	27	0	0	0	0	0	0	0
New Hampshire	28	0	33,942	0	88,628	0	1	1,585,557
New Mexico	30	0	0	0	0	0	0	0
North Carolina	32	47,790	96,835	20,072	166,179	1	2	6,367,960
Oklahoma	35	16,786	0	3,589	586	1	0	619,885
Oregon	36	423,494	61,889	249,761	79,168	1	6	6,743,740
Rhode Island	38	0	42,989	0	38,166	0	2	4,078,677
South Carolina	39	0	61,242	0	92,485	0	2	1,616,184
South Dakota	40	0	0	0	0	0	0	0
Tennessee	41	0	0	0	896	0	0	433,962
Utah	43	0	0	0	0	0	0	0
Vermont	44	0	0	0	0	0	0	0
Virginia	45	0	50,336	0	174,408	0	1	12,597,004
West Virginia	47	0	0	0	0	0	0	0
Wisconsin	48	0	0	0	0	0	0	0
Hawaii	52	0	0	0	587	0	0	2,399,030
Alaska	54	0	68,064	0	295,131	0	12	11,846,632
Total		540,105	661,691	334,005	1,977,337	5	56	110,488,924

Notes:

(3) - (9): Data are total for latest three policy years. See Section IX-D, Exhibit 3.
 (7), (8): Used in calculating countrywide credibilities.

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Pricing Example for Class 6824
 BOAT BUILDING OR REPAIRING & DRIVERS: US ACT

Calculation of Countrywide Relativity

State (1)	State Code (2)	Federal Class Codes Pitch Factors		Pure Premiums, on MA Level		Total (7)
		Indemnity (3)	Medical (4)	Indemnity (5)	Medical (6)	
Alabama	1	3.696	1.678	0.585	0.567	
Arizona	2	0.000	0.000	0.000	0.000	
Arkansas	3	5.205	0.973	0.000	0.000	
Colorado	5	0.000	0.000	0.000	0.000	
Connecticut	6	1.217	0.673	3.850	2.644	
D.C.	8	0.000	0.000	0.000	0.000	
Florida	9	2.076	0.902	1.877	2.225	
Georgia	10	0.093	0.071	0.000	0.000	
Idaho	11	0.000	0.000	0.000	0.000	
Illinois	12	3.482	1.207	0.000	0.292	
Indiana	13	1.655	0.676	0.000	0.000	
Iowa	14	4.687	1.377	3.251	1.524	
Kansas	15	0.000	0.000	0.000	0.000	
Kentucky	16	8.089	2.627	0.000	0.366	
Louisiana	17	2.214	0.962	1.566	2.995	
Maine	18	5.525	3.351	0.750	1.311	
Maryland	19	2.260	2.770	0.000	0.671	
Michigan	21	0.000	0.000	0.000	0.000	
Minnesota	22	0.000	0.000	0.000	0.000	
Mississippi	23	5.226	1.008	1.821	2.233	
Missouri	24	1.100	1.203	0.000	0.000	
Montana	25	0.000	0.000	0.000	0.000	
Nebraska	26	0.000	0.000	0.000	0.000	
Nevada	27	0.000	0.000	0.000	0.000	
New Hampshire	28	1.387	0.352	2.968	1.970	
New Mexico	30	0.000	0.000	0.000	0.000	
North Carolina	32	1.452	0.810	3.298	2.370	
Oklahoma	35	1.373	2.152	3.719	1.450	
Oregon	36	0.948	0.896	6.826	4.369	
Rhode Island	38	0.759	0.449	0.800	0.420	
South Carolina	39	0.802	0.397	3.041	2.270	
South Dakota	40	0.000	0.000	0.000	0.000	
Tennessee	41	3.098	2.016	0.000	0.416	
Utah	43	0.000	0.000	0.000	0.000	
Vermont	44	0.000	0.000	0.000	0.000	
Virginia	45	3.187	2.201	1.273	3.048	
West Virginia	47	279.915	21.347	0.000	0.000	
Wisconsin	48	0.000	0.000	0.000	0.000	
Hawaii	52	1.117	0.051	0.000	0.001	
Alaska	54	2.139	0.759	1.229	1.891	
(8)	Average of (5), (6) weighted by Payroll from Page 1, respectively			1.862	2.124	3.986
(9)	CW Federal Class Codes Pure Premium			2.136	1.426	3.562
(10)	CW Relativity = (8) / (9)			0.872	1.489	1.119
(11)	CW Relativity, balanced to unity			0.872	1.489	

Notes:

(3), (4) = (MA Total Federal Class Code Limited Losses) / [(Federal Class Code Pure Premium by State) x (MA Total Federal Class Code Exposure)].

(5) = 100 x [State Indemnity Losses / State Payroll] x (3), where State Indemnity Losses and State Payroll from page 1.

(6) = 100 x [State Medical Losses / State Payroll] x (4), where State Medical Losses and State Payroll from page 1.

(9) = (8) weighted by MA five year Federal Class Codes Exposure

(11): Relativities balanced to unity (weighted by MA exposure) over Federal Class Codes Industry Group.

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Section VIII - F-Class Recommendation
 Subsection I - Pricing Example
 7/1/2022

Section VIII-I
 Exhibit 3

Pricing Example for Class 6824 BOAT BUILDING OR REPAIRING & DRIVERS: US ACT

Calculation of Credibility and Balanced Formula Relativity:

- (1) MA Indicated Relativity
- (2) Countrywide Indicated Relativity
- (3) Relativity to Underlying Present Rate

Injury Type	
Indemnity	Medical
1.343	1.238
0.872	1.489
1.337	1.533

Calculation of MA Credibility:

The MA Credibilities are calculated using the formula $Z=(E / F)^{0.4}$ where E are expected losses for that injury type.

- (4) Adopted Relativity
- (5) Industry Group Pure Premium Underlying Present Rate Factor
- (6) Pure Premium Underlying Present Rate = (4) x (5)
- (7) Expected Losses = (6) x [(Total Exposure from Exhibit 1, Page 5)]
- (8) Full Credibility Standards
- (9) MA Credibility = Minimum of {100%, [(7) / (8)]^{0.4}}

Injury Type	
Indemnity	Medical
1.325	1.515
2.950	2.526
3.908	3.827
860,979	842,958
28,050,000	6,400,000
25%	44%

Calculation of Countrywide Credibility

The Countrywide Credibilities are calculated using the formula $Z=(E / F)^{0.4}$ where E are the countrywide claim counts for that injury type. The countrywide credibility is limited to no more than half of the complement of the credibility assigned to the Massachusetts data.

- (10) Countrywide Lost-Time Claims
- (11) Countrywide Claim Count Standard
- (12) Countrywide Credibility = Minimum of { [(10) / (11)]^{0.4}, 0.5 x [100% - (9)] }
- (13) Credibility to Underlying = 100% - (9) - (12)
- (14) Formula Relativity = [(1) x (9)] + [(2) x (12)] + [(3) x (13)]
- (15) Off Balance Factor

Injury Type	
Indemnity	Medical
61	61
1,150	1,000
31%	28%
44%	28%
1.194	1.391
1.044	1.056

- (16) Balanced Formula Relativity

Injury Type		
Indemnity	Medical	Total
1.144	1.318	1.217

Notes:

- (1): Exhibit 1, Page 5.
- (2): Exhibit 2, Page 2.
- (3): Relativity of (6) to Industry Group average, using 5 year Schedule Z exposure as weights.
- (4): Section VIII-F, Exhibit 3.
- (5): Section VIII-F, Exhibit 2.
- (8), (11): Section IX-D, Exhibit 1, Page 1.
- (10): Exhibit 2, Page 1.
- (15): Factor to balance Formula relativities across industry group to unity using 5 year Schedule Z exposure by injury type.
- (16) = (14) / (15), Total Balanced Formula Relativity is the weighted average of Partial Relativities using the MA Industry Group Pure Premium as weights.

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Section VIII - F-Class Recommendation
Subsection I - Pricing Example
7/1/2022

Section VIII-I
Exhibit 4

Pricing Example for Class 6824 BOAT BUILDING OR REPAIRING & DRIVERS: US ACT

Calculation of Proposed Average Rate and Proposed Manual Rate:

(1) Present Average Rate	10.87
(2) Total Balanced Formula Relativity	1.217
(3) Capped Rate Level Factor	7.519
(4) Maximum Average Rate	12.67
(5) Minimum Average Rate	8.32
(6) Proposed Average Capped Rate = (2) x (3), Subject to Caps (4), (5)	9.15
(7) Offset for Merit Rating	0.997
(8) Offset for ARAP	1.054
(9) Offset for Construction Classification Premium Adjustment Program	1.000
(10) Provision for Insolvency Fund Assessment Recoupment	0.0052
(11) Proposed Manual Rate = { (6) / [(7) x (8) x (9)] } x { 1.000 / [1.000 - (10)] }	8.75
(12) Minimum Premium	500
(13) Loss Constant	0
(14) Expected Loss Rate	3.39
(15) D-Ratio	0.20

Notes:

(1): Section VIII-H, Exhibit 3.

(2): Exhibit 3.

(3): Section VIII-H, Exhibit 1. Proposed average uncapped rates are capped by an iterative process using rate levels to determine if the required change is achieved. Class 6824 is in the Federal Class Codes Industry Group.

(4): Multiple caps apply including the maximum increase for any class within the industry group, a maximum absolute dollar change of \$15, and a maximum absolute average rate of \$90.

(5): Based on the minimum decrease for any class within the industry group.

(7), (8), (9), (10): Section IX - K, Exhibit 1. Class 6824 is not eligible for the Construction Credit prog

(12) = { [(11) x 35.0] + (13) + Expense Constant } subject to a maximum of \$500

Where Expense Constant = 159 if (11) x 35 + (13) < 200,

= 250 if (11) x 35 + (13) >= 200 and < 1000

or = 338 if (11) x 35 + (13) >= 1000.

(13): No loss constant for Federal classes.

(14) = (6) x Ratio of Experience Rating ELR to Average Rate, from Section X-C, Exhibit 1.

Class 6824 is in Hazard Group F.

(15): See text of Section X for an explanation of the calculation of D-Ratios.

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Section VIII - F-Class Recommendation
Subsection J - U.S.L.H. & H.W. Coverage Percentage
7/1/2022

Section VIII-J
Exhibit 1

Calculation of USLH & HW Compensation Coverage Percentage

(1)	Benefits Differential Underlying Current USLH & HW Coverage Percentage	1.162
(2)	State Benefit Level Adjustments Since Last Approval	1.016
(3)	Federal Benefit Level Adjustments Since Last Approval	1.004
(4)	Revised Benefits Differential = (1) x [(3) / (2)]	1.148
(5)	Federal Indemnity Losses as % of Total Federal Losses	58.0%
(6)	Expected Loss Ratio for State Classes	58.9%
(7)	Fixed Expense Ratio	5.8%
(8)	Special Fund Assessment Rate as % of Federal Indemnity Losses	0.113
(9)	Loss Adjustment Expense Factor (Applies to Losses)	1.187
(10)	USLH & HW Coverage Percentage for Manual Rates	1.195
(11)	USLH & HW Coverage Percentage for Expected Loss Rates	1.136

Notes:

(1): Section VIII-J, Exhibit 1 of 7/1/2018 Stipulation.

(2): Total Benefit Level Changes from Prior Effective Period to Prospective Period from Section IV-A, Exhibit 1

(3): Total Benefit Level Changes from Prior Effective Period to Prospective Period from Section IV-F, Exhibit 1

(5): Based on ratio of indemnity losses to total losses from Section VIII-C, Exhibit 1, Page 1.

(6): Section VI-J, Exhibit 1.

(7): Average of Fixed Expense Ratios for 2 PYs from Section VI-B, Exhibit 1.

(8): NCCI's Tax & Assessment Directory.

(9): Section VIII-E, Exhibit 1, Page 2.

(10) = { [(6) x (4) x (9)] + [(6) x (4) x (5) x (8)] + (7) } / { [(6) x (9)] + (7) }

(11) = { [(6) x (4) x (9)] + (7) } / { [(6) x (9)] + (7) }

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Section VIII - F-Class Recommendation
Subsection K - Federal Tax Multiplier
7/1/2022

Section VIII-K
Exhibit 1

Calculation of Federal Tax Multiplier

(1)	State Tax Multiplier	1.033
(2)	Loading for Taxes and Residual Market Subsidy = $1.0 - [1.0 / (1)]$	3.2%
(3)	Expected Loss Ratio (no LAE)	58.2%
(4)	Federal Special Funds Assessment	11.3%
(5)	Federal Indemnity Losses as % of Total Losses	58.0%
(6)	Loading for Federal Funds Assessment = $(3) \times (4) \times (5)$	3.8%
(7)	Federal Tax Multiplier = $1.0 / [1.0 - (2) - (6)]$	1.075

Notes:

(1),(3): Section XII-A, Exhibit 4.

(4): NCCI Tax and Assessment Directory.

(5): Based on ratio of federal indemnity losses to state and federal total losses from Section VIII-C, Exhibit 1, Pages 1 and 3.

CLASSIFICATION PRICING

Background

The primary goal of ratemaking is to determine an appropriate price for each insured based on the losses that the insured is expected to generate in the prospective policy period. Because many risks are too small to generate an accurate rate based on their own individual experience, risks are combined into classifications.

The workers' compensation system assigns similar risks to the same classification codes and calculates a rate separately for each code. In aggregating risks, it is desirable to balance stability and responsiveness and derive groups that are distinctly different from each other in terms of experience. In order to attain stability, we want a group large enough that its losses do not fluctuate too much; and for responsiveness, we want a group small enough so that its rate adjusts to the changing costs of similar risks.

In the Massachusetts workers' compensation system, insureds are separated into five Industry Groups: Manufacturing, Construction, Office and Clerical, Goods and Services, and Miscellaneous. The assignment of class codes to each industry group is based on products produced, processes involved, and services provided.

Summary

In this section we first calculate the rate change for each Industry Group as it varies from the statewide overall indicated rate change. The calculation of the indicated Industry Group rate change is similar to the process used in developing the overall rate level indication. We update the indicated class relativities within each Industry Group to reflect

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the ratio of the pure premium for the individual class to the pure premium for the given Industry Group. Class relativities are updated regularly in order to maintain a fair and accurate classification system.

Estimated pure premium relativities for each class are a credibility-weighted average of three pure premium relativities: (1) recent Massachusetts (MA) experience, (2) recent "countrywide" (CW) experience, and (3) the relativities underlying the present rate. Average rates are calculated from the updated relativities to derive the proposed rate change by Industry Group. Proposed average rates are capped by an iterative process to attain the required industry group changes. Finally, proposed manual rates are determined by applying offsets to the proposed average capped rates. Since ARAP, Merit and Experience Rating, and the Construction Credit program are each designed to be revenue neutral, an offset for each of these programs is applied to the rate.

Massachusetts Data

The data used for the purpose of classification pricing are the Unit Statistical Plan data from Schedule Z, which shows detailed policy year payroll, premium and loss data for each classification in Massachusetts. The data used exclude the experience of large deductible policies. In this review, we have utilized the five policy years of data, policy years 2014 through 2018. This is consistent with the WCRIBMA's overall approach regarding COVID-19 era data as described in Section I.

Adjustment of Massachusetts Data

We begin the process by calculating “limited losses.” Limited losses are determined by applying per claim limits and per occurrence limits. These limited losses are multiplied by primary conversion factors (PCF) (Section IX – B, Exhibit 1, Page 1) in order to adjust each policy year’s experience to reflect current conditions. Primary conversion factors include benefit level adjustments, loss development factors, and trend factors. Consistent with other sections of the filing, the WCRIBMA has selected five year average paid plus case loss development factors. Section IX-B, Exhibit 1, Page 1 shows the development factors used in the calculation of the primary conversion factors. Converted limited losses are the product of the limited losses and the primary conversion factors.

Next, we apply excess loss factors. Since the 2010 filing, the WCRIBMA has followed the NCCI’s class ratemaking methodology in calculating excess loss factors. A provision for excess losses has been determined using estimated excess ratios by hazard group from Section XII - F, Exhibit 3, Page 1. The excess ratios in Section XII – F, Exhibit 3, Page 1 are “per occurrence” excess ratios which need to be converted to “per claim” excess ratios. This is done by multiplying the excess ratios from Section XII – F, Exhibit 3, Page 1 by a factor of 0.985.

A factor (calculated as $[1.0 / (1.0 - \text{Excess Ratio})] - 1.0$) is applied separately for indemnity and medical losses to converted limited losses by class to derive unadjusted excess losses. Consistent with the methodology in past rate filings and with NCCI’s methodology, 30% of the unadjusted indemnity excess losses are reassigned to medical excess losses. The resulting quantities are termed the adjusted excess losses.

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Finally we calculate converted unlimited losses by multiplying the sum of the converted limited losses and the adjusted excess losses by the secondary conversion factors (SCF) (Section IX – B, Exhibit 1, Page 2). Secondary conversion factors include factors to load loss adjustment expenses and the investment income offset. Indemnity and medical converted unlimited losses are then summed by policy year. These sums are displayed by Industry Group in Section IX - C. Massachusetts indicated pure premiums are calculated by dividing these losses by exposure (generally payrolls).

Inclusion of Countrywide Data

Massachusetts relativities are credibility-weighted with countrywide relativities and with the pure premiums relativities underlying present rates. The countrywide data used in this filing are supplied by NCCI and other independent bureaus. Countrywide relativities are based upon three composite policy years, although the specific years vary by state (see Section IX - D, Exhibit 3). Before the data can be used for ratemaking purposes, they must be adjusted to reflect the Massachusetts' distribution of exposure and loss levels.

Pitch factors are used to adjust the countrywide data to a corresponding Massachusetts level. These pitch factors are calculated as follows:

1. Multiply each state's classification pure premiums by the corresponding Massachusetts exposure to estimate the loss level that would occur if the employers in that state were located in Massachusetts.

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2. Sum the indemnity and medical losses by state and industry group to determine the aggregate adjusted losses for each state.
3. Calculate aggregate adjusted losses for Massachusetts in a similar fashion.
4. Divide the aggregate adjusted losses for Massachusetts by the aggregate adjusted losses for each state to determine the pitch factors.

Pitch factors represent the amount by which another state's data must be adjusted to be on the same exposure distribution and loss level as the Massachusetts Schedule Z data (Section IX - D, Exhibit 2). Each state's pure premiums are multiplied by its corresponding pitch factor to derive adjusted pure premiums. The sum of the products of the adjusted pure premiums and exposures by state by class is then divided by the total exposure by class to derive countrywide class pure premiums.

For each Industry Group, the countrywide indicated pure premiums are converted to relativities, so that they balance to unity when weighted by Massachusetts exposures.

Underlying Relativities

The relativities underlying present rates are calculated by balancing to unity the pure premiums underlying present rates (which have been adjusted to reflect the impact of benefit changes and trend to the proposed effective period), based on five years of exposure.

Formula Relativities

Once we have the separate (MA Indicated, CW and Underlying) relativities, we use credibility-weighted averages to calculate formula relativities. The indicated Massachusetts relativity is multiplied by its credibility, the indicated countrywide relativity is multiplied by its (limited) credibility and the relativity underlying the present rate is multiplied by the remaining credibility. The total formula relativity is the weighted average of the indemnity and medical relativities, using the Industry Group indemnity and medical pure premiums as weights. The calculated formula relativities are then balanced to unity based on five policy years of exposure.

Credibility

Credibility reflects the relative reliability and volume of class data used to determine class relativities. In general, a class with higher expected losses has more weight given to its recent MA indicated relativities, while a class with lower expected losses has more weight given to the countrywide and underlying relativities. Credibilities

are calculated separately for the MA and the CW experience, and the remainder of credibility is assigned to the relativity underlying the present rate.

Massachusetts Credibility

This filing follows the classical credibility method, which has been used since the 2001 rate filing, based on the formula:

$$Z = (E / F)^{0.4}$$

Where Z = Credibility assigned to MA or CW experience
 E = Expected Losses for MA, Claim Counts for CW
 F = Full Credibility Criterion

The Massachusetts full credibility criterion is calculated as the product of the claim count standard and the average claim cost. We use NCCI's credibility standards. The average claim costs have been updated in Section IX - D, Exhibit 1, Page 2 of this filing.

Credibility is a function of the volume of indemnity and medical expected losses. By class, expected losses are calculated separately for indemnity and medical losses by multiplying the pure premiums underlying the present rate by exposure. Pure premiums underlying present rates are the product of the adopted relativities from the previous rate revision and pure premium underlying present rate factors. The factors are comprised of

IX 000008

the rate level factor implicit in the current rate and an adjustment for benefit level changes and trend since the previous revision (Section IX - E, Exhibit 1).

Practical Credibility Considerations

This method may produce anomalous credibilities for classes with small amounts of data. Therefore, the following constraints are applied:

1. Credibilities cannot be negative.
2. Countrywide credibilities are limited so that the sum of the Massachusetts and countrywide credibilities is not more than 100%.
3. Countrywide credibilities cannot be greater than 50% and are limited to $\frac{1}{2}$ of (1.0 - Massachusetts credibility).

Countrywide Credibility

The credibility of adjusted countrywide pure premiums is determined based on claim counts for lost time claims (Section IX - D, Exhibit 1, Page 1). Exposure cannot be used as a measure of credibility since wage levels vary significantly between states.

Proposed Average Capped Rates

Proposed average rates by class are calculated to achieve the proposed rate change by Industry Group. The uncapped rate for each class is the product of the formula pure premium relativity and the uncapped rate level factor for the Industry Group. This uncapped

IX 000009

rate level factor is the product of the present average rate and the average rate level change by industry group.

Proposed average uncapped rates are then subject to several capping mechanisms (Section IX – H, Exhibit 1) that consequently require an iterative process of adjusting capped average rates to balance to the required industry group change, apply the capping mechanism again, and repeating until the capped average rates produce an industry group change equal to the required industry group change. The WCRIBMA uses five years of exposures by class to determine if the required Industry Group change is achieved.

Swing Limits

The primary capping mechanism used in the process described above is the application of swing limits by class. Swing limits are used to establish an allowable range of rate changes by industry group. Swings limits do not impact the total premium for an industry group, but they do impact the dispersion of rates within an industry group. So long as the resulting allowable range of rate changes is valid (that is, it includes the required industry group change) the iterative process will yield a reasonable solution. As we did in the 2016, 2018 and 2020 filing, in this filing the WCRIBMA is proposing +/-20% swing limits centered around the required industry group rate changes.

This proposed method is comparable to what the NCCI has been doing since 1977. When NCCI began using this method, the allowable range of rate changes was based on the required industry group change plus or minus 25%. Currently, a number of NCCI states

have modified the calculation to employ +/- 20% or +/- 15% swing limits in calculating the allowable range of rate changes for an industry group.

Manual Rates

Section IX - A displays the proposed manual rates and rating values for this filing. Proposed manual rates are determined by applying offsets to the proposed average capped rates. We calculate offsets for the impact of merit and experience rating, ARAP, construction credits, and the recoupment of the Insolvency Fund assessments, as shown in Section IX - K.

All Risk Adjustment Program

The All Risk Adjustment Program (ARAP) surcharges those experience-rated risks, both voluntary and assigned, with a record of losses greater than expected under the Experience Rating Plan. The purpose of this program is to provide a pricing mechanism to reflect the unusually adverse experience of certain experience-rated risks and to provide an additional financial incentive for such risks to improve workplace safety. Because the program allows for surcharges only, it generates additional premium revenue. In order to achieve revenue-neutrality, we apply a corresponding offset to reduce the manual rates to make up for the anticipated surcharge premium.

The ARAP adjustment is calculated and identified as a separate factor on the Experience Rating Calculation sheet. The ARAP factor can range from 1.00 to a maximum of 1.25. The offset factor for ARAP, calculated in Section IX – K, Exhibit 3, is 1.054.

IX 000011

Merit Rating Program

The objective of the Merit Rating Program is to provide a pricing mechanism for risks too small to qualify for experience rating to share in the loss experience that they generate.

A risk is eligible for the Merit Rating Program if it is not eligible for experience rating and has an average annual premium over the last three policy years of at least \$500. Eligible risks receive the following adjustments to their premium, based on the number of lost-time claims over the most recent three policy years.

Number of Lost-Time Claims	Merit Rating Adjustment
0	5% credit
1	None
2 or more	5% debit

To make the program revenue neutral, rates should be offset by the average historical merit rating credit weighted by the percentage of premium eligible for merit rating. Section IX - K, Exhibit 2 shows the calculation of the combined offset of 0.997 for Experience and Merit Rating.

Construction Credit Program

IX 000012

The Massachusetts Construction Classification Premium Adjustment Program is a credit-only program and we have calculated an offset to the eligible classes to assure revenue neutrality. Section IX - K, Exhibit 4 shows the derivation our selection of the 3.7% offset to be applied to the eligible classes.

Loading for Recoupment of Insolvency Fund Assessments

Under Massachusetts law, the Fund may assess carriers to cover the Fund's costs of providing relief in the event of insurer insolvencies. If a carrier writes premium for a line of business covered by the Fund, such premium will be subject to assessment. The law provides that these assessments can be recouped from policyholders. Beginning in 1988, workers' compensation insurance has been covered by the Fund. The loading included in this filing is intended to recoup prior year assessments as provided in G.L. c. 175D, § 13.

The Fund does not maintain segregated accounts by line of business and consequently workers' compensation insurers may be assessed by the Fund for expenses related to the insolvency of non-workers' compensation carriers. The Fund assessment base is the total written premium for all lines covered by the Fund, and an individual carrier's assessment is a function of its written premium for all lines covered by the Fund. Therefore, we must first estimate the proportion of the total Fund assessment that is attributable to workers' compensation. This is done by dividing the Massachusetts workers' compensation Statutory Page 14 written premium by the total premium assessment base of the Fund. The assessment applicable to workers' compensation is the product of this ratio and the total Fund assessment. The resulting estimated workers' compensation assessment is then

IX 000013

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adjusted to reflect the impact of the time value of money, premium taxes, and commissions. This net assessment is divided by the expected written premium in the prospective period to arrive at the factor to load the assessment.

The Fund has not assessed carriers since the last rate revision. The Board of Directors of the Fund at its October 22, 2020 meeting reviewed the financial position of the Fund and voted to not have an assessment or refund of assessment in 2020. The Board of Directors of the Fund at its October 21, 2021 meeting reviewed the financial position of the Fund and voted to not have an assessment or refund in 2021. The loading in the 7/1/2020 rates was -0.0054 and was intended to apply to policies effective during the 7/1/2020 to 6/30/2021 policy period. The loading shown in this filing offsets the unanticipated impact to the policy period from 7/1/2021 to 6/30/2022. The proposed factor is a loading of 0.0052 (Section IX-K, Exhibit 5, Page 1).

Pricing Example

Section IX - L is a sample rate calculation, for Class 2660 – Boot or Shoe Manufacturing. Exhibit 1, page 2 shows the calculation of the MA indicated pure premium and relativity. Exhibit 2, page 2 shows the calculation of the CW indicated pure premium and relativity. On Exhibit 3, we calculate the credibilities and formula relativity. The derivation of the proposed manual rate is shown on Exhibit 4.

Special Classes

IX 000014

The following classes are special situations where the rates and rating values are calculated using a methodology other than that detailed above.

Class 5040 (Iron or Steel: Erection: Erection-Frame Structures), 5059 (Iron or Steel: Erection: Frame Struct Not Over 2 Strs in Hgt) and 5538 (Sheet Metal Work-Shop & Outside-NOC & Drivers) scopes update.

- Scopes update effective 7/1/2018
- 5538 class experience for policies that had 5040 and 5538 or 5059 and 5538 was reassigned to 5040 or 5059 respectively for the purpose of classification pricing.
- See Circular Letter No. 2331, released 3/29/2018.

6811, 6854, 6882, 6884: State Act Classes comparable to F-Class Codes

- Established 1/1/1990.
- The manual rates for 6811, 6854, 6882, and 6884 are set at 83.68¹% of the manual rates of F-Class Codes 6801 [Boat Building Wood NOC-US Act], 6843 [Ship Building Iron or Steel-NOC-US Act], 6872 [Ship Repair or Conversion-US Act] and 6874 [Painting Ship Hulls-US Act], respectively.
- The ELRs for 6811, 6854, 6882, and 6884 are set at 88.00%² of the ELRs of F-Class Codes 6801 [Boat Building Wood NOC-US Act], 6843 [Ship Building Iron or Steel-NOC-US Act], 6872 [Ship Repair or Conversion-US Act] and 6874 [Painting Ship Hulls-US Act], respectively.
- See Circular Letter No. 1519, released 1/3/1990.

¹ 83.68% = 1.0 / Proposed USLH&HW Coverage Percentage for Manual Rates. Coverage Percentage from Section VIII – J, Exhibit 1.

² 88.00% = 1.0 / Proposed USLH&HW Coverage Percentage for ELRs. Coverage Percentage from Section VIII – J, Exhibit 1.

IX 000015

Code 9044 - Casino Gambling – Hotel - All Employees & Clerical, Salespersons,

Drivers

- Approved Effective 2/1/2016.
- The rate and rating values for 9044 are assigned 90% of the rate and rating values of Class 9052 – Hotel: All Other Employees & Salespersons, Drivers.
- See Circular Letter No. 2270, released 12/2/2015.

Code 9062 - Casino Gambling - All Employees & Clerical, Salespersons, Drivers

- Approved Effective 2/1/2016.
- The rate and rating values for 9062 are assigned the rate and rating values of Class 9061 – Club NOC & Clerical.
- See Circular Letter No. 2270, released 12/2/2015.

IX 000016

MASSACHUSETTS WORKERS COMPENSATION AND EMPLOYERS LIABILITY INSURANCE MANUAL **RATES**

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RATES

LEGEND

- | | |
|--|---|
| (a) Rate for each individual risk must be obtained by Home Office from the MA Bureau.
D Supplement Disease Loading. Refer to Section IV of the Manual Supplement - - Treatment of Disease Coverage. | F Rate provides for coverage under the United States Longshore and Harbor Workers' Compensation Act.
M Risks are subject to Admiralty Law or Federal Employers Liability Act (FELA). |
|--|---|

CLASS CODE	RATE	MIN PREM	LOSS CONST	CLASS CODE	RATE	MIN PREM	LOSS CONST	CLASS CODE	RATE	MIN PREM	LOSS CONST	CLASS CODE	RATE	MIN PREM	LOSS CONST
0005	2.24	257.	20.	1924	2.03	230.	--	2501	1.98	228.	--	3082D	4.35	311.	--
0008	2.19	256.	20.	1925	6.44	475.	--	2503	0.99	194.	--	3085D	4.22	307.	--
0016	3.17	290.	20.	2003	3.32	275.	--	2570	3.45	280.	--	3110	7.91	500.	--
0034	2.74	275.	20.	2014	3.58	284.	--	2576	1.94	227.	--	3111	1.87	224.	--
0035	1.50	232.	20.	2021	2.42	244.	--	2585	2.51	247.	--	3113	1.54	213.	--
0036	2.74	275.	20.	2039	3.38	277.	--	2586	1.92	226.	--	3114	2.58	249.	--
0042	3.06	286.	20.	2041	2.10	233.	--	2587	2.07	251.	20.	3118	1.45	210.	--
0046	2.30	260.	20.	2070	3.02	265.	--	2623	4.31	310.	--	3119	0.83	188.	--
0050	3.91	346.	50.	2081	2.41	243.	--	2651	1.41	208.	--	3120	1.12	198.	--
0059D	0.24	.	.	2089	2.40	243.	--	2660	1.89	225.	--	3122	2.04	230.	--
0065D	0.10	.	.	2095	2.43	244.	--	2683	2.01	229.	--	3127	1.32	205.	--
0066D	0.08	.	.	2101	2.40	243.	--	2688	1.61	215.	--	3131	1.15	199.	--
0067D	0.08	.	.	2105	(a)	(a)	(a)	2702	12.07	500.	20.	3132	2.12	233.	--
0079	2.10	253.	20.	2111	1.98	228.	--	2710	5.68	358.	--	3145	1.46	210.	--
0083	3.27	293.	20.	2114	2.40	243.	--	2731	2.62	251.	--	3146	1.92	226.	--
0106	8.91	500.	20.	2115	5.62	356.	--	2747	4.95	332.	--	3169	2.36	242.	--
0113	2.74	275.	20.	2121	1.30	205.	--	2790	1.82	223.	--	3179	1.00	194.	--
0170	2.74	275.	20.	2130	1.34	206.	--	2802	3.33	276.	--	3180	2.22	237.	--
0771b	0.53	.	.	2131	2.74	255.	--	2835	1.63	216.	--	3188	2.15	234.	--
0908	77.00	141.	--	2143	2.37	242.	--	2836	2.25	238.	--	3200	1.95	227.	--
0909	173.00	237.	--	2150	3.38	277.	--	2841	3.36	277.	--	3220	2.62	251.	--
0912	345.00	409.	--	2156	3.34	276.	--	2883	2.95	262.	--	3223	(a)	(a)	(a)
0913	155.00	219.	--	2157	3.80	292.	--	2923	1.31	205.	--	3255	1.72	219.	--
0917	2.14	254.	20.	2172	1.58	214.	--	2942	1.49	211.	--	3257	2.20	236.	--
0918	0.40	193.	20.	2211	5.17	340.	--	3018	2.21	236.	--	3270	1.97	228.	--
1430	4.08	302.	--	2220	2.31	240.	--	3022	3.08	267.	--	3300	2.86	259.	--
1438	3.02	265.	--	2260	4.67	322.	--	3027	3.16	270.	--	3305	(a)	(a)	(a)
1463	11.87	500.	--	2288	3.43	279.	--	3028	2.41	243.	--	3315	2.66	252.	--
1624D	3.56	304.	20.	2305	2.50	247.	--	3030	4.48	316.	--	3336	2.43	244.	--
1655	2.15	254.	20.	2362	1.72	219.	--	3040	4.90	331.	--	3365	4.43	455.	50.
1701	2.05	231.	--	2380	1.57	214.	--	3041	2.44	244.	--	3372	1.89	225.	--
1710D	3.56	304.	20.	2402	2.02	230.	--	3042	3.50	282.	--	3373	3.29	274.	--
1747	2.33	241.	--	2413	3.09	267.	--	3066	2.13	234.	--	3381	1.68	218.	--
1748	2.94	262.	--	2416	2.07	231.	--	3076	1.99	229.	--	3383	1.38	207.	--
1853	1.16	200.	--	2417	1.68	218.	--	3081D	4.35	311.	--	3385	0.72	184.	--

Non-Ratable Code and Rate to be used with the following classifications:

b. 4771

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MASSACHUSETTS WORKERS COMPENSATION AND EMPLOYERS LIABILITY INSURANCE MANUAL **RATES**

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RATES															
CLASS CODE	RATE	MIN PREM	LOSS CONST	CLASS CODE	RATE	MIN PREM	LOSS CONST	CLASS CODE	RATE	MIN PREM	LOSS CONST	CLASS CODE	RATE	MIN PREM	LOSS CONST
3400	2.36	242.	--	4150	0.80	187.	--	4771c	3.52	301.	--	5507	5.28	485.	50.
3507	2.48	246.	--	4239	2.27	238.	--	4777	2.30	240.	--	5508D	4.06	351.	50.
3515	2.41	243.	--	4243	2.45	245.	--	4825	0.38	172.	--	5509	5.19	482.	50.
3558	0.68	183.	--	4244	2.68	253.	--	4828	0.81	187.	--	5538	3.99	349.	50.
3571	0.58	179.	--	4250	1.89	225.	--	4829	0.81	187.	--	5545	47.20	500.	50.
3574	1.49	211.	--	4251	1.99	229.	--	4902	1.49	211.	--	5547	10.66	500.	50.
3612	1.17	200.	--	4273	2.80	257.	--	4923	0.54	178.	--	5606	1.23	252.	50.
3620	3.26	273.	--	4279	2.03	230.	--	5020	4.07	351.	50.	5610	4.41	454.	50.
3629	1.49	211.	--	4283	1.33	206.	--	5022	9.68	500.	50.	5645	6.44	500.	50.
3632	1.49	211.	--	4299	1.59	215.	--	5037	14.97	500.	50.	5701	19.59	500.	50.
3634	1.33	206.	--	4304	4.09	302.	--	5040	20.09	500.	50.	5703	10.76	500.	50.
3635	2.33	241.	--	4307	1.46	210.	--	5057	17.85	500.	50.	5705	9.04	500.	50.
3638	1.49	211.	--	4308	1.78	221.	--	5059	22.69	500.	50.	6003	7.35	500.	50.
3642	0.93	192.	--	4351	0.80	187.	--	5102	6.05	500.	50.	6005	4.06	351.	50.
3643	1.40	208.	--	4352	1.06	196.	--	5146	6.49	500.	50.	6204	5.08	478.	50.
3647	2.10	233.	--	4360	0.54	178.	--	5160	2.81	307.	50.	6217	4.22	357.	50.
3648	1.07	196.	--	4361	0.54	198.	20.	5183	3.01	314.	50.	6229	3.73	340.	50.
3681	0.55	178.	--	4362	0.45	195.	20.	5188	3.74	340.	50.	6233	2.04	280.	50.
3685	0.52	177.	--	4410	2.84	258.	--	5190	2.30	290.	50.	6251D	4.17	355.	50.
3724	4.29	450.	50.	4432	0.62	181.	--	5191	0.71	204.	20.	6252D	5.18	481.	50.
3726	5.26	484.	50.	4439	4.57	319.	--	5192	2.54	268.	20.	6306	8.40	500.	50.
3807	2.36	242.	--	4452	2.39	243.	--	5213	10.90	500.	50.	6319	2.65	302.	50.
3808	2.97	263.	--	4459	2.62	251.	--	5215	4.05	351.	50.	6325	2.49	296.	50.
3821	4.50	337.	20.	4470	1.81	222.	--	5221	6.34	500.	50.	6400	4.63	462.	50.
3826	3.95	297.	--	4484	1.87	224.	--	5222	8.80	500.	50.	6504	2.40	243.	--
3830	1.49	211.	--	4493	1.73	220.	--	5223	3.92	346.	50.	6702M	(a)	.	--
3841	1.51	212.	--	4511	0.30	190.	20.	5348	4.65	463.	50.	6703M	(a)	.	--
4000	5.24	453.	20.	4512	0.08	182.	20.	5402	6.31	500.	50.	6704M	(a)	.	--
4021	2.89	260.	--	4557	1.64	216.	--	5403	8.64	500.	50.	6801F	6.36	473.	--
4024	3.52	282.	--	4558	1.42	209.	--	5437	3.54	333.	50.	6811	5.32	456.	20.
4034	5.42	349.	--	4583	2.30	240.	--	5443	3.43	329.	50.	6824F	8.75	500.	--
4036	1.70	219.	--	4611	0.77	186.	--	5445	6.14	500.	50.	6826F	5.26	343.	--
4038	2.34	241.	--	4635	4.49	316.	--	5462	5.33	487.	50.	6834	2.04	250.	20.
4053	2.19	236.	--	4653	1.78	221.	--	5472	7.43	500.	50.	6836	2.76	276.	20.
4062	1.75	220.	--	4665	9.49	500.	--	5473	8.65	500.	50.	6843F	11.84	500.	--
4112	0.34	171.	--	4692	0.47	175.	--	5474	3.90	346.	50.	6854	9.91	500.	20.
4113	2.19	236.	--	4693	0.73	185.	--	5478	3.36	327.	50.	6872F	16.54	500.	--
4114	2.48	246.	--	4720	1.47	210.	--	5479	5.27	484.	50.	6874F	18.04	500.	--
4130	3.21	271.	--	4740	0.70	184.	--	5480	4.45	456.	50.	6882	13.84	500.	20.
4133	1.42	209.	--	4741	2.31	240.	--	5506	5.42	490.	50.	6884	15.10	500.	20.

For Non-Ratable portion of Rate, refer to:
 c 0771

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MASSACHUSETTS WORKERS COMPENSATION AND EMPLOYERS LIABILITY INSURANCE MANUAL **RATES**

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RATES

CLASS CODE	RATE	MIN PREM	LOSS CONST	CLASS CODE	RATE	MIN PREM	LOSS CONST	CLASS CODE	RATE	MIN PREM	LOSS CONST	CLASS CODE	RATE	MIN PREM	LOSS CONST
7016M	1.88	.	--	7502	1.57	234.	20.	8232	5.07	356.	20.	8829	2.17	255.	20.
7024M	2.35	.	--	7515	3.08	287.	20.	8233	5.09	357.	20.	8831	0.96	213.	20.
7038M	3.55	.	--	7520	2.73	275.	20.	8235	3.74	310.	20.	8832	0.26	188.	20.
7046M	5.06	.	--	7538	5.28	485.	50.	8263	4.82	348.	20.	8833	1.01	214.	20.
7047M	2.95	.	--	7539	1.35	226.	20.	8264	4.58	339.	20.	8835	1.63	236.	20.
7050M	5.57	.	--	7580	3.15	289.	20.	8265	5.09	357.	20.	8837	(a)	(a)	(a)
7090M	4.44	.	--	7590	4.72	344.	20.	8279	3.47	300.	20.	8868	0.68	203.	20.
7098M	5.95	.	--	7600	3.46	300.	20.	8291	3.16	290.	20.	8901	0.06	181.	20.
7099M	7.46	.	--	7601	5.00	475.	50.	8292	3.10	288.	20.	9014	1.97	248.	20.
7133	(a)	(a)	(a)	7610	0.32	190.	20.	8293	7.07	500.	20.	9015	2.75	275.	20.
7151M	8.26	.	--	7704	3.27	293.	20.	8350	6.25	489.	20.	9016	1.60	235.	20.
7152M	12.95	.	--	7720	1.38	227.	20.	8380	2.38	262.	20.	9019	2.53	268.	20.
7153M	10.33	.	--	7855	3.11	318.	50.	8381	1.55	233.	20.	9033	2.21	256.	20.
7219	7.09	500.	20.	8001	1.53	233.	20.	8385	3.41	298.	20.	9040	2.86	279.	20.
7230	8.10	500.	20.	8002	1.83	243.	20.	8392	1.59	235.	20.	9044	1.22	222.	20.
7231	10.83	500.	20.	8006	1.10	218.	20.	8393	1.14	219.	20.	9052	1.35	226.	20.
7309F	10.86	500.	--	8008	0.72	204.	20.	8500	5.09	357.	20.	9058	1.35	226.	20.
7313F	15.01	500.	--	8010	1.52	232.	20.	8601	0.18	185.	20.	9060	0.93	212.	20.
7317F	18.32	500.	--	8013	0.34	191.	20.	8709F	5.67	357.	--	9061	0.94	212.	20.
7327F	23.82	500.	--	8017	0.90	211.	20.	8710	2.47	265.	20.	9062	0.94	212.	20.
7333M	7.53	.	--	8018	3.34	296.	20.	8719	2.47	265.	20.	9063	0.56	199.	20.
7335M	8.85	.	--	8021	3.15	289.	20.	8720	0.77	206.	20.	9077F	6.42	475.	--
7337M	11.10	.	--	8031	1.54	233.	20.	8721	0.20	186.	20.	9079	0.91	211.	20.
7350F	18.06	500.	--	8032	1.19	221.	20.	8726F	4.17	305.	--	9089	0.65	202.	20.
7360	3.94	317.	20.	8033	1.32	225.	20.	8734M	0.44	.	--	9093	1.01	214.	20.
7370	3.57	304.	20.	8034	2.75	275.	20.	8737M	0.35	.	--	9101	3.44	299.	20.
7380	5.58	465.	20.	8039	1.23	222.	20.	8738M	0.55	.	--	9102	1.91	246.	20.
7382	3.52	302.	20.	8044	2.53	268.	20.	8742	0.09	182.	20.	9154	1.44	229.	20.
7394M	9.68	.	--	8046	2.06	251.	20.	8745	5.74	471.	20.	9156	1.86	244.	20.
7395M	12.37	.	--	8048	2.25	258.	20.	8747	0.67	202.	20.	9178	12.47	500.	20.
7398M	15.51	.	--	8058	2.10	253.	20.	8748	0.62	201.	20.	9179	38.41	500.	20.
7403	3.18	290.	20.	8103	2.45	265.	20.	8800	0.92	211.	20.	9180	4.22	327.	20.
7405d	0.82	217.	20.	8105	7.45	500.	20.	8803	0.04	180.	20.	9182	2.73	275.	20.
7420	8.59	500.	20.	8106	4.77	346.	20.	8805M	0.18	.	--	9186	4.22	327.	20.
7421	1.01	214.	20.	8107	2.79	277.	20.	8810	0.06	181.	20.	9220	3.44	299.	20.
7422	1.01	214.	20.	8111	2.50	267.	20.	8814M	0.14	.	--	9402	3.64	306.	20.
7425	2.45	265.	20.	8203	5.65	468.	20.	8815M	0.23	.	--	9403	9.16	500.	20.
7431e	0.76	214.	20.	8204	6.07	482.	20.	8820	0.06	181.	20.	9410	3.53	303.	20.
7445f	0.27	.	.	8215	2.96	283.	20.	8824	1.99	249.	20.	9501	1.87	224.	--
7453g	0.25	.	.	8227	5.08	478.	50.	8826	1.42	229.	20.	9505	1.87	224.	--

For Non-Ratable portion of Rate, refer to:

d 7445 e 7453

Non-Ratable Code and Rate to be used with:

f 7405 g 7431

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Section IX - Classification Pricing
 Subsection A - Summary
 7/1/2022

Section IX - A
 Exhibit 1
 Page 4

**MASSACHUSETTS WORKERS COMPENSATION
 AND EMPLOYERS LIABILITY INSURANCE MANUAL**

RATES

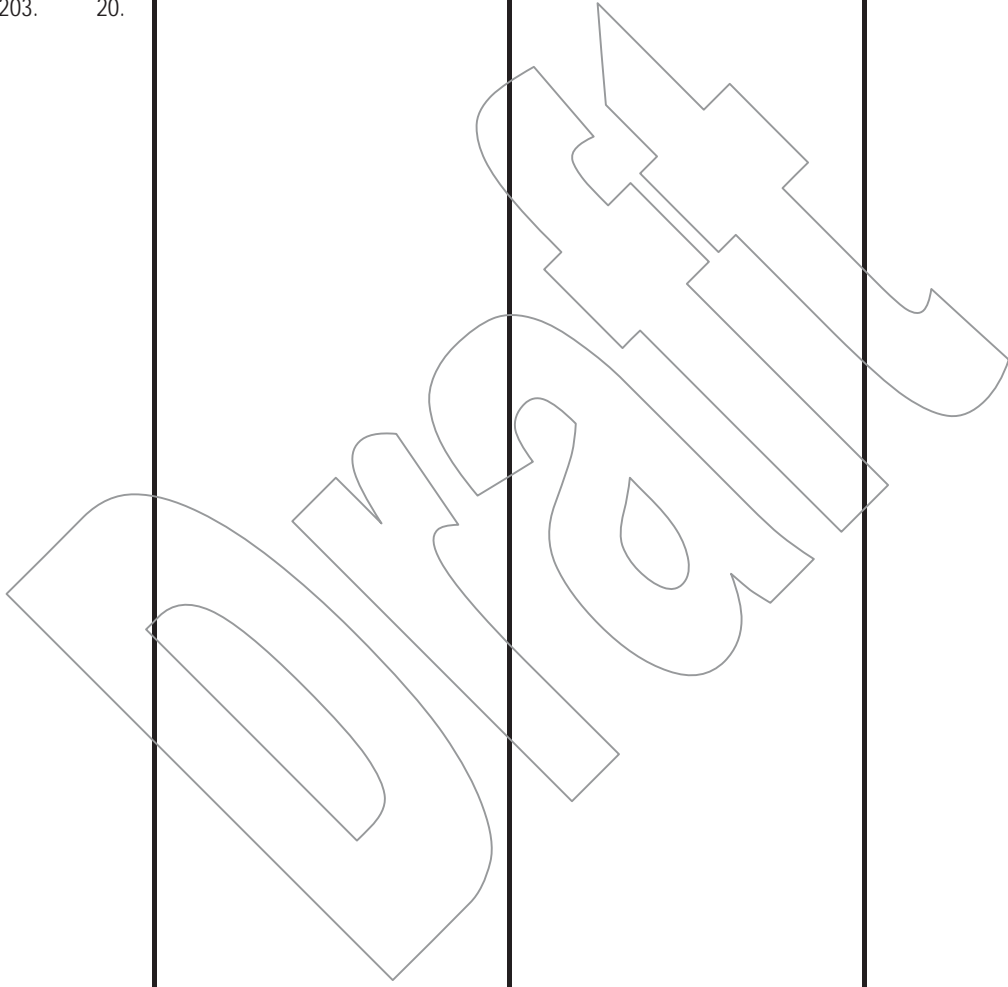
Draft

Proposed Effective July 1, 2022

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RATES

CLASS CODE	RATE	MIN PREM	LOSS CONST	CLASS CODE	RATE	MIN PREM	LOSS CONST	CLASS CODE	RATE	MIN PREM	LOSS CONST	CLASS CODE	RATE	MIN PREM	LOSS CONST
9519	2.32	260.	20.												
9521	2.75	255.	--												
9522	1.47	210.	--												
9533	15.72	500.	50.												
9534	5.15	480.	50.												
9549	3.71	339.	50.												
9552	6.46	500.	50.												
9586	0.30	190.	20.												
9620	0.68	203.	20.												



Calculation of Pure Premium Underlying Proposed Rate Factor

Industry Group (1)	Injury Type (2)	Uncapped Rate Level Factor (3)	Industry Group Pure Premium (4)	Percent of Pure Premium =(4) / [Total of (4)] (5)	Expected Loss and LAE Ratio (6)	Pure Premium Underlying Proposed Rate Factor = (3) x (5) x (6) (7)
Manufacturing	Indemnity	1.779	0.918	0.656	0.698	0.814
	Medical	1.779	0.482	0.344	0.698	0.427
	Total		1.400			
Construction	Indemnity	4.512	2.428	0.685	0.698	2.156
	Medical	4.512	1.118	0.315	0.698	0.993
	Total		3.546			
Office and Clerical	Indemnity	0.131	0.065	0.625	0.698	0.057
	Medical	0.131	0.039	0.375	0.698	0.034
	Total		0.104			
Goods and Services	Indemnity	1.517	0.765	0.643	0.698	0.680
	Medical	1.517	0.425	0.357	0.698	0.378
	Total		1.190			
Miscellaneous	Indemnity	4.299	2.226	0.659	0.698	1.978
	Medical	4.299	1.150	0.341	0.698	1.022
	Total		3.376			

Notes:

- (3): Section IX - H, Exhibit 1.
- (4): Section IX - C, Exhibits 1-5, page 2.
- (6): Section VI - J, Exhibit 1.

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IX 000021

Calculation of Indemnity and Medical Conversion Factors

(A). Benefit Level Adjustment Factors

The following factors are used to bring MA Unit Statistical Plan losses to the benefit level of the proposed effective policy year period.

Indemnity	Policy Year				
	2014	2015	2016	2017	2018
Fatal	1.063	1.051	1.045	1.039	1.032
Permanent Total	1.069	1.063	1.056	1.048	1.039
Permanent Partial	1.111	1.100	1.088	1.076	1.063
Temporary Total	1.045	1.041	1.037	1.032	1.026
Medical					
All Injury Types	1.000	1.000	1.000	1.000	1.000

(B). Loss Development Factors

The following factors are used to bring MA Unit Statistical Plan losses from first through fifth report to an ultimate basis.

Indemnity	Policy Year				
	2014	2015	2016	2017	2018
Likely	1.027	1.042	1.103	1.254	1.895
Not Likely	1.020	1.041	1.095	1.232	1.668
Medical					
Likely	0.933	0.926	0.929	0.954	1.009
Not Likely	0.993	0.990	0.994	0.995	1.014

(C). Trend Factors

The following factors trend the reported pure premiums from the reported period to the proposed effective period for new rates.

Indemnity	Policy Year				
	2014	2015	2016	2017	2018
All Injury Types	0.749	0.812	0.845	0.846	0.875
Medical					
Lost Time Medical	0.755	0.842	0.866	0.862	0.886
Medical Only	0.710	0.742	0.785	0.778	0.802

Notes:

- (A): Section IV - A, Exhibit 1.
- (B): Development to 10th report (Exhibit 2, Page 1) x Development from 10th to ultimate. The 10th to ultimate development factor was calculated using data from Financial Aggregate Policy Year Call (Call 2) and Large Loss & Catastrophe Call (Call 7).
- (C): Exhibit 3. Frequency x Severity Trends / Wage Trends

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Section IX - Classification Pricing
Subsection B - Conversion/Excess Loss Factors
7/1/2022

Section IX - B
Exhibit 1
Page 2

Calculation of Indemnity and Medical Conversion Factors

(D). Primary Conversion Factors (PCF)

Indemnity	Policy Year				
	2014	2015	2016	2017	2018
Fatal - LD	0.818	0.889	0.974	1.101	1.710
Fatal - NLD	0.812	0.889	0.967	1.082	1.505
Permanent Total	0.822	0.899	0.983	1.111	1.722
Permanent Partial - LD	0.854	0.930	1.014	1.141	1.761
Permanent Partial - NLD	0.849	0.929	1.007	1.121	1.550
Temporary Total - LD	0.804	0.881	0.966	1.094	1.700
Temporary Total - NLD	0.798	0.880	0.959	1.075	1.497
Medical					
Lost Time Medical -LD	0.705	0.779	0.804	0.822	0.894
Lost Time Medical -NLD	0.750	0.833	0.861	0.857	0.899
Medical - NLD	0.705	0.735	0.780	0.774	0.814

Notes:

(D) = (A) x (B) x (C)

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Section IX - Classification Pricing
Subsection B - Conversion/Excess Loss Factors
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Calculation of Indemnity and Medical Conversion Factors

(A). Loss Adjustment Expense Factor

The following factor is applied to include the proposed loss adjustment expense.

	Indemnity	Medical
Loss Adjustment Expense	1.187	1.187

(B). Investment Income Offset Factor

The following factor is applied to adjust for investment income.

	Investment Income Offset Factor
Indemnity	
Fatal	0.955
Permanent Total	0.942
Permanent Partial	1.010
Temporary Total	1.012
Medical	
Fatal	1.000
Permanent Total	0.944
Permanent Partial	1.011
Temporary Total	1.013
Medical Only	1.000

(C). Secondary Conversion Factors

The factors above are combined multiplicatively, resulting in the following conversion factors.

Indemnity	
Fatal	1.134
Permanent Total	1.118
Permanent Partial	1.199
Temporary Total	1.201
Medical	
Fatal	1.187
Permanent Total	1.120
Permanent Partial	1.200
Temporary Total	1.203
Medical Only	1.187

Notes:

(A): 1.000 + Loss Adjustment Expense (as a percent of losses) from Section VI-A, Exhibit 1.

(B): Exhibit 4.

(C) = (A) x (B)

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Summary of Development Factors

		Likely to Develop								
		Development Factors From:								
		18-30	30-42	42-54	54-66	66-78	78-90	90-102	102-114	114-126
		<u>(1) Indemnity Losses</u>								
5Yr Weighted Average		1.511	1.137	1.058	1.015	1.003	1.000	1.001	1.003	1.001
Cumulative		1.860	1.231	1.083	1.023	1.008	1.005	1.005	1.004	1.001
		<u>(2) Medical Losses</u>								
5Yr Weighted Average		1.057	1.027	1.004	0.992	0.990	0.997	0.989	0.997	0.992
Cumulative		1.044	0.988	0.962	0.958	0.966	0.976	0.978	0.989	0.992
		<u>(3) Claim Counts</u>								
2Yr Weighted Average		1.017	1.009	1.007	1.002	1.000	0.999	1.000	1.001	1.001
Cumulative		1.036	1.019	1.010	1.003	1.001	1.001	1.001	1.001	1.001
		Not-Likely to Develop								
		Development Factors From:								
		18-30	30-42	42-54	54-66	66-78	78-90	90-102	102-114	114-126
		<u>(4) Indemnity Losses</u>								
5Yr Weighted Average		1.354	1.125	1.052	1.021	1.010	1.001	1.003	1.000	1.001
Cumulative		1.661	1.227	1.091	1.037	1.015	1.005	1.004	1.001	1.001
		<u>(5) Medical Losses</u>								
5Yr Weighted Average		1.020	1.001	1.004	0.997	0.998	1.000	1.001	1.000	1.000
Cumulative		1.020	1.000	0.999	0.995	0.998	1.000	1.000	1.000	1.000
		<u>(6) Claim Counts</u>								
2Yr Weighted Average		1.016	1.005	1.002	1.001	1.000	1.000	1.000	1.000	1.000
Cumulative		1.026	1.009	1.004	1.002	1.001	1.001	1.001	1.000	1.000

Notes:
 (1), (2), (3): Page 3.
 (4), (5), (6): Page 5.

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Calculation of Likely to Develop Development Factors

Policy Year	Likely to Develop									
	Indemnity Losses			Medical Losses			Claim Counts			Link Ratio
	Evaluated at month		Link Ratio	Evaluated at month		Link Ratio	Evaluated at month		Link Ratio	
	18	30		18	30		18	30		
2013	69,395,059	102,482,934	1.477	42,850,230	44,918,953	1.048	1,539	1,560	1.014	
2014	80,776,937	119,950,871	1.485	53,764,229	54,964,549	1.022	1,620	1,654	1.021	
2015	77,532,903	116,291,031	1.500	47,965,661	50,974,268	1.063	1,535	1,552	1.011	
2016	73,444,071	112,026,490	1.525	45,138,590	48,563,086	1.076	1,483	1,506	1.016	
2017	72,853,633	114,452,403	1.571	45,840,193	49,542,862	1.081	1,478	1,506	1.019	
	5yr Weighted Average		1.511	5yr Weighted Average		1.057	2yr Weighted Average		1.017	
		30	42		30	42		30	42	
2012	109,712,587	124,748,693	1.137	51,647,591	51,984,464	1.007	1,664	1,664	1.000	
2013	109,319,306	122,512,998	1.121	46,898,791	48,026,579	1.024	1,618	1,634	1.010	
2014	128,448,947	147,327,335	1.147	58,212,585	59,061,999	1.015	1,736	1,742	1.003	
2015	121,919,728	139,263,557	1.142	52,644,878	55,170,109	1.048	1,597	1,619	1.014	
2016	119,544,840	135,711,039	1.135	52,033,095	54,361,525	1.045	1,567	1,574	1.004	
	5yr Weighted Average		1.137	5yr Weighted Average		1.027	2yr Weighted Average		1.009	
		42	54		42	54		42	54	
2011	129,128,028	138,664,860	1.074	56,202,854	56,711,673	1.009	1,715	1,726	1.006	
2012	131,885,814	139,717,949	1.059	54,594,224	55,322,683	1.013	1,699	1,710	1.006	
2013	128,500,349	136,320,902	1.061	49,727,789	49,385,518	0.993	1,667	1,674	1.004	
2014	154,123,554	161,611,104	1.049	61,358,737	61,157,408	0.997	1,776	1,787	1.006	
2015	146,351,908	153,950,243	1.052	57,456,023	57,770,757	1.005	1,654	1,667	1.008	
	5yr Weighted Average		1.058	5yr Weighted Average		1.004	2yr Weighted Average		1.007	
		54	66		54	66		54	66	
2010	129,763,719	133,092,438	1.026	53,078,984	52,083,814	0.981	1,799	1,800	1.001	
2011	144,613,263	146,048,125	1.010	59,349,989	58,426,002	0.984	1,752	1,759	1.004	
2012	147,318,198	150,624,523	1.022	57,367,286	57,178,424	0.997	1,741	1,745	1.002	
2013	142,992,234	143,983,819	1.007	51,101,408	51,403,034	1.006	1,698	1,703	1.003	
2014	169,409,356	171,282,558	1.011	63,012,087	62,483,170	0.992	1,821	1,823	1.001	
	5yr Weighted Average		1.015	5yr Weighted Average		0.992	2yr Weighted Average		1.002	
		66	78		66	78		66	78	
2009	134,236,802	134,838,824	1.004	53,505,760	52,582,284	0.983	1,583	1,583	1.000	
2010	135,030,721	133,799,745	0.991	52,602,292	52,799,047	1.004	1,807	1,812	1.003	
2011	149,003,220	150,422,717	1.010	59,845,765	61,370,525	1.025	1,773	1,778	1.003	
2012	157,173,495	158,447,712	1.008	58,821,523	56,083,601	0.953	1,770	1,771	1.001	
2013	146,962,150	147,001,788	1.000	52,692,415	51,906,609	0.985	1,719	1,718	0.999	
	5yr Weighted Average		1.003	5yr Weighted Average		0.990	2yr Weighted Average		1.000	
		78	90		78	90		78	90	
2008	138,835,094	138,685,765	0.999	53,762,704	53,561,084	0.996	1,727	1,723	0.998	
2009	136,120,158	135,722,335	0.997	52,939,050	53,232,001	1.006	1,593	1,594	1.001	
2010	135,865,364	135,811,786	1.000	53,309,903	53,565,219	1.005	1,821	1,823	1.001	
2011	151,939,320	152,898,644	1.006	61,656,783	60,513,265	0.981	1,784	1,781	0.998	
2012	159,504,044	159,447,346	1.000	56,354,310	56,416,003	1.001	1,775	1,776	1.001	
	5yr Weighted Average		1.000	5yr Weighted Average		0.997	2yr Weighted Average		0.999	
		90	102		90	102		90	102	
2007	153,063,595	153,045,131	1.000	61,011,756	60,583,473	0.993	2,005	2,008	1.001	
2008	139,337,626	139,310,614	1.000	53,948,922	52,857,869	0.980	1,728	1,728	1.000	
2009	139,082,347	139,127,415	1.000	53,957,497	53,611,739	0.994	1,606	1,604	0.999	
2010	135,628,472	135,866,120	1.002	53,258,998	53,114,241	0.997	1,823	1,822	0.999	
2011	154,081,821	154,563,658	1.003	60,939,387	59,953,191	0.984	1,785	1,785	1.000	
	5yr Weighted Average		1.001	5yr Weighted Average		0.989	2yr Weighted Average		1.000	
		102	114		102	114		102	114	
2006	163,972,076	164,512,037	1.003	68,346,050	68,909,481	1.008	2,243	2,250	1.003	
2007	153,382,793	154,002,727	1.004	60,604,380	60,393,949	0.997	2,009	2,019	1.005	
2008	138,950,462	139,328,204	1.003	52,583,369	52,082,398	0.990	1,728	1,731	1.002	
2009	139,030,456	139,386,310	1.003	53,498,539	52,535,693	0.982	1,604	1,606	1.001	
2010	136,080,119	136,114,497	1.000	53,448,710	53,561,894	1.002	1,823	1,824	1.001	
	5yr Weighted Average		1.003	5yr Weighted Average		0.997	2yr Weighted Average		1.001	
		114	126		114	126		114	126	
2005	166,308,356	166,306,920	1.000	71,088,329	71,335,711	1.003	2,443	2,444	1.000	
2006	163,781,853	164,071,230	1.002	68,677,665	67,780,098	0.987	2,248	2,249	1.000	
2007	154,002,727	154,130,843	1.001	60,393,949	59,952,045	0.993	2,019	2,017	0.999	
2008	139,588,204	140,044,115	1.003	52,107,398	52,137,270	1.001	1,732	1,736	1.002	
2009	139,691,954	139,700,500	1.000	52,811,210	51,519,611	0.976	1,611	1,609	0.999	
	5yr Weighted Average		1.001	5yr Weighted Average		0.992	2yr Weighted Average		1.001	

Note:
 Unit Statistical Plan data, excluding Large Deductibles.

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Section IX - Classification Pricing
 Subsection B - Conversion/Excess Loss Factors
 7/1/2022

Section IX - B
 Exhibit 2
 Page 3

Calculation of Not-Likely to Develop Development Factors

Policy Year	Not-Likely to Develop									
	Indemnity Losses			Medical Losses			Claim Counts			
	Evaluated at month	Link Ratio		Evaluated at month	Link Ratio		Evaluated at month	Link Ratio		
18	30		18	30		18	30			
2013	147,927,521	193,419,487	1.308	134,224,262	136,573,948	1.018	12,885	13,125	1.019	
2014	154,934,455	208,243,673	1.344	138,996,820	141,380,696	1.017	13,191	13,428	1.018	
2015	161,619,622	216,568,008	1.340	136,894,235	140,273,511	1.025	13,325	13,526	1.015	
2016	160,180,291	219,618,559	1.371	141,054,935	144,443,844	1.024	13,163	13,356	1.015	
2017	175,872,901	246,033,216	1.399	148,259,106	150,485,789	1.015	13,797	14,044	1.018	
	5yr Weighted Average		1.354	5yr Weighted Average		1.020	2yr Weighted Average		1.016	
	30	42		30	42		30	42		
2012	177,309,777	199,552,082	1.125	129,705,461	130,418,701	1.005	12,805	12,875	1.005	
2013	186,583,116	209,245,430	1.121	134,594,109	133,647,446	0.993	13,067	13,127	1.005	
2014	199,745,598	225,131,216	1.127	138,132,659	138,509,142	1.003	13,346	13,425	1.006	
2015	210,939,311	236,313,363	1.120	138,602,901	138,975,144	1.003	13,481	13,537	1.004	
2016	212,100,209	239,516,008	1.129	140,973,835	141,167,476	1.001	13,295	13,373	1.006	
	5yr Weighted Average		1.125	5yr Weighted Average		1.001	2yr Weighted Average		1.005	
	42	54		42	54		42	54		
2011	199,360,806	209,244,649	1.050	130,200,251	131,185,992	1.008	13,079	13,108	1.002	
2012	192,414,961	202,477,648	1.052	127,808,941	128,041,207	1.002	12,840	12,859	1.001	
2013	203,258,079	213,682,743	1.051	131,946,236	132,518,726	1.004	13,094	13,137	1.003	
2014	218,334,997	228,898,710	1.048	136,212,404	136,627,294	1.003	13,391	13,419	1.002	
2015	229,225,012	242,133,289	1.056	136,689,230	136,851,679	1.001	13,502	13,531	1.002	
	5yr Weighted Average		1.052	5yr Weighted Average		1.004	2yr Weighted Average		1.002	
	54	66		54	66		54	66		
2010	191,845,637	195,732,167	1.020	124,804,712	124,596,283	0.998	12,985	13,010	1.002	
2011	203,296,246	208,149,136	1.024	128,547,676	128,186,307	0.997	13,082	13,110	1.002	
2012	194,877,399	200,005,935	1.026	125,996,604	123,975,350	0.984	12,828	12,849	1.002	
2013	207,011,411	211,109,918	1.020	130,802,836	131,044,623	1.002	13,113	13,129	1.001	
2014	221,100,458	224,781,264	1.017	134,772,615	135,324,537	1.004	13,385	13,401	1.001	
	5yr Weighted Average		1.021	5yr Weighted Average		0.997	2yr Weighted Average		1.001	
	66	78		66	78		66	78		
2009	175,572,879	178,488,356	1.017	117,646,994	117,935,088	1.002	11,739	11,749	1.001	
2010	193,747,834	195,944,102	1.011	124,019,272	123,478,124	0.996	13,002	13,013	1.001	
2011	205,194,041	206,092,563	1.004	126,766,544	126,217,580	0.996	13,096	13,104	1.001	
2012	193,456,964	195,938,243	1.013	122,332,250	122,156,601	0.999	12,824	12,826	1.000	
2013	208,131,586	209,534,754	1.007	129,755,243	129,555,465	0.998	13,113	13,118	1.000	
	5yr Weighted Average		1.010	5yr Weighted Average		0.998	2yr Weighted Average		1.000	
	78	90		78	90		78	90		
2008	184,076,164	183,908,795	0.999	115,264,394	115,497,299	1.002	12,646	12,652	1.000	
2009	177,207,023	178,140,232	1.005	117,578,321	117,362,627	0.998	11,739	11,745	1.001	
2010	193,878,483	193,191,523	0.996	122,967,268	122,753,340	0.998	13,004	13,006	1.000	
2011	204,575,959	205,537,573	1.005	125,931,323	125,986,870	1.000	13,098	13,101	1.000	
2012	194,881,910	194,619,638	0.999	121,885,893	121,878,997	1.000	12,822	12,827	1.000	
	5yr Weighted Average		1.001	5yr Weighted Average		1.000	2yr Weighted Average		1.000	
	90	102		90	102		90	102		
2007	175,104,763	175,894,499	1.005	118,976,624	119,090,351	1.001	13,737	13,741	1.000	
2008	183,256,934	183,491,033	1.001	115,109,461	114,634,132	0.996	12,647	12,654	1.001	
2009	174,780,219	174,972,871	1.001	116,637,132	116,741,194	1.001	11,733	11,737	1.000	
2010	193,374,837	194,177,059	1.004	123,059,561	123,050,373	1.000	13,006	13,006	1.000	
2011	204,354,396	205,260,543	1.004	125,560,748	126,147,233	1.005	13,097	13,101	1.000	
	5yr Weighted Average		1.003	5yr Weighted Average		1.001	2yr Weighted Average		1.000	
	102	114		102	114		102	114		
2006	166,240,416	166,222,192	1.000	111,253,276	111,384,351	1.001	13,713	13,725	1.001	
2007	175,556,837	175,638,522	1.000	119,069,444	118,748,284	0.997	13,740	13,742	1.000	
2008	183,851,185	184,177,810	1.002	114,908,632	115,152,372	1.002	12,654	12,658	1.000	
2009	175,069,830	174,903,346	0.999	116,854,394	116,840,606	1.000	11,737	11,745	1.001	
2010	193,963,060	193,684,962	0.999	122,715,904	122,478,283	0.998	13,005	13,004	1.000	
	5yr Weighted Average		1.000	5yr Weighted Average		1.000	2yr Weighted Average		1.000	
	114	126		114	126		114	126		
2005	169,866,675	170,008,512	1.001	111,960,222	112,084,942	1.001	14,807	14,813	1.000	
2006	166,952,376	167,607,085	1.004	111,616,167	111,537,875	0.999	13,727	13,732	1.000	
2007	175,638,522	176,056,330	1.002	118,748,284	118,649,937	0.999	13,742	13,748	1.000	
2008	183,917,810	184,034,222	1.001	115,127,372	115,122,644	1.000	12,657	12,659	1.000	
2009	174,597,702	174,406,360	0.999	116,565,089	116,675,643	1.001	11,740	11,741	1.000	
	5yr Weighted Average		1.001	5yr Weighted Average		1.000	2yr Weighted Average		1.000	

Note:
 Unit Statistical Plan data, excluding Large Deductibles.

IX 000027

Section IX - Classification Pricing
 Subsection B - Conversion/Excess Loss Factors
 7/1/2022

Section IX - B
 Exhibit 3

Trend Factors

Policy Year	Statewide Average Weekly Wage	Indemnity Severity	Lost Time Medical Severity	Medical Only Severity	Lost Time Claim Frequency	Medical Only Claim Frequency
(1) Historical Values						
2014	1,265.09	30,366	11,766	848	176.63	336.14
2015	1,303.66	30,090	11,333	887	169.58	316.86
2016	1,349.36	30,384	11,575	902	167.04	304.86
2017	1,395.56	30,639	11,745	929	171.07	308.70
2018	1,445.94	31,748	12,237	950	165.43	303.46

(2) Trend to PY 2018						
2014	1.143	1.046	1.040	1.120	0.937	0.903
2015	1.109	1.055	1.080	1.071	0.976	0.958
2016	1.072	1.045	1.057	1.053	0.990	0.995
2017	1.036	1.036	1.042	1.022	0.967	0.983
2018	1.000	1.000	1.000	1.000	1.000	1.000

(3) Projected Trend from PY 2018 to Prospective Effective Period						
Selected Annual Trend	3.6%	2.0%	2.3%	2.8%	-1.5%	-4.0%
Trend Factor	1.171	1.094	1.108	1.131	0.936	0.831

(4) Trend Factors from PY 2018 to Prospective Effective Period						
Policy Year	Statewide Average Weekly Wage	Indemnity Severity	Lost Time Medical Severity	Medical Only Severity	Lost Time Claim Frequency	Medical Only Claim Frequency
2014	1.338	1.143	1.152	1.267	0.877	0.750
2015	1.298	1.154	1.197	1.211	0.913	0.795
2016	1.254	1.143	1.171	1.191	0.927	0.827
2017	1.213	1.133	1.155	1.156	0.905	0.816
2018	1.171	1.094	1.108	1.131	0.936	0.831

Notes:

- (1): Weekly Wage from Section V-G, Exhibit 2.
 Indemnity Severity from Section V-C, Exhibit 1, Page 1.
 Lost Time Medical Severity from Section V-D, Exhibit 1, Page 1.
 Medical Only Severity from Section V-D, Exhibit 2, Page 1.
 Lost Time Claim Frequency from Section V-B, Exhibit 1, Page 1.
 Medical Only Claim Frequency from Section V-B, Exhibit 2, Page 1.
- (2) = (1) / (1) for Policy Year 2018
- (3): Selected Annual Trend from Section I-D, Exhibit 1, Page 1.
 Trend Factor = (1.0 + Selected Annual Trend) ^ Trend Period, where Trend Period extends from the midpoint of PY 2018 to midpoint of policy effective period 7/1/2022 - 6/30/2023, which is 4.5 years.
- (4) = (2) x (3)

IX 000028

Section IX - Classification Pricing
Subsection B - Conversion/Excess Loss Factors
7/1/2022

Section IX - B
Exhibit 4

Calculation of Investment Income Offset Factor

Indemnity

Injury Type (1)	Loss Flow Discounted at 0.30% Post-Chapter 398 (2)	Injury Type Weights At Ultimate (3)	Investment Income Offset Factor (4)
Fatal	0.940	1.44%	0.955
Permanent Total	0.927	9.18%	0.942
Permanent Partial	0.993	37.77%	1.010
Temporary Total	0.995	18.67%	1.012
Total Indemnity			0.984

Medical

Injury Type (5)	Loss Flow Discounted at 0.30% Post-Chapter 398 (6)	Injury Type Weights At Ultimate (7)	Investment Income Offset Factor (8)
Fatal	0.940	0.13%	1.000
Permanent Total	0.927	5.14%	0.944
Permanent Partial	0.993	12.59%	1.011
Temporary Total	0.995	11.13%	1.013
Medical Only		3.95%	1.000
Total Medical			0.982

Notes:

(2), (6): Loss Flows are from the 8/1/99 rate filing, Section VIII - E, Exhibits 12 and 16. The discount rate is calculated by multiplying the pre-tax rate of return on governments (Section VII-J, Exhibit 1, Page 1) times the complement of the federal tax rate on investment income (Section VII-J, Exhibit 1, Page 1) $[0.36\% \times (1.000 - 15.27\%)] = 0.3\%$

(3): Section IV - E, Exhibit 2, Page 1.

(4) = (2) / 0.984, which is the weighted average of (2) and (3).

(7): Section IV - E, Exhibit 2, Page 2.

(8) = (6) / 0.982, which is the weighted average of (6) and (7). This weighted average excludes Fatal and Medical Only injury types as it is assumed that they generate no investment income.

IX 000029

Section IX - Classification Pricing
Subsection B - Conversion/Excess Loss Factors
7/1/2022

Section IX - B
Exhibit 5

Calculation of Excess Loss Factors

Hazard Group (1)	Excess Ratio (2)	Excess Factor (3) = [1.0 / (1.0 - (2))]
A	0.104	1.116
B	0.120	1.136
C	0.147	1.172
D	0.189	1.233
E	0.208	1.263
F	0.240	1.316
G	0.354	1.548

Note:

(2) = Excess Ratio for Accident Limit of \$500,000 x 0.985, where Excess Ratio from Section XII-F, Exhibit 3, Page 1 and 0.985 is the factor to convert the per occurrence claims to per claim basis.

Calculation of Converted Limited Losses by Indemnity Likely/Not-Likely and Medical Likely/Not-Likely
 Manufacturing Industry Group, Industry Code 1
 All Classes

Policy Year (1)	Injury Type (2)	Limited Losses					Converted Limited Losses				
		Indemnity		Medical		Total (7)	Indemnity		Medical		Total (12)
		Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)			Likely (8)	Not-Likely (9)	Likely (10)	
2014	Fatal	0	0	0	0	0	0	0	0	0	0
	Permanent Total	6,911,532	0	2,772,818	0	9,684,350	5,682,799	0	1,954,483	0	7,637,282
	Permanent Partial	8,494,725	14,606,419	3,192,280	5,509,362	31,802,786	7,257,653	12,395,853	2,250,150	4,131,941	26,035,597
	Temporary Total	5,717,075	12,983,644	1,591,196	9,579,742	29,871,657	4,594,297	10,364,004	1,121,590	7,184,666	23,264,557
	Medical Only	0	0	0	3,132,016	3,132,016	0	0	0	2,207,789	2,207,789
2015	Fatal	0	445,271	0	54,729	500,000	0	395,647	0	45,612	441,259
	Permanent Total	5,774,748	0	1,434,732	0	7,209,480	5,188,771	0	1,117,670	0	6,306,441
	Permanent Partial	9,264,980	16,008,746	2,559,726	6,094,397	33,927,849	8,614,336	14,877,714	1,994,051	5,079,147	30,565,248
	Temporary Total	3,931,208	14,910,257	1,455,067	9,932,579	30,229,111	3,461,467	13,122,629	1,133,511	8,277,937	25,995,544
	Medical Only	0	0	0	3,148,627	3,148,627	0	0	0	2,313,685	2,313,685
2016	Fatal	6,206	432,322	22,920	0	461,448	6,042	418,013	18,436	0	442,491
	Permanent Total	4,798,394	0	1,097,349	0	5,895,743	4,717,930	0	882,668	0	5,600,598
	Permanent Partial	5,665,291	17,302,614	2,153,071	7,076,282	32,197,258	5,742,434	17,418,777	1,731,853	6,089,181	30,982,245
	Temporary Total	4,119,922	13,232,824	2,330,535	8,677,560	28,360,841	3,979,167	12,693,690	1,874,599	7,467,090	26,014,546
	Medical Only	0	0	0	2,962,843	2,962,843	0	0	0	2,311,104	2,311,104
2017	Fatal	75,000	658,225	5,000	30,871	769,096	82,610	712,388	4,112	26,466	825,576
	Permanent Total	1,234,928	0	13,297	0	1,248,225	1,371,937	0	10,937	0	1,382,874
	Permanent Partial	5,290,379	14,872,777	2,692,738	5,787,102	28,642,996	6,034,780	16,669,975	2,214,765	4,961,356	29,880,876
	Temporary Total	3,627,089	11,736,366	1,761,002	8,333,537	25,457,994	3,968,214	12,616,497	1,448,416	7,144,447	25,177,574
	Medical Only	0	0	0	2,937,283	2,937,283	0	0	0	2,274,342	2,274,342
2018	Fatal	0	183,404	0	12,996	196,400	0	276,032	0	11,681	287,713
	Permanent Total	530,458	0	33,275	0	563,733	913,423	0	29,744	0	943,167
	Permanent Partial	3,521,634	8,513,463	2,453,079	5,361,429	19,849,605	6,200,876	13,196,388	2,192,745	4,819,124	26,409,133
	Temporary Total	3,781,353	12,854,395	2,542,013	10,587,766	29,765,527	6,429,575	19,240,958	2,272,241	9,516,819	37,459,593
	Medical Only	0	0	0	3,177,620	3,177,620	0	0	0	2,586,104	2,586,104
(13) All Years, All Injury Types		72,744,922	138,740,727	28,110,098	92,396,741	331,992,488	74,246,311	144,398,565	22,251,971	76,448,491	317,345,338

Notes:
 (3), (4), (5), (6): From Unit Statistical Plan data, excluding Large Deductibles.
 (7)= (3) + (4) + (5) + (6)
 (8)= (3) x Primary Conversion Factors from Section IX - B, Exhibit 1
 (9)= (4) x Primary Conversion Factors from Section IX - B, Exhibit 1
 (10)= (5) x Primary Conversion Factors from Section IX - B, Exhibit 1
 (11)= (6) x Primary Conversion Factors from Section IX - B, Exhibit 1
 (12)= (8) + (9) + (10) +(11)

IX 000030

Calculation of Converted Unlimited Losses by Indemnity Likely/Not-Likely and Medical Likely/Not-Likely
 Manufacturing Industry Group, Industry Code 1
 All Classes

Policy Year (1)	Injury Type (2)	Adjusted Excess Losses					Converted Unlimited Losses					Exposure (13)
		Indemnity		Medical		Total	Indemnity		Medical		Total	
		Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	(7)	Likely (8)	Not-Likely (9)	Likely (10)	Not-Likely (11)	(12)	
2014	Fatal	0	0	0	0	0	0	0	0	0	0	61,796,541
	Permanent Total	693,132	0	663,308	0	1,356,440	7,130,748	0	2,931,822	0	10,062,570	
	Permanent Partial	974,084	1,604,182	859,713	1,446,677	4,884,656	9,867,888	16,782,700	3,733,233	6,696,850	37,080,671	
	Temporary Total	556,878	1,299,721	438,956	1,865,056	4,160,611	6,186,840	14,008,767	1,876,940	10,884,516	32,957,063	
	Medical Only	0	0	0	392,602	392,602	0	0	0	3,086,664	3,086,664	
2015	Fatal	0	64,543	0	38,291	102,834	0	521,778	0	99,592	621,370	64,406,383
	Permanent Total	672,531	0	476,987	0	1,149,518	6,555,194	0	1,785,952	0	8,341,146	
	Permanent Partial	1,046,209	1,998,615	789,198	1,877,098	5,711,120	11,580,687	20,230,690	3,341,150	8,350,622	43,503,149	
	Temporary Total	418,251	1,605,440	370,251	2,165,788	4,559,730	4,659,751	17,689,211	1,808,643	12,561,149	36,718,754	
	Medical Only	0	0	0	407,326	407,326	0	0	0	3,229,840	3,229,840	
2016	Fatal	729	39,901	3,489	17,101	61,220	7,677	519,198	26,026	20,298	573,199	64,130,325
	Permanent Total	617,483	0	419,892	0	1,037,375	5,967,047	0	1,458,816	0	7,425,863	
	Permanent Partial	780,797	2,187,278	706,611	2,065,241	5,739,927	7,819,796	23,502,979	2,927,253	9,788,973	44,039,001	
	Temporary Total	479,292	1,616,335	535,266	2,066,942	4,697,835	5,354,852	17,187,117	2,898,455	11,467,018	36,907,442	
	Medical Only	0	0	0	419,143	419,143	0	0	0	3,240,802	3,240,802	
2017	Fatal	13,476	81,713	6,734	38,785	140,708	108,946	900,378	12,875	77,453	1,099,652	63,705,437
	Permanent Total	160,723	0	70,916	0	231,639	1,714,103	0	91,672	0	1,805,775	
	Permanent Partial	752,371	2,191,445	735,164	1,898,035	5,577,015	8,136,175	22,610,341	3,541,242	8,234,354	42,522,112	
	Temporary Total	497,580	1,617,592	469,505	1,975,642	4,560,319	5,363,662	17,095,913	2,306,772	10,969,150	35,735,497	
	Medical Only	0	0	0	405,876	405,876	0	0	0	3,181,419	3,181,419	
2018	Fatal	0	33,753	0	16,479	50,232	0	351,245	0	33,426	384,671	66,285,929
	Permanent Total	162,074	0	76,465	0	238,539	1,202,820	0	118,949	0	1,321,769	
	Permanent Partial	807,179	1,752,646	777,059	1,655,767	4,992,651	8,400,985	17,920,323	3,565,101	7,772,780	37,659,189	
	Temporary Total	843,397	2,490,378	772,321	2,842,807	6,948,903	8,735,234	26,100,515	3,661,835	14,865,490	53,363,074	
	Medical Only	0	0	0	470,808	470,808	0	0	0	3,628,554	3,628,554	
(14) All Years, All Injury Types		9,476,186	18,583,542	8,171,835	22,065,464	58,297,027	98,792,405	195,421,155	36,086,736	118,188,950	448,489,246	320,324,615
(15) Pure Premium							0.308	0.610	0.113	0.369	1.400	

Notes:
 (3), (4) = 0.7 x [Excess Factor - 1.0] x Indemnity Converted Limited Losses. Excess Factor from Section IX-B, Exhibit 5 and Indemnity Converted Limited Losses from Page 1, Columns (8) and (9).
 (5), (6) = [Excess Factor - 1.0] x Medical Converted Limited Losses + 0.3 x [Excess Factor - 1.0] x Indemnity Converted Limited Losses. Excess Factor from Section IX-B, Exhibit 5 and Medical Converted Limited Losses from Page 1, Columns (10) and (11).
 (7) = (3) + (4) + (5) + (6)
 (8), (9), (10), (11): (Converted Limited Losses from Page 1 + Adjusted Excess Losses) x Secondary Conversion Factors from Section IX - B, Exhibit 1, Page 3.
 (12) = (8) + (9) + (10) + (11)
 (13): Unit Statistical Plan data, excluding Large Deductibles.
 (15): Pure Premium calculated as the All Years, All Injury Types Converted Unlimited Losses divided by the All Years, All Injury Types Exposure.

IX 000031

Calculation of Converted Limited Losses by Indemnity Likely/Not-Likely and Medical Likely/Not-Likely
 Construction Industry Group, Industry Code 2
 All Classes

Policy Year (1)	Injury Type (2)	Limited Losses					Converted Limited Losses				
		Indemnity		Medical		Total (7)	Indemnity		Medical		Total (12)
		Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)			Likely (8)	Not-Likely (9)	Likely (10)	
2014	Fatal	1,712,931	463,733	201,480	56,018	2,434,162	1,400,573	376,634	142,018	42,013	1,961,238
	Permanent Total	22,953,371	0	8,635,653	0	31,589,024	18,872,718	0	6,087,032	0	24,959,750
	Permanent Partial	29,864,247	48,358,226	9,481,617	13,876,146	101,580,236	25,515,167	41,039,590	6,683,329	10,406,906	83,644,992
	Temporary Total	8,896,765	19,976,841	3,164,752	12,031,625	44,069,983	7,149,527	15,946,221	2,230,746	9,023,543	34,350,037
	Medical Only	0	0	0	3,791,520	3,791,520	0	0	0	2,672,680	2,672,680
2015	Fatal	601,928	6,125,619	42,564	358,022	7,128,133	535,089	5,442,935	33,158	298,380	6,309,562
	Permanent Total	17,692,085	0	6,853,670	0	24,545,755	15,896,828	0	5,339,073	0	21,235,901
	Permanent Partial	29,397,695	46,074,815	8,454,744	12,661,387	96,588,641	27,333,207	42,819,587	6,586,325	10,552,160	87,291,279
	Temporary Total	9,410,252	24,087,560	4,140,831	15,268,536	52,907,179	8,285,818	21,199,642	3,225,746	12,724,991	45,436,197
	Medical Only	0	0	0	3,587,928	3,587,928	0	0	0	2,636,494	2,636,494
2016	Fatal	277,094	4,003,014	0	190,768	4,470,876	269,760	3,870,522	0	164,157	4,304,439
	Permanent Total	13,375,054	0	5,416,932	0	18,791,986	13,150,768	0	4,357,186	0	17,507,954
	Permanent Partial	26,306,037	48,041,204	9,164,775	14,403,459	97,915,475	26,664,239	48,363,732	7,371,816	12,394,259	94,794,046
	Temporary Total	9,483,584	26,495,880	4,033,165	15,350,668	55,363,297	9,159,582	25,416,380	3,244,134	13,209,338	51,029,434
	Medical Only	0	0	0	3,589,187	3,589,187	0	0	0	2,799,670	2,799,670
2017	Fatal	232,015	3,148,535	33,283	493,305	3,907,138	255,558	3,407,614	27,375	422,917	4,113,464
	Permanent Total	9,577,846	0	4,166,732	0	13,744,578	10,640,456	0	3,427,119	0	14,067,575
	Permanent Partial	23,060,559	44,925,491	9,996,035	14,296,411	92,278,496	26,305,375	50,354,204	8,221,695	12,256,494	97,137,768
	Temporary Total	12,966,900	31,127,741	5,263,267	18,311,703	67,669,611	14,186,429	33,462,066	4,329,014	15,698,855	67,676,364
	Medical Only	0	0	0	3,704,554	3,704,554	0	0	0	2,868,440	2,868,440
2018	Fatal	0	1,423,507	0	125,146	1,548,653	0	2,142,446	0	112,488	2,254,934
	Permanent Total	907,477	0	560,488	0	1,467,965	1,562,632	0	501,006	0	2,063,638
	Permanent Partial	9,879,615	22,667,578	7,125,992	13,292,812	52,965,997	17,395,978	35,136,133	6,369,744	11,948,251	70,850,106
	Temporary Total	11,841,146	31,632,785	8,410,018	21,730,997	73,614,946	20,133,941	47,349,183	7,517,502	19,532,918	94,533,544
	Medical Only	0	0	0	4,081,935	4,081,935	0	0	0	3,322,080	3,322,080
(13) All Years, All Injury Types		238,436,601	358,552,529	95,145,998	171,202,127	863,337,255	244,713,645	376,326,889	75,694,018	143,087,034	839,821,586

Notes:

(3), (4), (5), (6): From Unit Statistical Plan data, excluding Large Deductibles.

(7)= (3) + (4) + (5) + (6)

(8)= (3) x Primary Conversion Factors from Section IX - B, Exhibit 1

(9)= (4) x Primary Conversion Factors from Section IX - B, Exhibit 1

(10)= (5) x Primary Conversion Factors from Section IX - B, Exhibit 1

(11)= (6) x Primary Conversion Factors from Section IX - B, Exhibit 1

(12)= (8) + (9) + (10) +(11)

IX 000032

Calculation of Converted Unlimited Losses by Indemnity Likely/Not-Likely and Medical Likely/Not-Likely
 Construction Industry Group, Industry Code 2
 All Classes

Policy Year (1)	Injury Type (2)	Adjusted Excess Losses					Converted Unlimited Losses					Exposure (13)
		Indemnity		Medical		Total	Indemnity		Medical		Total	
		Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	(7)	Likely (8)	Not-Likely (9)	Likely (10)	Not-Likely (11)	(12)	
2014	Fatal	363,440	76,196	200,608	45,591	685,835	2,000,097	513,434	406,697	103,985	3,024,213	63,078,999
	Permanent Total	4,304,729	0	3,934,394	0	8,239,123	25,921,316	0	11,223,602	0	37,144,918	
	Permanent Partial	5,752,577	9,063,365	4,640,349	7,192,072	26,648,363	37,482,562	60,061,484	13,593,506	21,126,689	132,264,241	
	Temporary Total	1,564,422	3,455,963	1,460,763	4,325,381	10,806,529	10,465,926	23,303,077	4,439,947	16,055,364	54,264,314	
	Medical Only	0	0	0	822,169	822,169	0	0	0	4,148,386	4,148,386	
2015	Fatal	182,843	1,297,557	87,070	651,927	2,219,397	814,016	7,642,591	142,710	1,128,015	9,727,332	70,029,781
	Permanent Total	3,783,698	0	3,646,260	0	7,429,958	22,010,410	0	10,063,219	0	32,073,629	
	Permanent Partial	6,416,419	9,650,665	5,099,491	7,494,660	28,661,235	40,457,745	62,899,308	14,028,235	21,664,301	139,049,589	
	Temporary Total	1,853,682	4,672,648	1,879,808	5,928,574	14,334,712	12,178,090	31,074,026	6,140,685	22,435,500	71,828,301	
	Medical Only	0	0	0	802,094	802,094	0	0	0	4,081,604	4,081,604	
2016	Fatal	55,814	1,001,473	23,920	501,879	1,583,086	369,146	5,524,027	28,393	790,584	6,712,150	73,951,895
	Permanent Total	2,974,843	0	2,766,335	0	5,741,178	18,034,646	0	7,978,063	0	26,012,709	
	Permanent Partial	5,928,572	10,972,488	4,917,786	8,722,963	30,541,809	39,071,000	71,129,965	14,753,050	25,350,164	150,304,179	
	Temporary Total	2,023,150	5,592,215	1,884,306	6,596,030	16,095,701	13,431,069	37,243,006	6,168,210	23,820,826	80,663,111	
	Medical Only	0	0	0	853,747	853,747	0	0	0	4,336,606	4,336,606	
2017	Fatal	56,492	762,550	32,856	456,616	1,308,514	353,812	4,728,269	71,494	1,044,005	6,197,580	79,827,937
	Permanent Total	2,216,022	0	1,960,605	0	4,176,627	14,378,495	0	6,034,038	0	20,412,533	
	Permanent Partial	6,001,045	11,635,134	5,191,859	9,032,770	31,860,808	38,727,685	74,310,418	16,102,298	25,556,691	154,697,092	
	Temporary Total	3,176,577	7,232,983	2,860,993	7,902,530	21,173,083	20,853,913	48,876,964	8,647,752	28,386,471	106,765,100	
	Medical Only	0	0	0	872,112	872,112	0	0	0	4,440,036	4,440,036	
2018	Fatal	0	600,818	0	289,769	890,587	0	3,110,402	0	477,478	3,587,880	86,183,968
	Permanent Total	565,363	0	494,206	0	1,059,569	2,379,918	0	1,114,598	0	3,494,516	
	Permanent Partial	4,190,892	8,131,153	3,972,680	7,603,187	23,897,912	25,877,504	51,867,148	12,415,560	23,470,519	113,630,731	
	Temporary Total	4,321,857	10,383,455	4,127,026	10,583,502	29,415,840	29,372,740	69,340,033	14,005,409	36,222,403	148,940,585	
	Medical Only	0	0	0	1,014,870	1,014,870	0	0	0	5,147,960	5,147,960	
(14) All Years, All Injury Types		55,732,437	84,528,663	49,181,315	81,692,443	271,134,858	354,180,090	551,624,152	147,357,466	269,787,587	1,322,949,295	373,072,580
(15) Pure Premium							0.949	1.479	0.395	0.723	3.546	

Notes:
 (3) , (4) = 0.7 x [Excess Factor - 1.0] x Indemnity Converted Limited Losses. Excess Factor from Section IX-B, Exhibit 5 and Indemnity Converted Limited Losses from Page 1, Columns (8) and (9).
 (5), (6) = [Excess Factor - 1.0] x Medical Converted Limited Losses + 0.3 x [Excess Factor - 1.0] x Indemnity Converted Limited Losses. Excess Factor from Section IX-B, Exhibit 5 and Medical Converted Limited Losses from Page 1, Columns (10) and (11).
 (7) = (3) + (4) + (5) + (6)
 (8), (9), (10), (11): (Converted Limited Losses from Page 1 + Adjusted Excess Losses) x Secondary Conversion Factors from Section IX - B, Exhibit 1, Page 3.
 (12) = (8) + (9) + (10) + (11)
 (13): Unit Statistical Plan data, excluding Large Deductibles.
 (15): Pure Premium calculated as the All Years, All Injury Types Converted Unlimited Losses divided by the All Years, All Injury Types Exposure.

IX 000033

Calculation of Converted Limited Losses by Indemnity Likely/Not-Likely and Medical Likely/Not-Likely
 Office and Clerical Industry Group, Industry Code 3
 All Classes

Policy Year (1)	Injury Type (2)	Limited Losses					Converted Limited Losses				
		Indemnity		Medical		Total (7)	Indemnity		Medical		Total (12)
		Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)			Likely (8)	Not-Likely (9)	Likely (10)	
2014	Fatal	53,753	614,405	41,145	2,244	711,547	43,951	499,007	29,002	1,683	573,643
	Permanent Total	3,803,767	0	881,123	0	4,684,890	3,127,533	0	621,079	0	3,748,612
	Permanent Partial	10,544,379	13,960,015	3,732,251	6,267,052	34,503,697	9,008,819	11,847,277	2,630,760	4,700,197	28,187,053
	Temporary Total	6,006,334	10,950,631	3,071,995	8,925,711	28,954,671	4,826,748	8,741,181	2,165,364	6,694,153	22,427,446
	Medical Only	0	0	0	5,869,759	5,869,759	0	0	0	4,137,651	4,137,651
2015	Fatal	250,000	373,188	0	51,261	674,449	222,240	331,597	0	42,722	596,559
	Permanent Total	3,993,562	0	1,339,783	0	5,333,345	3,588,326	0	1,043,704	0	4,632,030
	Permanent Partial	8,822,387	13,200,631	3,355,767	5,279,422	30,658,207	8,202,824	12,267,995	2,614,174	4,399,937	27,484,930
	Temporary Total	4,404,518	10,820,671	2,423,723	8,457,686	26,106,598	3,878,221	9,523,354	1,888,103	7,048,742	22,338,420
	Medical Only	0	0	0	5,532,857	5,532,857	0	0	0	4,065,673	4,065,673
2016	Fatal	0	961,837	0	7,346	969,183	0	930,002	0	6,321	936,323
	Permanent Total	2,075,736	0	1,012,741	0	3,088,477	2,040,928	0	814,612	0	2,855,540
	Permanent Partial	7,963,137	12,799,255	2,415,560	4,728,155	27,906,107	8,071,569	12,885,184	1,942,990	4,068,604	26,968,347
	Temporary Total	8,005,836	11,031,275	3,375,509	8,525,207	30,937,827	7,732,321	10,581,837	2,715,139	7,335,989	28,365,286
	Medical Only	0	0	0	5,720,648	5,720,648	0	0	0	4,462,271	4,462,271
2017	Fatal	0	581,826	0	139,204	721,030	0	629,702	0	119,342	749,044
	Permanent Total	1,246,352	0	411,968	0	1,658,320	1,384,628	0	338,842	0	1,723,470
	Permanent Partial	5,658,030	11,122,373	2,154,154	4,127,762	23,062,319	6,454,163	12,466,380	1,771,782	3,538,783	24,231,108
	Temporary Total	7,552,090	12,509,518	2,861,285	10,343,936	33,266,829	8,262,359	13,447,629	2,353,394	8,867,987	32,931,369
	Medical Only	0	0	0	6,659,454	6,659,454	0	0	0	5,156,423	5,156,423
2018	Fatal	0	448,183	0	51,817	500,000	0	674,536	0	46,576	721,112
	Permanent Total	164,964	0	355,458	0	520,422	284,060	0	317,735	0	601,795
	Permanent Partial	4,342,142	4,982,436	1,601,814	2,867,181	13,793,573	7,645,623	7,723,081	1,431,821	2,577,167	19,377,692
	Temporary Total	6,511,048	12,091,947	3,785,482	11,139,577	33,528,054	11,070,977	18,099,696	3,383,746	10,012,815	42,567,234
	Medical Only	0	0	0	6,613,491	6,613,491	0	0	0	5,382,385	5,382,385
(13) All Years, All Injury Types		81,398,035	116,448,191	32,819,758	101,309,770	331,975,754	85,845,290	120,648,458	26,062,247	82,665,421	315,221,416

Notes:
 (3), (4), (5), (6): From Unit Statistical Plan data, excluding Large Deductibles.
 (7)= (3) + (4) + (5) + (6)
 (8)= (3) x Primary Conversion Factors from Section IX - B, Exhibit 1
 (9)= (4) x Primary Conversion Factors from Section IX - B, Exhibit 1
 (10)= (5) x Primary Conversion Factors from Section IX - B, Exhibit 1
 (11)= (6) x Primary Conversion Factors from Section IX - B, Exhibit 1
 (12)= (8) + (9) + (10) + (11)

IX 000034

Calculation of Converted Unlimited Losses by Indemnity Likely/Not-Likely and Medical Likely/Not-Likely
 Office and Clerical Industry Group, Industry Code 3
 All Classes

Policy Year (1)	Injury Type (2)	Adjusted Excess Losses				Converted Unlimited Losses						Exposure (13)
		Indemnity		Medical		Indemnity		Medical		Total		
		Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Total (7)	Likely (8)	Not-Likely (9)	Likely (10)	Not-Likely (11)	Total (12)	
2014	Fatal	4,195	54,964	5,753	23,998	88,910	54,590	628,111	41,254	30,483	754,438	769,787,978
	Permanent Total	412,388	0	282,056	0	694,444	3,958,996	0	1,011,476	0	4,970,472	
	Permanent Partial	1,163,668	1,588,916	1,030,084	1,560,014	5,342,682	12,194,384	16,106,788	4,394,659	7,515,069	40,210,900	
	Temporary Total	642,033	1,074,702	668,247	1,619,534	4,004,516	6,568,303	11,789,409	3,408,114	9,999,254	31,765,080	
	Medical Only	0	0	0	725,450	725,450	0	0	0	5,772,502	5,772,502	
2015	Fatal	26,809	37,436	11,490	21,870	97,605	282,380	418,422	13,638	76,670	791,110	823,908,604
	Permanent Total	476,323	0	393,678	0	870,001	4,545,843	0	1,609,810	0	6,155,653	
	Permanent Partial	998,296	1,609,598	894,340	1,534,673	5,036,907	11,029,947	16,635,921	4,211,795	7,124,201	39,001,864	
	Temporary Total	481,051	1,204,240	544,693	1,724,843	3,954,827	5,235,722	12,884,422	2,926,036	10,552,395	31,598,575	
	Medical Only	0	0	0	716,179	716,179	0	0	0	5,676,059	5,676,059	
2016	Fatal	0	151,758	0	66,129	217,887	0	1,226,535	0	85,998	1,312,533	851,828,701
	Permanent Total	268,013	0	255,942	0	523,955	2,582,286	0	1,198,978	0	3,781,264	
	Permanent Partial	930,689	1,641,115	707,471	1,443,186	4,722,461	10,791,558	17,413,565	3,181,745	6,616,628	38,003,496	
	Temporary Total	962,637	1,327,206	887,943	1,831,778	5,009,564	10,443,116	14,303,407	4,333,592	11,026,495	40,106,610	
	Medical Only	0	0	0	787,053	787,053	0	0	0	6,230,948	6,230,948	
2017	Fatal	0	102,724	0	71,837	174,561	0	830,449	0	226,929	1,057,378	895,361,805
	Permanent Total	164,103	0	128,792	0	292,895	1,732,078	0	523,732	0	2,255,810	
	Permanent Partial	760,722	1,415,571	648,833	1,186,863	4,011,989	8,648,924	16,641,145	2,905,827	5,672,900	33,868,796	
	Temporary Total	1,009,814	1,676,675	841,540	2,253,028	5,781,057	11,136,384	18,165,111	3,842,695	13,375,756	46,519,946	
	Medical Only	0	0	0	913,886	913,886	0	0	0	7,205,457	7,205,457	
2018	Fatal	0	81,371	0	42,900	124,271	0	857,073	0	106,208	963,281	937,263,848
	Permanent Total	34,267	0	69,442	0	103,709	356,013	0	433,623	0	789,636	
	Permanent Partial	985,821	941,570	668,475	869,691	3,465,557	10,347,040	10,386,848	2,521,300	4,137,780	27,392,968	
	Temporary Total	1,368,420	2,152,871	1,189,837	2,651,914	7,363,042	14,940,391	24,324,433	5,500,859	15,232,452	59,998,135	
	Medical Only	0	0	0	934,856	934,856	0	0	0	7,498,565	7,498,565	
(14) All Years, All Injury Types		10,689,249	15,060,717	9,228,616	20,979,682	55,958,264	114,847,955	162,611,639	42,059,133	124,162,749	443,681,476	4,278,150,937
(15) Pure Premium							0.027	0.038	0.010	0.029	0.104	

Notes:
 (3), (4) = 0.7 x [Excess Factor - 1.0] x Indemnity Converted Limited Losses. Excess Factor from Section IX-B, Exhibit 5 and Indemnity Converted Limited Losses from Page 1, Columns (8) and (9).
 (5), (6) = [Excess Factor - 1.0] x Medical Converted Limited Losses + 0.3 x [Excess Factor - 1.0] x Indemnity Converted Limited Losses. Excess Factor from Section IX-B, Exhibit 5 and Medical Converted Limited Losses from Page 1, Columns (10) and (11).
 (7) = (3) + (4) + (5) + (6)
 (8), (9), (10), (11): (Converted Limited Losses from Page 1 + Adjusted Excess Losses) x Secondary Conversion Factors from Section IX - B, Exhibit 1, Page 3.
 (12) = (8) + (9) + (10) + (11)
 (13): Unit Statistical Plan data, excluding Large Deductibles.
 (15): Pure Premium calculated as the All Years, All Injury Types Converted Unlimited Losses divided by the All Years, All Injury Types Exposure.

IX 000035

Calculation of Converted Limited Losses by Indemnity Likely/Not-Likely and Medical Likely/Not-Likely
 Goods and Services Industry Group, Industry Code 9
 All Classes

Policy Year (1)	Injury Type (2)	Limited Losses					Converted Limited Losses				
		Indemnity		Medical		Total	Indemnity		Medical		Total
		Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	(7)	Likely (8)	Not-Likely (9)	Likely (10)	Not-Likely (11)	(12)
2014	Fatal	1,122,230	613,372	356,382	13,192	2,105,176	917,589	498,168	251,204	9,894	1,676,855
	Permanent Total	10,791,065	0	3,495,296	0	14,286,361	8,872,628	0	2,463,738	0	11,336,366
	Permanent Partial	23,534,041	40,695,369	9,411,330	16,752,208	90,392,948	20,106,819	34,536,446	6,633,785	12,563,911	73,840,961
	Temporary Total	13,944,168	30,451,514	6,181,012	23,082,239	73,658,933	11,205,669	24,307,475	4,356,824	17,311,341	57,181,309
	Medical Only	0	0	0	9,646,893	9,646,893	0	0	0	6,800,191	6,800,191
2015	Fatal	3,076	740,873	0	6,638	750,587	2,734	658,305	0	5,532	666,571
	Permanent Total	10,154,283	0	3,343,241	0	13,497,524	9,123,904	0	2,604,416	0	11,728,320
	Permanent Partial	23,975,250	41,335,625	9,489,972	15,368,669	90,169,516	22,291,560	38,415,226	7,392,777	12,808,443	80,908,006
	Temporary Total	13,921,749	29,619,098	6,387,553	22,286,675	72,215,075	12,258,235	26,067,990	4,975,964	18,573,997	61,876,186
	Medical Only	0	0	0	10,075,160	10,075,160	0	0	0	7,403,464	7,403,464
2016	Fatal	0	1,899,767	0	207,374	2,107,141	0	1,836,888	0	178,446	2,015,334
	Permanent Total	6,781,678	0	1,539,189	0	8,320,867	6,667,956	0	1,238,069	0	7,906,025
	Permanent Partial	20,566,029	34,177,417	7,119,333	14,519,666	76,382,445	20,846,071	34,406,870	5,726,536	12,494,255	73,473,732
	Temporary Total	12,640,574	30,755,527	6,100,620	24,653,334	74,150,055	12,208,715	29,502,480	4,907,121	21,214,335	67,832,651
	Medical Only	0	0	0	9,777,463	9,777,463	0	0	0	7,626,705	7,626,705
2017	Fatal	35,000	1,002,797	0	9,520	1,047,317	38,552	1,085,312	0	8,162	1,132,026
	Permanent Total	3,725,754	0	1,551,131	0	5,276,885	4,139,107	0	1,275,798	0	5,414,905
	Permanent Partial	19,137,544	37,155,256	7,927,393	17,215,912	81,436,105	21,830,359	41,645,028	6,520,246	14,759,419	84,755,052
	Temporary Total	13,912,893	34,275,669	6,974,243	25,645,975	80,808,780	15,221,392	36,846,062	5,736,284	21,986,619	79,790,357
	Medical Only	0	0	0	10,180,406	10,180,406	0	0	0	7,882,700	7,882,700
2018	Fatal	0	1,387,534	0	185,933	1,573,467	0	2,088,304	0	167,126	2,255,430
	Permanent Total	722,190	0	469,847	0	1,192,037	1,243,577	0	419,984	0	1,663,561
	Permanent Partial	10,244,105	20,669,991	4,011,403	10,794,596	45,720,095	18,037,770	32,039,751	3,585,691	9,702,728	63,365,940
	Temporary Total	11,729,587	34,134,443	7,581,528	29,874,610	83,320,168	19,944,253	51,093,761	6,776,936	26,852,809	104,667,759
	Medical Only	0	0	0	10,316,006	10,316,006	0	0	0	8,395,674	8,395,674
(13) All Years, All Injury Types		196,941,216	338,914,252	81,939,473	250,612,469	868,407,410	204,956,890	355,028,066	64,865,373	206,745,751	831,596,080

Notes:

(3), (4), (5), (6): From Unit Statistical Plan data, excluding Large Deductibles.

(7)= (3) + (4) + (5) + (6)

(8)= (3) x Primary Conversion Factors from Section IX - B, Exhibit 1

(9)= (4) x Primary Conversion Factors from Section IX - B, Exhibit 1

(10)= (5) x Primary Conversion Factors from Section IX - B, Exhibit 1

(11)= (6) x Primary Conversion Factors from Section IX - B, Exhibit 1

(12)= (8) + (9) + (10) + (11)

IX 000036

Calculation of Converted Unlimited Losses by Indemnity Likely/Not-Likely and Medical Likely/Not-Likely
 Goods and Services Industry Group, Industry Code 9
 All Classes

Policy Year (1)	Injury Type (2)	Indemnity		Adjusted Excess Losses Medical		Total (7)	Indemnity		Converted Unlimited Losses Medical		Total (12)	Exposure (13)
		Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)		Likely (8)	Not-Likely (9)	Likely (10)	Not-Likely (11)		
2014	Fatal	135,426	60,096	101,330	27,460	324,312	1,193,943	632,978	418,458	44,339	2,289,718	178,769,248
	Permanent Total	1,224,611	0	985,187	0	2,209,798	11,292,603	0	3,862,660	0	15,155,263	
	Permanent Partial	2,522,937	4,292,892	2,230,669	4,043,853	13,090,351	27,127,676	46,547,108	10,641,332	19,936,786	104,252,902	
	Temporary Total	1,395,513	3,134,019	1,360,559	4,441,194	10,331,285	15,134,703	32,958,725	6,876,559	26,162,775	81,132,762	
	Medical Only	0	0	0	1,126,415	1,126,415	0	0	0	9,408,881	9,408,881	
2015	Fatal	446	72,730	191	32,073	105,440	3,606	828,872	227	44,637	877,342	188,147,177
	Permanent Total	1,276,592	0	1,087,497	0	2,364,089	11,631,762	0	4,134,797	0	15,766,559	
	Permanent Partial	2,955,673	4,812,850	2,649,399	4,321,066	14,738,988	30,265,405	51,820,143	12,055,127	20,563,115	114,703,790	
	Temporary Total	1,658,495	3,215,247	1,578,598	4,622,922	11,075,262	16,714,748	35,170,758	7,883,473	27,900,000	87,668,979	
	Medical Only	0	0	0	1,228,763	1,228,763	0	0	0	10,246,453	10,246,453	
2016	Fatal	0	244,067	0	139,574	383,641	0	2,359,456	0	377,490	2,736,946	194,586,353
	Permanent Total	1,033,626	0	725,139	0	1,758,765	8,613,336	0	2,198,715	0	10,812,051	
	Permanent Partial	2,735,680	4,339,518	2,240,240	4,113,083	13,428,521	28,268,891	46,447,671	9,563,714	19,936,274	104,216,550	
	Temporary Total	1,461,882	3,550,578	1,507,812	5,174,723	11,694,995	16,419,129	39,698,518	7,715,534	31,739,333	95,572,514	
	Medical Only	0	0	0	1,285,503	1,285,503	0	0	0	10,578,791	10,578,791	
2017	Fatal	3,132	153,426	1,342	67,647	225,547	47,263	1,404,523	1,593	89,985	1,543,364	206,536,532
	Permanent Total	562,846	0	521,897	0	1,084,743	5,258,595	0	2,013,347	0	7,271,942	
	Permanent Partial	2,753,602	5,282,614	2,346,118	4,913,951	15,296,285	29,470,300	56,255,040	10,643,624	23,616,893	119,985,857	
	Temporary Total	1,867,358	4,529,385	1,832,028	5,815,486	14,044,257	20,524,516	49,694,159	9,102,757	33,438,870	112,760,302	
	Medical Only	0	0	0	1,316,280	1,316,280	0	0	0	10,919,189	10,919,189	
2018	Fatal	0	233,222	0	124,078	357,300	0	2,632,223	0	345,660	2,977,883	217,282,139
	Permanent Total	159,347	0	141,362	0	300,709	1,569,010	0	628,685	0	2,197,695	
	Permanent Partial	2,325,721	4,025,046	1,668,742	3,482,767	11,502,276	24,410,965	43,233,082	6,307,684	15,828,525	89,780,256	
	Temporary Total	2,435,254	6,478,018	2,223,270	7,524,198	18,660,740	26,879,003	69,146,833	10,824,961	41,346,808	148,197,605	
	Medical Only	0	0	0	1,397,404	1,397,404	0	0	0	11,624,384	11,624,384	
(14) All Years, All Injury Types		26,508,141	44,423,708	23,201,380	55,198,440	149,331,669	274,825,454	478,830,089	104,873,247	314,149,188	1,172,677,978	985,321,450
(15) Pure Premium							0.279	0.486	0.106	0.319	1.190	

Notes:
 (3), (4) = 0.7 x [Excess Factor - 1.0] x Indemnity Converted Limited Losses. Excess Factor from Section IX-B, Exhibit 5 and Indemnity Converted Limited Losses from Page 1, Columns (8) and (9).
 (5), (6) = [Excess Factor - 1.0] x Medical Converted Limited Losses + 0.3 x [Excess Factor - 1.0] x Indemnity Converted Limited Losses. Excess Factor from Section IX-B, Exhibit 5 and Medical Converted Limited Losses from Page 1, Columns (10) and (11).
 (7) = (3) + (4) + (5) + (6)
 (8), (9), (10), (11): (Converted Limited Losses from Page 1 + Adjusted Excess Losses) x Secondary Conversion Factors from Section IX - B, Exhibit 1, Page 3.
 (12) = (8) + (9) + (10) + (11)
 (13): Unit Statistical Plan data, excluding Large Deductibles.
 (15): Pure Premium calculated as the All Years, All Injury Types Converted Unlimited Losses divided by the All Years, All Injury Types Exposure.

IX 000037

Calculation of Converted Limited Losses by Indemnity Likely/Not-Likely and Medical Likely/Not-Likely
 Miscellaneous Industry Group, Industry Code 0
 All Classes

Policy Year (1)	Injury Type (2)	Limited Losses					Converted Limited Losses				
		Indemnity		Medical		Total	Indemnity		Medical		Total
		Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	(7)	Likely (8)	Not-Likely (9)	Likely (10)	Not-Likely (11)	(12)
2014	Fatal	103,800	512,777	152,618	125,247	894,442	84,872	416,467	107,576	93,933	702,848
	Permanent Total	5,413,495	0	1,732,718	0	7,146,213	4,451,083	0	1,221,345	0	5,672,428
	Permanent Partial	10,079,153	15,841,305	3,543,723	5,605,818	35,069,999	8,611,343	13,443,848	2,497,872	4,204,282	28,757,345
	Temporary Total	4,865,235	10,471,516	1,954,695	6,835,835	24,127,281	3,909,750	8,358,734	1,377,810	5,126,776	18,773,070
	Medical Only	0	0	0	2,631,021	2,631,021	0	0	0	1,854,633	1,854,633
2015	Fatal	287,617	2,345,934	137,161	346,005	3,116,717	255,680	2,084,486	106,850	288,365	2,735,381
	Permanent Total	5,202,202	0	2,033,821	0	7,236,023	4,674,322	0	1,584,366	0	6,258,688
	Permanent Partial	10,269,458	17,005,526	4,824,636	5,919,566	38,019,186	9,548,273	15,804,070	3,758,437	4,933,441	34,044,221
	Temporary Total	5,055,967	10,122,942	1,886,691	6,615,156	23,680,756	4,451,828	8,909,277	1,469,750	5,513,155	20,344,010
	Medical Only	0	0	0	2,898,552	2,898,552	0	0	0	2,129,924	2,129,924
2016	Fatal	0	557,162	0	2,188	559,350	0	538,721	0	1,883	540,604
	Permanent Total	2,740,719	0	2,264,055	0	5,004,774	2,694,760	0	1,821,125	0	4,515,885
	Permanent Partial	10,584,424	12,508,746	4,499,216	6,038,602	33,630,988	10,728,549	12,592,724	3,619,008	5,196,252	32,136,533
	Temporary Total	9,266,154	15,670,720	4,270,150	9,004,461	38,211,485	8,949,581	15,032,261	3,434,755	7,748,390	35,164,987
	Medical Only	0	0	0	2,866,334	2,866,334	0	0	0	2,235,824	2,235,824
2017	Fatal	0	581,554	0	6,029	587,583	0	629,408	0	5,169	634,577
	Permanent Total	2,660,258	0	835,096	0	3,495,354	2,955,399	0	686,863	0	3,642,262
	Permanent Partial	7,077,668	13,227,205	2,423,243	5,527,358	28,255,474	8,073,556	14,825,555	1,993,107	4,738,674	29,630,892
	Temporary Total	9,238,573	16,867,271	3,787,745	10,064,009	39,957,598	10,107,455	18,132,178	3,115,404	8,628,002	39,983,039
	Medical Only	0	0	0	3,035,420	3,035,420	0	0	0	2,350,329	2,350,329
2018	Fatal	0	1,000,199	0	4,802	1,005,001	0	1,505,347	0	4,317	1,509,664
	Permanent Total	377,334	0	374,782	0	752,116	649,751	0	335,008	0	984,759
	Permanent Partial	5,388,809	8,126,420	3,293,292	4,920,474	21,728,995	9,488,589	12,596,448	2,943,790	4,422,771	29,451,598
	Temporary Total	6,219,116	15,533,413	3,605,855	11,334,559	36,692,943	10,574,594	23,251,017	3,223,182	10,188,074	47,236,867
	Medical Only	0	0	0	3,064,021	3,064,021	0	0	0	2,493,651	2,493,651
(13) All Years, All Injury Types		94,829,982	140,372,690	41,619,497	86,845,457	363,667,626	100,209,385	148,120,541	33,296,248	72,157,845	353,784,019

Notes:

(3), (4), (5), (6): From Unit Statistical Plan data, excluding Large Deductibles.

(7)= (3) + (4) + (5) + (6)

(8)= (3) x Primary Conversion Factors from Section IX - B, Exhibit 1

(9)= (4) x Primary Conversion Factors from Section IX - B, Exhibit 1

(10)= (5) x Primary Conversion Factors from Section IX - B, Exhibit 1

(11)= (6) x Primary Conversion Factors from Section IX - B, Exhibit 1

(12)= (8) + (9) + (10) + (11)

IX 000038

Calculation of Converted Unlimited Losses by Indemnity Likely/Not-Likely and Medical Likely/Not-Likely
 Miscellaneous Industry Group, Industry Code 0
 All Classes

Policy Year (1)	Injury Type (2)	Adjusted Excess Losses					Converted Unlimited Losses					Exposure (13)
		Indemnity		Medical		Total (7)	Indemnity		Medical		Total (12)	
		Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)			Likely (8)	Not-Likely (9)	Likely (10)		Not-Likely (11)
2014	Fatal	15,724	73,392	37,389	53,720	180,225	114,059	555,418	172,074	175,265	1,016,816	28,298,494
	Permanent Total	780,400	0	630,464	0	1,410,864	5,850,814	0	2,073,952	0	7,924,766	
	Permanent Partial	1,597,336	2,446,940	1,343,757	2,148,270	7,536,303	12,237,769	19,049,262	4,611,683	7,625,919	43,524,633	
	Temporary Total	667,395	1,491,583	602,794	1,933,395	4,695,167	5,497,400	11,830,766	2,382,164	8,491,593	28,201,923	
	Medical Only	0	0	0	395,162	395,162	0	0	0	2,670,506	2,670,506	
2015	Fatal	36,577	425,937	40,577	270,006	773,097	331,371	2,846,400	174,995	662,787	4,015,553	30,890,848
	Permanent Total	851,343	0	772,563	0	1,623,906	6,179,822	0	2,639,667	0	8,819,489	
	Permanent Partial	1,728,474	2,820,155	1,656,331	2,489,415	8,694,375	13,518,128	22,326,000	6,500,156	8,910,766	51,255,050	
	Temporary Total	857,924	1,596,849	763,524	2,083,524	5,301,821	6,377,301	12,618,428	2,686,061	9,136,875	30,818,665	
	Medical Only	0	0	0	453,054	453,054	0	0	0	3,065,995	3,065,995	
2016	Fatal	0	85,590	0	37,006	122,596	0	707,865	0	46,161	754,026	31,911,307
	Permanent Total	547,656	0	772,911	0	1,320,567	3,626,270	0	2,905,218	0	6,531,488	
	Permanent Partial	1,831,913	2,282,528	1,737,441	2,312,565	8,164,447	15,056,996	17,831,876	6,430,148	9,013,957	48,332,977	
	Temporary Total	1,621,943	2,648,831	1,588,339	3,042,456	8,901,569	12,696,975	21,235,951	6,041,507	12,978,647	52,953,080	
	Medical Only	0	0	0	458,483	458,483	0	0	0	3,198,142	3,198,142	
2017	Fatal	0	163,428	0	71,626	235,054	0	898,943	0	91,156	990,099	33,822,770
	Permanent Total	535,220	0	427,802	0	963,022	3,903,857	0	1,248,381	0	5,152,238	
	Permanent Partial	1,388,679	2,634,777	1,091,075	2,313,651	7,428,182	11,342,961	20,930,771	3,702,405	8,465,962	44,442,099	
	Temporary Total	1,882,049	3,203,666	1,627,774	3,548,416	10,261,905	14,400,045	25,625,507	5,704,838	14,645,138	60,375,528	
	Medical Only	0	0	0	491,861	491,861	0	0	0	3,373,680	3,373,680	
2018	Fatal	0	332,761	0	143,975	476,736	0	2,084,107	0	176,022	2,260,129	32,129,713
	Permanent Total	94,032	0	100,108	0	194,140	831,837	0	487,313	0	1,319,150	
	Permanent Partial	1,592,377	2,280,571	1,449,411	2,145,509	7,467,868	13,283,433	17,833,994	5,273,817	7,884,889	44,276,133	
	Temporary Total	1,916,337	4,165,151	1,628,587	4,432,249	12,142,324	15,002,287	32,928,306	5,835,446	17,584,535	71,350,574	
	Medical Only	0	0	0	538,124	538,124	0	0	0	3,598,717	3,598,717	
(14) All Years, All Injury Types		17,945,379	26,652,159	16,270,847	29,362,467	90,230,852	140,251,325	209,303,594	58,869,825	121,796,712	530,221,456	157,053,132
(15) Pure Premium							0.893	1.333	0.375	0.776	3.376	

Notes:
 (3) , (4) = 0.7 x [Excess Factor - 1.0] x Indemnity Converted Limited Losses. Excess Factor from Section IX-B, Exhibit 5 and Indemnity Converted Limited Losses from Page 1, Columns (8) and (9).
 (5), (6) = [Excess Factor - 1.0] x Medical Converted Limited Losses + 0.3 x [Excess Factor - 1.0] x Indemnity Converted Limited Losses. Excess Factor from Section IX-B, Exhibit 5 and Medical Converted Limited Losses from Page 1, Columns (10) and (11).
 (7) = (3) + (4) + (5) + (6)
 (8), (9), (10), (11): (Converted Limited Losses from Page 1 + Adjusted Excess Losses) x Secondary Conversion Factors from Section IX - B, Exhibit 1, Page 3.
 (12) = (8) + (9) + (10) + (11)
 (13): Unit Statistical Plan data, excluding Large Deductibles.
 (15): Pure Premium calculated as the All Years, All Injury Types Converted Unlimited Losses divided by the All Years, All Injury Types Exposure.

IX 000039

Calculation of Converted Limited Losses by Indemnity Likely/Not-Likely and Medical Likely/Not-Likely
 All Industry Groups
 All Classes

Policy Year (1)	Injury Type (2)	Limited Losses					Converted Limited Losses				
		Indemnity		Medical		Total (7)	Indemnity		Medical		Total (12)
		Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)			Likely (8)	Not-Likely (9)	Likely (10)	
2014	Fatal	2,992,714	2,204,287	751,625	196,701	6,145,327	2,446,985	1,790,276	529,800	147,523	4,914,584
	Permanent Total	49,873,230	0	17,517,608	0	67,390,838	41,006,761	0	12,347,677	0	53,354,438
	Permanent Partial	82,516,545	133,461,334	29,361,201	48,010,586	293,349,666	70,499,801	113,263,014	20,695,896	36,007,237	240,465,948
	Temporary Total	39,429,577	84,834,146	15,963,650	60,455,152	200,682,525	31,685,991	67,717,615	11,252,334	45,340,479	155,996,419
	Medical Only	0	0	0	25,071,209	25,071,209	0	0	0	17,672,944	17,672,944
2015	Fatal	1,142,621	10,030,885	179,725	816,655	12,169,886	1,015,743	8,912,970	140,008	680,611	10,749,332
	Permanent Total	42,816,880	0	15,005,247	0	57,822,127	38,472,151	0	11,689,229	0	50,161,380
	Permanent Partial	81,729,770	133,625,343	28,684,845	45,323,441	289,363,399	75,990,200	124,184,592	22,345,764	37,773,128	260,293,684
	Temporary Total	36,723,694	89,560,528	16,293,865	62,560,632	205,138,719	32,335,569	78,822,892	12,693,074	52,138,822	175,990,357
	Medical Only	0	0	0	25,243,124	25,243,124	0	0	0	18,549,240	18,549,240
2016	Fatal	283,300	7,854,102	22,920	407,676	8,567,998	275,802	7,594,146	18,436	350,807	8,239,191
	Permanent Total	29,771,581	0	11,330,266	0	41,101,847	29,272,342	0	9,113,660	0	38,386,002
	Permanent Partial	71,084,918	124,829,236	25,351,955	46,766,164	268,032,273	72,052,862	125,667,287	20,392,203	40,242,551	258,354,903
	Temporary Total	43,516,070	97,186,226	20,109,979	66,211,230	227,023,505	42,029,366	93,226,648	16,175,748	56,975,142	208,406,904
	Medical Only	0	0	0	24,916,475	24,916,475	0	0	0	19,435,574	19,435,574
2017	Fatal	342,015	5,972,937	38,283	678,929	7,032,164	376,720	6,464,424	31,487	582,056	7,454,687
	Permanent Total	18,445,138	0	6,978,224	0	25,423,362	20,491,527	0	5,739,559	0	26,231,086
	Permanent Partial	60,224,180	121,303,102	25,193,563	46,954,545	253,675,390	68,698,233	135,961,142	20,721,595	40,254,726	265,635,696
	Temporary Total	47,297,545	106,516,565	20,647,542	72,699,160	247,160,812	51,745,849	114,504,432	16,982,512	62,325,910	245,558,703
	Medical Only	0	0	0	26,517,117	26,517,117	0	0	0	20,532,234	20,532,234
2018	Fatal	0	4,442,827	0	380,694	4,823,521	0	6,686,665	0	342,188	7,028,853
	Permanent Total	2,702,423	0	1,793,850	0	4,496,273	4,653,443	0	1,603,477	0	6,256,920
	Permanent Partial	33,376,305	64,959,888	18,485,580	37,236,492	154,058,265	58,768,836	100,691,801	16,523,791	33,470,041	209,454,469
	Temporary Total	40,082,250	106,246,983	25,924,896	84,667,509	256,921,638	68,153,340	159,034,615	23,173,607	76,103,435	326,464,997
	Medical Only	0	0	0	27,253,073	27,253,073	0	0	0	22,179,894	22,179,894
(13) All Years, All Injury Types		684,350,756	1,093,028,389	279,634,824	702,366,564	2,759,380,533	709,971,521	1,144,522,519	222,169,857	581,104,542	2,657,768,439

Notes:
 (3) - (12): Total of Section IX - C, Page 1 of Exhibits 1 through 5.

IX 000040

Calculation of Converted Unlimited Losses by Indemnity Likely/Not-Likely and Medical Likely/Not-Likely
 All Industry Groups
 All Classes

Policy Year (1)	Injury Type (2)	Adjusted Excess Losses				Converted Unlimited Losses						Exposure (13)
		Indemnity		Medical		Indemnity		Medical		Total		
		Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Total (7)	Likely (8)	Not-Likely (9)	Likely (10)	Not-Likely (11)	Total (12)	
2014	Fatal	518,785	264,648	345,080	150,769	1,279,282	3,362,689	2,329,941	1,038,483	354,072	7,085,185	1,101,731,261
	Permanent Total	7,415,260	0	6,495,409	0	13,910,669	54,154,477	0	21,103,512	0	75,257,989	
	Permanent Partial	12,010,602	18,996,295	10,104,572	16,390,886	57,502,355	98,910,279	158,547,342	36,974,413	62,901,313	357,333,347	
	Temporary Total	4,826,241	10,455,988	4,531,319	14,184,560	33,998,108	43,853,172	93,890,744	18,983,724	71,593,502	228,321,142	
	Medical Only	0	0	0	3,461,798	3,461,798	0	0	0	25,086,939	25,086,939	
2015	Fatal	246,675	1,898,203	139,328	1,014,167	3,298,373	1,431,373	12,258,063	331,570	2,011,701	16,032,707	1,177,382,794
	Permanent Total	7,060,487	0	6,376,985	0	13,437,472	50,923,031	0	20,233,445	0	71,156,476	
	Permanent Partial	13,145,071	20,891,883	11,088,759	17,716,912	62,842,625	106,851,912	173,912,062	40,136,463	66,613,005	387,513,442	
	Temporary Total	5,269,403	12,294,424	5,136,874	16,525,651	39,226,352	45,165,612	109,436,845	21,444,898	82,585,919	258,633,274	
	Medical Only	0	0	0	3,607,416	3,607,416	0	0	0	26,299,951	26,299,951	
2016	Fatal	56,543	1,522,789	27,409	761,689	2,368,430	376,823	10,337,081	54,419	1,320,531	12,088,854	1,216,408,581
	Permanent Total	5,441,621	0	4,940,219	0	10,381,840	38,823,585	0	15,739,790	0	54,563,375	
	Permanent Partial	12,207,651	21,422,927	10,309,549	18,657,038	62,597,165	101,008,241	176,326,056	36,855,910	70,705,996	384,896,203	
	Temporary Total	6,548,904	14,735,165	6,403,666	18,711,929	46,399,664	58,345,141	129,667,999	27,157,298	91,032,319	306,202,757	
	Medical Only	0	0	0	3,803,929	3,803,929	0	0	0	27,585,289	27,585,289	
2017	Fatal	73,100	1,263,841	40,932	706,511	2,084,384	510,021	8,762,562	85,962	1,529,528	10,888,073	1,279,254,481
	Permanent Total	3,638,914	0	3,110,012	0	6,748,926	26,987,128	0	9,911,170	0	36,898,298	
	Permanent Partial	11,656,419	23,159,541	10,013,049	19,345,270	64,174,279	96,326,045	190,747,715	36,895,396	71,546,800	395,515,956	
	Temporary Total	8,433,378	18,260,301	7,631,840	21,495,102	55,820,621	72,278,520	159,457,654	29,604,814	100,815,385	362,156,373	
	Medical Only	0	0	0	4,000,015	4,000,015	0	0	0	29,119,781	29,119,781	
2018	Fatal	0	1,281,925	0	617,201	1,899,126	0	9,035,050	0	1,138,794	10,173,844	1,339,145,597
	Permanent Total	1,015,083	0	881,583	0	1,896,666	6,339,598	0	2,783,168	0	9,122,766	
	Permanent Partial	9,901,990	17,130,986	8,536,367	15,756,921	51,326,264	82,319,927	141,241,395	30,083,462	59,094,493	312,739,277	
	Temporary Total	10,885,265	25,669,873	9,941,041	28,034,670	74,530,849	94,929,655	221,840,120	39,828,510	125,251,688	481,849,973	
	Medical Only	0	0	0	4,356,062	4,356,062	0	0	0	31,498,180	31,498,180	
(14) All Years, All Injury Types		120,351,392	189,248,789	106,053,993	209,298,496	624,952,670	982,897,229	1,597,790,629	389,246,407	948,085,186	3,918,019,451	6,113,922,714
(15) Pure Premium							0.161	0.261	0.064	0.155	0.641	

Notes:
 (3) - (13): Total of Section IX - C, Page 2 of Exhibits 1 through 5.
 (15): Pure Premium calculated as the All Years, All Injury Types Converted Unlimited Losses divided by the All Years, All Injury Types Exposure.

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Exhibit 1
Page 1

MA Full Credibility Standard and Partial Credibility

	Indemnity	Medical
(1) Average Claim Cost (See Page 2)	33,000	16,000
(2) Claims	850	400
(3) Full Credibility Standard =(1) x (2)	28,050,000	6,400,000

Partial Credibility Z is given in terms of E, the expected losses and F, the criterion for full credibility by the formula:

$$Z=(E / F)^{0.4}$$

Credibility of Countrywide Data

	Indemnity	Medical
(4) Number of Countrywide Claims	1,150	1,000

Notes:

Partial Credibility is determined from the full credibility standard and the observed number of countrywide claims using the same formula as is done for the Massachusetts data.

(2),(4): From the paper "Class Ratemaking for Workers Compensation: NCCI's New Methodology" by Tom Daley.

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Selection of Average Massachusetts Claim Costs

Policy Year 2018

	Injury Type				
	1	2	9	5	6
	Indemnity				
(1) Losses Developed to Ultimate	10,996,706	10,760,854	193,829,231	274,354,619	
(2) On-Level Factor	1.032	1.039	1.063	1.026	
(3) On-Level Ultimate Losses = (1) x (2)	11,347,410	11,183,857	205,992,778	281,560,165	
	Medical				
(4) Losses Developed to Ultimate	748,629	9,428,264	75,471,931	126,223,071	29,121,609
(5) On-Level Factor	1.000	1.000	1.000	1.000	1.000
(6) On-Level Ultimate Losses = (4) x (5)	748,629	9,428,264	75,471,931	126,223,071	29,121,609
	Claim Count				
(7) Claim Count Developed to Fifth Report	23	23	1,898	13,507	
Summary:					
(8) Ultimate Losses			Indemnity 510,084,210		
(9) Ultimate Claim Count			15,450		
(10) Average Claim Cost = (8) / (9)			33,015		
(11) Selected Average Claim Cost			33,000		
(12) Ultimate Losses			Medical 240,993,504		
(13) Ultimate Claim Count			15,450		
(14) Average Claim Cost = (12) / (13)			15,598		
(15) Selected Average Claim Cost			16,000		

Notes:

- (1), (4) : Unit Statistical Plan Data, developed to Ultimate using development factors from Section X-A, Exhibit 5, Pages 2 and 5.
- (2), (5): Section IV-A, Exhibit 1.
- (7) : Unit Statistical Plan Data, developed to fifth report using development factors from Section IX-B, Exhibit 2, Page 1.
- (8) = Sum of (3)
- (9), (13) = Sum of (7)
- (12) = Sum of (6)

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Section IX - Classification Pricing
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Section IX - D
 Exhibit 2

Countrywide Classification Experience: Pitch Factors

State (1)	State Code (2)	Industry Group (3)	Industry Code (4)	Indemnity (5)	Medical (6)
Alabama	1	Manufacturing	1	2.483	0.635
		Construction	2	2.690	0.527
		Office and Clerical	3	1.561	0.408
		Goods and Services	9	2.265	0.491
		Miscellaneous	0	2.664	0.646
Arizona	2	Manufacturing	1	3.235	0.435
		Construction	2	3.222	0.499
		Office and Clerical	3	2.798	0.446
		Goods and Services	9	3.283	0.506
		Miscellaneous	0	3.220	0.636
Arkansas	3	Manufacturing	1	3.273	1.060
		Construction	2	3.543	1.060
		Office and Clerical	3	2.508	1.011
		Goods and Services	9	3.331	1.123
		Miscellaneous	0	3.565	1.146
Colorado	5	Manufacturing	1	2.071	0.628
		Construction	2	1.990	0.660
		Office and Clerical	3	1.688	0.587
		Goods and Services	9	1.620	0.557
		Miscellaneous	0	1.917	0.768
Connecticut	6	Manufacturing	1	0.938	0.504
		Construction	2	0.945	0.485
		Office and Clerical	3	0.570	0.420
		Goods and Services	9	0.759	0.424
		Miscellaneous	0	0.930	0.495
D.C.	8	Manufacturing	1	0.780	0.429
		Construction	2	1.688	0.828
		Office and Clerical	3	0.770	0.512
		Goods and Services	9	1.506	0.952
		Miscellaneous	0	0.731	0.482
Florida	9	Manufacturing	1	2.058	0.454
		Construction	2	1.760	0.380
		Office and Clerical	3	1.271	0.332
		Goods and Services	9	1.575	0.397
		Miscellaneous	0	1.710	0.525
Georgia	10	Manufacturing	1	1.363	0.710
		Construction	2	0.779	0.399
		Office and Clerical	3	1.323	0.715
		Goods and Services	9	1.089	0.621
		Miscellaneous	0	1.195	0.727
Idaho	11	Manufacturing	1	1.454	0.411
		Construction	2	1.422	0.433
		Office and Clerical	3	0.774	0.238
		Goods and Services	9	1.169	0.376
		Miscellaneous	0	1.753	0.619

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 Exhibit 2

Countrywide Classification Experience: Pitch Factors

State (1)	State Code (2)	Industry Group (3)	Industry Code (4)	Indemnity (5)	Medical (6)
Illinois	12	Manufacturing	1	1.027	0.476
		Construction	2	0.989	0.544
		Office and Clerical	3	0.954	0.592
		Goods and Services	9	1.069	0.511
		Miscellaneous	0	1.039	0.602
Indiana	13	Manufacturing	1	3.601	0.737
		Construction	2	5.071	1.014
		Office and Clerical	3	1.547	0.394
		Goods and Services	9	3.680	0.682
		Miscellaneous	0	3.877	0.919
Iowa	14	Manufacturing	1	1.388	0.444
		Construction	2	1.646	0.546
		Office and Clerical	3	0.803	0.344
		Goods and Services	9	1.359	0.461
		Miscellaneous	0	1.679	0.622
Kansas	15	Manufacturing	1	2.381	0.573
		Construction	2	3.226	0.724
		Office and Clerical	3	2.355	0.641
		Goods and Services	9	2.722	0.624
		Miscellaneous	0	2.985	0.743
Kentucky	16	Manufacturing	1	2.057	0.899
		Construction	2	2.059	0.838
		Office and Clerical	3	1.077	0.488
		Goods and Services	9	2.029	0.914
		Miscellaneous	0	1.998	0.950
Louisiana	17	Manufacturing	1	1.663	0.565
		Construction	2	1.788	0.566
		Office and Clerical	3	1.008	0.330
		Goods and Services	9	1.534	0.487
		Miscellaneous	0	1.577	0.555
Maine	18	Manufacturing	1	1.068	0.509
		Construction	2	1.169	0.577
		Office and Clerical	3	0.490	0.243
		Goods and Services	9	0.983	0.497
		Miscellaneous	0	0.478	0.598
Maryland	19	Manufacturing	1	1.574	0.795
		Construction	2	1.808	0.755
		Office and Clerical	3	1.491	0.918
		Goods and Services	9	1.654	0.839
		Miscellaneous	0	1.259	0.808
Michigan	21	Manufacturing	1	2.261	0.813
		Construction	2	2.732	1.130
		Office and Clerical	3	2.686	0.946
		Goods and Services	9	2.353	0.853
		Miscellaneous	0	2.341	1.117
Minnesota	22	Manufacturing	1	1.519	0.714
		Construction	2	1.826	0.827
		Office and Clerical	3	1.526	0.680
		Goods and Services	9	1.585	0.695
		Miscellaneous	0	1.557	0.821

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Section IX - Classification Pricing
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Section IX - D
 Exhibit 2

Countrywide Classification Experience: Pitch Factors

State (1)	State Code (2)	Industry Group (3)	Industry Code (4)	Indemnity (5)	Medical (6)
Mississippi	23	Manufacturing	1	1.719	0.684
		Construction	2	2.069	0.647
		Office and Clerical	3	0.985	0.371
		Goods and Services	9	1.752	0.599
		Miscellaneous	0	1.975	0.810
Missouri	24	Manufacturing	1	1.442	0.495
		Construction	2	1.744	0.568
		Office and Clerical	3	0.753	0.330
		Goods and Services	9	1.409	0.461
		Miscellaneous	0	1.568	0.582
Montana	25	Manufacturing	1	1.305	0.370
		Construction	2	1.666	0.501
		Office and Clerical	3	0.544	0.233
		Goods and Services	9	1.456	0.424
		Miscellaneous	0	2.024	0.629
Nebraska	26	Manufacturing	1	1.728	0.495
		Construction	2	2.059	0.611
		Office and Clerical	3	0.997	0.270
		Goods and Services	9	1.826	0.521
		Miscellaneous	0	2.153	0.702
Nevada	27	Manufacturing	1	0.803	0.468
		Construction	2	1.358	0.633
		Office and Clerical	3	0.525	0.263
		Goods and Services	9	1.280	0.579
		Miscellaneous	0	1.008	0.589
New Hampshire	28	Manufacturing	1	1.850	0.409
		Construction	2	1.516	0.451
		Office and Clerical	3	1.966	0.474
		Goods and Services	9	1.708	0.419
		Miscellaneous	0	1.851	0.633
New Mexico	30	Manufacturing	1	0.532	0.277
		Construction	2	1.751	0.574
		Office and Clerical	3	0.581	0.254
		Goods and Services	9	1.553	0.529
		Miscellaneous	0	1.947	0.655
North Carolina	32	Manufacturing	1	1.785	1.069
		Construction	2	1.440	0.694
		Office and Clerical	3	0.979	0.602
		Goods and Services	9	1.586	0.847
		Miscellaneous	0	1.376	0.891
Oklahoma	35	Manufacturing	1	1.269	0.579
		Construction	2	1.431	0.609
		Office and Clerical	3	0.405	0.306
		Goods and Services	9	1.032	0.483
		Miscellaneous	0	1.452	0.643
Oregon	36	Manufacturing	1	2.089	0.847
		Construction	2	2.171	0.925
		Office and Clerical	3	1.647	0.595
		Goods and Services	9	1.731	0.689
		Miscellaneous	0	1.927	0.949

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 Subsection D - Credibility/Countrywide Data
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Section IX - D
 Exhibit 2

Countrywide Classification Experience: Pitch Factors

State (1)	State Code (2)	Industry Group (3)	Industry Code (4)	Indemnity (5)	Medical (6)
Rhode Island	38	Manufacturing	1	0.717	0.700
		Construction	2	1.040	1.053
		Office and Clerical	3	0.293	0.596
		Goods and Services	9	0.693	0.699
		Miscellaneous	0	0.977	1.012
South Carolina	39	Manufacturing	1	0.831	0.607
		Construction	2	1.011	0.528
		Office and Clerical	3	0.566	0.496
		Goods and Services	9	0.999	0.652
		Miscellaneous	0	1.077	0.682
South Dakota	40	Manufacturing	1	3.117	0.581
		Construction	2	2.489	0.611
		Office and Clerical	3	0.894	0.252
		Goods and Services	9	2.251	0.544
		Miscellaneous	0	3.544	0.863
Tennessee	41	Manufacturing	1	3.126	0.773
		Construction	2	3.286	0.674
		Office and Clerical	3	1.789	0.551
		Goods and Services	9	3.202	0.786
		Miscellaneous	0	2.995	0.801
Utah	43	Manufacturing	1	4.459	0.924
		Construction	2	3.604	0.667
		Office and Clerical	3	1.725	0.651
		Goods and Services	9	3.998	0.763
		Miscellaneous	0	2.874	0.799
Vermont	44	Manufacturing	1	1.048	0.457
		Construction	2	1.145	0.490
		Office and Clerical	3	0.722	0.337
		Goods and Services	9	0.837	0.437
		Miscellaneous	0	0.962	0.575
Virginia	45	Manufacturing	1	2.553	0.553
		Construction	2	2.565	0.509
		Office and Clerical	3	2.545	0.600
		Goods and Services	9	2.390	0.531
		Miscellaneous	0	2.401	0.637
West Virginia	47	Manufacturing	1	2.551	1.135
		Construction	2	3.148	1.126
		Office and Clerical	3	1.770	0.731
		Goods and Services	9	2.439	0.883
		Miscellaneous	0	3.106	1.540
Wisconsin	48	Manufacturing	1	2.057	0.416
		Construction	2	1.679	0.399
		Office and Clerical	3	1.208	0.295
		Goods and Services	9	1.554	0.354
		Miscellaneous	0	1.744	0.459
Hawaii	52	Manufacturing	1	0.854	0.386
		Construction	2	1.674	0.824
		Office and Clerical	3	0.427	0.244
		Goods and Services	9	0.913	0.448
		Miscellaneous	0	1.035	0.515

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Section IX - D
Exhibit 2

Countrywide Classification Experience: Pitch Factors

State (1)	State Code (2)	Industry Group (3)	Industry Code (4)	Indemnity (5)	Medical (6)
Alaska	54	Manufacturing	1	1.017	0.165
		Construction	2	2.367	0.477
		Office and Clerical	3	0.981	0.178
		Goods and Services	9	2.062	0.354
		Miscellaneous	0	3.404	0.564

Notes:

Factors to adjust countrywide data to the same payroll distribution and loss level as MA.

Pitch Factor = (MA Unlimited Losses) / [(State Pure Premium) x (MA Exposure)]

For a sample countrywide pure premium calculation, see Section IX - L, Exhibit 2, Page 2.

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Section IX - Classification Pricing
 Subsection D - Credibility/Countrywide Data
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Section IX - D
 Exhibit 3

Countrywide Classification Experience: Database

State (1)	State Code (2)	Experience Data					
		First Report (3)		Second Report (4)		Third Report (5)	
Alabama	1	5/1/2016	- 4/30/2017	5/1/2015	- 4/30/2016	5/1/2014	- 4/30/2015
Arizona	2	3/1/2016	- 2/28/2017	3/1/2015	- 2/29/2016	3/1/2014	- 2/28/2015
Arkansas	3	2/1/2017	- 1/31/2018	2/1/2016	- 1/31/2017	2/1/2015	- 1/31/2016
Colorado	5	3/1/2016	- 2/28/2017	3/1/2015	- 2/29/2016	3/1/2014	- 2/28/2015
Connecticut	6	8/1/2016	- 7/31/2017	8/1/2015	- 7/31/2016	8/1/2014	- 7/31/2015
D.C.	8	2/1/2016	- 1/31/2017	2/1/2015	- 1/31/2016	2/1/2014	- 1/31/2015
Florida	9	1/1/2016	- 12/31/2016	1/1/2015	- 12/31/2015	1/1/2014	- 12/31/2014
Georgia	10	7/1/2016	- 6/30/2017	7/1/2015	- 6/30/2016	7/1/2014	- 6/30/2015
Idaho	11	7/1/2016	- 6/30/2017	7/1/2015	- 6/30/2016	7/1/2014	- 6/30/2015
Illinois	12	4/1/2016	- 3/31/2017	4/1/2015	- 3/31/2016	4/1/2014	- 3/31/2015
Indiana	13	7/1/2016	- 6/30/2017	7/1/2015	- 6/30/2016	7/1/2014	- 6/30/2015
Iowa	14	3/1/2016	- 2/28/2017	3/1/2015	- 2/29/2016	3/1/2014	- 2/28/2015
Kansas	15	7/1/2016	- 6/30/2017	7/1/2015	- 6/30/2016	7/1/2014	- 6/30/2015
Kentucky	16	5/1/2016	- 4/30/2017	5/1/2015	- 4/30/2016	5/1/2014	- 4/30/2015
Louisiana	17	9/1/2016	- 8/31/2017	9/1/2015	- 8/31/2016	9/1/2014	- 8/31/2015
Maine	18	6/1/2016	- 5/31/2017	6/1/2015	- 5/31/2016	6/1/2014	- 5/31/2015
Maryland	19	4/1/2016	- 3/31/2017	4/1/2015	- 3/31/2016	4/1/2014	- 3/31/2015
Michigan	21	4/1/2017	- 3/31/2018	4/1/2016	- 3/31/2017	4/1/2015	- 3/31/2016
Minnesota	22	1/1/2017	- 12/31/2017	1/1/2016	- 12/31/2016	1/1/2015	- 12/31/2015
Mississippi	23	9/1/2016	- 8/31/2017	9/1/2015	- 8/31/2016	9/1/2014	- 8/31/2015
Missouri	24	7/1/2016	- 6/30/2017	7/1/2015	- 6/30/2016	7/1/2014	- 6/30/2015
Montana	25	1/1/2017	- 12/31/2017	1/1/2016	- 12/31/2016	1/1/2015	- 12/31/2015
Nebraska	26	8/1/2016	- 7/31/2017	8/1/2015	- 7/31/2016	8/1/2014	- 7/31/2015
Nevada	27	1/1/2016	- 12/31/2016	1/1/2015	- 12/31/2015	1/1/2014	- 12/31/2014
New Hampshire	28	4/1/2016	- 3/31/2017	4/1/2015	- 3/31/2016	4/1/2014	- 3/31/2015
New Mexico	30	7/1/2016	- 6/30/2017	7/1/2015	- 6/30/2016	7/1/2014	- 6/30/2015
North Carolina	32	1/1/2016	- 12/31/2016	1/1/2015	- 12/31/2015	1/1/2014	- 12/31/2014
Oklahoma	35	6/1/2016	- 5/31/2017	6/1/2015	- 5/31/2016	6/1/2014	- 5/31/2015
Oregon	36	1/1/2016	- 12/31/2016	1/1/2015	- 12/31/2015	1/1/2014	- 12/31/2014
Rhode Island	38	1/1/2016	- 12/31/2016	1/1/2015	- 12/31/2015	1/1/2014	- 12/31/2014
South Carolina	39	5/1/2016	- 4/30/2017	5/1/2015	- 4/30/2016	5/1/2014	- 4/30/2015
South Dakota	40	1/1/2017	- 12/31/2017	1/1/2016	- 12/31/2016	1/1/2015	- 12/31/2015
Tennessee	41	6/1/2016	- 5/31/2017	6/1/2015	- 5/31/2016	6/1/2014	- 5/31/2015
Utah	43	7/1/2016	- 6/30/2017	7/1/2015	- 6/30/2016	7/1/2014	- 6/30/2015
Vermont	44	7/1/2016	- 6/30/2017	7/1/2015	- 6/30/2016	7/1/2014	- 6/30/2015
Virginia	45	2/1/2016	- 1/31/2017	2/1/2015	- 1/31/2016	2/1/2014	- 1/31/2015
West Virginia	47	7/1/2016	- 6/30/2017	7/1/2015	- 6/30/2016	7/1/2014	- 6/30/2015
Wisconsin	48	1/1/2017	- 12/31/2017	1/1/2016	- 12/31/2016	1/1/2015	- 12/31/2015
Hawaii	52	6/1/2016	- 5/31/2017	6/1/2015	- 5/31/2016	6/1/2014	- 5/31/2015
Alaska	54	4/1/2016	- 3/31/2017	4/1/2015	- 3/31/2016	4/1/2014	- 3/31/2015

Calculation of Pure Premium Underlying Present Rate Factor

Industry Group (1)	Injury Type (2)	Uncapped Rate Level Factor (3)	Industry Group Pure Premium From Previous Revision (4)	Percent of Pure Premium =(4) / [Total of (4)] (5)	Expected Loss and LAE Ratio (6)	Benefit Level Change Factor (7)	Trend Factor (8)	Pure Premium Underlying Present Rate Factor = (3) x (5) x (6) x (7) x (8) (9)
Manufacturing	Indemnity	1.707	0.971	0.655	0.757	1.024	0.942	0.816
	Medical	1.707	0.512	0.345	0.757	1.000	0.943	0.421
	Total		1.483					
Construction	Indemnity	4.370	2.604	0.687	0.757	1.024	0.942	2.193
	Medical	4.370	1.187	0.313	0.757	1.000	0.943	0.976
	Total		3.791					
Office and Clerical	Indemnity	0.130	0.069	0.616	0.757	1.024	0.942	0.059
	Medical	0.130	0.043	0.384	0.757	1.000	0.943	0.036
	Total		0.112					
Goods and Services	Indemnity	1.492	0.825	0.639	0.757	1.024	0.942	0.696
	Medical	1.492	0.466	0.361	0.757	1.000	0.943	0.384
	Total		1.291					
Miscellaneous	Indemnity	4.201	2.408	0.660	0.757	1.024	0.942	2.025
	Medical	4.201	1.241	0.340	0.757	1.000	0.943	1.020
	Total		3.649					

Notes:

(3): Section IX - H, Exhibit 1 of 07/01/20 stipulation.

(4): Section IX - G of 07/01/20 stipulation.

(6): Section VI - J, Exhibit 1 of 07/01/20 stipulation.

(7): Section IV - A, Exhibit 1.

(8): Net Indemnity and Medical Trends from Section V - A, Exhibit 1.

IX 000050

IX 000051

Section IX - Classification Pricing
 Subsection F - Underlying Pure Premiums
 7/1/2022

Section IX - F
 Exhibit 1

Calculation of Pure Premiums Underlying Present Rate Manufacturing Industry Group, Industry Code 1

Class (1)	Adopted Relativities		Pure Premiums Underlying Present Rate		
	Indemnity (2)	Medical (3)	Indemnity (4)	Medical (5)	Total (6) = (4) + (5)
1430	2.267	2.009	1.850	0.846	2.696
1438	1.838	1.652	1.500	0.695	2.195
1463	5.131	7.806	4.187	3.286	7.473
1701	1.234	1.132	1.007	0.477	1.484
1747	1.508	1.625	1.231	0.684	1.915
1748	1.388	2.092	1.133	0.881	2.013
1853	0.832	0.470	0.679	0.198	0.876
1924	1.242	1.110	1.014	0.467	1.481
1925	2.180	26.831	1.779	11.296	13.075
2003	2.017	1.781	1.646	0.750	2.396
2014	2.105	1.834	1.718	0.772	2.490
2021	1.267	1.237	1.034	0.521	1.555
2039	1.908	1.922	1.557	0.809	2.366
2041	1.356	1.159	1.106	0.488	1.594
2070	2.015	1.671	1.644	0.704	2.347
2081	1.302	1.713	1.063	0.721	1.784
2089	1.528	1.220	1.247	0.514	1.761
2095	1.711	1.326	1.396	0.558	1.955
2101	1.528	1.220	1.247	0.514	1.761
2111	1.147	1.154	0.936	0.486	1.422
2114	1.528	1.220	1.247	0.514	1.761
2115	3.184	2.486	2.598	1.047	3.645
2121	0.758	0.734	0.619	0.309	0.928
2130	0.779	0.757	0.636	0.319	0.954
2131	1.541	1.517	1.257	0.639	1.896
2143	1.297	1.067	1.058	0.449	1.507
2150	2.046	2.059	1.669	0.867	2.536
2156	2.240	2.368	1.827	0.997	2.824
2157	2.277	1.762	1.858	0.742	2.600
2172	1.043	0.709	0.851	0.298	1.149
2211	3.112	3.212	2.539	1.352	3.891
2220	1.185	1.195	0.967	0.503	1.470
2260	3.045	2.481	2.485	1.045	3.530
2288	1.839	1.808	1.500	0.761	2.262
2305	2.049	1.742	1.672	0.733	2.405
2362	0.740	1.084	0.604	0.456	1.060
2380	1.109	1.140	0.905	0.480	1.385
2402	1.155	1.228	0.943	0.517	1.460
2413	1.748	1.757	1.426	0.740	2.166
2416	1.335	1.275	1.089	0.537	1.626
2417	1.101	0.818	0.898	0.344	1.242
2501	1.051	1.026	0.858	0.432	1.290
2503	0.689	0.512	0.562	0.215	0.778
2570	2.199	1.720	1.794	0.724	2.518
2576	1.062	1.181	0.866	0.497	1.364
2585	1.419	1.557	1.158	0.655	1.813
2586	0.978	1.094	0.798	0.461	1.259
2623	2.589	2.580	2.112	1.086	3.199

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Section IX - Classification Pricing
 Subsection F - Underlying Pure Premiums
 7/1/2022

Section IX - F
 Exhibit 1

Calculation of Pure Premiums Underlying Present Rate Manufacturing Industry Group, Industry Code 1

Class (1)	Adopted Relativities		Pure Premiums Underlying Present Rate		
	Indemnity (2)	Medical (3)	Indemnity (4)	Medical (5)	Total (6) = (4) + (5)
2651	0.792	0.854	0.646	0.359	1.006
2660	1.089	1.175	0.889	0.495	1.383
2683	1.063	1.260	0.868	0.530	1.398
2688	0.933	1.094	0.761	0.461	1.222
2710	3.107	3.431	2.535	1.445	3.980
2731	1.505	1.765	1.228	0.743	1.971
2747	3.005	2.761	2.452	1.162	3.614
2790	0.897	0.843	0.732	0.355	1.087
2802	1.919	1.974	1.566	0.831	2.397
2835	0.732	0.808	0.597	0.340	0.937
2836	1.114	1.038	0.909	0.437	1.346
2841	1.853	2.281	1.512	0.960	2.473
2883	1.787	1.651	1.458	0.695	2.154
2923	0.865	0.834	0.706	0.351	1.057
2942	0.863	0.975	0.705	0.410	1.115
3018	1.381	1.251	1.127	0.527	1.654
3022	1.783	1.951	1.455	0.821	2.276
3027	1.616	2.125	1.319	0.895	2.214
3028	1.459	1.601	1.190	0.674	1.864
3030	3.201	3.053	2.612	1.285	3.897
3040	2.747	1.951	2.242	0.821	3.063
3041	1.420	1.452	1.159	0.611	1.770
3042	2.350	2.321	1.917	0.977	2.895
3066	1.181	1.260	0.964	0.530	1.494
3076	1.117	1.049	0.912	0.442	1.353
3081	2.349	3.135	1.917	1.320	3.237
3082	2.349	3.135	1.917	1.320	3.237
3085	2.416	2.278	1.971	0.959	2.930
3110	4.180	4.387	3.411	1.847	5.258
3111	1.006	0.943	0.821	0.397	1.218
3113	0.827	0.852	0.675	0.359	1.033
3114	1.666	1.629	1.360	0.686	2.045
3118	0.935	0.753	0.763	0.317	1.080
3119	0.370	0.459	0.302	0.193	0.495
3120	0.719	0.592	0.586	0.249	0.836
3122	1.163	1.326	0.949	0.558	1.507
3127	0.951	0.987	0.776	0.416	1.192
3131	0.715	0.800	0.583	0.337	0.920
3132	1.285	1.475	1.049	0.621	1.670
3145	0.876	0.827	0.715	0.348	1.063
3146	1.134	1.256	0.926	0.529	1.454
3169	1.252	1.776	1.021	0.748	1.769
3179	0.642	0.540	0.524	0.227	0.751
3180	1.220	1.115	0.996	0.470	1.465
3188	1.271	1.215	1.037	0.512	1.548
3200	1.068	1.088	0.871	0.458	1.329
3220	1.593	1.532	1.300	0.645	1.944
3255	1.036	1.028	0.845	0.433	1.278

IX 000053

Section IX - Classification Pricing
 Subsection F - Underlying Pure Premiums
 7/1/2022

Section IX - F
 Exhibit 1

Calculation of Pure Premiums Underlying Present Rate Manufacturing Industry Group, Industry Code 1

Class (1)	Adopted Relativities		Pure Premiums Underlying Present Rate		
	Indemnity (2)	Medical (3)	Indemnity (4)	Medical (5)	Total (6) = (4) + (5)
3257	1.152	1.225	0.940	0.516	1.456
3270	1.255	1.184	1.024	0.499	1.523
3300	1.478	2.012	1.206	0.847	2.053
3315	1.524	1.478	1.243	0.622	1.866
3336	1.734	1.352	1.415	0.569	1.984
3372	1.050	1.112	0.857	0.468	1.325
3373	2.103	1.579	1.716	0.665	2.381
3381	1.096	1.019	0.895	0.429	1.324
3383	0.810	0.975	0.661	0.410	1.071
3385	0.349	0.380	0.285	0.160	0.445
3400	1.252	1.776	1.021	0.748	1.769
3507	1.490	1.275	1.216	0.537	1.753
3515	1.468	1.512	1.198	0.637	1.834
3558	0.344	0.563	0.281	0.237	0.518
3571	0.393	0.357	0.321	0.150	0.471
3574	0.864	0.869	0.705	0.366	1.071
3612	0.698	0.788	0.570	0.332	0.902
3620	1.704	2.042	1.391	0.860	2.250
3629	0.864	0.869	0.705	0.366	1.071
3632	0.864	0.869	0.705	0.366	1.071
3634	0.777	0.657	0.634	0.276	0.911
3635	1.414	1.787	1.154	0.752	1.906
3638	0.864	0.869	0.705	0.366	1.071
3642	0.586	0.568	0.478	0.239	0.717
3643	0.806	0.775	0.657	0.326	0.984
3647	1.140	1.072	0.930	0.451	1.382
3648	0.597	0.691	0.487	0.291	0.778
3681	0.376	0.317	0.307	0.133	0.440
3685	0.359	0.296	0.293	0.125	0.418
3807	1.252	1.776	1.021	0.748	1.769
3808	1.704	1.793	1.390	0.755	2.145
3826	2.529	3.387	2.064	1.426	3.490
3830	0.864	0.869	0.705	0.366	1.071
3841	0.725	0.739	0.592	0.311	0.903
4021	1.858	1.917	1.516	0.807	2.323
4024	1.776	1.629	1.449	0.686	2.135
4034	2.805	3.080	2.289	1.297	3.586
4036	1.049	1.099	0.856	0.463	1.318
4038	1.864	1.066	1.521	0.449	1.970
4053	1.150	1.224	0.938	0.515	1.453
4062	0.959	0.948	0.783	0.399	1.182
4112	0.209	0.220	0.170	0.093	0.263
4113	1.150	1.224	0.938	0.515	1.453
4114	1.461	1.046	1.192	0.440	1.632
4130	1.607	1.443	1.311	0.608	1.919
4133	0.789	0.690	0.644	0.290	0.934
4150	0.446	0.334	0.364	0.141	0.504
4239	1.105	1.081	0.902	0.455	1.357

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Section IX - Classification Pricing
 Subsection F - Underlying Pure Premiums
 7/1/2022

Section IX - F
 Exhibit 1

Calculation of Pure Premiums Underlying Present Rate Manufacturing Industry Group, Industry Code 1

Class (1)	Adopted Relativities		Pure Premiums Underlying Present Rate		
	Indemnity (2)	Medical (3)	Indemnity (4)	Medical (5)	Total (6) = (4) + (5)
4243	1.616	1.337	1.319	0.563	1.882
4244	1.427	1.153	1.165	0.485	1.650
4250	0.916	0.909	0.748	0.383	1.130
4251	1.200	0.843	0.979	0.355	1.334
4273	1.622	1.499	1.324	0.631	1.955
4279	1.155	1.051	0.942	0.443	1.385
4283	0.954	0.821	0.778	0.346	1.124
4299	0.927	0.948	0.757	0.399	1.156
4304	2.323	2.390	1.896	1.006	2.902
4307	0.777	0.870	0.634	0.366	1.000
4308	1.544	0.384	1.260	0.161	1.421
4351	0.471	0.469	0.384	0.197	0.582
4352	0.736	0.565	0.601	0.238	0.839
4360	0.324	0.300	0.265	0.126	0.391
4410	1.391	1.872	1.135	0.788	1.923
4432	0.346	0.445	0.283	0.187	0.470
4439	2.565	3.384	2.093	1.425	3.518
4452	1.445	1.320	1.179	0.556	1.735
4459	1.452	1.389	1.185	0.585	1.770
4470	1.082	1.055	0.883	0.444	1.327
4484	0.996	1.165	0.813	0.490	1.303
4493	1.006	0.981	0.821	0.413	1.234
4557	0.926	0.814	0.756	0.343	1.099
4558	0.747	0.863	0.609	0.363	0.973
4583	1.433	1.272	1.169	0.535	1.705
4611	0.388	0.384	0.317	0.162	0.478
4635	2.326	3.028	1.898	1.275	3.173
4653	0.950	0.819	0.775	0.345	1.120
4665	4.697	4.414	3.833	1.858	5.691
4692	0.277	0.239	0.226	0.101	0.327
4693	0.425	0.473	0.346	0.199	0.546
4720	0.917	0.898	0.748	0.378	1.126
4740	0.486	0.455	0.396	0.191	0.588
4741	1.201	0.946	0.980	0.398	1.378
4771	1.787	1.063	1.458	0.448	1.906
4777	1.433	1.272	1.169	0.535	1.705
4825	0.259	0.219	0.212	0.092	0.304
4828	0.508	0.474	0.414	0.200	0.614
4829	0.508	0.474	0.414	0.200	0.614
4902	0.863	0.975	0.705	0.410	1.115
4923	0.324	0.300	0.265	0.126	0.391
6504	1.528	1.220	1.247	0.514	1.761
9501	1.086	1.137	0.886	0.479	1.365
9505	1.086	1.137	0.886	0.479	1.365
9521	1.611	1.585	1.315	0.667	1.982
9522	0.887	0.827	0.724	0.348	1.072

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Section IX - Classification Pricing
Subsection F - Underlying Pure Premiums
7/1/2022

Section IX - F
Exhibit 1

Calculation of Pure Premiums Underlying Present Rate Manufacturing Industry Group, Industry Code 1

Class (1)	Adopted Relativities		Pure Premiums Underlying Present Rate		
	Indemnity (2)	Medical (3)	Indemnity (4)	Medical (5)	Total (6) = (4) + (5)

Notes:

(2), (3): Section IX - I, Exhibit 1 of 07/01/2020 stipulation.

(4) = (2) x Pure Premium Underlying Present Rate Factors from Section IX - E, Exhibit 1

(5) = (3) x Pure Premium Underlying Present Rate Factors from Section IX - E, Exhibit 1
(Indemnity = 0.816, Medical = 0.421).

IX 000056

Section IX - Classification Pricing
 Subsection F - Underlying Pure Premiums
 7/1/2022

Section IX - F
 Exhibit 2

Calculation of Pure Premiums Underlying Present Rate Construction Industry Group, Industry Code 2

Class (1)	Adopted Relativities		Pure Premiums Underlying Present Rate		
	Indemnity (2)	Medical (3)	Indemnity (4)	Medical (5)	Total (6) = (4) + (5)
0050	0.882	0.864	1.935	0.843	2.778
3365	0.997	1.119	2.187	1.092	3.279
3724	1.076	1.072	2.360	1.047	3.406
3726	0.915	0.669	2.007	0.653	2.659
5020	1.021	0.787	2.239	0.768	3.007
5022	2.128	1.995	4.666	1.947	6.613
5037	3.772	3.163	8.273	3.087	11.360
5040	4.915	4.030	10.779	3.933	14.712
5057	4.168	6.500	9.141	6.344	15.485
5059	5.037	5.636	11.045	5.500	16.546
5102	1.555	1.154	3.410	1.126	4.536
5146	1.524	1.504	3.343	1.468	4.811
5160	0.538	0.516	1.180	0.504	1.684
5183	0.667	0.640	1.462	0.625	2.087
5188	0.934	0.677	2.047	0.661	2.708
5190	0.464	0.511	1.018	0.499	1.517
5213	2.505	2.280	5.494	2.225	7.718
5215	0.914	0.800	2.003	0.780	2.784
5221	1.517	1.239	3.326	1.209	4.535
5222	2.340	1.741	5.132	1.699	6.831
5223	0.853	0.855	1.870	0.835	2.705
5348	0.970	0.748	2.127	0.730	2.857
5402	1.286	1.269	2.819	1.239	4.058
5403	1.854	1.730	4.066	1.689	5.755
5437	0.914	0.863	2.004	0.842	2.847
5443	0.777	0.750	1.703	0.732	2.435
5445	1.408	1.091	3.088	1.065	4.152
5462	1.270	1.083	2.786	1.057	3.843
5472	1.862	1.513	4.084	1.477	5.561
5473	2.141	2.247	4.695	2.193	6.889
5474	0.879	0.840	1.927	0.819	2.747
5478	0.927	0.674	2.033	0.657	2.690
5479	1.204	1.020	2.641	0.996	3.637
5480	1.121	0.950	2.458	0.927	3.385
5506	1.050	0.927	2.303	0.904	3.208
5507	1.304	1.020	2.860	0.996	3.855
5508	0.882	0.864	1.935	0.843	2.778
5509	1.000	1.154	2.193	1.127	3.320
5538	0.909	0.911	1.994	0.889	2.883
5545	7.564	11.544	16.588	11.267	27.855
5547	2.113	2.829	4.634	2.761	7.395
5606	0.265	0.330	0.582	0.322	0.904
5610	1.014	0.712	2.223	0.695	2.918
5645	1.374	1.728	3.012	1.686	4.698
5701	3.929	5.281	8.617	5.155	13.772
5703	2.365	2.116	5.186	2.065	7.250
5705	2.229	2.175	4.889	2.123	7.012
6003	1.912	1.639	4.193	1.600	5.792

IX 000057

Section IX - Classification Pricing
Subsection F - Underlying Pure Premiums
7/1/2022

Section IX - F
Exhibit 2

Calculation of Pure Premiums Underlying Present Rate Construction Industry Group, Industry Code 2

Class (1)	Adopted Relativities		Pure Premiums Underlying Present Rate		
	Indemnity (2)	Medical (3)	Indemnity (4)	Medical (5)	Total (6) = (4) + (5)
6005	0.882	0.864	1.935	0.843	2.778
6204	1.163	1.022	2.550	0.998	3.548
6217	0.941	0.891	2.064	0.870	2.933
6229	0.845	0.804	1.852	0.784	2.637
6233	0.520	0.397	1.140	0.388	1.528
6251	1.100	0.665	2.412	0.649	3.062
6252	1.179	0.941	2.585	0.919	3.504
6306	1.627	1.439	3.569	1.405	4.973
6319	0.673	0.621	1.477	0.606	2.083
6325	0.609	0.574	1.335	0.560	1.895
6400	0.981	1.142	2.152	1.115	3.266
7538	1.359	1.372	2.980	1.339	4.319
7601	1.153	1.391	2.529	1.358	3.887
7855	0.796	0.690	1.745	0.674	2.419
8227	0.952	1.094	2.087	1.068	3.155
9533	2.926	2.954	6.416	2.883	9.299
9534	1.211	1.057	2.656	1.031	3.687
9549	1.018	0.756	2.233	0.738	2.971
9552	1.475	1.910	3.234	1.864	5.099

Notes:

(2), (3): Section IX - I, Exhibit 1 of 07/01/2020 stipulation.

(4) = (2) x Pure Premium Underlying Present Rate Factors from Section IX - E, Exhibit 1

(5) = (3) x Pure Premium Underlying Present Rate Factors from Section IX - E, Exhibit 1
(Indemnity = 2.193, Medical = 0.976).

IX 000058

Section IX - Classification Pricing
Subsection F - Underlying Pure Premiums
7/1/2022

Section IX - F
Exhibit 3

Calculation of Pure Premiums Underlying Present Rate Office and Clerical Industry Group, Industry Code 3

Class (1)	Adopted Relativities		Pure Premiums Underlying Present Rate		
	Indemnity (2)	Medical (3)	Indemnity (4)	Medical (5)	Total (6) = (4) + (5)
4361	4.539	5.657	0.268	0.204	0.471
7610	4.420	2.789	0.261	0.100	0.361
8601	1.562	1.434	0.092	0.052	0.144
8721	1.903	2.108	0.112	0.076	0.188
8742	0.738	0.816	0.044	0.029	0.073
8748	4.960	4.374	0.293	0.157	0.450
8800	7.707	6.528	0.455	0.235	0.690
8803	0.312	0.311	0.018	0.011	0.030
8810	0.461	0.490	0.027	0.018	0.045
8820	0.565	0.532	0.033	0.019	0.052
8832	2.140	1.871	0.126	0.067	0.194
8833	9.023	6.582	0.532	0.237	0.769
8868	4.884	5.460	0.288	0.197	0.485
8901	0.461	0.490	0.027	0.018	0.045
9156	11.155	14.856	0.658	0.535	1.193

Notes:

(2), (3): Section IX - I, Exhibit 1 of 07/01/2020 stipulation.

(4) = (2) x Pure Premium Underlying Present Rate Factors from Section IX - E, Exhibit 1

(5) = (3) x Pure Premium Underlying Present Rate Factors from Section IX - E, Exhibit 1
(Indemnity = 0.059, Medical = 0.036).

IX 000059

Section IX - Classification Pricing
 Subsection F - Underlying Pure Premiums
 7/1/2022

Section IX - F
 Exhibit 4

Calculation of Pure Premiums Underlying Present Rate Goods and Services Industry Group, Industry Code 9

Class (1)	Adopted Relativities		Pure Premiums Underlying Present Rate		
	Indemnity (2)	Medical (3)	Indemnity (4)	Medical (5)	Total (6) = (4) + (5)
0005	1.474	1.411	1.026	0.542	1.568
0008	1.471	1.835	1.024	0.704	1.728
0016	2.162	2.245	1.505	0.862	2.367
0034	1.782	2.176	1.240	0.836	2.076
0035	1.114	1.241	0.775	0.477	1.252
0036	1.782	2.176	1.240	0.836	2.076
0042	2.146	2.362	1.494	0.907	2.401
0046	1.540	2.131	1.072	0.818	1.890
0079	1.328	2.003	0.924	0.769	1.694
0083	2.153	2.202	1.499	0.845	2.344
0113	1.782	2.176	1.240	0.836	2.076
0170	1.782	2.176	1.240	0.836	2.076
0908	106.933	87.456	74.425	33.583	108.008
0909	177.779	318.470	123.734	122.292	246.026
0912	177.779	318.470	123.734	122.292	246.026
0913	106.933	87.456	74.425	33.583	108.008
0917	1.729	1.321	1.203	0.507	1.710
0918	0.345	0.212	0.240	0.081	0.322
2587	1.584	1.193	1.103	0.458	1.561
3821	2.961	3.436	2.061	1.319	3.380
4362	0.327	0.300	0.228	0.115	0.343
4511	0.177	0.162	0.123	0.062	0.185
4512	0.059	0.055	0.041	0.021	0.062
5191	0.513	0.463	0.357	0.178	0.535
5192	1.680	1.596	1.170	0.613	1.782
8001	0.942	1.215	0.656	0.467	1.123
8002	0.974	1.573	0.678	0.604	1.282
8006	0.701	0.882	0.488	0.339	0.826
8008	0.451	0.468	0.314	0.180	0.494
8010	1.008	1.128	0.702	0.433	1.135
8013	0.199	0.263	0.138	0.101	0.239
8017	0.563	0.652	0.392	0.251	0.643
8018	2.358	2.018	1.641	0.775	2.416
8021	2.264	1.896	1.576	0.728	2.304
8031	1.053	1.170	0.733	0.449	1.182
8032	0.754	0.789	0.525	0.303	0.828
8033	0.986	0.908	0.686	0.349	1.035
8034	2.019	1.562	1.405	0.600	2.005
8039	0.699	0.987	0.486	0.379	0.865
8044	1.813	1.753	1.262	0.673	1.935
8046	1.202	1.385	0.836	0.532	1.368
8048	1.666	1.575	1.160	0.605	1.764
8058	1.232	1.733	0.858	0.666	1.523
8103	1.572	1.544	1.094	0.593	1.687
8105	11.829	7.719	8.233	2.964	11.197
8106	3.301	3.925	2.297	1.507	3.805

IX 000060

Section IX - Classification Pricing
 Subsection F - Underlying Pure Premiums
 7/1/2022

Section IX - F
 Exhibit 4

Calculation of Pure Premiums Underlying Present Rate Goods and Services Industry Group, Industry Code 9

Class (1)	Adopted Relativities		Pure Premiums Underlying Present Rate		
	Indemnity (2)	Medical (3)	Indemnity (4)	Medical (5)	Total (6) = (4) + (5)
8107	1.701	1.813	1.184	0.696	1.880
8111	1.694	1.932	1.179	0.742	1.921
8203	3.991	3.702	2.778	1.421	4.199
8204	3.759	5.234	2.616	2.010	4.626
8215	2.178	2.388	1.516	0.917	2.433
8232	3.635	3.558	2.530	1.366	3.896
8233	3.455	3.701	2.404	1.421	3.826
8235	2.572	2.431	1.790	0.934	2.723
8263	2.726	2.994	1.897	1.150	3.047
8264	3.019	3.092	2.102	1.187	3.289
8265	3.455	3.701	2.404	1.421	3.826
8279	2.259	2.949	1.572	1.132	2.704
8291	2.407	2.464	1.675	0.946	2.622
8292	2.236	2.246	1.556	0.862	2.419
8293	5.085	4.994	3.539	1.918	5.457
8350	4.367	3.706	3.039	1.423	4.463
8380	1.692	1.574	1.177	0.604	1.782
8381	1.084	1.235	0.755	0.474	1.229
8385	1.989	1.897	1.384	0.728	2.112
8392	0.852	1.091	0.593	0.419	1.012
8393	0.866	0.676	0.603	0.259	0.862
8500	3.455	3.701	2.404	1.421	3.826
8710	2.176	1.652	1.514	0.634	2.149
8719	2.176	1.652	1.514	0.634	2.149
8720	0.527	0.459	0.367	0.176	0.543
8745	3.355	4.785	2.335	1.837	4.172
8747	0.557	0.353	0.388	0.136	0.523
8824	1.119	1.210	0.779	0.465	1.243
8826	0.929	0.894	0.646	0.343	0.990
8829	1.437	1.225	1.000	0.470	1.471
8831	0.462	0.929	0.322	0.357	0.678
8835	1.268	0.959	0.882	0.368	1.251
9014	1.392	1.343	0.969	0.516	1.484
9015	1.949	1.835	1.356	0.705	2.061
9016	1.011	1.345	0.704	0.516	1.220
9033	1.661	1.440	1.156	0.553	1.709
9040	1.736	1.948	1.208	0.748	1.957
9052	0.988	0.856	0.688	0.329	1.016
9058	0.885	0.894	0.616	0.343	0.960
9060	0.534	0.814	0.372	0.313	0.684
9061	0.562	0.679	0.391	0.261	0.652
9063	0.307	0.496	0.214	0.190	0.404
9079	0.605	0.725	0.421	0.278	0.700
9089	0.472	0.602	0.329	0.231	0.560
9093	0.603	0.924	0.420	0.355	0.775
9101	2.071	2.458	1.442	0.944	2.386

IX 000061

Section IX - Classification Pricing
Subsection F - Underlying Pure Premiums
7/1/2022

Section IX - F
Exhibit 4

Calculation of Pure Premiums Underlying Present Rate Goods and Services Industry Group, Industry Code 9

Class (1)	Adopted Relativities		Pure Premiums Underlying Present Rate		
	Indemnity (2)	Medical (3)	Indemnity (4)	Medical (5)	Total (6) = (4) + (5)
9220	2.054	1.977	1.430	0.759	2.189
9410	2.161	2.590	1.504	0.994	2.498
9519	1.765	1.357	1.228	0.521	1.749
9586	0.206	0.173	0.144	0.066	0.210
9620	0.461	0.517	0.321	0.199	0.519

Notes:

(2), (3): Section IX - I, Exhibit 1 of 07/01/2020 stipulation.

(4) = (2) x Pure Premium Underlying Present Rate Factors from Section IX - E, Exhibit 1

(5) = (3) x Pure Premium Underlying Present Rate Factors from Section IX - E, Exhibit 1
(Indemnity = 0.696, Medical = 0.384).

IX 000062

Section IX - Classification Pricing
 Subsection F - Underlying Pure Premiums
 7/1/2022

Section IX - F
 Exhibit 5

Calculation of Pure Premiums Underlying Present Rate Miscellaneous Industry Group, Industry Code 0

Class (1)	Adopted Relativities		Pure Premiums Underlying Present Rate		
	Indemnity (2)	Medical (3)	Indemnity (4)	Medical (5)	Total (6) = (4) + (5)
0106	1.863	2.763	3.772	2.818	6.590
1624	0.787	0.883	1.594	0.901	2.495
1655	0.567	0.543	1.148	0.554	1.702
1710	0.787	0.883	1.594	0.901	2.495
2702	2.753	2.689	5.575	2.743	8.318
4000	1.130	1.139	2.289	1.162	3.451
6834	0.490	0.656	0.993	0.669	1.663
6836	0.708	0.990	1.433	1.010	2.443
7219	1.984	1.699	4.019	1.733	5.751
7230	2.246	1.839	4.548	1.876	6.424
7231	2.545	2.779	5.153	2.835	7.988
7360	0.872	0.864	1.766	0.881	2.647
7370	0.812	0.992	1.644	1.011	2.656
7380	1.342	1.294	2.717	1.320	4.037
7382	0.795	0.842	1.609	0.859	2.468
7403	0.828	0.996	1.677	1.016	2.693
7405	0.273	0.257	0.553	0.262	0.815
7420	3.154	3.493	6.386	3.563	9.949
7421	0.288	0.239	0.584	0.244	0.828
7422	0.288	0.239	0.584	0.244	0.828
7425	0.623	0.386	1.262	0.393	1.655
7431	0.288	0.239	0.584	0.244	0.828
7502	0.390	0.363	0.789	0.371	1.160
7515	0.503	1.494	1.019	1.524	2.543
7520	0.660	0.654	1.337	0.667	2.004
7539	0.261	0.298	0.528	0.304	0.833
7580	0.755	0.646	1.529	0.659	2.188
7590	1.159	1.339	2.348	1.365	3.713
7600	0.863	0.655	1.748	0.668	2.417
7704	0.868	1.148	1.757	1.171	2.928
7720	0.308	0.343	0.624	0.350	0.974
9019	0.842	0.662	1.705	0.675	2.380
9102	0.470	0.563	0.953	0.575	1.527
9154	0.286	0.393	0.579	0.401	0.980
9178	1.444	6.234	2.925	6.358	9.283
9179	7.859	17.298	15.915	17.644	33.560
9180	0.752	1.474	1.523	1.504	3.027
9182	0.585	0.952	1.185	0.971	2.156
9186	0.752	1.474	1.523	1.504	3.027
9402	0.926	0.848	1.876	0.865	2.741
9403	2.276	2.011	4.610	2.051	6.661

Notes:

- (2), (3): Section IX - I, Exhibit 1 of 07/01/2020 stipulation.
- (4) = (2) x Pure Premium Underlying Present Rate Factors from Section IX - E, Exhibit 1
- (5) = (3) x Pure Premium Underlying Present Rate Factors from Section IX - E, Exhibit 1
 (Indemnity = 2.025, Medical = 1.02).

IX 000063

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2022

Section IX - G

A-Sheet Table of Contents

Class	To find the A-Sheet for:		Look at the A-Sheet for:	
		Description	Class	Exhibit
0005	FARM: NURSERY EMP & DRIVERS		0005	Section IX - G, Exhibit 1
0008	FARM: GARDENING-MARKET OR TRUCK & DRIVERS		0008	Section IX - G, Exhibit 1
0016	FARM: ORCHARDS & DRIVERS		0016	Section IX - G, Exhibit 2
0034	FARM: POULTRY OR EGG PRODUCERS & DRIVERS		0034	Section IX - G, Exhibit 2
0035	FARM: FLORIST & DRIVERS		0035	Section IX - G, Exhibit 3
0036	FARM: DAIRY & DRIVERS		0034	Section IX - G, Exhibit 2
0042	LANDSCAPE GARDENING & DRIVERS		0042	Section IX - G, Exhibit 3
0046	FERTILIZER OR PESTICIDE APPLICATION-COMM OR DOMESTIC, DRIVERS		0046	Section IX - G, Exhibit 4
0050	FARM MACHINERY OPERATION-BY CONTRACTOR & DRIVERS		0050	Section IX - G, Exhibit 4
0079	FARM: BERRY OR VINEYARD & DRIVERS		0079	Section IX - G, Exhibit 5
0083	FARM: CATTLE OR LIVESTOCK RAISING NOC & DRIVERS		0083	Section IX - G, Exhibit 5
0106	TREE PRUNING, SPRAYING, REPAIRING & DRIVERS		0106	Section IX - G, Exhibit 6
0113	FARM: FISH HATCHERY & DRIVERS		0034	Section IX - G, Exhibit 2
0170	FARM: ANIMAL RAISING & DRIVERS		0034	Section IX - G, Exhibit 2
0908	DOMESTIC WORKERS-INSIDE-OCCASIONAL-NOC		0908	Section IX - G, Exhibit 6
0909	DOMESTIC WORKERS-OUTSIDE-OCCASIONAL-INCL OCCASNL PRIV CHAUFF		0909	Section IX - G, Exhibit 7
0912	DOMESTIC WORKERS-OUTSIDE-INCL PRIVATE CHAUFFERS		0909	Section IX - G, Exhibit 7
0913	DOMESTIC WORKERS-INSIDE-NOC		0908	Section IX - G, Exhibit 6
0917	DOMESTIC SERVICE CONTRACTOR-INSIDE		0917	Section IX - G, Exhibit 7
0918	DOMESTIC WORKERS-INSIDE-PHYSICAL ASSISTANCE		0918	Section IX - G, Exhibit 8
1430	SMELTING, SINTERING OR REFINING-LEAD & DRIVERS		1430	Section IX - G, Exhibit 8
1438	SMELTING, SINTERING OR REFINING-METALS-NOT IRON OR LEAD-NOC & D		1438	Section IX - G, Exhibit 9
1463	ASPHALT WORKS & DRIVERS		1463	Section IX - G, Exhibit 9
1624	QUARRY NOC & DRIVERS		1624	Section IX - G, Exhibit 10
1655	LIME MFG-QUARRY-SURFACE & DRIVERS		1655	Section IX - G, Exhibit 10
1701	CEMENT MFG		1701	Section IX - G, Exhibit 11
1710	STONE CRUSHING & DRIVERS		1624	Section IX - G, Exhibit 10
1747	EMERY WORKS & DRIVERS		1747	Section IX - G, Exhibit 11
1748	ABRASIVE WHEEL MFG & DRIVERS		1748	Section IX - G, Exhibit 12
1853	MICA GOODS MFG & MICA PREPARING		1853	Section IX - G, Exhibit 12
1924	WIRE DRAWING OR CABLE MFG-NOT IRON OR STEEL		1924	Section IX - G, Exhibit 13
1925	DIE CASTING MFG		1925	Section IX - G, Exhibit 13
2003	BAKERY & DRIVERS, ROUTE SUPERVISORS		2003	Section IX - G, Exhibit 14
2014	GRAIN MILLING		2014	Section IX - G, Exhibit 14
2021	SUGAR REFINING-ALL OPERATIONS & DRIVERS		2021	Section IX - G, Exhibit 15
2039	ICE CREAM MFG & DRIVERS		2039	Section IX - G, Exhibit 15
2041	CONFECTION MFG		2041	Section IX - G, Exhibit 16
2070	CREAMERY OR DAIRY & ROUTE SUPERVISORS, DRIVERS		2070	Section IX - G, Exhibit 16
2081	BUTCHERING		2081	Section IX - G, Exhibit 17
2089	PACKING HOUSE- ALL OPERATIONS		2089	Section IX - G, Exhibit 17
2095	MEAT PRODUCTS MFG-NOC		2095	Section IX - G, Exhibit 18
2101	FISH CURING		2089	Section IX - G, Exhibit 17
2111	CANNERY NOC		2111	Section IX - G, Exhibit 18
2114	OYSTERMEN		2089	Section IX - G, Exhibit 17
2115	SEAFOOD PRODUCTS MFG-NOC		2115	Section IX - G, Exhibit 19
2121	BREWERY & DRIVERS		2121	Section IX - G, Exhibit 19
2130	SPIRITUOUS LIQUOR DISTILLERY		2130	Section IX - G, Exhibit 20
2131	SPIRITUOUS LIQUOR BOTTLING		2131	Section IX - G, Exhibit 20
2143	FRUIT JUICE MFG		2143	Section IX - G, Exhibit 21
2150	ICE MFG		2150	Section IX - G, Exhibit 21
2156	BOTTLING-NOT CARBONATED LIQUIDS OR SPIRIT LIQRS & RTE SUP,DR		2156	Section IX - G, Exhibit 22
2157	BOTTLING NOC & ROUTE SUPERVISORS, DRIVERS		2157	Section IX - G, Exhibit 22
2172	CIGARETTE MFG		2172	Section IX - G, Exhibit 23
2211	COTTON BATTING,WADDING OR WASTE MFG		2211	Section IX - G, Exhibit 23
2220	YARN OR THREAD MFG-COTTON		2220	Section IX - G, Exhibit 24
2260	WOOL COMBING OR SCOURING		2260	Section IX - G, Exhibit 24
2288	FELTING MFG		2288	Section IX - G, Exhibit 25
2305	TEXTILE FIBER MFG-SYNTHETIC		2305	Section IX - G, Exhibit 25
2362	KNIT GOODS MFG NOC		2362	Section IX - G, Exhibit 26
2380	WEBBING MFG		2380	Section IX - G, Exhibit 26
2402	CARPET OR RUG MFG NOC		2402	Section IX - G, Exhibit 27
2413	TEXTILE - BLEACHING, DYEING, MERCERZNG, FINISH		2413	Section IX - G, Exhibit 27
2416	YARN OR THREAD DYEING OR FINISHING		2416	Section IX - G, Exhibit 28
2417	CLOTH PRINTING		2417	Section IX - G, Exhibit 28
2501	CLOTHING MFG		2501	Section IX - G, Exhibit 29
2503	DRESSMAKING OR TAILORING-CUSTOM EXCLUSIVELY		2503	Section IX - G, Exhibit 29
2570	MATTRESS OR BOX SPRING MFG		2570	Section IX - G, Exhibit 30

IX 000064

Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2022

Section IX - G

A-Sheet Table of Contents

To find the A-Sheet for:		Look at the A-Sheet for:	
Class	Description	Class	Exhibit
2576	CANVAS GOODS MFG NOC-SHOP	2576	Section IX - G, Exhibit 30
2585	LAUNDRY NOC & ROUTE SUPERVISORS, DRIVERS	2585	Section IX - G, Exhibit 31
2586	CLEANING OR DYEING & ROUTE SUPERVISORS, DRIVERS	2586	Section IX - G, Exhibit 31
2587	TOWEL OR TOILET SUPPLY CO & RTE SUPERVISORS, DR	2587	Section IX - G, Exhibit 32
2623	TANNING	2623	Section IX - G, Exhibit 32
2651	SHOE STOCK MFG	2651	Section IX - G, Exhibit 33
2660	BOOT OR SHOE MFG NOC	2660	Section IX - G, Exhibit 33
2683	LUGGAGE MFG	2683	Section IX - G, Exhibit 34
2688	LEATHER GOODS MFG NOC	2688	Section IX - G, Exhibit 34
2702	LOGGING OR LUMBERING & DRIVERS	2702	Section IX - G, Exhibit 35
2710	SAWMILLS	2710	Section IX - G, Exhibit 35
2731	PLANING OR MOLDING MILL	2731	Section IX - G, Exhibit 36
2747	COOPERAGE ASSEMBLY	2747	Section IX - G, Exhibit 36
2790	PATTERN MAKING NOC	2790	Section IX - G, Exhibit 37
2802	CARPENTRY-SHOP ONLY & DRIVERS	2802	Section IX - G, Exhibit 37
2835	BRUSH OR BROOM ASSEMBLY	2835	Section IX - G, Exhibit 38
2836	BRUSH OR BROOM MFG NOC	2836	Section IX - G, Exhibit 38
2841	WOODENWARE MFG NOC	2841	Section IX - G, Exhibit 39
2883	FURNITURE MFG-WOOD-NOC	2883	Section IX - G, Exhibit 39
2923	PIANO MFG	2923	Section IX - G, Exhibit 40
2942	PENCIL, PENHOLDER OR CRAYON MFG	2942	Section IX - G, Exhibit 40
3018	IRON OR STEEL: MFG: ROLLING MILL & DRIVERS	3018	Section IX - G, Exhibit 41
3022	PIPE OR TUBE MFG NOC & DRIVERS	3022	Section IX - G, Exhibit 41
3027	ROLLING MILL NOC & DRIVERS	3027	Section IX - G, Exhibit 42
3028	PIPE OR TUBE MFG - IRON OR STEEL & DRIVERS	3028	Section IX - G, Exhibit 42
3030	IRON OR STEEL: FABRICATION: IRON/STEEL WORK-SHOP-STRUCT & DR	3030	Section IX - G, Exhibit 43
3040	IRON OR STEEL: FABRICATION: IRON WORKS-SHOP-ORNAMENTAL & DR	3040	Section IX - G, Exhibit 43
3041	IRON OR STEEL: FABRICATION: IRON WORKS-SHP-DEC/ART &FNDRS,DR	3041	Section IX - G, Exhibit 44
3042	ELEVATOR OR ESCALATOR MFG	3042	Section IX - G, Exhibit 44
3066	SHEET METAL WORK - SHOP	3066	Section IX - G, Exhibit 45
3076	FIREPROOF EQUIPMENT MFG	3076	Section IX - G, Exhibit 45
3081	FOUNDRY-FERROUS-NOC	3081	Section IX - G, Exhibit 46
3082	FOUNDRY-STEEL CASTINGS	3082	Section IX - G, Exhibit 46
3085	FOUNDRY-NON FERROUS	3085	Section IX - G, Exhibit 46
3110	FORGING WORK - DROP OR MACHINE	3110	Section IX - G, Exhibit 47
3111	BLACKSMITH	3111	Section IX - G, Exhibit 47
3113	TOOL MFG-NOT DROP OR MACHINE FORGED-NOC	3113	Section IX - G, Exhibit 48
3114	TOOL MFG-DROP OR MACHINE FORGED-NOC: MACHINING OR FINISHING	3114	Section IX - G, Exhibit 48
3118	SAW MFG	3118	Section IX - G, Exhibit 49
3119	NEEDLE MFG	3119	Section IX - G, Exhibit 49
3120	RAZOR MFG-SAFETY	3120	Section IX - G, Exhibit 50
3122	CUTLERY MFG-NOC	3122	Section IX - G, Exhibit 50
3127	PRECISION MEASURING TOOL MFG-NOC	3127	Section IX - G, Exhibit 51
3131	BUTTON OR FASTENER MFG-METAL	3131	Section IX - G, Exhibit 51
3132	NUT OR BOLT MFG	3132	Section IX - G, Exhibit 52
3145	SCREW MFG	3145	Section IX - G, Exhibit 52
3146	HARDWARE MFG-NOC	3146	Section IX - G, Exhibit 53
3169	STOVE MFG	3169	Section IX - G, Exhibit 53
3179	ELECTRICAL APPARATUS MFG-NOC	3179	Section IX - G, Exhibit 54
3180	ELECTRIC OR GAS LIGHTING FIXTURES MFG	3180	Section IX - G, Exhibit 54
3188	PLUMBERS SUPPLIES MFG-NOC	3188	Section IX - G, Exhibit 55
3200	ARMS MFG-SMALL	3200	Section IX - G, Exhibit 55
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3255	WIRE CLOTH MFG	3255	Section IX - G, Exhibit 56
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Section IX - Classification Pricing
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Section IX - G

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services		
0005 FARM: NURSERY EMP & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	111.959	1	18	12.494	6.914	4.198	15.691	39.296	0.173	0.178	0.351
2015	117.774	0	18	0	324.210	0	99.754	423.964	2.753	0.847	3.600
2016	119.731	2	28	70.408	5.100	63.025	37.701	176.234	0.631	0.841	1.472
2017	133.117	0	28	0	15.927	0	33.441	49.368	0.120	0.251	0.371
2018	133.342	0	14	0	102.802	0	50.258	153.060	0.771	0.377	1.148
MA Total:	615.922	3	106	82.903	454.952	67.223	236.845	841.922	0.873	0.494	1.367

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.142	1.161	.
(14) Massachusetts Credibility:	0.220	0.310	.
(15) Countrywide Pure Premium:	1.444	0.791	2.236
(16) Countrywide Indicated Relativity:	1.922	1.871	.
(17) Countrywide Credibility:	0.390	0.350	.
(18) Countrywide Lost-Time Claims:	1802.0	.	.
(19) Pure Premium Underlying Present Rate:	1.026	0.542	1.568
(20) Relativity to Underlying Present Rate:	1.481	1.418	.
(21) Credibility to Underlying Relativity:	0.390	0.340	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	1.578	1.497	.
(24) Balanced Formula Relativity:	1.569	1.498	1.543

Class(es):		Effective: 7/1/2022							Goods and Services		
0008 FARM: GARDENING-MARKET OR TRUCK & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	323.952	0	47	0	118.985	0	193.409	312.394	0.367	0.597	0.964
2015	355.510	1	48	31.756	343.170	2.524	146.590	524.040	1.055	0.419	1.474
2016	460.969	2	65	95.998	359.348	27.804	508.686	991.836	0.988	1.164	2.152
2017	540.655	1	59	27.963	365.443	49.164	270.826	713.396	0.728	0.592	1.320
2018	569.896	0	63	0	176.282	0	174.806	351.088	0.309	0.307	0.616
MA Total:	2,250.982	4	282	155.717	1,363.229	79.492	1,294.316	2,892.754	0.675	0.610	1.285

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.882	1.435	.
(14) Massachusetts Credibility:	0.370	0.570	.
(15) Countrywide Pure Premium:	1.539	0.859	2.398
(16) Countrywide Indicated Relativity:	2.048	2.031	.
(17) Countrywide Credibility:	0.320	0.220	.
(18) Countrywide Lost-Time Claims:	4759.0	.	.
(19) Pure Premium Underlying Present Rate:	1.024	0.704	1.728
(20) Relativity to Underlying Present Rate:	1.479	1.843	.
(21) Credibility to Underlying Relativity:	0.310	0.210	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	1.440	1.652	.
(24) Balanced Formula Relativity:	1.431	1.653	1.511

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Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2022

Section IX - G
 Exhibit 2

Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services		
0016 FARM: ORCHARDS & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	76.680	0	7	0	827	0	6.532	7.359	0.011	0.085	0.096
2015	77.633	0	12	0	3,793	0	22.907	26.700	0.049	0.295	0.344
2016	73.234	1	8	63,235	783	9,947	5,508	79,473	0.874	0.211	1.085
2017	76.542	0	5	0	63,141	0	65.836	128,978	0.825	0.860	1.685
2018	83.745	1	6	110,266	1,898	16,512	18,525	147,201	1.339	0.418	1.758
MA Total:	387,833	2	38	173,501	70,443	26,459	119,307	389,710	0.629	0.376	1.005

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.822	0.884	.
(14) Massachusetts Credibility:	0.210	0.310	.
(15) Countrywide Pure Premium:	2.207	1.392	3.599
(16) Countrywide Indicated Relativity:	2.937	3.290	.
(17) Countrywide Credibility:	0.400	0.350	.
(18) Countrywide Lost-Time Claims:	964.00	.	.
(19) Pure Premium Underlying Present Rate:	1.505	0.862	2.367
(20) Relativity to Underlying Present Rate:	2.174	2.256	.
(21) Credibility to Underlying Relativity:	0.390	0.340	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	2.195	2.193	.
(24) Balanced Formula Relativity:	2.182	2.194	2.186

Class(es):		Effective: 7/1/2022							Goods and Services		
0034 FARM: POULTRY OR EGG PRODUCERS & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	96.359	0	20	0	6,678	0	36.823	43.501	0.069	0.382	0.451
2015	104.310	1	24	27,592	58,289	80,163	117,274	283,318	0.823	1.893	2.716
2016	104.089	1	16	27,849	1,398	13,211	25,611	68,069	0.281	0.373	0.654
2017	102.311	0	19	0	57,011	0	70,643	127,654	0.557	0.690	1.248
2018	115.173	0	20	0	76,423	0	125,432	201,855	0.664	1.089	1.753
MA Total:	522,242	2	99	55,441	199,800	93,374	375,782	724,397	0.489	0.898	1.387

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.639	2.112	.
(14) Massachusetts Credibility:	0.220	0.340	.
(15) Countrywide Pure Premium:	1.748	0.911	2.659
(16) Countrywide Indicated Relativity:	2.326	2.153	.
(17) Countrywide Credibility:	0.390	0.330	.
(18) Countrywide Lost-Time Claims:	3674.0	.	.
(19) Pure Premium Underlying Present Rate:	1.240	0.836	2.076
(20) Relativity to Underlying Present Rate:	1.792	2.187	.
(21) Credibility to Underlying Relativity:	0.390	0.330	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	1.746	2.150	.
(24) Balanced Formula Relativity:	1.735	2.152	1.884

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Section IX - Classification Pricing
 Subsection G - Class Relativities
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Section IX - G
 Exhibit 3

Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services		
0035 FARM: FLORIST & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	381,340	0	41	0	222,418	0	173,643	396,061	0.583	0.455	1.039
2015	381,802	1	61	6,010	246,910	8,329	145,125	406,374	0.662	0.402	1.064
2016	415,202	1	40	4,268	249,938	7,353	150,782	412,341	0.612	0.381	0.993
2017	485,829	0	43	0	73,052	0	90,043	163,095	0.150	0.185	0.336
2018	796,995	1	80	52,385	534,073	31,280	275,112	892,850	0.736	0.384	1.120
MA Total:	2,461,167	3	265	62,664	1,326,391	46,962	834,705	2,270,721	0.564	0.358	0.923

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.738	0.842	.
(14) Massachusetts Credibility:	0.340	0.510	.
(15) Countrywide Pure Premium:	0.896	0.593	1.489
(16) Countrywide Indicated Relativity:	1.192	1.402	.
(17) Countrywide Credibility:	0.330	0.250	.
(18) Countrywide Lost-Time Claims:	1396.0	.	.
(19) Pure Premium Underlying Present Rate:	0.775	0.477	1.252
(20) Relativity to Underlying Present Rate:	1.120	1.247	.
(21) Credibility to Underlying Relativity:	0.330	0.240	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	1.014	1.079	.
(24) Balanced Formula Relativity:	1.007	1.080	1.033

Class(es):		Effective: 7/1/2022							Goods and Services		
0042 LANDSCAPE GARDENING & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	5,036,348	31	757	3,399,021	5,367,240	1,208,958	3,594,533	13,569,752	1.741	0.954	2.694
2015	5,615,705	27	706	2,881,474	3,997,020	1,062,935	3,782,583	11,724,011	1.225	0.863	2.088
2016	5,990,222	25	714	3,459,461	4,868,085	1,412,716	5,200,391	14,940,653	1.390	1.104	2.494
2017	6,387,338	37	720	4,994,844	6,607,802	1,321,141	4,870,240	17,794,027	1.817	0.969	2.786
2018	6,959,223	29	784	3,979,123	7,047,267	1,342,732	5,012,695	17,381,817	1.584	0.913	2.498
MA Total:	29,988,837	149	3,681	18,713,922	27,887,415	6,348,482	22,460,441	75,410,260	1.554	0.961	2.515

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.032	2.259	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	2.272	1.253	3.525
(16) Countrywide Indicated Relativity:	3.023	2.962	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	7558.0	.	.
(19) Pure Premium Underlying Present Rate:	1.494	0.907	2.401
(20) Relativity to Underlying Present Rate:	2.158	2.374	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	2.032	2.259	.
(24) Balanced Formula Relativity:	2.019	2.260	2.105

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services			
0046 FERTILIZER OR PESTICIDE APPLICATION-COMM OR DOMESTIC, DRIVERS												
Converted Unlimited Losses												
Amount												
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2014	133,322	0	21	0	19,506	0	24,544	44,050	0.146	0.184	0.330	
2015	128,180	0	15	0	194,491	0	118,857	313,348	1.517	0.927	2.445	
2016	144,205	2	17	498,991	70,591	281,629	98,106	949,317	3.950	2.633	6.583	
2017	168,314	2	23	320,657	280,054	347,010	199,212	1,146,932	3.569	3.245	6.814	
2018	192,482	0	23	0	94,759	0	71,042	165,801	0.492	0.369	0.861	
MA Total:	766,502	4	99	819,648	659,401	628,639	511,760	2,619,448	1.930	1.488	3.417	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.523	3.499	.
(14) Massachusetts Credibility:	0.240	0.390	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	1.534	2.123	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	1.072	0.818	1.890
(20) Relativity to Underlying Present Rate:	1.548	2.141	.
(21) Credibility to Underlying Relativity:	0.760	0.610	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	1.782	2.671	.
(24) Balanced Formula Relativity:	1.771	2.672	2.093

Class(es):		Effective: 7/1/2022							Construction			
0050 FARM MACHINERY OPERATION-BY CONTRACTOR & DRIVERS												
Converted Unlimited Losses												
Amount												
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2014	22,996	0	1	0	0	0	1,442	1,442	0.000	0.063	0.063	
2015	19,519	0	0	0	0	0	0	0	0.000	0.000	0.000	
2016	17,940	0	0	0	0	0	0	0	0.000	0.000	0.000	
2017	16,971	0	0	0	0	0	0	0	0.000	0.000	0.000	
2018	15,552	0	0	0	0	0	0	0	0.000	0.000	0.000	
MA Total:	92,978	0	1	0	0	0	1,442	1,442	0.000	0.016	0.016	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.014	.
(14) Massachusetts Credibility:	0.130	0.170	.
(15) Countrywide Pure Premium:	2.760	1.461	4.222
(16) Countrywide Indicated Relativity:	1.155	1.343	.
(17) Countrywide Credibility:	0.440	0.420	.
(18) Countrywide Lost-Time Claims:	850.00	.	.
(19) Pure Premium Underlying Present Rate:	1.935	0.843	2.778
(20) Relativity to Underlying Present Rate:	0.884	0.866	.
(21) Credibility to Underlying Relativity:	0.430	0.410	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	0.888	0.921	.
(24) Balanced Formula Relativity:	0.897	0.921	0.904

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Section IX - Classification Pricing
 Subsection G - Class Relativities
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Section IX - G
 Exhibit 5

Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services		
0079 FARM: BERRY OR VINEYARD & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	151,607	0	18	0	42,228	0	69,286	111,514	0.279	0.457	0.736
2015	159,411	0	24	0	66,807	0	97,807	164,614	0.419	0.614	1.033
2016	162,612	0	18	0	100,037	0	65,182	165,220	0.615	0.401	1.016
2017	155,835	0	13	0	97,056	0	122,686	219,742	0.623	0.787	1.410
2018	174,134	1	10	54,155	104,277	44,333	90,850	293,614	0.910	0.776	1.686
MA Total:	803,600	1	83	54,155	410,405	44,333	445,811	954,703	0.578	0.610	1.188

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.756	1.434	.
(14) Massachusetts Credibility:	0.230	0.390	.
(15) Countrywide Pure Premium:	1.202	0.758	1.960
(16) Countrywide Indicated Relativity:	1.600	1.792	.
(17) Countrywide Credibility:	0.390	0.310	.
(18) Countrywide Lost-Time Claims:	283.00	.	.
(19) Pure Premium Underlying Present Rate:	0.924	0.769	1.694
(20) Relativity to Underlying Present Rate:	1.335	2.013	.
(21) Credibility to Underlying Relativity:	0.380	0.300	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	1.305	1.719	.
(24) Balanced Formula Relativity:	1.297	1.720	1.448

Class(es):		Effective: 7/1/2022							Goods and Services		
0083 FARM: CATTLE OR LIVESTOCK RAISING NOC & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	55,904	0	8	0	0	0	5,981	5,981	0.000	0.107	0.107
2015	61,471	0	10	0	38,940	0	6,351	45,292	0.633	0.103	0.737
2016	55,705	0	10	0	535	0	26,041	26,576	0.010	0.467	0.477
2017	76,331	1	4	209,570	2,293	47,716	7,114	266,694	2.776	0.718	3.494
2018	71,854	0	8	0	57,694	0	100,102	157,796	0.803	1.393	2.196
MA Total:	321,265	1	40	209,570	99,463	47,716	145,589	502,338	0.962	0.602	1.564

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.258	1.415	.
(14) Massachusetts Credibility:	0.200	0.280	.
(15) Countrywide Pure Premium:	2.177	1.225	3.403
(16) Countrywide Indicated Relativity:	2.897	2.897	.
(17) Countrywide Credibility:	0.400	0.360	.
(18) Countrywide Lost-Time Claims:	2869.0	.	.
(19) Pure Premium Underlying Present Rate:	1.499	0.845	2.344
(20) Relativity to Underlying Present Rate:	2.165	2.212	.
(21) Credibility to Underlying Relativity:	0.400	0.360	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	2.276	2.236	.
(24) Balanced Formula Relativity:	2.262	2.237	2.253

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Calculation of Class Relativities

Class(es): 0106 TREE PRUNING, SPRAYING, REPAIRING & DRIVERS									Effective: 7/1/2022			Miscellaneous		
Converted Unlimited Losses														
Amount														
Claim Count				Indemnity		Medical		Total	MA Indicated Pure Premiums					
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)			
2014	412,803	6	90	117,049	1,134,302	394,147	873,567	2,519,065	3,031	3,071	6,102			
2015	446,651	8	89	862,069	1,303,881	480,296	722,244	3,368,491	4,849	2,692	7,542			
2016	464,731	5	96	1,148,862	769,758	625,912	742,346	3,286,878	4,128	2,944	7,073			
2017	586,715	2	96	618,009	948,062	606,493	947,453	3,120,017	2,669	2,649	5,318			
2018	659,579	3	114	734,416	3,509,488	426,259	1,749,367	6,419,530	6,434	3,299	9,733			
MA Total:	2,570,479	24	485	3,480,405	7,665,491	2,533,106	5,034,978	18,713,981	4,336	2,944	7,280			

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.948	2.559	.
(14) Massachusetts Credibility:	0.650	1.000	.
(15) Countrywide Pure Premium:	4.317	2.713	7.030
(16) Countrywide Indicated Relativity:	2.034	2.516	.
(17) Countrywide Credibility:	0.180	0.000	.
(18) Countrywide Lost-Time Claims:	3142.0	.	.
(19) Pure Premium Underlying Present Rate:	3.772	2.818	6.590
(20) Relativity to Underlying Present Rate:	1.858	2.745	.
(21) Credibility to Underlying Relativity:	0.170	0.000	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	1.948	2.559	.
(24) Balanced Formula Relativity:	1.944	2.576	2.159

Class(es): 0908 DOMESTIC WORKERS-INSIDE-OCCASIONAL-NOC									Effective: 7/1/2022			Goods and Services		
Converted Unlimited Losses														
Amount														
Claim Count				Indemnity		Medical		Total	MA Indicated Pure Premiums					
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)			
2014	3,338	1	21	81,121	527,071	3,748	185,720	797,659	182.21	56.763	238.97			
2015	3,429	0	21	0	70,232	0	119,939	190,171	20.482	34.979	55.461			
2016	3,528	2	14	79,833	241,820	17,011	162,649	501,314	91.161	50.918	142.08			
2017	3,513	1	16	667	27,311	1,534	58,064	87,576	7.964	16.964	24.927			
2018	3,478	1	18	73,005	179,095	41,751	85,592	379,443	72.486	36.615	109.10			
MA Total:	17,286	5	90	234,626	1,045,529	64,044	611,963	1,956,162	74.056	39.107	113.16			

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	96.820	91.958	.
(14) Massachusetts Credibility:	0.310	0.400	.
(15) Countrywide Pure Premium:	147.54	63.866	211.40
(16) Countrywide Indicated Relativity:	119.95	98.072	.
(17) Countrywide Credibility:	0.350	0.300	.
(18) Countrywide Lost-Time Claims:	463.00	.	.
(19) Pure Premium Underlying Present Rate:	83.779	37.804	121.58
(20) Relativity to Underlying Present Rate:	121.02	98.915	.
(21) Credibility to Underlying Relativity:	0.340	0.300	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	113.14	95.879	.
(24) Balanced Formula Relativity:	112.44	95.929	106.54

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Section IX - Classification Pricing
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Section IX - G
 Exhibit 7

Calculation of Class Relativities

Class(es):										Effective: 7/1/2022		Goods and Services	
0909 DOMESTIC WORKERS-OUTSIDE-OCCASIONAL-INCL OCCASNL PRIV CHAUFF													
Converted Unlimited Losses													
Amount													
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)		
2014	338	0	5	0	47.037	0	92.585	139.622	139.22	274.04	413.27		
2015	336	0	4	0	0	0	2.902	2.902	0.000	8.627	8.627		
2016	342	1	3	2,130	1,802	15,331	3,474	22,737	11,497	54,985	66,482		
2017	299	0	2	0	0	0	30.136	30.136	0.000	100.84	100.84		
2018	294	0	4	0	418	0	9,424	9,841	1,419	32,027	33,445		
MA Total:	1,609	1	18	2,130	49,257	15,331	138,521	205,239	31,930	95,599	127.53		

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	41.745	224.80	.
(14) Massachusetts Credibility:	0.150	0.270	.
(15) Countrywide Pure Premium:	147.43	91.193	238.62
(16) Countrywide Indicated Relativity:	208.29	373.01	.
(17) Countrywide Credibility:	0.140	0.140	.
(18) Countrywide Lost-Time Claims:	8.000	.	.
(19) Pure Premium Underlying Present Rate:	145.48	143.79	289.27
(20) Relativity to Underlying Present Rate:	210.15	376.22	.
(21) Credibility to Underlying Relativity:	0.710	0.590	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	184.63	334.89	.
(24) Balanced Formula Relativity:	183.49	335.06	237.65

Class(es):										Effective: 7/1/2022		Goods and Services	
0917 DOMESTIC SERVICE CONTRACTOR-INSIDE													
Converted Unlimited Losses													
Amount													
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)		
2014	372.616	2	47	804	158.183	1,700	73.409	234.095	0.427	0.202	0.628		
2015	414.630	2	51	155.614	76.835	9,581	162.734	404.764	0.561	0.416	0.976		
2016	446.746	2	59	114.585	255.871	24,918	126.906	522.280	0.829	0.340	1.169		
2017	497.224	3	38	238.567	212.518	70,881	134.900	656.866	0.907	0.414	1.321		
2018	638.553	3	52	145.920	694.316	44,191	276.690	1,161.117	1.316	0.503	1.818		
MA Total:	2,369.770	12	247	655.489	1,397.723	151,270	774.639	2,979.122	0.866	0.391	1.257		

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.133	0.919	.
(14) Massachusetts Credibility:	0.400	0.510	.
(15) Countrywide Pure Premium:	1.506	0.883	2.389
(16) Countrywide Indicated Relativity:	2.004	2.088	.
(17) Countrywide Credibility:	0.300	0.250	.
(18) Countrywide Lost-Time Claims:	890.00	.	.
(19) Pure Premium Underlying Present Rate:	1.203	0.507	1.710
(20) Relativity to Underlying Present Rate:	1.738	1.327	.
(21) Credibility to Underlying Relativity:	0.300	0.240	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	1.576	1.309	.
(24) Balanced Formula Relativity:	1.566	1.310	1.474

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services		
0918 DOMESTIC WORKERS-INSIDE-PHYSICAL ASSISTANCE											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	6,713,372	10	62	425,463	409,741	145,511	146,642	1,127,357	0.124	0.044	0.168
2015	7,313,039	9	80	500,664	807,163	89,145	434,428	1,831,400	0.179	0.072	0.250
2016	6,494,666	7	78	512,096	676,345	109,033	220,942	1,518,416	0.183	0.051	0.234
2017	8,654,614	14	82	661,264	1,637,919	109,968	732,063	3,141,213	0.266	0.097	0.363
2018	8,914,428	10	94	1,080,808	1,546,626	253,003	419,193	3,299,631	0.295	0.075	0.370
MA Total:	38,090,118	50	396	3,180,295	5,077,794	706,660	1,953,269	10,918,018	0.217	0.070	0.287

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.283	0.164	.
(14) Massachusetts Credibility:	0.640	0.750	.
(15) Countrywide Pure Premium:	0.334	0.124	0.458
(16) Countrywide Indicated Relativity:	0.444	0.293	.
(17) Countrywide Credibility:	0.180	0.130	.
(18) Countrywide Lost-Time Claims:	53.000	.	.
(19) Pure Premium Underlying Present Rate:	0.240	0.081	0.322
(20) Relativity to Underlying Present Rate:	0.347	0.213	.
(21) Credibility to Underlying Relativity:	0.180	0.120	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	0.324	0.187	.
(24) Balanced Formula Relativity:	0.322	0.187	0.274

Class(es):		Effective: 7/1/2022							Manufacturing		
1430 SMELTING, SINTERING OR REFINING-LEAD & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	92	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	0	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	92	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.010	0.010	.
(15) Countrywide Pure Premium:	1.202	0.813	2.015
(16) Countrywide Indicated Relativity:	1.434	1.862	.
(17) Countrywide Credibility:	0.320	0.340	.
(18) Countrywide Lost-Time Claims:	68.000	.	.
(19) Pure Premium Underlying Present Rate:	1.850	0.846	2.696
(20) Relativity to Underlying Present Rate:	2.266	2.012	.
(21) Credibility to Underlying Relativity:	0.670	0.650	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.977	1.941	.
(24) Balanced Formula Relativity:	1.969	1.926	1.954

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing			
1438 SMELTING, SINTERING OR REFINING-METALS-NOT IRON OR LEAD-NOC & D												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical					MA Indicated Pure Premiums	
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2014	141,023	1	19	82,832	56,450	6,672	111,914	257,869	0.988	0.841	1.829	
2015	135,407	0	18	0	29,972	0	37,716	67,688	0.221	0.279	0.500	
2016	128,957	0	13	0	5,938	0	30,924	36,862	0.046	0.240	0.286	
2017	144,211	0	16	0	104,485	0	72,024	176,508	0.725	0.499	1.224	
2018	156,408	0	23	0	48,722	0	86,414	135,136	0.312	0.552	0.864	
MA Total:	706,007	1	89	82,832	245,567	6,672	338,992	674,063	0.465	0.490	0.955	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.506	1.017	.
(14) Massachusetts Credibility:	0.270	0.360	.
(15) Countrywide Pure Premium:	2.375	1.051	3.425
(16) Countrywide Indicated Relativity:	2.832	2.405	.
(17) Countrywide Credibility:	0.370	0.320	.
(18) Countrywide Lost-Time Claims:	704.00	.	.
(19) Pure Premium Underlying Present Rate:	1.500	0.695	2.195
(20) Relativity to Underlying Present Rate:	1.837	1.654	.
(21) Credibility to Underlying Relativity:	0.360	0.320	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.846	1.665	.
(24) Balanced Formula Relativity:	1.839	1.653	1.775

Class(es):		Effective: 7/1/2022							Manufacturing			
1463 ASPHALT WORKS & DRIVERS												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical					MA Indicated Pure Premiums	
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2014	137,912	4	25	916,026	193,396	574,233	151,917	1,835,572	8.044	5.265	13.310	
2015	81,397	1	12	238,150	141,325	36,947	234,352	650,773	4.662	3.333	7.995	
2016	89,008	2	24	517,056	444,238	631,010	395,829	1,988,133	10.800	11.536	22.337	
2017	103,477	2	21	133,290	502,583	45,608	206,048	887,529	6.145	2.432	8.577	
2018	97,814	0	26	0	821,965	0	391,823	1,213,788	8.403	4.006	12.409	
MA Total:	509,608	9	108	1,804,521	2,103,508	1,287,798	1,379,969	6,575,795	7.669	5.235	12.904	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	8.349	10.869	.
(14) Massachusetts Credibility:	0.360	0.580	.
(15) Countrywide Pure Premium:	3.669	1.841	5.509
(16) Countrywide Indicated Relativity:	4.375	4.214	.
(17) Countrywide Credibility:	0.320	0.210	.
(18) Countrywide Lost-Time Claims:	598.00	.	.
(19) Pure Premium Underlying Present Rate:	4.187	3.286	7.473
(20) Relativity to Underlying Present Rate:	5.127	7.816	.
(21) Credibility to Underlying Relativity:	0.320	0.210	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	6.046	8.830	.
(24) Balanced Formula Relativity:	6.023	8.766	6.967

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Section IX - Classification Pricing
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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Miscellaneous		
1624 QUARRY NOC & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	492,709	3	62	400,638	364,052	201,997	379,072	1,345,759	1,552	1,179	2,731
2015	500,603	1	78	16,901	246,106	4,084	385,870	652,961	0,525	0,779	1,304
2016	496,311	2	63	576,895	900,271	145,873	463,395	2,086,433	2,976	1,228	4,204
2017	514,950	3	68	248,321	524,789	74,373	310,891	1,158,373	1,501	0,748	2,249
2018	550,723	1	66	444,907	1,337,699	251,420	833,824	2,867,850	3,237	1,971	5,207
MA Total:	2,555,296	10	337	1,687,663	3,372,917	677,746	2,373,051	8,111,377	1,980	1,194	3,174

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.890	1.038	.
(14) Massachusetts Credibility:	0.460	0.660	.
(15) Countrywide Pure Premium:	1.529	0.769	2.298
(16) Countrywide Indicated Relativity:	0.720	0.713	.
(17) Countrywide Credibility:	0.270	0.170	.
(18) Countrywide Lost-Time Claims:	1173.0	.	.
(19) Pure Premium Underlying Present Rate:	1.594	0.901	2.495
(20) Relativity to Underlying Present Rate:	0.785	0.878	.
(21) Credibility to Underlying Relativity:	0.270	0.170	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	0.816	0.955	.
(24) Balanced Formula Relativity:	0.814	0.962	0.864

Class(es):		Effective: 7/1/2022							Miscellaneous		
1655 LIME MFG-QUARRY-SURFACE & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	3,780	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	6,197	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	3,319	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	2,018	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	462	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	15,776	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.050	0.070	.
(15) Countrywide Pure Premium:	0.800	0.392	1.192
(16) Countrywide Indicated Relativity:	0.377	0.363	.
(17) Countrywide Credibility:	0.170	0.180	.
(18) Countrywide Lost-Time Claims:	13.000	.	.
(19) Pure Premium Underlying Present Rate:	1.148	0.554	1.702
(20) Relativity to Underlying Present Rate:	0.566	0.540	.
(21) Credibility to Underlying Relativity:	0.780	0.750	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	0.505	0.470	.
(24) Balanced Formula Relativity:	0.504	0.473	0.494

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Section IX - Classification Pricing
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Section IX - G
 Exhibit 11

Calculation of Class Relativities

Class(es): 1701 CEMENT MFG		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	8,079	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	6,989	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	1,876	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	422	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	710	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	18,076	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.050	0.070	.
(15) Countrywide Pure Premium:	1.134	0.604	1.738
(16) Countrywide Indicated Relativity:	1.352	1.382	.
(17) Countrywide Credibility:	0.480	0.470	.
(18) Countrywide Lost-Time Claims:	460.00	.	.
(19) Pure Premium Underlying Present Rate:	1.007	0.477	1.484
(20) Relativity to Underlying Present Rate:	1.233	1.134	.
(21) Credibility to Underlying Relativity:	0.470	0.460	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.229	1.171	.
(24) Balanced Formula Relativity:	1.224	1.163	1.203

Class(es): 1747 EMERY WORKS & DRIVERS		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	46,843	2	6	179,455	23,979	202,184	18,560	424,178	4,343	4,712	9,055
2015	47,083	0	9	0	15,098	0	16,794	31,892	0.321	0.357	0.677
2016	46,528	0	9	0	12,991	0	14,723	27,714	0.279	0.316	0.596
2017	52,458	0	3	0	596	0	969	1,565	0.011	0.018	0.030
2018	53,351	0	3	0	11,124	0	1,379	12,503	0.209	0.026	0.234
MA Total:	246,263	2	30	179,455	63,788	202,184	52,425	497,853	0.988	1.034	2.022

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.075	2.147	.
(14) Massachusetts Credibility:	0.160	0.230	.
(15) Countrywide Pure Premium:	0.885	0.387	1.272
(16) Countrywide Indicated Relativity:	1.056	0.885	.
(17) Countrywide Credibility:	0.300	0.320	.
(18) Countrywide Lost-Time Claims:	56.000	.	.
(19) Pure Premium Underlying Present Rate:	1.231	0.684	1.915
(20) Relativity to Underlying Present Rate:	1.507	1.628	.
(21) Credibility to Underlying Relativity:	0.540	0.450	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.303	1.509	.
(24) Balanced Formula Relativity:	1.298	1.498	1.367

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
1748 ABRASIVE WHEEL MFG & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	40,371	0	14	0	3,833	0	18,444	22,277	0.095	0.457	0.552
2015	38,198	0	9	0	25,344	0	51,092	76,437	0.663	1.338	2.001
2016	43,459	1	8	154,203	3,138	54,229	16,103	227,674	3.620	1.618	5.239
2017	50,469	0	12	0	23,315	0	14,691	38,007	0.462	0.291	0.753
2018	51,014	0	7	0	0	0	6,759	6,759	0.000	0.132	0.132
MA Total:	223,511	1	50	154,203	55,631	54,229	107,090	371,153	0.939	0.722	1.661

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.022	1.499	.
(14) Massachusetts Credibility:	0.150	0.250	.
(15) Countrywide Pure Premium:	1.618	1.243	2.861
(16) Countrywide Indicated Relativity:	1.929	2.846	.
(17) Countrywide Credibility:	0.300	0.320	.
(18) Countrywide Lost-Time Claims:	58.000	.	.
(19) Pure Premium Underlying Present Rate:	1.133	0.881	2.013
(20) Relativity to Underlying Present Rate:	1.387	2.094	.
(21) Credibility to Underlying Relativity:	0.550	0.430	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.495	2.186	.
(24) Balanced Formula Relativity:	1.489	2.170	1.723

Class(es):		Effective: 7/1/2022							Manufacturing		
1853 MICA GOODS MFG & MICA PREPARING											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	1,611	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	1,161	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	840	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	957	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	957	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	5,525	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.030	0.030	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	0.821	0.465	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	0.679	0.198	0.876
(20) Relativity to Underlying Present Rate:	0.831	0.471	.
(21) Credibility to Underlying Relativity:	0.970	0.970	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.806	0.456	.
(24) Balanced Formula Relativity:	0.803	0.453	0.683

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing			
1924 WIRE DRAWING OR CABLE MFG-NOT IRON OR STEEL												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2014	142,738	0	20	0	120,604	0	47,306	167,910	0.845	0.331	1.176	
2015	152,446	0	23	0	26,365	0	39,498	65,863	0.173	0.259	0.432	
2016	149,172	1	19	87,186	298,256	8,895	161,489	555,826	2.584	1.142	3.726	
2017	126,667	0	22	0	33,583	0	55,711	89,294	0.265	0.440	0.705	
2018	138,111	1	16	81,582	185,956	33,833	115,417	416,787	1.937	1.081	3.018	
MA Total:	709,134	2	100	168,768	664,763	42,728	419,420	1,295,680	1.175	0.652	1.827	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.280	1.353	.
(14) Massachusetts Credibility:	0.230	0.310	.
(15) Countrywide Pure Premium:	0.918	0.512	1.430
(16) Countrywide Indicated Relativity:	1.095	1.172	.
(17) Countrywide Credibility:	0.390	0.350	.
(18) Countrywide Lost-Time Claims:	499.00	.	.
(19) Pure Premium Underlying Present Rate:	1.014	0.467	1.481
(20) Relativity to Underlying Present Rate:	1.241	1.111	.
(21) Credibility to Underlying Relativity:	0.380	0.340	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.193	1.207	.
(24) Balanced Formula Relativity:	1.189	1.198	1.192

Class(es):		Effective: 7/1/2022							Manufacturing			
1925 DIE CASTING MFG												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2014	3,090	0	0	0	0	0	0	0	0.000	0.000	0.000	
2015	240	0	0	0	0	0	0	0	0.000	0.000	0.000	
2016	185	0	1	0	253	0	623	876	1.367	3.362	4.729	
2017	0	0	0	0	0	0	0	0	0.000	0.000	0.000	
2018	0	0	0	0	0	0	0	0	0.000	0.000	0.000	
MA Total:	3,515	0	1	0	253	0	623	876	0.072	0.177	0.249	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.078	0.368	.
(14) Massachusetts Credibility:	0.030	0.130	.
(15) Countrywide Pure Premium:	1.515	0.960	2.474
(16) Countrywide Indicated Relativity:	1.806	2.197	.
(17) Countrywide Credibility:	0.490	0.440	.
(18) Countrywide Lost-Time Claims:	704.00	.	.
(19) Pure Premium Underlying Present Rate:	1.779	11.296	13.075
(20) Relativity to Underlying Present Rate:	2.178	26.865	.
(21) Credibility to Underlying Relativity:	0.480	0.430	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.933	12.567	.
(24) Balanced Formula Relativity:	1.926	12.474	5.554

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Section IX - Classification Pricing
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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
2003 BAKERY & DRIVERS, ROUTE SUPERVISORS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums		
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	2,017,733	16	298	1,799,871	3,165,888	690,315	1,602,555	7,258,629	2,461	1,136	3,597
2015	2,132,914	9	325	781,689	2,428,944	167,092	1,603,317	4,981,043	1,505	0,830	2,335
2016	2,279,377	10	291	1,199,456	3,108,235	349,195	1,478,408	6,135,294	1,890	0,802	2,692
2017	2,509,327	10	336	933,096	3,455,477	238,423	1,628,417	6,255,413	1,749	0,744	2,493
2018	2,686,597	11	340	1,279,165	3,959,591	289,456	1,898,997	7,427,209	1,950	0,815	2,765
MA Total:	11,625,948	56	1,590	5,993,277	16,118,135	1,734,481	8,211,695	32,057,588	1,902	0,856	2,757

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.071	1.776	.
(14) Massachusetts Credibility:	0.860	1.000	.
(15) Countrywide Pure Premium:	1.526	0.711	2.237
(16) Countrywide Indicated Relativity:	1.820	1.627	.
(17) Countrywide Credibility:	0.070	0.000	.
(18) Countrywide Lost-Time Claims:	6356.0	.	.
(19) Pure Premium Underlying Present Rate:	1.646	0.750	2.396
(20) Relativity to Underlying Present Rate:	2.016	1.784	.
(21) Credibility to Underlying Relativity:	0.070	0.000	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	2.049	1.776	.
(24) Balanced Formula Relativity:	2.041	1.763	1.946

Class(es):		Effective: 7/1/2022							Manufacturing		
2014 GRAIN MILLING											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums		
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	1,984	0	1	0	0	0	106	106	0.000	0.053	0.053
2015	1,861	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	2,168	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	2,351	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	1,740	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	10,105	0	1	0	0	0	106	106	0.000	0.010	0.010

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.022	.
(14) Massachusetts Credibility:	0.050	0.070	.
(15) Countrywide Pure Premium:	2.018	1.120	3.137
(16) Countrywide Indicated Relativity:	2.406	2.563	.
(17) Countrywide Credibility:	0.480	0.470	.
(18) Countrywide Lost-Time Claims:	1270.0	.	.
(19) Pure Premium Underlying Present Rate:	1.718	0.772	2.490
(20) Relativity to Underlying Present Rate:	2.103	1.836	.
(21) Credibility to Underlying Relativity:	0.470	0.460	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	2.144	2.051	.
(24) Balanced Formula Relativity:	2.135	2.036	2.101

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
2021 SUGAR REFINING-ALL OPERATIONS & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	1,850	0	1	0	0	0	474	474	0.000	0.256	0.256
2015	4,600	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	4,223	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	2,135	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	1,410	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	14,219	0	1	0	0	0	474	474	0.000	0.033	0.033

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.069	.
(14) Massachusetts Credibility:	0.050	0.070	.
(15) Countrywide Pure Premium:	1.409	0.835	2.245
(16) Countrywide Indicated Relativity:	1.681	1.912	.
(17) Countrywide Credibility:	0.480	0.470	.
(18) Countrywide Lost-Time Claims:	292.00	.	.
(19) Pure Premium Underlying Present Rate:	1.034	0.521	1.555
(20) Relativity to Underlying Present Rate:	1.266	1.239	.
(21) Credibility to Underlying Relativity:	0.470	0.460	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.402	1.473	.
(24) Balanced Formula Relativity:	1.397	1.463	1.419

Class(es):		Effective: 7/1/2022							Manufacturing		
2039 ICE CREAM MFG & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	160,530	3	35	386,124	94,462	135,993	143,913	760,492	2,994	1,744	4,737
2015	173,109	3	33	310,753	127,436	70,116	113,474	621,780	2,531	1,061	3,592
2016	132,001	2	22	243,777	304,795	19,427	110,086	678,084	4,156	0,981	5,137
2017	59,707	0	7	0	2,849	0	4,704	7,552	0,048	0,079	0,126
2018	59,489	0	41	0	174,539	0	146,581	321,120	2,934	2,464	5,398
MA Total:	584,835	8	138	940,654	704,081	225,536	518,757	2,389,028	2,812	1,273	4,085

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.062	2.642	.
(14) Massachusetts Credibility:	0.250	0.350	.
(15) Countrywide Pure Premium:	1.211	0.537	1.748
(16) Countrywide Indicated Relativity:	1.444	1.229	.
(17) Countrywide Credibility:	0.380	0.330	.
(18) Countrywide Lost-Time Claims:	398.00	.	.
(19) Pure Premium Underlying Present Rate:	1.557	0.809	2.366
(20) Relativity to Underlying Present Rate:	1.906	1.924	.
(21) Credibility to Underlying Relativity:	0.370	0.320	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	2.020	1.946	.
(24) Balanced Formula Relativity:	2.012	1.932	1.984

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Calculation of Class Relativities

Class(es): 2041 CONFECTION MFG		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	216,574	4	16	221,231	325,687	17,567	172,094	736,578	2,525	0.876	3.401
2015	235,757	0	16	0	30,201	0	45,431	75,632	0.128	0.193	0.321
2016	217,288	0	17	0	250,470	0	155,864	406,335	1.153	0.717	1.870
2017	175,099	0	21	0	26,144	0	46,234	72,378	0.149	0.264	0.413
2018	103,393	0	7	0	25,836	0	12,538	38,375	0.250	0.121	0.371
MA Total:	948,111	4	77	221,231	658,339	17,567	432,161	1,329,297	0.928	0.474	1.402

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.010	0.985	.
(14) Massachusetts Credibility:	0.270	0.350	.
(15) Countrywide Pure Premium:	1.212	0.543	1.755
(16) Countrywide Indicated Relativity:	1.446	1.242	.
(17) Countrywide Credibility:	0.370	0.330	.
(18) Countrywide Lost-Time Claims:	1023.0	.	.
(19) Pure Premium Underlying Present Rate:	1.106	0.488	1.594
(20) Relativity to Underlying Present Rate:	1.355	1.160	.
(21) Credibility to Underlying Relativity:	0.360	0.320	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.295	1.126	.
(24) Balanced Formula Relativity:	1.290	1.118	1.231

Class(es): 2070 CREAMERY OR DAIRY & ROUTE SUPERVISORS, DRIVERS		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	298,686	4	31	432,064	204,756	199,069	116,889	952,778	2.132	1.058	3.190
2015	297,353	1	28	253,305	40,411	58,077	124,087	475,879	0.988	0.613	1.600
2016	148,130	0	13	0	167,520	0	63,111	230,631	1.131	0.426	1.557
2017	150,023	1	14	925	62,649	623	60,698	124,895	0.424	0.409	0.833
2018	151,559	1	17	25,174	62,481	13,767	41,363	142,784	0.578	0.364	0.942
MA Total:	1,045,751	7	103	711,468	537,816	271,536	406,147	1,926,967	1.195	0.648	1.843

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.301	1.346	.
(14) Massachusetts Credibility:	0.330	0.420	.
(15) Countrywide Pure Premium:	1.948	0.819	2.767
(16) Countrywide Indicated Relativity:	2.323	1.876	.
(17) Countrywide Credibility:	0.340	0.290	.
(18) Countrywide Lost-Time Claims:	3449.0	.	.
(19) Pure Premium Underlying Present Rate:	1.644	0.704	2.347
(20) Relativity to Underlying Present Rate:	2.013	1.673	.
(21) Credibility to Underlying Relativity:	0.330	0.290	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.883	1.594	.
(24) Balanced Formula Relativity:	1.876	1.583	1.775

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Calculation of Class Relativities

Class(es): 2081 BUTCHERING		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	18,882	0	10	0	38	0	5,565	5,602	0.002	0.295	0.297
2015	21,751	0	7	0	3,237	0	5,740	8,977	0.149	0.264	0.413
2016	25,569	0	5	0	5,975	0	9,361	15,336	0.234	0.366	0.600
2017	27,808	0	16	0	23,425	0	31,162	54,587	0.842	1.121	1.963
2018	32,556	1	19	36,617	30,848	14,295	61,967	143,728	2.072	2.343	4.415
MA Total:	126,565	1	57	36,617	63,524	14,295	113,794	228,230	0.791	1.012	1.803

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.861	2.101	.
(14) Massachusetts Credibility:	0.120	0.180	.
(15) Countrywide Pure Premium:	1.086	0.717	1.803
(16) Countrywide Indicated Relativity:	1.296	1.641	.
(17) Countrywide Credibility:	0.440	0.410	.
(18) Countrywide Lost-Time Claims:	922.00	.	.
(19) Pure Premium Underlying Present Rate:	1.063	0.721	1.784
(20) Relativity to Underlying Present Rate:	1.301	1.715	.
(21) Credibility to Underlying Relativity:	0.440	0.410	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.246	1.754	.
(24) Balanced Formula Relativity:	1.241	1.741	1.413

Class(es): 2089 PACKING HOUSE- ALL OPERATIONS		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	1,419,367	7	216	680,142	635,172	234,068	407,208	1,956,591	0.927	0.452	1.378
2015	1,658,375	14	222	1,797,978	1,427,662	437,023	837,692	4,500,354	1.945	0.769	2.714
2016	1,732,079	5	244	649,123	982,980	113,432	589,036	2,334,571	0.942	0.406	1.348
2017	1,971,416	8	271	612,591	2,395,592	102,075	1,020,194	4,130,452	1.526	0.569	2.095
2018	2,112,369	5	327	749,739	2,414,105	602,394	1,062,625	4,828,863	1.498	0.788	2.286
MA Total:	8,893,607	39	1,280	4,489,573	7,855,510	1,488,992	3,916,754	17,750,830	1.388	0.608	1.996

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.511	1.262	.
(14) Massachusetts Credibility:	0.690	0.870	.
(15) Countrywide Pure Premium:	1.157	0.619	1.776
(16) Countrywide Indicated Relativity:	1.380	1.417	.
(17) Countrywide Credibility:	0.160	0.070	.
(18) Countrywide Lost-Time Claims:	10764	.	.
(19) Pure Premium Underlying Present Rate:	1.247	0.514	1.761
(20) Relativity to Underlying Present Rate:	1.527	1.222	.
(21) Credibility to Underlying Relativity:	0.150	0.060	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.493	1.270	.
(24) Balanced Formula Relativity:	1.487	1.261	1.409

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Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2022

Section IX - G
 Exhibit 18

Calculation of Class Relativities

Class(es): 2095 MEAT PRODUCTS MFG-NOC		Effective: 7/1/2022							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums	
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	398,697	1	59	21,253	227,608	1,402	132,122	382,385	0.624	0.335	0.959
2015	406,845	4	60	566,987	414,743	109,537	161,156	1,252,424	2.413	0.665	3.078
2016	473,075	1	72	2,185	284,001	5,477	150,498	442,161	0.605	0.330	0.935
2017	493,673	2	78	223,216	435,942	71,077	243,463	973,698	1.335	0.637	1.972
2018	573,447	2	79	78,420	256,011	61,474	170,973	566,878	0.583	0.405	0.989
MA Total:	2,345,736	10	348	892,061	1,618,305	248,967	858,212	3,617,546	1.070	0.472	1.542

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.165	0.980	.
(14) Massachusetts Credibility:	0.420	0.530	.
(15) Countrywide Pure Premium:	1.514	0.857	2.371
(16) Countrywide Indicated Relativity:	1.805	1.963	.
(17) Countrywide Credibility:	0.290	0.240	.
(18) Countrywide Lost-Time Claims:	3887.0	.	.
(19) Pure Premium Underlying Present Rate:	1.396	0.558	1.955
(20) Relativity to Underlying Present Rate:	1.710	1.328	.
(21) Credibility to Underlying Relativity:	0.290	0.230	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.509	1.296	.
(24) Balanced Formula Relativity:	1.503	1.286	1.428

Class(es): 2111 CANNERY NOC		Effective: 7/1/2022							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums	
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	7,438	0	1	0	1,531	0	1,506	3,037	0.206	0.202	0.408
2015	9,343	0	1	0	0	0	281	281	0.000	0.030	0.030
2016	10,683	0	2	0	45,174	0	22,518	67,692	4.229	2.108	6.337
2017	4,054	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	17,365	0	4	0	1,958	0	3,762	5,720	0.113	0.217	0.329
MA Total:	48,882	0	8	0	48,663	0	28,066	76,729	0.996	0.574	1.570

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.084	1.192	.
(14) Massachusetts Credibility:	0.080	0.110	.
(15) Countrywide Pure Premium:	0.971	0.548	1.519
(16) Countrywide Indicated Relativity:	1.158	1.254	.
(17) Countrywide Credibility:	0.460	0.450	.
(18) Countrywide Lost-Time Claims:	1032.0	.	.
(19) Pure Premium Underlying Present Rate:	0.936	0.486	1.422
(20) Relativity to Underlying Present Rate:	1.146	1.156	.
(21) Credibility to Underlying Relativity:	0.460	0.440	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.146	1.204	.
(24) Balanced Formula Relativity:	1.142	1.195	1.160

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Section IX - G
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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
2115 SEAFOOD PRODUCTS MFG-NOC											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	178,880	2	28	678,388	284,161	64,319	100,427	1,127,296	5,381	0,921	6,302
2015	173,410	2	47	513,763	488,920	78,688	308,845	1,390,216	5,782	2,235	8,017
2016	69,585	0	21	0	62,668	0	97,936	160,604	0,901	1,407	2,308
2017	71,351	0	18	0	17,388	0	29,036	46,424	0,244	0,407	0,651
2018	63,005	1	13	10,120	215,101	4,739	219,686	449,646	3,575	3,562	7,137
MA Total:	556,231	5	127	1,202,271	1,068,238	147,746	755,931	3,174,186	4,082	1,625	5,707

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	4.444	3.373	.
(14) Massachusetts Credibility:	0.310	0.380	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	3.142	2.460	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	2.598	1.047	3.645
(20) Relativity to Underlying Present Rate:	3.182	2.490	.
(21) Credibility to Underlying Relativity:	0.690	0.620	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	3.573	2.825	.
(24) Balanced Formula Relativity:	3.559	2.805	3.300

Class(es):		Effective: 7/1/2022							Manufacturing		
2121 BREWERY & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	114,534	0	15	0	2,880	0	9,846	12,726	0,025	0,086	0,111
2015	159,804	0	22	0	149,543	0	56,067	205,610	0,936	0,351	1,287
2016	211,012	0	45	0	498,265	0	266,898	765,164	2,361	1,265	3,626
2017	307,327	1	38	45,850	26,006	11,632	43,385	126,873	0,234	0,179	0,413
2018	348,508	0	36	0	47,987	0	52,929	100,916	0,138	0,152	0,290
MA Total:	1,141,184	1	156	45,850	724,682	11,632	429,126	1,211,290	0,675	0,386	1,061

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.735	0.802	.
(14) Massachusetts Credibility:	0.230	0.310	.
(15) Countrywide Pure Premium:	0.656	0.355	1.011
(16) Countrywide Indicated Relativity:	0.783	0.812	.
(17) Countrywide Credibility:	0.390	0.350	.
(18) Countrywide Lost-Time Claims:	608.00	.	.
(19) Pure Premium Underlying Present Rate:	0.619	0.309	0.928
(20) Relativity to Underlying Present Rate:	0.758	0.735	.
(21) Credibility to Underlying Relativity:	0.380	0.340	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.762	0.783	.
(24) Balanced Formula Relativity:	0.759	0.777	0.765

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Section IX - G
 Exhibit 20

Calculation of Class Relativities

Class(es): 2130 SPIRITUOUS LIQUOR DISTILLERY		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	4,230	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	13,861	0	1	0	0	0	1,193	1,193	0.000	0.086	0.086
2016	9,836	0	1	0	0	0	873	873	0.000	0.089	0.089
2017	9,182	0	1	0	0	0	981	981	0.000	0.107	0.107
2018	14,640	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	51,750	0	3	0	0	0	3,047	3,047	0.000	0.059	0.059

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.122	.
(14) Massachusetts Credibility:	0.070	0.090	.
(15) Countrywide Pure Premium:	0.750	0.434	1.185
(16) Countrywide Indicated Relativity:	0.895	0.994	.
(17) Countrywide Credibility:	0.470	0.460	.
(18) Countrywide Lost-Time Claims:	279.00	.	.
(19) Pure Premium Underlying Present Rate:	0.636	0.319	0.954
(20) Relativity to Underlying Present Rate:	0.778	0.758	.
(21) Credibility to Underlying Relativity:	0.460	0.450	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.779	0.809	.
(24) Balanced Formula Relativity:	0.776	0.804	0.785

Class(es): 2131 SPIRITUOUS LIQUOR BOTTLING		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	64,419	0	18	0	306,274	0	136,305	442,579	4,754	2,116	6,870
2015	56,368	0	18	0	18,051	0	21,286	39,336	0.320	0.378	0.698
2016	58,005	0	26	0	389,741	0	102,773	492,514	6,719	1,772	8,491
2017	64,821	0	19	0	22,936	0	50,336	73,272	0.354	0.777	1.130
2018	62,202	0	25	0	236,868	0	168,850	405,717	3,808	2,715	6,523
MA Total:	305,816	0	106	0	973,869	0	479,550	1,453,418	3.184	1.568	4.753

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.467	3.256	.
(14) Massachusetts Credibility:	0.180	0.250	.
(15) Countrywide Pure Premium:	0.641	0.374	1.015
(16) Countrywide Indicated Relativity:	0.765	0.855	.
(17) Countrywide Credibility:	0.410	0.380	.
(18) Countrywide Lost-Time Claims:	153.00	.	.
(19) Pure Premium Underlying Present Rate:	1.257	0.639	1.896
(20) Relativity to Underlying Present Rate:	1.540	1.519	.
(21) Credibility to Underlying Relativity:	0.410	0.370	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.569	1.701	.
(24) Balanced Formula Relativity:	1.563	1.689	1.606

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Calculation of Class Relativities

Class(es): 2143 FRUIT JUICE MFG		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	46,627	0	8	0	168	0	7,274	7,442	0.004	0.156	0.160
2015	57,914	1	18	177,133	65,188	33,830	63,583	339,734	4.184	1.682	5.866
2016	62,149	0	11	0	8,158	0	7,398	15,557	0.131	0.119	0.250
2017	71,778	1	8	572,479	7,932	25,585	2,778	608,773	8.086	0.395	8.481
2018	74,426	0	14	0	9,030	0	17,720	26,750	0.121	0.238	0.359
MA Total:	312,894	2	59	749,613	90,476	59,415	98,754	998,257	2.685	0.506	3.190

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.923	1.050	.
(14) Massachusetts Credibility:	0.170	0.220	.
(15) Countrywide Pure Premium:	1.044	0.505	1.550
(16) Countrywide Indicated Relativity:	1.245	1.157	.
(17) Countrywide Credibility:	0.420	0.390	.
(18) Countrywide Lost-Time Claims:	287.00	.	.
(19) Pure Premium Underlying Present Rate:	1.058	0.449	1.507
(20) Relativity to Underlying Present Rate:	1.296	1.068	.
(21) Credibility to Underlying Relativity:	0.410	0.390	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.551	1.099	.
(24) Balanced Formula Relativity:	1.545	1.091	1.389

Class(es): 2150 ICE MFG		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	6,795	0	2	0	2,265	0	2,208	4,473	0.333	0.325	0.658
2015	7,338	0	1	0	3,137	0	1,486	4,623	0.428	0.202	0.630
2016	11,932	0	2	0	0	0	1,528	1,528	0.000	0.128	0.128
2017	11,783	0	3	0	50,090	0	42,624	92,714	4.251	3.617	7.868
2018	11,938	0	2	0	0	0	1,291	1,291	0.000	0.108	0.108
MA Total:	49,785	0	10	0	55,492	0	49,137	104,629	1.115	0.987	2.102

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.214	2.049	.
(14) Massachusetts Credibility:	0.100	0.140	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	2.019	2.037	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	1.669	0.867	2.536
(20) Relativity to Underlying Present Rate:	2.044	2.062	.
(21) Credibility to Underlying Relativity:	0.900	0.860	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.961	2.060	.
(24) Balanced Formula Relativity:	1.954	2.045	1.985

IX 000091

Calculation of Class Relativities

Class(es): 2156 BOTTLING-NOT CARBONATED LIQUIDS OR SPIRIT LIQRS & RTE SUP,DR									Effective: 7/1/2022 Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums	
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	77,369	0	14	0	24,993	0	55,187	80,180	0.323	0.713	1.036
2015	89,808	1	11	29,134	108,600	71,133	34,131	242,998	1.534	1.172	2.706
2016	92,127	1	9	89,623	43,755	26,335	49,894	209,607	1.448	0.827	2.275
2017	113,880	0	10	0	127,992	0	84,910	212,902	1.124	0.746	1.870
2018	115,290	0	17	0	17,414	0	33,801	51,214	0.151	0.293	0.444
MA Total:	488,473	2	61	118,757	322,754	97,468	257,923	796,902	0.904	0.728	1.631

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.984	1.511	.
(14) Massachusetts Credibility:	0.250	0.360	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	2.210	2.342	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	1.827	0.997	2.824
(20) Relativity to Underlying Present Rate:	2.238	2.371	.
(21) Credibility to Underlying Relativity:	0.750	0.640	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.924	2.061	.
(24) Balanced Formula Relativity:	1.917	2.046	1.961

Class(es): 2157 BOTTLING NOC & ROUTE SUPERVISORS, DRIVERS									Effective: 7/1/2022 Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums	
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	322,436	1	83	74,440	301,507	12,419	237,267	625,633	1.166	0.774	1.940
2015	344,869	1	89	235,108	505,169	32,326	310,347	1,082,949	2.147	0.994	3.140
2016	362,709	1	95	128,579	800,840	24,441	308,376	1,262,235	2.562	0.918	3.480
2017	404,074	2	119	595,008	669,613	159,039	288,733	1,712,393	3.130	1.108	4.238
2018	480,417	1	143	127,683	929,928	147,060	405,123	1,609,794	2.201	1.149	3.351
MA Total:	1,914,505	6	529	1,160,817	3,207,057	375,284	1,549,845	6,293,004	2.281	1.006	3.287

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.484	2.088	.
(14) Massachusetts Credibility:	0.440	0.550	.
(15) Countrywide Pure Premium:	1.993	0.776	2.769
(16) Countrywide Indicated Relativity:	2.377	1.776	.
(17) Countrywide Credibility:	0.280	0.230	.
(18) Countrywide Lost-Time Claims:	5768.0	.	.
(19) Pure Premium Underlying Present Rate:	1.858	0.742	2.600
(20) Relativity to Underlying Present Rate:	2.276	1.764	.
(21) Credibility to Underlying Relativity:	0.280	0.220	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	2.396	1.945	.
(24) Balanced Formula Relativity:	2.386	1.931	2.230

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Section IX - Classification Pricing
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Section IX - G
 Exhibit 23

Calculation of Class Relativities

Class(es): 2172 CIGARETTE MFG		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	1,669	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	0	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	1,669	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.020	0.020	.
(15) Countrywide Pure Premium:	0.881	0.366	1.247
(16) Countrywide Indicated Relativity:	1.051	0.838	.
(17) Countrywide Credibility:	0.490	0.490	.
(18) Countrywide Lost-Time Claims:	282.00	.	.
(19) Pure Premium Underlying Present Rate:	0.851	0.298	1.149
(20) Relativity to Underlying Present Rate:	1.042	0.710	.
(21) Credibility to Underlying Relativity:	0.490	0.490	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.025	0.758	.
(24) Balanced Formula Relativity:	1.021	0.753	0.929

Class(es): 2211 COTTON BATTING,WADDING OR WASTE MFG		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	468	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	263	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	858	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	2,367	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	3,955	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.040	0.060	.
(15) Countrywide Pure Premium:	2.800	1.430	4.230
(16) Countrywide Indicated Relativity:	3.339	3.274	.
(17) Countrywide Credibility:	0.300	0.320	.
(18) Countrywide Lost-Time Claims:	58.000	.	.
(19) Pure Premium Underlying Present Rate:	2.539	1.352	3.891
(20) Relativity to Underlying Present Rate:	3.109	3.216	.
(21) Credibility to Underlying Relativity:	0.660	0.620	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	3.054	3.042	.
(24) Balanced Formula Relativity:	3.042	3.020	3.034

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Section IX - Classification Pricing
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 7/1/2022

Section IX - G
 Exhibit 24

Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
2220 YARN OR THREAD MFG-COTTON											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	94,001	0	25	0	53,976	0	52,200	106,176	0.574	0.555	1.130
2015	96,917	1	17	6,017	505	656	13,466	20,643	0.067	0.146	0.213
2016	105,665	2	24	227,148	130,512	61,520	38,144	457,324	3.385	0.943	4.328
2017	106,153	0	21	0	193,245	0	93,785	287,030	1.820	0.883	2.704
2018	103,224	0	23	0	394,412	0	328,081	722,493	3.821	3.178	6.999
MA Total:	505,960	3	110	233,165	772,650	62,176	525,675	1,593,666	1.988	1.162	3.150

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.164	2.412	.
(14) Massachusetts Credibility:	0.200	0.280	.
(15) Countrywide Pure Premium:	0.827	0.450	1.277
(16) Countrywide Indicated Relativity:	0.986	1.030	.
(17) Countrywide Credibility:	0.400	0.360	.
(18) Countrywide Lost-Time Claims:	811.00	.	.
(19) Pure Premium Underlying Present Rate:	0.967	0.503	1.470
(20) Relativity to Underlying Present Rate:	1.185	1.197	.
(21) Credibility to Underlying Relativity:	0.400	0.360	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.301	1.477	.
(24) Balanced Formula Relativity:	1.296	1.466	1.355

Class(es):		Effective: 7/1/2022							Manufacturing		
2260 WOOL COMBING OR SCOURING											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	488	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	522	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	522	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	534	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	324	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	2,390	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.030	0.040	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	3.005	2.455	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	2.485	1.045	3.530
(20) Relativity to Underlying Present Rate:	3.043	2.484	.
(21) Credibility to Underlying Relativity:	0.970	0.960	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	2.952	2.385	.
(24) Balanced Formula Relativity:	2.941	2.368	2.743

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Section IX - Classification Pricing
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Calculation of Class Relativities

Class(es): 2288 FELTING MFG		Effective: 7/1/2022							Manufacturing		
Converted Unlimited Losses											
Amount											
Claim Count				Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	110.090	1	17	57,372	188,366	4,882	34,671	285,291	2,232	0,359	2,591
2015	117,630	0	26	0	335,798	0	77,377	413,175	2,855	0,658	3,512
2016	68,868	0	9	0	366,888	0	167,859	534,747	5,327	2,437	7,765
2017	31,564	0	7	0	93,020	0	49,333	142,353	2,947	1,563	4,510
2018	26,418	0	4	0	1,627	0	3,941	5,568	0,062	0,149	0,211
MA Total:	354,570	1	63	57,372	985,698	4,882	333,181	1,381,134	2,942	0,953	3,895

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.203	1.980	.
(14) Massachusetts Credibility:	0.200	0.280	.
(15) Countrywide Pure Premium:	1.396	0.942	2.338
(16) Countrywide Indicated Relativity:	1.665	2.157	.
(17) Countrywide Credibility:	0.400	0.360	.
(18) Countrywide Lost-Time Claims:	213.00	.	.
(19) Pure Premium Underlying Present Rate:	1.500	0.761	2.262
(20) Relativity to Underlying Present Rate:	1.837	1.811	.
(21) Credibility to Underlying Relativity:	0.400	0.360	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	2.042	1.983	.
(24) Balanced Formula Relativity:	2.034	1.968	2.011

Class(es): 2305 TEXTILE FIBER MFG-SYNTHETIC		Effective: 7/1/2022							Manufacturing		
Converted Unlimited Losses											
Amount											
Claim Count				Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	2,148	0	2	0	0	0	1,662	1,662	0,000	0,774	0,774
2015	3,525	0	2	0	1,909	0	1,924	3,834	0,542	0,546	1,088
2016	5,945	0	1	0	0	0	76	76	0,000	0,013	0,013
2017	4,509	0	3	0	5,986	0	5,567	11,553	1,327	1,235	2,562
2018	5,438	0	6	0	922	0	3,336	4,259	0,170	0,614	0,783
MA Total:	21,565	0	14	0	8,818	0	12,567	21,384	0,409	0,583	0,992

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.445	1.210	.
(14) Massachusetts Credibility:	0.070	0.090	.
(15) Countrywide Pure Premium:	0.911	0.518	1.429
(16) Countrywide Indicated Relativity:	1.087	1.185	.
(17) Countrywide Credibility:	0.470	0.460	.
(18) Countrywide Lost-Time Claims:	698.00	.	.
(19) Pure Premium Underlying Present Rate:	1.672	0.733	2.405
(20) Relativity to Underlying Present Rate:	2.047	1.744	.
(21) Credibility to Underlying Relativity:	0.460	0.450	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.483	1.439	.
(24) Balanced Formula Relativity:	1.478	1.428	1.461

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Section IX - Classification Pricing
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Calculation of Class Relativities

Class(es): 2362 KNIT GOODS MFG NOC		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	13.641	0	1	0	0	0	2.833	2.833	0.000	0.208	0.208
2015	9.754	0	3	0	4.940	0	23.364	28.304	0.506	2.395	2.902
2016	10.080	0	6	0	7.077	0	12.836	19.913	0.702	1.273	1.975
2017	21.300	0	1	0	0	0	634	634	0.000	0.030	0.030
2018	16.826	0	5	0	0	0	1.723	1.723	0.000	0.102	0.102
MA Total:	71,601	0	16	0	12,016	0	41,390	53,406	0.168	0.578	0.746

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.183	1.200	.
(14) Massachusetts Credibility:	0.080	0.120	.
(15) Countrywide Pure Premium:	1.029	0.572	1.601
(16) Countrywide Indicated Relativity:	1.228	1.310	.
(17) Countrywide Credibility:	0.450	0.440	.
(18) Countrywide Lost-Time Claims:	155.00	.	.
(19) Pure Premium Underlying Present Rate:	0.604	0.456	1.060
(20) Relativity to Underlying Present Rate:	0.739	1.085	.
(21) Credibility to Underlying Relativity:	0.470	0.440	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.915	1.198	.
(24) Balanced Formula Relativity:	0.911	1.189	1.007

Class(es): 2380 WEBBING MFG		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	70.637	0	5	0	5.512	0	8.915	14.427	0.078	0.126	0.204
2015	63.280	0	15	0	13.535	0	28.218	41.753	0.214	0.446	0.660
2016	62.937	0	6	0	4.472	0	6.933	11.405	0.071	0.110	0.181
2017	56.467	0	5	0	3.567	0	5.458	9.025	0.063	0.097	0.160
2018	45.089	0	2	0	280	0	1.400	1.680	0.006	0.031	0.037
MA Total:	298,411	0	33	0	27,366	0	50,925	78,291	0.092	0.171	0.262

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.100	0.354	.
(14) Massachusetts Credibility:	0.160	0.220	.
(15) Countrywide Pure Premium:	0.763	0.453	1.216
(16) Countrywide Indicated Relativity:	0.910	1.038	.
(17) Countrywide Credibility:	0.420	0.390	.
(18) Countrywide Lost-Time Claims:	187.00	.	.
(19) Pure Premium Underlying Present Rate:	0.905	0.480	1.385
(20) Relativity to Underlying Present Rate:	1.108	1.142	.
(21) Credibility to Underlying Relativity:	0.420	0.390	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.863	0.928	.
(24) Balanced Formula Relativity:	0.860	0.921	0.881

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
2402 CARPET OR RUG MFG NOC											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	6.545	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	8.562	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	10.548	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	9.820	0	1	0	0	0	598	598	0.000	0.061	0.061
2018	8.583	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	44,058	0	1	0	0	0	598	598	0.000	0.014	0.014

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.028	.
(14) Massachusetts Credibility:	0.070	0.100	.
(15) Countrywide Pure Premium:	1.123	0.681	1.804
(16) Countrywide Indicated Relativity:	1.339	1.559	.
(17) Countrywide Credibility:	0.470	0.450	.
(18) Countrywide Lost-Time Claims:	491.00	.	.
(19) Pure Premium Underlying Present Rate:	0.943	0.517	1.460
(20) Relativity to Underlying Present Rate:	1.155	1.230	.
(21) Credibility to Underlying Relativity:	0.460	0.450	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.160	1.258	.
(24) Balanced Formula Relativity:	1.156	1.249	1.188

Class(es):		Effective: 7/1/2022							Manufacturing		
2413 TEXTILE - BLEACHING, DYEING, MERCERZNG, FINISH											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	328.027	2	42	177.018	316.511	37.266	211.958	742.752	1.505	0.760	2.264
2015	297.053	3	49	780.734	361.649	359.116	174.241	1,675.739	3.846	1.795	5.641
2016	248.924	1	26	121.256	399.985	14.108	162.145	697.495	2.094	0.708	2.802
2017	113.159	0	16	0	167.603	0	65.680	233.283	1.481	0.580	2.062
2018	85.106	1	7	177.121	31.614	97.172	21.096	327.004	2.453	1.390	3.842
MA Total:	1,072,269	7	140	1,256,129	1,277,361	507,662	635,120	3,676,272	2,363	1,066	3,428

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.572	2.213	.
(14) Massachusetts Credibility:	0.310	0.430	.
(15) Countrywide Pure Premium:	0.943	0.683	1.626
(16) Countrywide Indicated Relativity:	1.125	1.562	.
(17) Countrywide Credibility:	0.350	0.290	.
(18) Countrywide Lost-Time Claims:	241.00	.	.
(19) Pure Premium Underlying Present Rate:	1.426	0.740	2.166
(20) Relativity to Underlying Present Rate:	1.746	1.760	.
(21) Credibility to Underlying Relativity:	0.340	0.280	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.785	1.897	.
(24) Balanced Formula Relativity:	1.778	1.883	1.814

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Calculation of Class Relativities

Class(es): 2416 YARN OR THREAD DYEING OR FINISHING		Effective: 7/1/2022							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	16,410	0	2	0	0	0	2,470	2,470	0.000	0.151	0.151
2015	14,775	1	3	661	407	7,476	15,704	24,249	0.072	1.569	1.641
2016	16,949	0	3	0	16,806	0	5,930	22,736	0.992	0.350	1.341
2017	20,981	0	7	0	0	0	6,130	6,130	0.000	0.292	0.292
2018	23,058	0	6	0	4,380	0	8,640	13,019	0.190	0.375	0.565
MA Total:	92,173	1	21	661	21,593	7,476	38,874	68,604	0.241	0.503	0.744

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.263	1.044	.
(14) Massachusetts Credibility:	0.110	0.140	.
(15) Countrywide Pure Premium:	0.886	0.755	1.641
(16) Countrywide Indicated Relativity:	1.057	1.728	.
(17) Countrywide Credibility:	0.250	0.270	.
(18) Countrywide Lost-Time Claims:	37.000	.	.
(19) Pure Premium Underlying Present Rate:	1.089	0.537	1.626
(20) Relativity to Underlying Present Rate:	1.334	1.276	.
(21) Credibility to Underlying Relativity:	0.640	0.590	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.147	1.366	.
(24) Balanced Formula Relativity:	1.142	1.356	1.216

Class(es): 2417 CLOTH PRINTING		Effective: 7/1/2022							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	54,295	0	2	0	71,215	0	14,918	86,133	1.312	0.275	1.586
2015	59,268	0	1	0	280	0	874	1,154	0.005	0.015	0.019
2016	18,910	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	2,061	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	11,784	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	146,319	0	3	0	71,495	0	15,793	87,287	0.489	0.108	0.597

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.532	0.224	.
(14) Massachusetts Credibility:	0.120	0.140	.
(15) Countrywide Pure Premium:	0.833	0.299	1.131
(16) Countrywide Indicated Relativity:	0.993	0.683	.
(17) Countrywide Credibility:	0.240	0.260	.
(18) Countrywide Lost-Time Claims:	34.000	.	.
(19) Pure Premium Underlying Present Rate:	0.898	0.344	1.242
(20) Relativity to Underlying Present Rate:	1.100	0.819	.
(21) Credibility to Underlying Relativity:	0.640	0.600	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.006	0.701	.
(24) Balanced Formula Relativity:	1.002	0.695	0.897

IX 000098

Section IX - Classification Pricing
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Section IX - G
 Exhibit 29

Calculation of Class Relativities

Class(es): 2501 CLOTHING MFG		Effective: 7/1/2022							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	861.903	3	81	486.603	726.943	153.010	430.442	1.796.998	1.408	0.677	2.085
2015	913.151	2	110	350.451	790.117	29.257	329.049	1.498.874	1.249	0.392	1.641
2016	951.077	5	103	623.158	715.667	170.325	375.862	1.885.012	1.408	0.574	1.982
2017	969.529	1	100	87.595	473.004	15.171	293.373	869.143	0.578	0.318	0.896
2018	962.981	1	81	146.830	1.140.496	30.828	646.261	1.964.415	1.337	0.703	2.040
MA Total:	4,658,641	12	475	1,694,636	3,846,227	398,591	2,074,988	8,014,442	1.189	0.531	1.720

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.295	1.102	.
(14) Massachusetts Credibility:	0.460	0.630	.
(15) Countrywide Pure Premium:	0.964	0.555	1.519
(16) Countrywide Indicated Relativity:	1.150	1.270	.
(17) Countrywide Credibility:	0.270	0.190	.
(18) Countrywide Lost-Time Claims:	2629.0	.	.
(19) Pure Premium Underlying Present Rate:	0.858	0.432	1.290
(20) Relativity to Underlying Present Rate:	1.050	1.027	.
(21) Credibility to Underlying Relativity:	0.270	0.180	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.190	1.121	.
(24) Balanced Formula Relativity:	1.185	1.112	1.160

Class(es): 2503 DRESSMAKING OR TAILORING-CUSTOM EXCLUSIVELY		Effective: 7/1/2022							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	62.087	0	2	0	3.676	0	1.505	5.181	0.059	0.024	0.083
2015	54.241	0	2	0	307.740	0	50.349	358.088	5.674	0.928	6.602
2016	49.561	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	41.958	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	36.099	0	1	0	0	0	1.144	1.144	0.000	0.032	0.032
MA Total:	243,946	0	5	0	311,416	0	52,997	364,413	1.277	0.217	1.494

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.390	0.451	.
(14) Massachusetts Credibility:	0.120	0.150	.
(15) Countrywide Pure Premium:	0.165	0.115	0.280
(16) Countrywide Indicated Relativity:	0.196	0.264	.
(17) Countrywide Credibility:	0.240	0.250	.
(18) Countrywide Lost-Time Claims:	31.000	.	.
(19) Pure Premium Underlying Present Rate:	0.562	0.215	0.778
(20) Relativity to Underlying Present Rate:	0.689	0.513	.
(21) Credibility to Underlying Relativity:	0.640	0.600	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.655	0.441	.
(24) Balanced Formula Relativity:	0.652	0.438	0.578

IX 000099

Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
2570 MATTRESS OR BOX SPRING MFG											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	33.050	0	4	0	0	0	3.161	3.161	0.000	0.096	0.096
2015	38.338	0	6	0	732	0	2.317	3.049	0.019	0.060	0.080
2016	40.003	0	1	0	0	0	139	139	0.000	0.003	0.003
2017	44.344	1	8	142.217	7.496	33.885	12.572	196.169	3.376	1.048	4.424
2018	51.633	0	5	0	47.848	0	22.472	70.321	0.927	0.435	1.362
MA Total:	207.368	1	24	142,217	56,076	33,885	40,660	272,838	0.956	0.359	1.316

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.041	0.746	.
(14) Massachusetts Credibility:	0.180	0.220	.
(15) Countrywide Pure Premium:	1.736	0.822	2.557
(16) Countrywide Indicated Relativity:	2.070	1.881	.
(17) Countrywide Credibility:	0.410	0.390	.
(18) Countrywide Lost-Time Claims:	559.00	.	.
(19) Pure Premium Underlying Present Rate:	1.794	0.724	2.518
(20) Relativity to Underlying Present Rate:	2.197	1.722	.
(21) Credibility to Underlying Relativity:	0.410	0.390	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.937	1.569	.
(24) Balanced Formula Relativity:	1.930	1.558	1.802

Class(es):		Effective: 7/1/2022							Manufacturing		
2576 CANVAS GOODS MFG NOC-SHOP											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	111.278	1	11	2.093	38.510	2.952	56.065	99.621	0.365	0.530	0.895
2015	117.479	0	11	0	316.610	0	88.980	405.590	2.695	0.757	3.452
2016	130.560	0	14	0	19.464	0	25.288	44.752	0.149	0.194	0.343
2017	128.065	2	13	143.021	292.321	77.638	57.431	570.411	3.399	1.055	4.454
2018	127.202	0	12	0	17.203	0	33.317	50.520	0.135	0.262	0.397
MA Total:	614.583	3	61	145,115	684,108	80,590	261,081	1,170,894	1.349	0.556	1.905

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.469	1.154	.
(14) Massachusetts Credibility:	0.200	0.300	.
(15) Countrywide Pure Premium:	0.656	0.680	1.336
(16) Countrywide Indicated Relativity:	0.782	1.556	.
(17) Countrywide Credibility:	0.160	0.170	.
(18) Countrywide Lost-Time Claims:	12.000	.	.
(19) Pure Premium Underlying Present Rate:	0.866	0.497	1.364
(20) Relativity to Underlying Present Rate:	1.061	1.183	.
(21) Credibility to Underlying Relativity:	0.640	0.530	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.098	1.238	.
(24) Balanced Formula Relativity:	1.094	1.229	1.140

IX 000100

Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
2585 LAUNDRY NOC & ROUTE SUPERVISORS, DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	743.525	4	111	365.979	611.471	53.615	311.740	1.342.806	1.315	0.491	1.806
2015	782.259	6	115	726.528	287.255	612.169	257.098	1.883.050	1.296	1.111	2.407
2016	884.918	3	119	165.462	757.854	76.577	370.502	1.370.395	1.043	0.505	1.549
2017	854.185	5	120	403.188	769.546	292.794	579.448	2.044.976	1.373	1.021	2.394
2018	827.022	2	114	235.890	461.986	36.249	423.883	1.158.008	0.844	0.556	1.400
MA Total:	4,091,908	20	579	1,897,046	2,888,113	1,071,405	1,942,671	7,799,235	1.169	0.737	1.906

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.273	1.529	.
(14) Massachusetts Credibility:	0.490	0.710	.
(15) Countrywide Pure Premium:	1.493	0.711	2.204
(16) Countrywide Indicated Relativity:	1.781	1.627	.
(17) Countrywide Credibility:	0.260	0.150	.
(18) Countrywide Lost-Time Claims:	3468.0	.	.
(19) Pure Premium Underlying Present Rate:	1.158	0.655	1.813
(20) Relativity to Underlying Present Rate:	1.418	1.559	.
(21) Credibility to Underlying Relativity:	0.250	0.140	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.441	1.548	.
(24) Balanced Formula Relativity:	1.436	1.537	1.470

Class(es):		Effective: 7/1/2022							Manufacturing		
2586 CLEANING OR DYEING & ROUTE SUPERVISORS, DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	492.235	0	55	0	334.014	0	170.597	504.611	0.679	0.347	1.025
2015	532.720	2	49	70.418	139.406	36.673	69.770	316.267	0.394	0.200	0.594
2016	538.000	3	41	329.431	1.063.369	41.880	818.436	2.253.116	2.589	1.599	4.188
2017	491.949	0	21	0	172.915	0	33.910	206.825	0.351	0.069	0.420
2018	446.396	0	23	0	147.910	0	158.441	306.351	0.331	0.355	0.686
MA Total:	2,501,301	5	189	399,849	1,857,615	78,553	1,251,153	3,587,170	0.903	0.532	1.434

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.983	1.104	.
(14) Massachusetts Credibility:	0.350	0.500	.
(15) Countrywide Pure Premium:	1.143	0.636	1.780
(16) Countrywide Indicated Relativity:	1.364	1.457	.
(17) Countrywide Credibility:	0.330	0.250	.
(18) Countrywide Lost-Time Claims:	227.00	.	.
(19) Pure Premium Underlying Present Rate:	0.798	0.461	1.259
(20) Relativity to Underlying Present Rate:	0.977	1.096	.
(21) Credibility to Underlying Relativity:	0.320	0.250	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.107	1.190	.
(24) Balanced Formula Relativity:	1.102	1.181	1.130

IX 000101

Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services		
2587 TOWEL OR TOILET SUPPLY CO & RTE SUPERVISORS, DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	28,700	1	2	55,700	912	28,989	1,086	86,686	1,973	1,048	3,020
2015	27,234	0	1	0	0	0	254	254	0,000	0,009	0,009
2016	50,527	0	5	0	2,590	0	4,780	7,370	0,051	0,095	0,146
2017	37,788	0	1	0	0	0	1,227	1,227	0,000	0,032	0,032
2018	63,628	0	5	0	6,842	0	6,498	13,340	0,108	0,102	0,210
MA Total:	207,878	1	14	55,700	10,343	28,989	13,845	108,877	0,318	0,206	0,524

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.415	0.485	.
(14) Massachusetts Credibility:	0.150	0.190	.
(15) Countrywide Pure Premium:	1.147	0.563	1.710
(16) Countrywide Indicated Relativity:	1.526	1.332	.
(17) Countrywide Credibility:	0.350	0.370	.
(18) Countrywide Lost-Time Claims:	86,000	.	.
(19) Pure Premium Underlying Present Rate:	1.103	0.458	1.561
(20) Relativity to Underlying Present Rate:	1.593	1.199	.
(21) Credibility to Underlying Relativity:	0.500	0.440	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	1.393	1.112	.
(24) Balanced Formula Relativity:	1.384	1.113	1.287

Class(es):		Effective: 7/1/2022							Manufacturing		
2623 TANNING											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	2,628	0	0	0	0	0	0	0	0,000	0,000	0,000
2015	2,528	0	0	0	0	0	0	0	0,000	0,000	0,000
2016	168	0	0	0	0	0	0	0	0,000	0,000	0,000
2017	205	0	0	0	0	0	0	0	0,000	0,000	0,000
2018	198	0	0	0	0	0	0	0	0,000	0,000	0,000
MA Total:	5,727	0	0	0	0	0	0	0	0,000	0,000	0,000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.050	0.060	.
(15) Countrywide Pure Premium:	2.292	1.326	3.618
(16) Countrywide Indicated Relativity:	2.734	3.035	.
(17) Countrywide Credibility:	0.360	0.390	.
(18) Countrywide Lost-Time Claims:	92,000	.	.
(19) Pure Premium Underlying Present Rate:	2.112	1.086	3.199
(20) Relativity to Underlying Present Rate:	2.587	2.584	.
(21) Credibility to Underlying Relativity:	0.590	0.550	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	2.510	2.605	.
(24) Balanced Formula Relativity:	2.501	2.586	2.530

IX 000102

Section IX - Classification Pricing
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Section IX - G
 Exhibit 33

Calculation of Class Relativities

Class(es): 2651 SHOE STOCK MFG		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	61,617	0	4	0	1,370	0	5,960	7,329	0.022	0.097	0.119
2015	58,024	1	4	12,611	15,491	21,437	51,562	101,102	0.484	1.258	1.742
2016	55,673	0	2	0	5,915	0	14,042	19,957	0.106	0.252	0.358
2017	47,248	0	5	0	11,981	0	4,977	16,958	0.254	0.105	0.359
2018	47,245	0	4	0	1,436	0	6,711	8,146	0.030	0.142	0.172
MA Total:	269,807	1	19	12,611	36,192	21,437	83,252	153,492	0.181	0.388	0.569

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.197	0.806	.
(14) Massachusetts Credibility:	0.130	0.190	.
(15) Countrywide Pure Premium:	0.827	0.462	1.289
(16) Countrywide Indicated Relativity:	0.986	1.057	.
(17) Countrywide Credibility:	0.350	0.370	.
(18) Countrywide Lost-Time Claims:	86.000	.	.
(19) Pure Premium Underlying Present Rate:	0.646	0.359	1.006
(20) Relativity to Underlying Present Rate:	0.791	0.855	.
(21) Credibility to Underlying Relativity:	0.520	0.440	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.782	0.920	.
(24) Balanced Formula Relativity:	0.779	0.913	0.825

Class(es): 2660 BOOT OR SHOE MFG NOC		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	46,156	1	2	3,730	0	1,855	310	5,895	0.081	0.047	0.128
2015	44,779	0	4	0	97,077	0	31,183	128,260	2.168	0.696	2.864
2016	37,929	0	7	0	539	0	3,273	3,812	0.014	0.086	0.100
2017	52,045	0	3	0	1,496	0	3,276	4,772	0.029	0.063	0.092
2018	53,397	0	5	0	66,826	0	14,795	81,621	1.252	0.277	1.529
MA Total:	234,306	1	21	3,730	165,939	1,855	52,836	224,360	0.724	0.233	0.958

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.788	0.485	.
(14) Massachusetts Credibility:	0.140	0.200	.
(15) Countrywide Pure Premium:	0.958	0.692	1.650
(16) Countrywide Indicated Relativity:	1.143	1.584	.
(17) Countrywide Credibility:	0.430	0.400	.
(18) Countrywide Lost-Time Claims:	297.00	.	.
(19) Pure Premium Underlying Present Rate:	0.889	0.495	1.383
(20) Relativity to Underlying Present Rate:	1.088	1.176	.
(21) Credibility to Underlying Relativity:	0.430	0.400	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.070	1.201	.
(24) Balanced Formula Relativity:	1.066	1.192	1.109

IX 000103

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Section IX - G
 Exhibit 34

Calculation of Class Relativities

Class(es): 2683 LUGGAGE MFG		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	1,056	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	2,504	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	2,320	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	2,131	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	2,201	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	10,211	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.040	0.060	.
(15) Countrywide Pure Premium:	1.185	0.779	1.964
(16) Countrywide Indicated Relativity:	1.413	1.783	.
(17) Countrywide Credibility:	0.250	0.270	.
(18) Countrywide Lost-Time Claims:	37.000	.	.
(19) Pure Premium Underlying Present Rate:	0.868	0.530	1.398
(20) Relativity to Underlying Present Rate:	1.062	1.261	.
(21) Credibility to Underlying Relativity:	0.710	0.670	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.108	1.327	.
(24) Balanced Formula Relativity:	1.103	1.317	1.177

Class(es): 2688 LEATHER GOODS MFG NOC		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	81,800	1	7	52,435	78,966	2,275	49,811	183,487	1,606	0,637	2,243
2015	81,706	0	8	0	3,244	0	10,983	14,227	0,040	0,134	0,174
2016	78,560	1	2	125,218	2,885	42,560	1,080	171,743	1,631	0,556	2,186
2017	82,441	0	12	0	2,942	0	12,410	15,352	0,036	0,151	0,186
2018	80,590	0	2	0	195	0	2,669	2,864	0,002	0,033	0,036
MA Total:	405,096	2	31	177,653	88,233	44,835	76,953	387,673	0,656	0,301	0,957

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.715	0.624	.
(14) Massachusetts Credibility:	0.160	0.240	.
(15) Countrywide Pure Premium:	0.806	0.536	1.342
(16) Countrywide Indicated Relativity:	0.961	1.227	.
(17) Countrywide Credibility:	0.390	0.380	.
(18) Countrywide Lost-Time Claims:	112.00	.	.
(19) Pure Premium Underlying Present Rate:	0.761	0.461	1.222
(20) Relativity to Underlying Present Rate:	0.932	1.095	.
(21) Credibility to Underlying Relativity:	0.450	0.380	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.909	1.033	.
(24) Balanced Formula Relativity:	0.905	1.025	0.946

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Miscellaneous		
2702 LOGGING OR LUMBERING & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	33.107	0	6	0	40.097	0	63.497	103.594	1.211	1.918	3.129
2015	42.026	0	8	0	68.618	0	38.195	106.812	1.633	0.909	2.542
2016	48.865	0	3	0	6.241	0	3.261	9.501	0.128	0.067	0.194
2017	44.984	0	3	0	21.315	0	32.225	53.540	0.474	0.716	1.190
2018	50.315	0	9	0	456.587	0	678.014	1,134.601	9.075	13.475	22.550
MA Total:	219,298	0	29	0	592,858	0	815,192	1,408,050	2.703	3.717	6.421

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.215	3.231	.
(14) Massachusetts Credibility:	0.290	0.390	.
(15) Countrywide Pure Premium:	8.095	4.588	12.683
(16) Countrywide Indicated Relativity:	3.814	4.254	.
(17) Countrywide Credibility:	0.360	0.310	.
(18) Countrywide Lost-Time Claims:	1443.0	.	.
(19) Pure Premium Underlying Present Rate:	5.575	2.743	8.318
(20) Relativity to Underlying Present Rate:	2.746	2.671	.
(21) Credibility to Underlying Relativity:	0.350	0.300	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	2.686	3.380	.
(24) Balanced Formula Relativity:	2.681	3.402	2.926

Class(es):		Effective: 7/1/2022							Manufacturing		
2710 SAWMILLS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	30.445	1	8	2.144	15.144	3.057	17.289	37.634	0.568	0.668	1.236
2015	36.050	1	6	10.413	40.411	15.515	19.175	85.515	1.410	0.962	2.372
2016	32.162	0	9	0	115.851	0	69.532	185.383	3.602	2.162	5.764
2017	33.841	0	5	0	1.816	0	6.758	8.574	0.054	0.200	0.253
2018	26.758	0	1	0	204.372	0	23.068	227.440	7.638	0.862	8.500
MA Total:	159,255	2	29	12,557	377,595	18,572	135,822	544,546	2.450	0.969	3.419

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.667	2.013	.
(14) Massachusetts Credibility:	0.180	0.260	.
(15) Countrywide Pure Premium:	3.194	1.921	5.115
(16) Countrywide Indicated Relativity:	3.810	4.397	.
(17) Countrywide Credibility:	0.410	0.370	.
(18) Countrywide Lost-Time Claims:	2238.0	.	.
(19) Pure Premium Underlying Present Rate:	2.535	1.445	3.980
(20) Relativity to Underlying Present Rate:	3.104	3.436	.
(21) Credibility to Underlying Relativity:	0.410	0.370	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	3.315	3.422	.
(24) Balanced Formula Relativity:	3.302	3.396	3.335

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
2731 PLANING OR MOLDING MILL											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	37,484	0	7	0	16,648	0	29,468	46,116	0.444	0.786	1.230
2015	39,539	0	7	0	25,210	0	21,572	46,783	0.638	0.546	1.183
2016	41,077	0	6	0	783	0	5,441	6,224	0.019	0.132	0.152
2017	41,093	1	8	1,400	16,954	93	17,588	36,035	0.447	0.430	0.877
2018	50,870	0	11	0	19,478	0	22,113	41,591	0.383	0.435	0.818
MA Total:	210,062	1	39	1,400	79,073	93	96,183	176,749	0.383	0.458	0.841

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.417	0.952	.
(14) Massachusetts Credibility:	0.150	0.230	.
(15) Countrywide Pure Premium:	1.462	0.950	2.412
(16) Countrywide Indicated Relativity:	1.744	2.174	.
(17) Countrywide Credibility:	0.430	0.390	.
(18) Countrywide Lost-Time Claims:	1352.0	.	.
(19) Pure Premium Underlying Present Rate:	1.228	0.743	1.971
(20) Relativity to Underlying Present Rate:	1.504	1.767	.
(21) Credibility to Underlying Relativity:	0.420	0.380	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.444	1.738	.
(24) Balanced Formula Relativity:	1.439	1.725	1.537

Class(es):		Effective: 7/1/2022							Manufacturing		
2747 COOPERAGE ASSEMBLY											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	1	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	0	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	1	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.000	0.000	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	2.965	2.731	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	2.452	1.162	3.614
(20) Relativity to Underlying Present Rate:	3.002	2.764	.
(21) Credibility to Underlying Relativity:	1.000	1.000	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	3.002	2.764	.
(24) Balanced Formula Relativity:	2.991	2.744	2.906

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Calculation of Class Relativities

Class(es): 2790 PATTERN MAKING NOC		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	35,435	0	8	0	20,006	0	23,221	43,227	0.565	0.655	1,220
2015	39,867	0	3	0	1,069	0	4,330	5,399	0.027	0.109	0.135
2016	34,859	0	5	0	1,660	0	3,536	5,197	0.048	0.101	0.149
2017	49,425	0	11	0	194,311	0	88,905	283,216	3.931	1,799	5,730
2018	43,851	1	5	403,651	0	45,052	1,736	450,438	9,205	1,067	10,272
MA Total:	203,436	1	32	403,651	217,046	45,052	121,729	787,477	3.051	0.820	3.871

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.322	1.702	.
(14) Massachusetts Credibility:	0.120	0.170	.
(15) Countrywide Pure Premium:	0.804	0.458	1.262
(16) Countrywide Indicated Relativity:	0.959	1.048	.
(17) Countrywide Credibility:	0.440	0.420	.
(18) Countrywide Lost-Time Claims:	179.00	.	.
(19) Pure Premium Underlying Present Rate:	0.732	0.355	1.087
(20) Relativity to Underlying Present Rate:	0.896	0.844	.
(21) Credibility to Underlying Relativity:	0.440	0.410	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.215	1.076	.
(24) Balanced Formula Relativity:	1.210	1.068	1.161

Class(es): 2802 CARPENTRY-SHOP ONLY & DRIVERS		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	1,078,139	1	169	13,677	626,235	7,458	594,925	1,242,295	0.594	0.559	1,152
2015	1,138,051	6	169	431,708	1,835,065	187,460	873,617	3,327,849	1.992	0.932	2,924
2016	1,197,062	6	174	278,356	1,380,907	131,031	864,033	2,654,326	1.386	0.831	2,217
2017	1,236,771	6	162	466,202	2,746,003	648,789	1,150,457	5,011,451	2.597	1.455	4,052
2018	1,270,061	4	176	488,531	1,829,538	172,493	915,407	3,405,968	1.825	0.857	2,682
MA Total:	5,920,085	23	850	1,678,473	8,417,748	1,147,230	4,398,438	15,641,889	1.705	0.937	2,642

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.857	1.945	.
(14) Massachusetts Credibility:	0.640	0.900	.
(15) Countrywide Pure Premium:	1.961	1.129	3.090
(16) Countrywide Indicated Relativity:	2.338	2.584	.
(17) Countrywide Credibility:	0.180	0.050	.
(18) Countrywide Lost-Time Claims:	5951.0	.	.
(19) Pure Premium Underlying Present Rate:	1.566	0.831	2.397
(20) Relativity to Underlying Present Rate:	1.917	1.977	.
(21) Credibility to Underlying Relativity:	0.180	0.050	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.954	1.979	.
(24) Balanced Formula Relativity:	1.947	1.964	1.953

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
2835 BRUSH OR BROOM ASSEMBLY											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums		
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	46,309	0	5	0	185	0	5,318	5,503	0.004	0.115	0.119
2015	50,627	0	3	0	118	0	2,055	2,173	0.002	0.041	0.043
2016	49,397	1	4	3,236	0	22,369	2,344	27,948	0.066	0.500	0.566
2017	53,322	0	6	0	0	0	4,468	4,468	0.000	0.084	0.084
2018	65,105	0	14	0	291,654	0	26,339	317,993	4.480	0.405	4.884
MA Total:	264,761	1	32	3,236	291,956	22,369	40,524	358,085	1.115	0.238	1.352

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.214	0.493	.
(14) Massachusetts Credibility:	0.130	0.180	.
(15) Countrywide Pure Premium:	1.171	0.489	1.660
(16) Countrywide Indicated Relativity:	1.397	1.119	.
(17) Countrywide Credibility:	0.330	0.350	.
(18) Countrywide Lost-Time Claims:	70.000	.	.
(19) Pure Premium Underlying Present Rate:	0.597	0.340	0.937
(20) Relativity to Underlying Present Rate:	0.731	0.809	.
(21) Credibility to Underlying Relativity:	0.540	0.470	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.014	0.861	.
(24) Balanced Formula Relativity:	1.010	0.854	0.956

Class(es):		Effective: 7/1/2022							Manufacturing		
2836 BRUSH OR BROOM MFG NOC											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums		
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	5,804	0	1	0	203	0	581	785	0.035	0.100	0.135
2015	6,979	0	1	0	0	0	83	83	0.000	0.012	0.012
2016	5,718	0	1	0	8,925	0	864	9,790	1.561	0.151	1.712
2017	7,209	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	7,632	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	33,341	0	3	0	9,128	0	1,528	10,657	0.274	0.046	0.320

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.298	0.095	.
(14) Massachusetts Credibility:	0.070	0.090	.
(15) Countrywide Pure Premium:	2.002	0.756	2.758
(16) Countrywide Indicated Relativity:	2.388	1.730	.
(17) Countrywide Credibility:	0.290	0.300	.
(18) Countrywide Lost-Time Claims:	51.000	.	.
(19) Pure Premium Underlying Present Rate:	0.909	0.437	1.346
(20) Relativity to Underlying Present Rate:	1.114	1.039	.
(21) Credibility to Underlying Relativity:	0.640	0.610	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.426	1.161	.
(24) Balanced Formula Relativity:	1.421	1.153	1.328

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Calculation of Class Relativities

Class(es): 2841 WOODENWARE MFG NOC		Effective: 7/1/2022							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	49,723	0	12	0	58,861	0	17,364	76,225	1.184	0.349	1.533
2015	42,775	0	6	0	22,698	0	25,401	48,099	0.531	0.594	1.124
2016	34,041	0	1	0	0	0	148	148	0.000	0.004	0.004
2017	32,136	1	0	231,190	0	190,852	0	422,042	7.194	5.939	13.133
2018	41,549	0	5	0	1,579	0	5,331	6,911	0.038	0.128	0.166
MA Total:	200,224	1	24	231,190	83,138	190,852	48,245	553,425	1.570	1.194	2.764

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.709	2.479	.
(14) Massachusetts Credibility:	0.160	0.250	.
(15) Countrywide Pure Premium:	1.450	1.049	2.499
(16) Countrywide Indicated Relativity:	1.730	2.401	.
(17) Countrywide Credibility:	0.420	0.380	.
(18) Countrywide Lost-Time Claims:	187.00	.	.
(19) Pure Premium Underlying Present Rate:	1.512	0.960	2.473
(20) Relativity to Underlying Present Rate:	1.852	2.284	.
(21) Credibility to Underlying Relativity:	0.420	0.370	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.778	2.377	.
(24) Balanced Formula Relativity:	1.771	2.360	1.974

Class(es): 2883 FURNITURE MFG-WOOD-NOC		Effective: 7/1/2022							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	509,563	5	68	753,212	605,557	69,113	308,175	1,736,056	2.667	0.740	3.407
2015	546,445	3	67	394,456	233,465	73,382	297,156	998,459	1.149	0.678	1.827
2016	555,315	2	103	461,654	400,079	105,732	235,653	1,203,118	1.552	0.615	2.167
2017	537,621	4	83	827,132	460,347	367,954	284,666	1,940,099	2.395	1.214	3.609
2018	509,975	0	67	0	574,773	0	293,437	868,210	1.127	0.575	1.702
MA Total:	2,658,920	14	388	2,436,454	2,274,222	616,181	1,419,085	6,745,942	1.772	0.765	2.537

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.929	1.589	.
(14) Massachusetts Credibility:	0.450	0.610	.
(15) Countrywide Pure Premium:	1.336	0.759	2.095
(16) Countrywide Indicated Relativity:	1.593	1.738	.
(17) Countrywide Credibility:	0.280	0.200	.
(18) Countrywide Lost-Time Claims:	5136.0	.	.
(19) Pure Premium Underlying Present Rate:	1.458	0.695	2.154
(20) Relativity to Underlying Present Rate:	1.786	1.653	.
(21) Credibility to Underlying Relativity:	0.270	0.190	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.796	1.631	.
(24) Balanced Formula Relativity:	1.789	1.619	1.731

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Calculation of Class Relativities

Class(es): 2923 PIANO MFG		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	52,592	0	2	0	0	0	1,963	1,963	0.000	0.037	0.037
2015	51,404	1	2	182,765	0	67,192	598	250,555	3,555	1,319	4,874
2016	58,472	0	1	0	0	0	400	400	0.000	0.007	0.007
2017	58,733	0	4	0	0	0	1,302	1,302	0.000	0.022	0.022
2018	62,085	0	5	0	6,781	0	20,948	27,728	0.109	0.337	0.447
MA Total:	283,287	1	14	182,765	6,781	67,192	25,211	281,949	0.669	0.326	0.995

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.728	0.677	.
(14) Massachusetts Credibility:	0.140	0.190	.
(15) Countrywide Pure Premium:	0.534	0.331	0.865
(16) Countrywide Indicated Relativity:	0.636	0.758	.
(17) Countrywide Credibility:	0.340	0.360	.
(18) Countrywide Lost-Time Claims:	76.000	.	.
(19) Pure Premium Underlying Present Rate:	0.706	0.351	1.057
(20) Relativity to Underlying Present Rate:	0.864	0.835	.
(21) Credibility to Underlying Relativity:	0.520	0.450	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.768	0.777	.
(24) Balanced Formula Relativity:	0.765	0.772	0.767

Class(es): 2942 PENCIL, PENHOLDER OR CRAYON MFG		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	145,227	0	8	0	15,699	0	16,384	32,083	0.108	0.113	0.221
2015	140,412	0	9	0	0	0	6,527	6,527	0.000	0.046	0.046
2016	134,148	0	12	0	183,886	0	60,878	244,765	1.371	0.454	1.825
2017	160,530	0	18	0	191,052	0	77,684	268,737	1.190	0.484	1.674
2018	188,079	0	16	0	11,722	0	18,956	30,678	0.062	0.101	0.163
MA Total:	768,396	0	63	0	402,359	0	180,430	582,789	0.524	0.235	0.758

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.570	0.488	.
(14) Massachusetts Credibility:	0.210	0.300	.
(15) Countrywide Pure Premium:	0.856	0.520	1.377
(16) Countrywide Indicated Relativity:	1.021	1.191	.
(17) Countrywide Credibility:	0.400	0.350	.
(18) Countrywide Lost-Time Claims:	440.00	.	.
(19) Pure Premium Underlying Present Rate:	0.705	0.410	1.115
(20) Relativity to Underlying Present Rate:	0.863	0.976	.
(21) Credibility to Underlying Relativity:	0.390	0.350	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.865	0.905	.
(24) Balanced Formula Relativity:	0.861	0.898	0.874

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
3018 IRON OR STEEL: MFG: ROLLING MILL & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	185.303	1	17	1.633	110.487	10.399	53.053	175.571	0.605	0.342	0.947
2015	171.105	0	6	0	169.908	0	50.570	220.478	0.993	0.296	1.289
2016	209.784	1	31	78.202	301.857	16.600	170.785	567.444	1.812	0.893	2.705
2017	218.380	1	18	86.193	102.907	10.829	86.859	286.788	0.866	0.447	1.313
2018	228.390	3	22	148.577	205.370	76.475	106.295	536.718	1.550	0.800	2.350
MA Total:	1,012,962	6	94	314.605	890,530	114,303	467,561	1,787,000	1.190	0.574	1.764

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.295	1.193	.
(14) Massachusetts Credibility:	0.280	0.370	.
(15) Countrywide Pure Premium:	1.123	0.552	1.675
(16) Countrywide Indicated Relativity:	1.339	1.264	.
(17) Countrywide Credibility:	0.360	0.320	.
(18) Countrywide Lost-Time Claims:	455.00	.	.
(19) Pure Premium Underlying Present Rate:	1.127	0.527	1.654
(20) Relativity to Underlying Present Rate:	1.380	1.253	.
(21) Credibility to Underlying Relativity:	0.360	0.310	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.342	1.234	.
(24) Balanced Formula Relativity:	1.336	1.225	1.298

Class(es):		Effective: 7/1/2022							Manufacturing		
3022 PIPE OR TUBE MFG NOC & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	17.051	1	4	14.825	15.019	31.093	25.742	86.679	1.750	3.333	5.083
2015	18.656	0	6	0	18.561	0	13.701	32.262	0.995	0.734	1.729
2016	8.139	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	5.211	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	6.360	0	1	0	7.238	0	1.976	9.213	1.138	0.311	1.449
MA Total:	55,418	1	11	14.825	40,818	31,093	41,419	128,154	1.004	1.308	2.313

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.093	2.717	.
(14) Massachusetts Credibility:	0.100	0.140	.
(15) Countrywide Pure Premium:	1.544	0.751	2.296
(16) Countrywide Indicated Relativity:	1.842	1.719	.
(17) Countrywide Credibility:	0.450	0.430	.
(18) Countrywide Lost-Time Claims:	438.00	.	.
(19) Pure Premium Underlying Present Rate:	1.455	0.821	2.276
(20) Relativity to Underlying Present Rate:	1.781	1.954	.
(21) Credibility to Underlying Relativity:	0.450	0.430	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.740	1.960	.
(24) Balanced Formula Relativity:	1.733	1.945	1.806

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
3027 ROLLING MILL NOC & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	3,641	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	10,658	1	3	25,675	4,342	4,513	9,921	44,451	2,816	1,354	4,171
2016	9,601	0	1	0	0	0	615	615	0.000	0.064	0.064
2017	7,162	0	1	0	0	0	418	418	0.000	0.058	0.058
2018	188	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	31,251	1	5	25,675	4,342	4,513	10,954	45,484	0.961	0.495	1.455

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.046	1.028	.
(14) Massachusetts Credibility:	0.070	0.110	.
(15) Countrywide Pure Premium:	0.871	0.457	1.328
(16) Countrywide Indicated Relativity:	1.038	1.046	.
(17) Countrywide Credibility:	0.470	0.450	.
(18) Countrywide Lost-Time Claims:	389.00	.	.
(19) Pure Premium Underlying Present Rate:	1.319	0.895	2.214
(20) Relativity to Underlying Present Rate:	1.615	2.128	.
(21) Credibility to Underlying Relativity:	0.460	0.440	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.304	1.520	.
(24) Balanced Formula Relativity:	1.299	1.509	1.371

Class(es):		Effective: 7/1/2022							Manufacturing		
3028 PIPE OR TUBE MFG - IRON OR STEEL & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	5,315	0	1	0	7,315	0	8,088	15,403	1,376	1,522	2,898
2015	24,770	0	9	0	7,041	0	14,177	21,219	0.284	0.572	0.857
2016	6,253	0	5	0	7,766	0	5,160	12,927	1,242	0.825	2,067
2017	5,763	0	3	0	9,645	0	4,876	14,521	1,674	0.846	2,520
2018	5,715	0	2	0	0	0	1,062	1,062	0.000	0.186	0.186
MA Total:	47,816	0	20	0	31,767	0	33,364	65,131	0.664	0.698	1.362

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.723	1.449	.
(14) Massachusetts Credibility:	0.080	0.120	.
(15) Countrywide Pure Premium:	1.179	0.627	1.806
(16) Countrywide Indicated Relativity:	1.406	1.436	.
(17) Countrywide Credibility:	0.460	0.440	.
(18) Countrywide Lost-Time Claims:	1049.0	.	.
(19) Pure Premium Underlying Present Rate:	1.190	0.674	1.864
(20) Relativity to Underlying Present Rate:	1.458	1.603	.
(21) Credibility to Underlying Relativity:	0.460	0.440	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.375	1.511	.
(24) Balanced Formula Relativity:	1.370	1.500	1.415

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Calculation of Class Relativities

Class(es):									Effective: 7/1/2022			Manufacturing		
3030 IRON OR STEEL: FABRICATION: IRON/STEEL WORK-SHOP-STRUCT & DR														
Converted Unlimited Losses														
Amount														
		Claim Count		Indemnity		Medical		Total	MA Indicated Pure Premiums					
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)			
2014	117.891	0	11	0	12.169	0	16.970	29.139	0.103	0.144	0.247			
2015	124.152	0	25	0	208.782	0	175.858	384.641	1.682	1.416	3.098			
2016	125.621	1	21	137.068	35.114	207.068	107.033	486.283	1.371	2.500	3.871			
2017	120.391	1	20	16.573	436.370	28.189	145.294	626.426	3.762	1.441	5.203			
2018	132.412	1	19	93.069	129.313	91.044	79.716	393.142	1.679	1.290	2.969			
MA Total:	620.467	3	96	246.711	821.748	326.301	524.871	1,919.630	1.722	1.372	3.094			

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.875	2.848	.
(14) Massachusetts Credibility:	0.320	0.430	.
(15) Countrywide Pure Premium:	2.142	1.104	3.246
(16) Countrywide Indicated Relativity:	2.555	2.526	.
(17) Countrywide Credibility:	0.340	0.290	.
(18) Countrywide Lost-Time Claims:	2542.0	.	.
(19) Pure Premium Underlying Present Rate:	2.612	1.285	3.897
(20) Relativity to Underlying Present Rate:	3.198	3.057	.
(21) Credibility to Underlying Relativity:	0.340	0.280	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	2.556	2.813	.
(24) Balanced Formula Relativity:	2.546	2.793	2.631

Class(es):									Effective: 7/1/2022			Manufacturing		
3040 IRON OR STEEL: FABRICATION: IRON WORKS-SHOP-ORNAMENTAL & DR														
Converted Unlimited Losses														
Amount														
		Claim Count		Indemnity		Medical		Total	MA Indicated Pure Premiums					
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)			
2014	184.645	1	31	222.642	92.751	24.542	48.679	388.615	1.708	0.397	2.105			
2015	196.068	2	21	647.184	632.852	75.519	138.293	1,493.849	6.529	1.091	7.619			
2016	217.526	2	40	681.247	121.676	86.747	164.506	1,054.175	3.691	1.155	4.846			
2017	239.716	0	39	0	316.880	0	160.480	477.360	1.322	0.669	1.991			
2018	253.533	1	45	385.994	890.340	127.870	377.405	1,781.609	5.034	1.993	7.027			
MA Total:	1,091.488	6	176	1,937.067	2,054.499	314.677	889.363	5,195.608	3.657	1.103	4.760			

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.982	2.290	.
(14) Massachusetts Credibility:	0.380	0.460	.
(15) Countrywide Pure Premium:	2.265	1.166	3.432
(16) Countrywide Indicated Relativity:	2.702	2.669	.
(17) Countrywide Credibility:	0.310	0.270	.
(18) Countrywide Lost-Time Claims:	1530.0	.	.
(19) Pure Premium Underlying Present Rate:	2.242	0.821	3.063
(20) Relativity to Underlying Present Rate:	2.745	1.954	.
(21) Credibility to Underlying Relativity:	0.310	0.270	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	3.202	2.302	.
(24) Balanced Formula Relativity:	3.189	2.285	2.878

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
3041 IRON OR STEEL: FABRICATION: IRON WORKS-SHP-DEC/ART &FNDRS,DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	50,510	0	4	0	0	0	2,358	2,358	0.000	0.047	0.047
2015	40,557	0	3	0	0	0	1,262	1,262	0.000	0.031	0.031
2016	43,286	0	2	0	4,314	0	2,493	6,806	0.100	0.058	0.157
2017	50,813	0	6	0	930	0	5,789	6,719	0.018	0.114	0.132
2018	55,058	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	240,224	0	15	0	5,244	0	11,902	17,146	0.022	0.050	0.071

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.024	0.103	.
(14) Massachusetts Credibility:	0.160	0.220	.
(15) Countrywide Pure Premium:	1.823	0.792	2.615
(16) Countrywide Indicated Relativity:	2.174	1.813	.
(17) Countrywide Credibility:	0.420	0.390	.
(18) Countrywide Lost-Time Claims:	204.00	.	.
(19) Pure Premium Underlying Present Rate:	1.159	0.611	1.770
(20) Relativity to Underlying Present Rate:	1.419	1.453	.
(21) Credibility to Underlying Relativity:	0.420	0.390	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.513	1.296	.
(24) Balanced Formula Relativity:	1.507	1.287	1.431

Class(es):		Effective: 7/1/2022							Manufacturing		
3042 ELEVATOR OR ESCALATOR MFG											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	6,749	0	2	0	0	0	709	709	0.000	0.105	0.105
2015	7,198	0	2	0	0	0	1,772	1,772	0.000	0.246	0.246
2016	7,941	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	8,752	0	2	0	0	0	2,850	2,850	0.000	0.326	0.326
2018	14,292	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	44,932	0	6	0	0	0	5,331	5,331	0.000	0.119	0.119

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.246	.
(14) Massachusetts Credibility:	0.100	0.140	.
(15) Countrywide Pure Premium:	1.739	1.018	2.756
(16) Countrywide Indicated Relativity:	2.074	2.330	.
(17) Countrywide Credibility:	0.450	0.430	.
(18) Countrywide Lost-Time Claims:	209.00	.	.
(19) Pure Premium Underlying Present Rate:	1.917	0.977	2.895
(20) Relativity to Underlying Present Rate:	2.348	2.324	.
(21) Credibility to Underlying Relativity:	0.450	0.430	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.990	2.035	.
(24) Balanced Formula Relativity:	1.982	2.021	1.995

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Calculation of Class Relativities

Class(es): 3066 SHEET METAL WORK - SHOP		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	920,719	4	139	157,241	546,456	40,291	413,370	1,157,358	0.764	0.493	1.257
2015	950,801	3	149	173,535	488,910	47,842	354,638	1,064,924	0.697	0.423	1.120
2016	942,065	2	135	190,886	602,821	91,840	425,995	1,311,543	0.843	0.550	1.392
2017	988,826	2	130	464,467	973,058	87,437	588,335	2,113,297	1.454	0.683	2.137
2018	1,034,565	3	109	530,676	498,537	227,680	413,149	1,670,042	0.995	0.619	1.614
MA Total:	4,836,976	14	662	1,516,805	3,109,783	495,089	2,195,486	7,317,163	0.957	0.556	1.513

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.041	1.155	.
(14) Massachusetts Credibility:	0.490	0.690	.
(15) Countrywide Pure Premium:	1.435	0.749	2.184
(16) Countrywide Indicated Relativity:	1.711	1.715	.
(17) Countrywide Credibility:	0.260	0.160	.
(18) Countrywide Lost-Time Claims:	996.00	.	.
(19) Pure Premium Underlying Present Rate:	0.964	0.530	1.494
(20) Relativity to Underlying Present Rate:	1.180	1.262	.
(21) Credibility to Underlying Relativity:	0.250	0.150	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.250	1.261	.
(24) Balanced Formula Relativity:	1.245	1.251	1.247

Class(es): 3076 FIREPROOF EQUIPMENT MFG		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	364,179	0	34	0	18,833	0	52,071	70,904	0.052	0.143	0.195
2015	281,707	4	46	357,760	236,610	136,119	106,522	837,010	2.110	0.861	2.971
2016	270,095	0	27	0	193,602	0	89,463	283,065	0.717	0.331	1.048
2017	291,169	2	31	73,547	17,833	17,947	39,515	148,842	0.314	0.197	0.511
2018	311,984	2	45	116,112	254,019	42,477	190,419	603,027	1.186	0.747	1.933
MA Total:	1,519,134	8	183	547,418	720,897	196,543	477,990	1,942,848	0.835	0.444	1.279

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.909	0.922	.
(14) Massachusetts Credibility:	0.300	0.410	.
(15) Countrywide Pure Premium:	1.239	0.693	1.932
(16) Countrywide Indicated Relativity:	1.478	1.587	.
(17) Countrywide Credibility:	0.350	0.300	.
(18) Countrywide Lost-Time Claims:	8741.0	.	.
(19) Pure Premium Underlying Present Rate:	0.912	0.442	1.353
(20) Relativity to Underlying Present Rate:	1.116	1.051	.
(21) Credibility to Underlying Relativity:	0.350	0.290	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.181	1.159	.
(24) Balanced Formula Relativity:	1.176	1.150	1.167

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Calculation of Class Relativities

Class(es): 3081 FOUNDRY-FERROUS-NOC		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	18,779	2	4	136,488	49	46,986	3,126	186,649	7,271	2,669	9,939
2015	15,003	0	4	0	6,471	0	34,462	40,933	0,431	2,297	2,728
2016	16,294	0	2	0	0	0	399	399	0,000	0,024	0,024
2017	19,902	1	4	12,141	1,324	7,043	3,267	23,774	0,677	0,518	1,195
2018	18,143	0	5	0	72,578	0	35,554	108,132	4,000	1,960	5,960
MA Total:	88,121	3	19	148,629	80,421	54,028	76,808	359,886	2,599	1,485	4,084

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.830	3.083	.
(14) Massachusetts Credibility:	0.130	0.200	.
(15) Countrywide Pure Premium:	2.058	0.979	3.037
(16) Countrywide Indicated Relativity:	2.455	2.241	.
(17) Countrywide Credibility:	0.440	0.400	.
(18) Countrywide Lost-Time Claims:	1837.0	.	.
(19) Pure Premium Underlying Present Rate:	1.917	1.320	3.237
(20) Relativity to Underlying Present Rate:	2.347	3.140	.
(21) Credibility to Underlying Relativity:	0.430	0.400	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	2.457	2.769	.
(24) Balanced Formula Relativity:	2.448	2.749	2.551

Class(es): 3085 FOUNDRY-NON FERROUS		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	116,847	0	23	0	130,805	0	58,274	189,079	1,119	0,499	1,618
2015	112,511	2	10	477,792	183,012	243,512	53,293	957,609	5,873	2,638	8,511
2016	109,493	0	18	0	14,674	0	38,691	53,365	0,134	0,353	0,487
2017	134,230	0	31	0	199,677	0	105,993	305,670	1,488	0,790	2,277
2018	120,913	0	32	0	583,321	0	374,434	957,756	4,824	3,097	7,921
MA Total:	593,995	2	114	477,792	1,111,490	243,512	630,685	2,463,479	2,676	1,472	4,147

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.913	3.056	.
(14) Massachusetts Credibility:	0.280	0.380	.
(15) Countrywide Pure Premium:	1.741	1.041	2.782
(16) Countrywide Indicated Relativity:	2.077	2.383	.
(17) Countrywide Credibility:	0.360	0.310	.
(18) Countrywide Lost-Time Claims:	858.00	.	.
(19) Pure Premium Underlying Present Rate:	1.971	0.959	2.930
(20) Relativity to Underlying Present Rate:	2.414	2.281	.
(21) Credibility to Underlying Relativity:	0.360	0.310	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	2.432	2.607	.
(24) Balanced Formula Relativity:	2.423	2.588	2.480

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
3110 FORGING WORK - DROP OR MACHINE											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	14,155	0	5	0	25,845	0	10,413	36,258	1,826	0,736	2,562
2015	11,186	0	6	0	469,379	0	95,227	564,606	41,963	8,513	50,476
2016	20,193	1	12	147,614	151,101	33,588	65,777	398,080	14,793	4,921	19,714
2017	17,397	0	9	0	114,752	0	42,237	156,989	6,596	2,428	9,024
2018	15,634	1	3	63,484	2,263	17,358	3,796	86,902	4,206	1,353	5,559
MA Total:	78,564	2	35	211,098	763,341	50,946	217,449	1,242,835	12,403	3,416	15,819

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	13.504	7.093	.
(14) Massachusetts Credibility:	0.160	0.220	.
(15) Countrywide Pure Premium:	2.057	0.959	3.016
(16) Countrywide Indicated Relativity:	2.453	2.196	.
(17) Countrywide Credibility:	0.420	0.390	.
(18) Countrywide Lost-Time Claims:	398.00	.	.
(19) Pure Premium Underlying Present Rate:	3.411	1.847	5.258
(20) Relativity to Underlying Present Rate:	4.177	4.393	.
(21) Credibility to Underlying Relativity:	0.420	0.390	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	4.945	4.130	.
(24) Balanced Formula Relativity:	4.926	4.100	4.642

Class(es):		Effective: 7/1/2022							Manufacturing		
3111 BLACKSMITH											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	66,537	2	12	146,563	13,837	29,274	18,375	208,049	2,411	0,716	3,127
2015	71,625	0	9	0	6,654	0	31,703	38,357	0,093	0,443	0,536
2016	79,120	0	7	0	6,508	0	24,667	31,176	0,082	0,312	0,394
2017	81,346	0	7	0	134,657	0	40,441	175,098	1,655	0,497	2,153
2018	130,223	0	16	0	160,198	0	106,874	267,072	1,230	0,821	2,051
MA Total:	428,852	2	51	146,563	321,854	29,274	222,061	719,752	1,092	0,586	1,678

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.189	1.217	.
(14) Massachusetts Credibility:	0.170	0.230	.
(15) Countrywide Pure Premium:	1.066	0.432	1.498
(16) Countrywide Indicated Relativity:	1.271	0.990	.
(17) Countrywide Credibility:	0.420	0.390	.
(18) Countrywide Lost-Time Claims:	225.00	.	.
(19) Pure Premium Underlying Present Rate:	0.821	0.397	1.218
(20) Relativity to Underlying Present Rate:	1.005	0.944	.
(21) Credibility to Underlying Relativity:	0.410	0.380	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.148	1.025	.
(24) Balanced Formula Relativity:	1.144	1.017	1.100

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
3113 TOOL MFG-NOT DROP OR MACHINE FORGED-NOC											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	848.311	5	65	636.566	133.080	127.817	160.418	1,057.881	0.907	0.340	1.247
2015	882.440	5	69	625.506	578.770	227.671	363.780	1,795.727	1.365	0.670	2.035
2016	805.080	1	87	78.876	364.870	19.764	211.902	675.411	0.551	0.288	0.839
2017	751.772	2	65	104.649	512.415	73.337	348.988	1,039.390	0.821	0.562	1.383
2018	754.877	2	66	283.829	288.951	169.271	241.076	983.127	0.759	0.544	1.302
MA Total:	4,042.480	15	352	1,729.425	1,878.087	617.861	1,326.164	5,551.536	0.892	0.481	1.373

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.972	0.998	.
(14) Massachusetts Credibility:	0.390	0.550	.
(15) Countrywide Pure Premium:	0.720	0.379	1.099
(16) Countrywide Indicated Relativity:	0.858	0.868	.
(17) Countrywide Credibility:	0.310	0.230	.
(18) Countrywide Lost-Time Claims:	1539.0	.	.
(19) Pure Premium Underlying Present Rate:	0.675	0.359	1.033
(20) Relativity to Underlying Present Rate:	0.826	0.854	.
(21) Credibility to Underlying Relativity:	0.300	0.220	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.893	0.937	.
(24) Balanced Formula Relativity:	0.889	0.930	0.903

Class(es):		Effective: 7/1/2022							Manufacturing		
3114 TOOL MFG-DROP OR MACHINE FORGED-NOC: MACHINING OR FINISHING											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	34.349	1	7	15.200	126.909	18.292	46.940	207.341	4.137	1.899	6.036
2015	38.343	0	13	0	3.234	0	11.587	14.821	0.084	0.302	0.387
2016	41.619	1	9	77.384	314	9.864	6.085	93.646	1.867	0.383	2.250
2017	30.261	0	9	0	1.049	0	7.315	8.364	0.035	0.242	0.276
2018	51.565	0	12	0	14.024	0	14.654	28.678	0.272	0.284	0.556
MA Total:	196.137	2	50	92.583	145.530	28.156	86.581	352.850	1.214	0.585	1.799

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.322	1.215	.
(14) Massachusetts Credibility:	0.160	0.210	.
(15) Countrywide Pure Premium:	1.298	0.609	1.907
(16) Countrywide Indicated Relativity:	1.548	1.394	.
(17) Countrywide Credibility:	0.420	0.400	.
(18) Countrywide Lost-Time Claims:	256.00	.	.
(19) Pure Premium Underlying Present Rate:	1.360	0.686	2.045
(20) Relativity to Underlying Present Rate:	1.665	1.631	.
(21) Credibility to Underlying Relativity:	0.420	0.390	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.561	1.449	.
(24) Balanced Formula Relativity:	1.555	1.438	1.515

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Calculation of Class Relativities

Class(es): 3118 SAW MFG		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	329.012	1	20	367.294	281.162	39.592	67.737	755.786	1.971	0.326	2.297
2015	332.270	0	15	0	245.076	0	192.360	437.436	0.738	0.579	1.317
2016	261.973	0	17	0	60.297	0	56.491	116.789	0.230	0.216	0.446
2017	90.032	0	9	0	74.987	0	118.294	193.281	0.833	1.314	2.147
2018	68.594	0	3	0	16.029	0	4.777	20.806	0.234	0.070	0.303
MA Total:	1,081.881	1	64	367.294	677.551	39.592	439.659	1,524.097	0.966	0.443	1.409

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.051	0.920	.
(14) Massachusetts Credibility:	0.240	0.310	.
(15) Countrywide Pure Premium:	0.592	0.337	0.928
(16) Countrywide Indicated Relativity:	0.706	0.770	.
(17) Countrywide Credibility:	0.380	0.350	.
(18) Countrywide Lost-Time Claims:	113.00	.	.
(19) Pure Premium Underlying Present Rate:	0.763	0.317	1.080
(20) Relativity to Underlying Present Rate:	0.934	0.754	.
(21) Credibility to Underlying Relativity:	0.380	0.340	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.875	0.811	.
(24) Balanced Formula Relativity:	0.872	0.805	0.849

Class(es): 3119 NEEDLE MFG		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	57.363	1	7	44.953	3.366	12.582	12.257	73.157	0.842	0.433	1.275
2015	65.239	1	6	62.392	0	11.026	3.089	76.507	0.956	0.216	1.173
2016	57.898	0	6	0	53.845	0	45.595	99.440	0.930	0.788	1.718
2017	58.683	0	2	0	0	0	7.357	0.000	0.125	0.125	
2018	65.473	1	4	137.308	9.638	31.720	12.930	191.595	2.244	0.682	2.926
MA Total:	304.656	3	25	244.653	66.848	55.327	81.228	448.057	1.022	0.448	1.471

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.113	0.931	.
(14) Massachusetts Credibility:	0.100	0.150	.
(15) Countrywide Pure Premium:	0.799	0.325	1.124
(16) Countrywide Indicated Relativity:	0.952	0.744	.
(17) Countrywide Credibility:	0.180	0.190	.
(18) Countrywide Lost-Time Claims:	16.000	.	.
(19) Pure Premium Underlying Present Rate:	0.302	0.193	0.495
(20) Relativity to Underlying Present Rate:	0.370	0.460	.
(21) Credibility to Underlying Relativity:	0.720	0.660	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.549	0.585	.
(24) Balanced Formula Relativity:	0.547	0.580	0.558

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Calculation of Class Relativities

Class(es): 3120 RAZOR MFG-SAFETY		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	6,869	1	0	7,647	0	5,763	0	13,409	1,113	0,839	1,952
2015	34,123	1	1	11,435	0	369	2,133	13,936	0,335	0,073	0,408
2016	53,954	1	1	30,898	2,485	3,400	585	37,368	0,619	0,074	0,693
2017	60,462	1	4	13,737	44,683	5,585	14,377	78,383	0,966	0,330	1,296
2018	30,728	0	0	0	0	0	0	0	0,000	0,000	0,000
MA Total:	186,137	4	6	63,717	47,169	15,116	17,095	143,096	0,596	0,173	0,769

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.649	0.359	.
(14) Massachusetts Credibility:	0.110	0.140	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	0.709	0.586	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	0.586	0.249	0.836
(20) Relativity to Underlying Present Rate:	0.718	0.593	.
(21) Credibility to Underlying Relativity:	0.890	0.860	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.710	0.560	.
(24) Balanced Formula Relativity:	0.708	0.556	0.656

Class(es): 3122 CUTLERY MFG-NOC		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	111,219	1	24	137,384	87,475	20,119	58,944	303,923	2,022	0,711	2,733
2015	122,922	1	39	98,555	53,671	3,686	49,409	205,320	1,238	0,432	1,670
2016	126,037	0	46	0	291,617	0	116,340	407,956	2,314	0,923	3,237
2017	127,683	0	39	0	13,765	0	35,807	49,572	0,108	0,280	0,388
2018	119,055	1	37	30,944	18,459	12,250	35,948	97,602	0,415	0,405	0,820
MA Total:	606,915	3	185	266,883	464,987	36,055	296,449	1,064,374	1,206	0,548	1,754

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.313	1.138	.
(14) Massachusetts Credibility:	0.210	0.310	.
(15) Countrywide Pure Premium:	0.954	0.549	1.503
(16) Countrywide Indicated Relativity:	1.137	1.257	.
(17) Countrywide Credibility:	0.400	0.350	.
(18) Countrywide Lost-Time Claims:	113.00	.	.
(19) Pure Premium Underlying Present Rate:	0.949	0.558	1.507
(20) Relativity to Underlying Present Rate:	1.162	1.328	.
(21) Credibility to Underlying Relativity:	0.390	0.340	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.184	1.244	.
(24) Balanced Formula Relativity:	1.179	1.235	1.199

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
3127 PRECISION MEASURING TOOL MFG-NOC											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	1,665	0	1	0	92,990	0	22,426	115,415	55,864	13,472	69,337
2015	2,614	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	1,749	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	1,642	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	4,287	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	11,957	0	1	0	92,990	0	22,426	115,415	7,777	1,876	9,653

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	8.467	3.894	.
(14) Massachusetts Credibility:	0.040	0.060	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	0.939	0.976	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	0.776	0.416	1.192
(20) Relativity to Underlying Present Rate:	0.951	0.988	.
(21) Credibility to Underlying Relativity:	0.960	0.940	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.251	1.163	.
(24) Balanced Formula Relativity:	1.246	1.154	1.215

Class(es):		Effective: 7/1/2022							Manufacturing		
3131 BUTTON OR FASTENER MFG-METAL											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	7,090	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	7,968	0	1	0	0	0	1,793	1,793	0.000	0.225	0.225
2016	8,520	0	1	0	0	0	219	219	0.000	0.026	0.026
2017	9,894	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	7,903	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	41,374	0	2	0	0	0	2,012	2,012	0.000	0.049	0.049

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.101	.
(14) Massachusetts Credibility:	0.060	0.090	.
(15) Countrywide Pure Premium:	0.511	0.401	0.912
(16) Countrywide Indicated Relativity:	0.610	0.917	.
(17) Countrywide Credibility:	0.470	0.460	.
(18) Countrywide Lost-Time Claims:	265.00	.	.
(19) Pure Premium Underlying Present Rate:	0.583	0.337	0.920
(20) Relativity to Underlying Present Rate:	0.714	0.801	.
(21) Credibility to Underlying Relativity:	0.470	0.450	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.622	0.792	.
(24) Balanced Formula Relativity:	0.620	0.786	0.677

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Calculation of Class Relativities

Class(es): 3132 NUT OR BOLT MFG		Effective: 7/1/2022							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	10,358	0	4	0	75,637	0	27,718	103,355	7,302	2,676	9,978
2015	13,189	0	2	0	1,296	0	8,974	10,270	0,098	0,680	0,779
2016	15,158	0	2	0	0	0	2,453	2,453	0,000	0,162	0,162
2017	15,421	0	1	0	0	0	962	962	0,000	0,062	0,062
2018	28,384	0	7	0	17,715	0	17,881	35,596	0,624	0,630	1,254
MA Total:	82,511	0	16	0	94,648	0	57,989	152,637	1,147	0,703	1,850

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.249	1.459	.
(14) Massachusetts Credibility:	0.100	0.150	.
(15) Countrywide Pure Premium:	0.879	0.557	1.437
(16) Countrywide Indicated Relativity:	1.049	1.276	.
(17) Countrywide Credibility:	0.450	0.430	.
(18) Countrywide Lost-Time Claims:	302.00	.	.
(19) Pure Premium Underlying Present Rate:	1.049	0.621	1.670
(20) Relativity to Underlying Present Rate:	1.284	1.477	.
(21) Credibility to Underlying Relativity:	0.450	0.420	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.175	1.388	.
(24) Balanced Formula Relativity:	1.170	1.378	1.242

Class(es): 3145 SCREW MFG		Effective: 7/1/2022							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	199,751	0	15	0	117,880	0	26,597	144,477	0,590	0,133	0,723
2015	205,780	1	25	206,963	34,987	14,280	56,159	312,389	1,176	0,342	1,518
2016	205,318	1	18	170,363	34,422	134,098	57,443	396,326	0,997	0,933	1,930
2017	344,237	0	15	0	127,209	0	114,380	241,589	0,370	0,332	0,702
2018	221,442	0	12	0	3,586	0	13,530	17,116	0,016	0,061	0,077
MA Total:	1,176,527	2	85	377,327	318,084	148,378	268,109	1,111,898	0,591	0,354	0,945

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.644	0.735	.
(14) Massachusetts Credibility:	0.250	0.330	.
(15) Countrywide Pure Premium:	0.808	0.460	1.268
(16) Countrywide Indicated Relativity:	0.964	1.052	.
(17) Countrywide Credibility:	0.380	0.340	.
(18) Countrywide Lost-Time Claims:	550.00	.	.
(19) Pure Premium Underlying Present Rate:	0.715	0.348	1.063
(20) Relativity to Underlying Present Rate:	0.876	0.828	.
(21) Credibility to Underlying Relativity:	0.370	0.330	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.851	0.874	.
(24) Balanced Formula Relativity:	0.848	0.867	0.855

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Calculation of Class Relativities

Class(es): 3146 HARDWARE MFG-NOC		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	105,273	0	11	0	214,228	0	26,142	240,370	2,035	0,248	2,283
2015	86,768	1	12	7,309	35,175	16,566	107,777	166,826	0,490	1,433	1,923
2016	89,198	1	11	53,546	691	48,144	9,768	112,149	0,608	0,649	1,257
2017	91,785	0	17	0	12,200	0	24,021	36,221	0,133	0,262	0,395
2018	91,813	0	14	0	4,021	0	15,833	19,854	0,044	0,172	0,216
MA Total:	464,838	2	65	60,855	266,315	64,710	183,541	575,421	0,704	0,534	1,238

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.766	1.109	.
(14) Massachusetts Credibility:	0.190	0.270	.
(15) Countrywide Pure Premium:	0.993	0.549	1.542
(16) Countrywide Indicated Relativity:	1.185	1.256	.
(17) Countrywide Credibility:	0.410	0.370	.
(18) Countrywide Lost-Time Claims:	1612.0	.	.
(19) Pure Premium Underlying Present Rate:	0.926	0.529	1.454
(20) Relativity to Underlying Present Rate:	1.133	1.257	.
(21) Credibility to Underlying Relativity:	0.400	0.360	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.085	1.217	.
(24) Balanced Formula Relativity:	1.080	1.208	1.124

Class(es): 3169 STOVE MFG		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	437,178	1	51	35,158	234,072	15,470	511,277	795,978	0,616	1,205	1,821
2015	415,233	3	50	289,280	468,793	310,364	289,754	1,358,190	1,826	1,445	3,271
2016	420,303	0	52	0	451,546	0	458,744	910,291	1,074	1,091	2,166
2017	451,102	0	59	0	139,467	0	158,543	298,010	0,309	0,351	0,661
2018	503,174	0	62	0	390,413	0	197,746	588,160	0,776	0,393	1,169
MA Total:	2,226,990	4	274	324,437	1,684,292	325,834	1,616,065	3,950,628	0,902	0,872	1,774

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.982	1.811	.
(14) Massachusetts Credibility:	0.370	0.580	.
(15) Countrywide Pure Premium:	1.181	0.685	1.866
(16) Countrywide Indicated Relativity:	1.409	1.567	.
(17) Countrywide Credibility:	0.320	0.210	.
(18) Countrywide Lost-Time Claims:	6691.0	.	.
(19) Pure Premium Underlying Present Rate:	1.021	0.748	1.769
(20) Relativity to Underlying Present Rate:	1.251	1.778	.
(21) Credibility to Underlying Relativity:	0.310	0.210	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.202	1.753	.
(24) Balanced Formula Relativity:	1.197	1.740	1.384

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
3179 ELECTRICAL APPARATUS MFG-NOC											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	1,236,577	3	85	244,072	84,257	47,678	83,548	459,554	0.266	0.106	0.372
2015	1,369,620	0	75	0	513,289	0	291,211	804,499	0.375	0.213	0.587
2016	1,330,715	1	82	24,446	519,169	43,123	336,104	922,843	0.409	0.285	0.693
2017	1,545,662	1	92	8,514	1,096,958	84,311	305,368	1,495,152	0.715	0.252	0.967
2018	1,906,198	3	76	127,561	207,878	125,968	158,986	620,393	0.176	0.149	0.325
MA Total:	7,388,773	8	410	404,594	2,421,551	301,079	1,175,217	4,302,441	0.382	0.200	0.582

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.416	0.415	.
(14) Massachusetts Credibility:	0.450	0.590	.
(15) Countrywide Pure Premium:	0.761	0.383	1.143
(16) Countrywide Indicated Relativity:	0.907	0.876	.
(17) Countrywide Credibility:	0.280	0.210	.
(18) Countrywide Lost-Time Claims:	3821.0	.	.
(19) Pure Premium Underlying Present Rate:	0.524	0.227	0.751
(20) Relativity to Underlying Present Rate:	0.641	0.541	.
(21) Credibility to Underlying Relativity:	0.270	0.200	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.615	0.537	.
(24) Balanced Formula Relativity:	0.612	0.533	0.585

Class(es):		Effective: 7/1/2022							Manufacturing		
3180 ELECTRIC OR GAS LIGHTING FIXTURES MFG											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	120,495	0	30	0	112,078	0	57,786	169,864	0.930	0.480	1.410
2015	118,871	2	23	564,938	82,694	95,940	43,774	787,347	5.448	1.175	6.624
2016	124,574	1	19	29,667	4,397	7,315	14,088	55,468	0.273	0.172	0.445
2017	130,353	0	25	0	236,742	0	100,062	336,804	1.816	0.768	2.584
2018	121,517	1	17	80,908	404,495	23,492	50,104	558,999	3.995	0.606	4.600
MA Total:	615,810	4	114	675,513	840,407	126,747	265,814	1,908,481	2.462	0.637	3.099

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.680	1.324	.
(14) Massachusetts Credibility:	0.220	0.290	.
(15) Countrywide Pure Premium:	0.680	0.479	1.160
(16) Countrywide Indicated Relativity:	0.811	1.097	.
(17) Countrywide Credibility:	0.390	0.360	.
(18) Countrywide Lost-Time Claims:	332.00	.	.
(19) Pure Premium Underlying Present Rate:	0.996	0.470	1.465
(20) Relativity to Underlying Present Rate:	1.219	1.117	.
(21) Credibility to Underlying Relativity:	0.390	0.350	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.382	1.170	.
(24) Balanced Formula Relativity:	1.376	1.161	1.302

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Calculation of Class Relativities

Class(es): 3188 PLUMBERS SUPPLIES MFG-NOC		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	22,598	0	7	0	17,681	0	9,103	26,784	0.782	0.403	1.185
2015	21,597	0	5	0	253,377	0	58,662	312,039	11.732	2.716	14.448
2016	22,318	0	5	0	0	0	3,807	3,807	0.000	0.171	0.171
2017	21,811	0	4	0	8,031	0	13,133	21,163	0.368	0.602	0.970
2018	26,987	0	1	0	0	0	640	640	0.000	0.024	0.024
MA Total:	115,310	0	22	0	279,089	0	85,345	364,433	2.420	0.740	3.160

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.635	1.537	.
(14) Massachusetts Credibility:	0.110	0.150	.
(15) Countrywide Pure Premium:	0.830	0.489	1.318
(16) Countrywide Indicated Relativity:	0.990	1.118	.
(17) Countrywide Credibility:	0.450	0.430	.
(18) Countrywide Lost-Time Claims:	392.00	.	.
(19) Pure Premium Underlying Present Rate:	1.037	0.512	1.548
(20) Relativity to Underlying Present Rate:	1.270	1.217	.
(21) Credibility to Underlying Relativity:	0.440	0.420	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.294	1.222	.
(24) Balanced Formula Relativity:	1.289	1.213	1.263

Class(es): 3200 ARMS MFG-SMALL		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	69,092	1	13	47,505	45,613	7,599	28,710	129,427	1.348	0.526	1.873
2015	69,171	0	7	0	83,765	0	20,753	104,518	1.211	0.300	1.511
2016	106,226	0	9	0	105,142	0	108,308	213,449	0.990	1.020	2.009
2017	58,551	0	7	0	151,861	0	34,669	186,529	2.594	0.592	3.186
2018	20,249	0	6	0	13,499	0	27,903	41,401	0.667	1.378	2.045
MA Total:	323,290	1	42	47,505	399,879	7,599	220,342	675,325	1.384	0.705	2.089

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.507	1.464	.
(14) Massachusetts Credibility:	0.160	0.220	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	1.054	1.076	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	0.871	0.458	1.329
(20) Relativity to Underlying Present Rate:	1.067	1.089	.
(21) Credibility to Underlying Relativity:	0.840	0.780	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.137	1.172	.
(24) Balanced Formula Relativity:	1.133	1.163	1.143

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Calculation of Class Relativities

Class(es): 3220 CAN MFG		Effective: 7/1/2022							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	100,269	2	12	249,528	7,712	362,489	10,324	630,052	2,565	3,718	6,284
2015	98,802	1	10	447,444	0	33,379	14,992	495,815	4,529	0,490	5,018
2016	66,719	0	8	0	11,938	0	20,938	32,876	0,179	0,314	0,493
2017	101,274	0	5	0	173,672	0	40,652	214,324	1,715	0,401	2,116
2018	0	0	0	0	0	0	0	0	0,000	0,000	0,000
MA Total:	367,064	3	35	696,972	193,322	395,868	86,905	1,373,068	2,425	1,315	3,741

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.641	2.731	.
(14) Massachusetts Credibility:	0.200	0.270	.
(15) Countrywide Pure Premium:	0.762	0.343	1.104
(16) Countrywide Indicated Relativity:	0.908	0.784	.
(17) Countrywide Credibility:	0.400	0.370	.
(18) Countrywide Lost-Time Claims:	290.00	.	.
(19) Pure Premium Underlying Present Rate:	1.300	0.645	1.944
(20) Relativity to Underlying Present Rate:	1.592	1.534	.
(21) Credibility to Underlying Relativity:	0.400	0.360	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.528	1.580	.
(24) Balanced Formula Relativity:	1.522	1.568	1.538

Class(es): 3255 WIRE CLOTH MFG		Effective: 7/1/2022							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	1,620	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	1,937	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	968	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	1,331	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	1,155	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	7,011	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.030	0.050	.
(15) Countrywide Pure Premium:	0.887	0.524	1.411
(16) Countrywide Indicated Relativity:	1.058	1.199	.
(17) Countrywide Credibility:	0.230	0.250	.
(18) Countrywide Lost-Time Claims:	30.000	.	.
(19) Pure Premium Underlying Present Rate:	0.845	0.433	1.278
(20) Relativity to Underlying Present Rate:	1.035	1.029	.
(21) Credibility to Underlying Relativity:	0.740	0.700	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.009	1.020	.
(24) Balanced Formula Relativity:	1.006	1.012	1.008

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Calculation of Class Relativities

Class(es): 3257 WIRE GOODS MFG - NOC		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	210.922	1	44	29.156	140.900	5.094	83.634	258.784	0.806	0.421	1.227
2015	217.374	0	61	0	221.024	0	155.175	376.199	1.017	0.714	1.731
2016	239.664	2	48	649.919	15.364	227.289	36.538	929.110	2.776	1.101	3.877
2017	251.847	0	62	0	122.491	0	90.611	213.102	0.486	0.360	0.846
2018	264.351	0	28	0	174.858	0	454.678	629.536	0.661	1.720	2.381
MA Total:	1,184,157	3	243	679,075	674,638	232,383	820,635	2,406,731	1.143	0.889	2.032

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.245	1.846	.
(14) Massachusetts Credibility:	0.280	0.390	.
(15) Countrywide Pure Premium:	1.003	0.565	1.568
(16) Countrywide Indicated Relativity:	1.197	1.293	.
(17) Countrywide Credibility:	0.360	0.310	.
(18) Countrywide Lost-Time Claims:	939.00	.	.
(19) Pure Premium Underlying Present Rate:	0.940	0.516	1.456
(20) Relativity to Underlying Present Rate:	1.151	1.227	.
(21) Credibility to Underlying Relativity:	0.360	0.300	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.194	1.489	.
(24) Balanced Formula Relativity:	1.189	1.478	1.288

Class(es): 3270 EYELET MFG		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	6.237	0	1	0	0	0	544	544	0.000	0.087	0.087
2015	6.211	0	1	0	0	0	53	53	0.000	0.009	0.009
2016	6.087	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	5.750	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	9.623	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	33.908	0	2	0	0	0	598	598	0.000	0.018	0.018

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.037	.
(14) Massachusetts Credibility:	0.070	0.090	.
(15) Countrywide Pure Premium:	1.024	0.612	1.636
(16) Countrywide Indicated Relativity:	1.222	1.401	.
(17) Countrywide Credibility:	0.440	0.460	.
(18) Countrywide Lost-Time Claims:	149.00	.	.
(19) Pure Premium Underlying Present Rate:	1.024	0.499	1.523
(20) Relativity to Underlying Present Rate:	1.254	1.186	.
(21) Credibility to Underlying Relativity:	0.490	0.450	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.152	1.181	.
(24) Balanced Formula Relativity:	1.148	1.173	1.156

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
3300 BED SPRING OR WIRE MATTRESS MFG											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	113	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	4,863	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	286	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	1,538	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	6,801	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.040	0.060	.
(15) Countrywide Pure Premium:	1.281	1.124	2.405
(16) Countrywide Indicated Relativity:	1.528	2.574	.
(17) Countrywide Credibility:	0.480	0.470	.
(18) Countrywide Lost-Time Claims:	369.00	.	.
(19) Pure Premium Underlying Present Rate:	1.206	0.847	2.053
(20) Relativity to Underlying Present Rate:	1.477	2.015	.
(21) Credibility to Underlying Relativity:	0.480	0.470	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.442	2.156	.
(24) Balanced Formula Relativity:	1.437	2.141	1.679

Class(es):		Effective: 7/1/2022							Manufacturing		
3315 BRASS OR COPPER GOODS MFG											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	199,184	0	36	0	46,605	0	42,806	89,412	0.234	0.215	0.449
2015	212,728	0	47	0	149,932	0	187,630	337,562	0.705	0.882	1.587
2016	197,543	0	38	0	315,630	0	259,057	574,687	1.598	1.311	2.909
2017	217,137	0	34	0	560,356	0	244,262	804,618	2.581	1.125	3.706
2018	207,391	0	24	0	254,597	0	108,989	363,586	1.228	0.526	1.753
MA Total:	1,033,984	0	179	0	1,327,121	0	842,744	2,169,865	1.284	0.815	2.099

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.397	1.692	.
(14) Massachusetts Credibility:	0.290	0.400	.
(15) Countrywide Pure Premium:	1.562	0.548	2.110
(16) Countrywide Indicated Relativity:	1.863	1.255	.
(17) Countrywide Credibility:	0.360	0.300	.
(18) Countrywide Lost-Time Claims:	153.00	.	.
(19) Pure Premium Underlying Present Rate:	1.243	0.622	1.866
(20) Relativity to Underlying Present Rate:	1.522	1.480	.
(21) Credibility to Underlying Relativity:	0.350	0.300	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.609	1.498	.
(24) Balanced Formula Relativity:	1.603	1.487	1.563

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Calculation of Class Relativities

Class(es): 3336 TYPE FOUNDRY		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	9,353	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	5,644	0	2	0	1,657	0	1,060	2,717	0.294	0.188	0.481
2016	4,317	0	4	0	696	0	2,106	2,801	0.161	0.488	0.649
2017	4,022	0	1	0	0	0	225	225	0.000	0.056	0.056
2018	6,990	0	5	0	28,291	0	7,191	35,482	4.047	1.029	5.076
MA Total:	30,326	0	12	0	30,644	0	10,582	41,226	1.010	0.349	1.359

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.100	0.725	.
(14) Massachusetts Credibility:	0.070	0.090	.
(15) Countrywide Pure Premium:	1.179	0.542	1.722
(16) Countrywide Indicated Relativity:	1.406	1.241	.
(17) Countrywide Credibility:	0.470	0.460	.
(18) Countrywide Lost-Time Claims:	302.00	.	.
(19) Pure Premium Underlying Present Rate:	1.415	0.569	1.984
(20) Relativity to Underlying Present Rate:	1.733	1.354	.
(21) Credibility to Underlying Relativity:	0.460	0.450	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.535	1.245	.
(24) Balanced Formula Relativity:	1.529	1.236	1.429

Class(es): 3365 WELDING OR CUTTING - NOC & DRIVERS		Effective: 7/1/2022							Construction		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	139,860	2	31	12,810	40,935	9,033	84,467	147,245	0.384	0.669	1.053
2015	151,786	1	23	43,818	366,285	3,259	264,063	677,425	2.702	1.761	4.463
2016	157,538	0	28	0	143,582	0	166,235	309,817	0.911	1.055	1.967
2017	162,454	0	19	0	376,856	0	208,300	585,157	2.320	1.282	3.602
2018	140,942	1	20	53,500	300,593	49,258	457,617	860,968	2.512	3.596	6.109
MA Total:	752,579	4	121	110,128	1,228,251	61,550	1,180,683	2,580,612	1.778	1.651	3.429

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.732	1.476	.
(14) Massachusetts Credibility:	0.320	0.440	.
(15) Countrywide Pure Premium:	2.137	0.941	3.078
(16) Countrywide Indicated Relativity:	0.894	0.865	.
(17) Countrywide Credibility:	0.340	0.280	.
(18) Countrywide Lost-Time Claims:	954.00	.	.
(19) Pure Premium Underlying Present Rate:	2.187	1.092	3.279
(20) Relativity to Underlying Present Rate:	0.999	1.122	.
(21) Credibility to Underlying Relativity:	0.340	0.280	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	0.878	1.206	.
(24) Balanced Formula Relativity:	0.886	1.206	0.987

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Calculation of Class Relativities

Class(es): 3372 ELECTROPLATING		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	542,333	0	76	0	421,347	0	190,122	611,469	0.777	0.351	1.127
2015	562,107	2	47	85,102	260,798	29,539	110,642	486,080	0.615	0.249	0.865
2016	570,001	1	49	32,276	572,325	2,265	253,764	860,631	1.061	0.449	1.510
2017	586,890	2	54	118,153	182,686	116,526	154,239	571,603	0.513	0.461	0.974
2018	608,214	5	71	460,121	376,338	198,433	263,694	1,298,587	1.375	0.760	2.135
MA Total:	2,869,546	10	297	695,651	1,813,495	346,763	972,461	3,828,370	0.874	0.460	1.334

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.952	0.955	.
(14) Massachusetts Credibility:	0.380	0.540	.
(15) Countrywide Pure Premium:	1.148	0.651	1.799
(16) Countrywide Indicated Relativity:	1.369	1.491	.
(17) Countrywide Credibility:	0.310	0.230	.
(18) Countrywide Lost-Time Claims:	970.00	.	.
(19) Pure Premium Underlying Present Rate:	0.857	0.468	1.325
(20) Relativity to Underlying Present Rate:	1.050	1.113	.
(21) Credibility to Underlying Relativity:	0.310	0.230	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.111	1.115	.
(24) Balanced Formula Relativity:	1.107	1.106	1.107

Class(es): 3373 GALVANIZING OR TINNING - NOT ELECTROLYTIC		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	9,304	1	0	156,928	0	18,249	0	175,177	16.866	1.961	18.828
2015	7,823	0	2	0	0	0	736	736	0.000	0.094	0.094
2016	8,421	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	7,270	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	9,883	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	42,701	1	2	156,928	0	18,249	736	175,913	3.675	0.445	4.120

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	4.001	0.923	.
(14) Massachusetts Credibility:	0.090	0.110	.
(15) Countrywide Pure Premium:	1.439	0.803	2.242
(16) Countrywide Indicated Relativity:	1.716	1.838	.
(17) Countrywide Credibility:	0.440	0.450	.
(18) Countrywide Lost-Time Claims:	151.00	.	.
(19) Pure Premium Underlying Present Rate:	1.716	0.665	2.381
(20) Relativity to Underlying Present Rate:	2.102	1.581	.
(21) Credibility to Underlying Relativity:	0.470	0.440	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	2.103	1.624	.
(24) Balanced Formula Relativity:	2.095	1.613	1.929

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Calculation of Class Relativities

Class(es): 3381 SILVERWARE MFG		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	8,487	0	2	0	0	0	1,201	1,201	0.000	0.141	0.141
2015	8,683	0	2	0	0	0	1,518	1,518	0.000	0.175	0.175
2016	7,946	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	7,161	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	7,276	0	1	0	0	0	163	163	0.000	0.022	0.022
MA Total:	39,554	0	5	0	0	0	2,882	2,882	0.000	0.073	0.073

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.151	.
(14) Massachusetts Credibility:	0.070	0.090	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	1.082	1.008	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	0.895	0.429	1.324
(20) Relativity to Underlying Present Rate:	1.095	1.021	.
(21) Credibility to Underlying Relativity:	0.930	0.910	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.019	0.942	.
(24) Balanced Formula Relativity:	1.015	0.935	0.988

Class(es): 3383 JEWELRY MFG		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	601,130	4	64	434,257	302,869	144,772	201,250	1,083,148	1,226	0.576	1,802
2015	630,897	2	50	45,933	441,873	25,644	218,924	732,373	0.773	0.388	1,161
2016	572,785	1	53	30,605	441,860	11,712	275,508	759,686	0.825	0.501	1,326
2017	521,522	0	40	0	111,842	0	107,126	218,968	0.214	0.205	0,420
2018	629,724	1	36	63,587	362,768	35,911	187,842	650,108	0.677	0.355	1,032
MA Total:	2,956,058	8	243	574,382	1,661,212	218,038	990,650	3,444,283	0.756	0.409	1,165

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.823	0.849	.
(14) Massachusetts Credibility:	0.340	0.510	.
(15) Countrywide Pure Premium:	0.646	0.304	0.950
(16) Countrywide Indicated Relativity:	0.770	0.696	.
(17) Countrywide Credibility:	0.330	0.250	.
(18) Countrywide Lost-Time Claims:	249.00	.	.
(19) Pure Premium Underlying Present Rate:	0.661	0.410	1.071
(20) Relativity to Underlying Present Rate:	0.809	0.976	.
(21) Credibility to Underlying Relativity:	0.330	0.240	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.801	0.841	.
(24) Balanced Formula Relativity:	0.798	0.835	0.811

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Calculation of Class Relativities

Class(es): 3385 WATCH MFG		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	27,218	0	2	0	0	0	494	494	0.000	0.018	0.018
2015	27,842	0	3	0	6,109	0	10,827	16,936	0.219	0.389	0.608
2016	24,624	0	2	0	0	0	2,042	2,042	0.000	0.083	0.083
2017	24,734	0	2	0	0	0	1,761	1,761	0.000	0.071	0.071
2018	19,496	0	2	0	0	0	1,879	1,879	0.000	0.096	0.096
MA Total:	123,915	0	11	0	6,109	0	17,004	23,113	0.049	0.137	0.187

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.054	0.285	.
(14) Massachusetts Credibility:	0.070	0.100	.
(15) Countrywide Pure Premium:	0.717	0.275	0.992
(16) Countrywide Indicated Relativity:	0.855	0.629	.
(17) Countrywide Credibility:	0.190	0.200	.
(18) Countrywide Lost-Time Claims:	18.000	.	.
(19) Pure Premium Underlying Present Rate:	0.285	0.160	0.445
(20) Relativity to Underlying Present Rate:	0.349	0.380	.
(21) Credibility to Underlying Relativity:	0.740	0.700	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.424	0.421	.
(24) Balanced Formula Relativity:	0.423	0.418	0.421

Class(es): 3507 CONSTRUCTION OR AGRICULTURAL MACHINERY MFG		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	55,651	0	12	0	12,171	0	7,050	19,221	0.219	0.127	0.345
2015	35,050	0	7	0	5,321	0	22,568	27,889	0.152	0.644	0.796
2016	34,192	0	4	0	6,106	0	10,584	16,689	0.179	0.310	0.488
2017	26,520	0	5	0	327,633	0	83,846	411,479	12.354	3.162	15.516
2018	31,839	0	4	0	0	0	7,920	7,920	0.000	0.249	0.249
MA Total:	183,252	0	32	0	351,231	0	131,967	483,199	1.917	0.720	2.637

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.087	1.495	.
(14) Massachusetts Credibility:	0.140	0.190	.
(15) Countrywide Pure Premium:	1.140	0.595	1.735
(16) Countrywide Indicated Relativity:	1.360	1.362	.
(17) Countrywide Credibility:	0.430	0.410	.
(18) Countrywide Lost-Time Claims:	4568.0	.	.
(19) Pure Premium Underlying Present Rate:	1.216	0.537	1.753
(20) Relativity to Underlying Present Rate:	1.489	1.277	.
(21) Credibility to Underlying Relativity:	0.430	0.400	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.517	1.353	.
(24) Balanced Formula Relativity:	1.511	1.343	1.453

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Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2022

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
3515 TEXTILE MACHINERY MFG											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	35,015	0	24	0	34,428	0	29,021	63,449	0.983	0.829	1.812
2015	43,110	1	18	75,187	26,454	10,368	22,561	134,569	2.358	0.764	3.122
2016	46,748	1	18	138,583	64,848	6,667	49,936	260,034	4.352	1.211	5.563
2017	53,464	0	12	0	35,317	0	21,227	56,544	0.661	0.397	1.058
2018	52,129	0	16	0	75,987	0	14,985	90,972	1.458	0.287	1.745
MA Total:	230,466	2	88	213,770	237,033	17,036	137,730	605,568	1.956	0.672	2.628

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.130	1.394	.
(14) Massachusetts Credibility:	0.160	0.220	.
(15) Countrywide Pure Premium:	0.817	0.514	1.330
(16) Countrywide Indicated Relativity:	0.974	1.176	.
(17) Countrywide Credibility:	0.270	0.290	.
(18) Countrywide Lost-Time Claims:	45.000	.	.
(19) Pure Premium Underlying Present Rate:	1.198	0.637	1.834
(20) Relativity to Underlying Present Rate:	1.467	1.514	.
(21) Credibility to Underlying Relativity:	0.570	0.490	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.440	1.390	.
(24) Balanced Formula Relativity:	1.434	1.379	1.415

Class(es):		Effective: 7/1/2022							Manufacturing		
3558 BOOT OR SHOE MACHINERY MFG											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	2,251	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	2,313	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	2,390	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	2,374	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	2,557	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	11,885	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.030	0.050	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	0.340	0.557	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	0.281	0.237	0.518
(20) Relativity to Underlying Present Rate:	0.344	0.564	.
(21) Credibility to Underlying Relativity:	0.970	0.950	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.333	0.536	.
(24) Balanced Formula Relativity:	0.332	0.532	0.401

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
3571 STEAM OR AIR PRESSURE GAUGE MFG											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	7.421	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	8.824	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	8.666	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	9.343	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	11.801	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	46,054	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.050	0.070	.
(15) Countrywide Pure Premium:	0.104	0.046	0.150
(16) Countrywide Indicated Relativity:	0.124	0.105	.
(17) Countrywide Credibility:	0.060	0.060	.
(18) Countrywide Lost-Time Claims:	1.000	.	.
(19) Pure Premium Underlying Present Rate:	0.321	0.150	0.471
(20) Relativity to Underlying Present Rate:	0.393	0.358	.
(21) Credibility to Underlying Relativity:	0.890	0.870	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.357	0.318	.
(24) Balanced Formula Relativity:	0.355	0.315	0.342

Class(es):		Effective: 7/1/2022							Manufacturing		
3574 CASH REGISTER MFG											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	6,011.026	14	522	1,662,253	2,870,211	1,003,820	1,883,328	7,419,612	0.754	0.480	1,234
2015	6,277.843	8	476	1,239,600	2,904,989	345,071	1,852,412	6,342,072	0.660	0.350	1,010
2016	6,117.980	13	461	1,836,827	4,340,236	453,610	1,995,132	8,625,805	1.010	0.400	1,410
2017	5,938.310	11	419	1,959,102	2,530,817	630,531	1,973,981	7,094,432	0.756	0.439	1,195
2018	6,412.676	8	410	1,447,463	4,186,747	319,585	2,361,848	8,315,644	0.879	0.418	1,297
MA Total:	30,757.834	54	2,288	8,145,245	16,833,001	2,752,618	10,066,701	37,797,565	0.812	0.417	1,229

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.884	0.865	.
(14) Massachusetts Credibility:	0.900	1.000	.
(15) Countrywide Pure Premium:	0.769	0.407	1.176
(16) Countrywide Indicated Relativity:	0.917	0.933	.
(17) Countrywide Credibility:	0.050	0.000	.
(18) Countrywide Lost-Time Claims:	17680	.	.
(19) Pure Premium Underlying Present Rate:	0.705	0.366	1.071
(20) Relativity to Underlying Present Rate:	0.863	0.870	.
(21) Credibility to Underlying Relativity:	0.050	0.000	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.885	0.865	.
(24) Balanced Formula Relativity:	0.881	0.859	0.874

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Calculation of Class Relativities

Class(es): 3612 PUMP MFG		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	293.375	0	22	0	13.269	0	22.890	36.159	0.045	0.078	0.123
2015	278.611	0	20	0	2.962	0	29.943	32.905	0.011	0.107	0.118
2016	284.610	0	21	0	47.353	0	154.530	201.882	0.166	0.543	0.709
2017	274.512	0	14	0	31.969	0	20.564	52.533	0.116	0.075	0.191
2018	236.794	0	14	0	280.380	0	60.404	340.783	1.184	0.255	1.439
MA Total:	1,367,903	0	91	0	375,932	0	288,331	664,263	0.275	0.211	0.486

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.299	0.438	.
(14) Massachusetts Credibility:	0.240	0.350	.
(15) Countrywide Pure Premium:	0.763	0.388	1.151
(16) Countrywide Indicated Relativity:	0.910	0.889	.
(17) Countrywide Credibility:	0.380	0.330	.
(18) Countrywide Lost-Time Claims:	1594.0	.	.
(19) Pure Premium Underlying Present Rate:	0.570	0.332	0.902
(20) Relativity to Underlying Present Rate:	0.698	0.790	.
(21) Credibility to Underlying Relativity:	0.380	0.320	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.683	0.699	.
(24) Balanced Formula Relativity:	0.680	0.694	0.685

Class(es): 3620 BOILERMAKING		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	161.029	0	24	0	38.512	0	63.435	101.946	0.239	0.394	0.633
2015	157.183	1	20	379.087	25.368	43.463	20.739	468.657	2.573	0.408	2.982
2016	139.554	0	15	0	429.393	0	72.094	501.487	3.077	0.517	3.594
2017	129.551	0	18	0	742.933	0	312.345	1,055.279	5.735	2.411	8.146
2018	127.865	0	16	0	135.870	0	187.167	323.037	1.063	1.464	2.526
MA Total:	715.183	1	93	379.087	1,372.076	43.463	655.780	2,450.406	2.449	0.978	3.426

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.666	2.030	.
(14) Massachusetts Credibility:	0.260	0.390	.
(15) Countrywide Pure Premium:	1.396	0.697	2.093
(16) Countrywide Indicated Relativity:	1.665	1.595	.
(17) Countrywide Credibility:	0.370	0.310	.
(18) Countrywide Lost-Time Claims:	1122.0	.	.
(19) Pure Premium Underlying Present Rate:	1.391	0.860	2.250
(20) Relativity to Underlying Present Rate:	1.703	2.045	.
(21) Credibility to Underlying Relativity:	0.370	0.300	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.939	1.900	.
(24) Balanced Formula Relativity:	1.932	1.886	1.916

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Calculation of Class Relativities

Class(es): 3634 VALVE MFG		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	322,852	2	35	146,466	181,531	22,358	150,834	501,188	1,016	0,536	1,552
2015	460,279	0	23	0	127,110	0	29,443	156,553	0,276	0,064	0,340
2016	295,587	0	19	0	412,557	0	64,272	476,829	1,396	0,217	1,613
2017	251,348	0	21	0	63,647	0	82,633	146,280	0,253	0,329	0,582
2018	368,076	2	17	62,966	439,255	38,073	191,836	732,130	1,364	0,625	1,989
MA Total:	1,698,142	4	115	209,432	1,224,100	60,430	519,017	2,012,980	0,844	0,341	1,185

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.919	0.708	.
(14) Massachusetts Credibility:	0.270	0.350	.
(15) Countrywide Pure Premium:	0.681	0.319	1.001
(16) Countrywide Indicated Relativity:	0.812	0.731	.
(17) Countrywide Credibility:	0.370	0.330	.
(18) Countrywide Lost-Time Claims:	851.00	.	.
(19) Pure Premium Underlying Present Rate:	0.634	0.276	0.911
(20) Relativity to Underlying Present Rate:	0.777	0.657	.
(21) Credibility to Underlying Relativity:	0.360	0.320	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.828	0.700	.
(24) Balanced Formula Relativity:	0.825	0.695	0.780

Class(es): 3635 GEAR MFG OR GRINDING		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	273,066	2	33	105,486	335,723	15,638	299,188	756,035	1,616	1,153	2,769
2015	302,157	0	40	0	90,853	0	87,012	177,866	0,301	0,288	0,589
2016	339,117	4	38	158,135	286,923	114,387	677,935	1,237,379	1,312	2,336	3,649
2017	55,670	0	5	0	2,269	0	2,785	5,054	0,041	0,050	0,091
2018	75,529	0	5	0	2,968	0	9,709	12,677	0,039	0,129	0,168
MA Total:	1,045,539	6	121	263,621	718,736	130,025	1,076,630	2,189,011	0,940	1,154	2,094

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.023	2.396	.
(14) Massachusetts Credibility:	0.280	0.430	.
(15) Countrywide Pure Premium:	0.806	0.430	1.236
(16) Countrywide Indicated Relativity:	0.961	0.983	.
(17) Countrywide Credibility:	0.360	0.290	.
(18) Countrywide Lost-Time Claims:	524.00	.	.
(19) Pure Premium Underlying Present Rate:	1.154	0.752	1.906
(20) Relativity to Underlying Present Rate:	1.413	1.790	.
(21) Credibility to Underlying Relativity:	0.360	0.280	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.141	1.817	.
(24) Balanced Formula Relativity:	1.137	1.803	1.366

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Calculation of Class Relativities

Class(es): 3642 BATTERY MFG-DRY		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	196.131	0	14	0	168.486	0	62.252	230.738	0.859	0.317	1.176
2015	167.546	0	10	0	7.832	0	22.813	30.645	0.047	0.136	0.183
2016	41.867	0	2	0	0	0	3.039	3.039	0.000	0.073	0.073
2017	68.163	0	1	0	0	0	1.457	1.457	0.000	0.021	0.021
2018	79.481	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	553.187	0	27	0	176.318	0	89.561	265.879	0.319	0.162	0.481

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.347	0.336	.
(14) Massachusetts Credibility:	0.150	0.210	.
(15) Countrywide Pure Premium:	0.493	0.270	0.763
(16) Countrywide Indicated Relativity:	0.588	0.617	.
(17) Countrywide Credibility:	0.350	0.370	.
(18) Countrywide Lost-Time Claims:	84.000	.	.
(19) Pure Premium Underlying Present Rate:	0.478	0.239	0.717
(20) Relativity to Underlying Present Rate:	0.585	0.569	.
(21) Credibility to Underlying Relativity:	0.500	0.420	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.550	0.538	.
(24) Balanced Formula Relativity:	0.548	0.534	0.543

Class(es): 3643 ELECTRIC POWER OR TRANSMISSION EQUIP MFG		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	917.874	2	65	13.181	145.486	5.011	146.759	310.436	0.173	0.165	0.338
2015	892.848	3	61	151.083	557.085	34.046	235.277	977.491	0.793	0.302	1.095
2016	1,013.186	4	35	396.058	554.085	285.269	148.253	1,383.666	0.938	0.428	1.366
2017	1,061.762	2	65	123.773	446.987	49.835	336.292	956.886	0.538	0.364	0.901
2018	1,093.376	5	57	394.074	558.801	180.976	295.937	1,429.787	0.871	0.436	1.308
MA Total:	4,979.047	16	283	1,078.169	2,262.444	555.136	1,162.517	5,058.266	0.671	0.345	1.016

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.730	0.716	.
(14) Massachusetts Credibility:	0.420	0.580	.
(15) Countrywide Pure Premium:	0.876	0.437	1.314
(16) Countrywide Indicated Relativity:	1.045	1.001	.
(17) Countrywide Credibility:	0.290	0.210	.
(18) Countrywide Lost-Time Claims:	2008.0	.	.
(19) Pure Premium Underlying Present Rate:	0.657	0.326	0.984
(20) Relativity to Underlying Present Rate:	0.805	0.776	.
(21) Credibility to Underlying Relativity:	0.290	0.210	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.843	0.789	.
(24) Balanced Formula Relativity:	0.840	0.783	0.820

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Calculation of Class Relativities

Class(es): 3647 BATTERY MFG-STORAGE		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	791	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	860	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	2,400	0	1	0	0	0	1,589	1,589	0.000	0.662	0.662
2017	3,828	0	1	0	0	0	189	189	0.000	0.049	0.049
2018	2,071	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	9,949	0	2	0	0	0	1,778	1,778	0.000	0.179	0.179

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.371	.
(14) Massachusetts Credibility:	0.040	0.050	.
(15) Countrywide Pure Premium:	1.246	0.615	1.860
(16) Countrywide Indicated Relativity:	1.486	1.407	.
(17) Countrywide Credibility:	0.480	0.480	.
(18) Countrywide Lost-Time Claims:	399.00	.	.
(19) Pure Premium Underlying Present Rate:	0.930	0.451	1.382
(20) Relativity to Underlying Present Rate:	1.139	1.073	.
(21) Credibility to Underlying Relativity:	0.480	0.470	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.260	1.198	.
(24) Balanced Formula Relativity:	1.255	1.190	1.233

Class(es): 3648 AUTOMOTIVE LIGHTING, IGNITION APPARATUS MFG NOC		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	933	0	1	0	0	0	283	283	0.000	0.304	0.304
2015	1,248	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	40,505	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	31,529	0	1	0	0	0	64	64	0.000	0.002	0.002
2018	36,729	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	110,943	0	2	0	0	0	347	347	0.000	0.003	0.003

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.006	.
(14) Massachusetts Credibility:	0.080	0.120	.
(15) Countrywide Pure Premium:	0.593	0.381	0.974
(16) Countrywide Indicated Relativity:	0.708	0.872	.
(17) Countrywide Credibility:	0.460	0.440	.
(18) Countrywide Lost-Time Claims:	551.00	.	.
(19) Pure Premium Underlying Present Rate:	0.487	0.291	0.778
(20) Relativity to Underlying Present Rate:	0.597	0.692	.
(21) Credibility to Underlying Relativity:	0.460	0.440	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.600	0.689	.
(24) Balanced Formula Relativity:	0.598	0.684	0.627

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
3681 TELEVISION, RADIO, TELEPHONE OR TELECOMMUNCTN DEVICE MFG NOC											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	5,584,890	7	199	803,475	577,866	217,821	523,451	2,122,613	0.247	0.133	0.380
2015	5,277,890	2	191	64,868	1,196,961	5,396	777,915	2,045,141	0.239	0.148	0.387
2016	5,300,377	8	154	1,182,112	1,057,928	497,864	385,476	3,123,381	0.423	0.167	0.589
2017	5,713,910	6	187	528,517	1,290,179	438,175	634,023	2,890,895	0.318	0.188	0.506
2018	5,606,373	1	179	33,485	1,149,940	15,888	710,105	1,909,419	0.211	0.129	0.341
MA Total:	27,483,440	24	910	2,612,458	5,272,874	1,175,145	3,030,971	12,091,448	0.287	0.153	0.440

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.312	0.318	.
(14) Massachusetts Credibility:	0.620	0.800	.
(15) Countrywide Pure Premium:	0.278	0.156	0.435
(16) Countrywide Indicated Relativity:	0.332	0.358	.
(17) Countrywide Credibility:	0.190	0.100	.
(18) Countrywide Lost-Time Claims:	2767.0	.	.
(19) Pure Premium Underlying Present Rate:	0.307	0.133	0.440
(20) Relativity to Underlying Present Rate:	0.376	0.317	.
(21) Credibility to Underlying Relativity:	0.190	0.100	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.328	0.322	.
(24) Balanced Formula Relativity:	0.327	0.319	0.324

Class(es):		Effective: 7/1/2022							Manufacturing		
3685 INSTRUMENT MFG NOC											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	6,760,840	5	253	446,094	1,594,539	81,252	892,874	3,014,758	0.302	0.144	0.446
2015	7,268,251	7	250	770,072	2,013,384	93,834	906,759	3,784,049	0.383	0.138	0.521
2016	6,636,729	9	204	473,842	881,178	151,395	673,172	2,179,588	0.204	0.124	0.328
2017	6,500,544	4	229	695,327	521,379	70,791	533,633	1,821,130	0.187	0.093	0.280
2018	6,729,390	6	210	118,114	909,135	133,729	854,779	2,015,756	0.153	0.147	0.300
MA Total:	33,895,754	31	1,146	2,503,449	5,919,615	531,001	3,861,216	12,815,281	0.248	0.130	0.378

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.271	0.269	.
(14) Massachusetts Credibility:	0.660	0.850	.
(15) Countrywide Pure Premium:	0.379	0.202	0.581
(16) Countrywide Indicated Relativity:	0.452	0.461	.
(17) Countrywide Credibility:	0.170	0.080	.
(18) Countrywide Lost-Time Claims:	2057.0	.	.
(19) Pure Premium Underlying Present Rate:	0.293	0.125	0.418
(20) Relativity to Underlying Present Rate:	0.359	0.296	.
(21) Credibility to Underlying Relativity:	0.170	0.070	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.316	0.286	.
(24) Balanced Formula Relativity:	0.315	0.284	0.305

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Construction		
3724 MACHINERY OR EQUIPMENT ERECT OR REPAIR NOC &DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	2,736,936	24	311	3,538,104	5,119,956	1,478,887	2,575,158	12,712,105	3,163	1,481	4,645
2015	3,238,900	19	401	4,877,492	4,443,232	1,104,490	3,260,841	13,686,054	2,878	1,348	4,226
2016	3,528,829	14	371	2,135,400	4,855,266	615,268	2,921,680	10,527,615	1,981	1,002	2,983
2017	3,532,968	15	371	3,352,519	5,220,396	765,042	2,833,171	12,171,129	2,427	1,018	3,445
2018	4,081,178	11	372	1,530,218	4,052,106	500,788	2,387,857	8,470,969	1,368	0,708	2,076
MA Total:	17,118,811	83	1,826	15,433,734	23,690,957	4,464,475	13,978,706	57,567,871	2,285	1,077	3,363

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.941	0.964	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	1.691	0.734	2.425
(16) Countrywide Indicated Relativity:	0.707	0.675	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	7875.0	.	.
(19) Pure Premium Underlying Present Rate:	2.360	1.047	3.406
(20) Relativity to Underlying Present Rate:	1.078	1.075	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	0.941	0.964	.
(24) Balanced Formula Relativity:	0.950	0.963	0.954

Class(es):		Effective: 7/1/2022							Construction		
3726 BOILER INSTALLATION OR REPAIR-STEAM											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	90,952	1	4	84,879	4,984	14,155	31,698	135,715	0.988	0.504	1.492
2015	113,846	0	6	0	5,941	0	22,758	28,699	0.052	0.200	0.252
2016	181,597	2	5	940,473	40,406	195,270	40,053	1,216,202	5.401	1.296	6.697
2017	154,068	0	5	0	88,885	0	27,601	116,486	0.577	0.179	0.756
2018	105,467	0	1	0	0	0	1,626	1,626	0.000	0.015	0.015
MA Total:	645,930	3	21	1,025,352	140,216	209,425	123,736	1,498,728	1.804	0.516	2.320

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.743	0.461	.
(14) Massachusetts Credibility:	0.290	0.340	.
(15) Countrywide Pure Premium:	1.808	0.690	2.498
(16) Countrywide Indicated Relativity:	0.756	0.634	.
(17) Countrywide Credibility:	0.360	0.330	.
(18) Countrywide Lost-Time Claims:	531.00	.	.
(19) Pure Premium Underlying Present Rate:	2.007	0.653	2.659
(20) Relativity to Underlying Present Rate:	0.917	0.670	.
(21) Credibility to Underlying Relativity:	0.350	0.330	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	0.809	0.587	.
(24) Balanced Formula Relativity:	0.816	0.587	0.744

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
3808 AUTOMOBILE MFG OR ASSEMBLY											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	130.689	2	35	179.715	6.839	57.154	33.362	277.071	1.427	0.693	2.120
2015	155.929	0	49	0	122.709	0	134.636	257.345	0.787	0.863	1.650
2016	123.879	3	38	213.750	26.155	43.692	34.336	317.932	1.937	0.630	2.566
2017	280.125	0	61	0	641.988	0	415.072	1,057.060	2.292	1.482	3.774
2018	352.933	1	61	57.369	367.906	27.038	303.407	755.721	1.205	0.936	2.141
MA Total:	1,043,555	6	244	450,834	1,165,597	127,884	920,812	2,665,128	1.549	1.005	2.554

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.686	2.087	.
(14) Massachusetts Credibility:	0.310	0.430	.
(15) Countrywide Pure Premium:	1.448	0.661	2.108
(16) Countrywide Indicated Relativity:	1.727	1.512	.
(17) Countrywide Credibility:	0.350	0.290	.
(18) Countrywide Lost-Time Claims:	6170.0	.	.
(19) Pure Premium Underlying Present Rate:	1.390	0.755	2.145
(20) Relativity to Underlying Present Rate:	1.702	1.795	.
(21) Credibility to Underlying Relativity:	0.340	0.280	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.706	1.838	.
(24) Balanced Formula Relativity:	1.699	1.825	1.743

Class(es):		Effective: 7/1/2022							Goods and Services		
3821 AUTOMOBILE DISMANTLING & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	160.662	3	27	384.750	22.310	198.322	84.257	689.639	2.534	1.759	4.292
2015	156.663	0	19	0	148.081	0	74.190	222.271	0.945	0.474	1.419
2016	156.778	1	27	125.343	612.033	65.545	281.536	1,084.457	4.703	2.214	6.917
2017	189.725	1	21	174.956	220.217	302.723	70.044	767.940	2.083	1.965	4.048
2018	182.727	0	16	0	79	0	14.197	14.277	0.000	0.078	0.078
MA Total:	846,555	5	110	685,050	1,002,720	566,590	524,224	2,778,584	1.994	1.289	3.282

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.607	3.030	.
(14) Massachusetts Credibility:	0.330	0.500	.
(15) Countrywide Pure Premium:	2.615	1.498	4.112
(16) Countrywide Indicated Relativity:	3.479	3.541	.
(17) Countrywide Credibility:	0.340	0.250	.
(18) Countrywide Lost-Time Claims:	921.00	.	.
(19) Pure Premium Underlying Present Rate:	2.061	1.319	3.380
(20) Relativity to Underlying Present Rate:	2.977	3.452	.
(21) Credibility to Underlying Relativity:	0.330	0.250	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	3.025	3.263	.
(24) Balanced Formula Relativity:	3.007	3.265	3.099

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
3826 AIRCRAFT ENGINE MFG											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums		
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	1,729,388	16	250	1,413,180	1,733,168	581,986	2,491,513	6,219,847	1,819	1,777	3,597
2015	1,607,228	9	261	1,749,838	4,380,152	499,638	3,214,832	9,844,460	3,814	2,311	6,125
2016	2,272,901	13	187	1,658,770	2,146,196	971,533	1,877,554	6,654,053	1,674	1,254	2,928
2017	2,282,308	10	150	589,758	2,613,619	253,804	2,022,338	5,479,519	1,404	0,997	2,401
2018	2,291,202	8	144	788,537	3,084,112	276,808	1,687,641	5,837,098	1,690	0,857	2,548
MA Total:	10,183,027	56	992	6,200,084	13,957,246	2,583,770	11,293,877	34,034,977	1,980	1,363	3,342

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.155	2.830	.
(14) Massachusetts Credibility:	0.890	1.000	.
(15) Countrywide Pure Premium:	0.400	0.176	0.575
(16) Countrywide Indicated Relativity:	0.477	0.402	.
(17) Countrywide Credibility:	0.060	0.000	.
(18) Countrywide Lost-Time Claims:	423.00	.	.
(19) Pure Premium Underlying Present Rate:	2.064	1.426	3.490
(20) Relativity to Underlying Present Rate:	2.527	3.392	.
(21) Credibility to Underlying Relativity:	0.050	0.000	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	2.073	2.830	.
(24) Balanced Formula Relativity:	2.065	2.809	2.321

Class(es):		Effective: 7/1/2022							Manufacturing		
3841 TUBULAR METAL PRODUCTS MFG OR ASSEMBLY											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums		
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	57,808	0	5	0	33,431	0	44,470	77,901	0.578	0.769	1,348
2015	58,501	1	1	347,954	0	38,811	995	387,761	5,948	0.680	6,628
2016	64,013	0	3	0	0	0	1,501	1,501	0.000	0.023	0.023
2017	61,442	0	4	0	3,927	0	9,680	13,607	0.064	0.158	0,221
2018	64,393	0	6	0	6,916	0	4,273	11,189	0.107	0.066	0.174
MA Total:	306,157	1	19	347,954	44,274	38,811	60,919	491,959	1,281	0,326	1,607

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.395	0.676	.
(14) Massachusetts Credibility:	0.130	0.190	.
(15) Countrywide Pure Premium:	1.111	0.576	1.686
(16) Countrywide Indicated Relativity:	1.325	1.318	.
(17) Countrywide Credibility:	0.350	0.370	.
(18) Countrywide Lost-Time Claims:	86.000	.	.
(19) Pure Premium Underlying Present Rate:	0.592	0.311	0.903
(20) Relativity to Underlying Present Rate:	0.724	0.740	.
(21) Credibility to Underlying Relativity:	0.520	0.440	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.022	0.942	.
(24) Balanced Formula Relativity:	1.018	0.935	0.989

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Miscellaneous			
4000 SAND OR GRAVEL DIGGING & DRIVERS												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2014	397,186	4	33	892,842	421,452	351,180	192,989	1,858,462	3,309	1,370	4,679	
2015	445,165	4	49	886,589	897,383	254,070	271,988	2,310,030	4,007	1,182	5,189	
2016	479,501	5	40	1,215,603	221,005	835,066	219,740	2,491,414	2,996	2,200	5,196	
2017	496,267	0	41	0	501,115	0	596,195	1,097,310	1,010	1,201	2,211	
2018	525,947	2	48	97,406	2,099,159	87,946	861,074	3,145,585	4,176	1,804	5,981	
MA Total:	2,344,066	15	211	3,092,440	4,140,113	1,528,262	2,141,986	10,902,802	3,085	1,566	4,651	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.386	1.361	.
(14) Massachusetts Credibility:	0.520	0.710	.
(15) Countrywide Pure Premium:	2.393	1.138	3.532
(16) Countrywide Indicated Relativity:	1.128	1.056	.
(17) Countrywide Credibility:	0.240	0.150	.
(18) Countrywide Lost-Time Claims:	995.00	.	.
(19) Pure Premium Underlying Present Rate:	2.289	1.162	3.451
(20) Relativity to Underlying Present Rate:	1.128	1.132	.
(21) Credibility to Underlying Relativity:	0.240	0.140	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	1.262	1.283	.
(24) Balanced Formula Relativity:	1.259	1.291	1.270

Class(es):		Effective: 7/1/2022							Manufacturing			
4021 BRICK OR CLAY PRODUCTS MFG NOC & DRIVERS												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2014	15,367	0	0	0	0	0	0	0	0.000	0.000	0.000	
2015	13,365	0	0	0	0	0	0	0	0.000	0.000	0.000	
2016	10,263	0	2	0	11,214	0	12,753	23,968	1,093	1,243	2,335	
2017	7,427	0	0	0	0	0	0	0	0.000	0.000	0.000	
2018	11,696	0	0	0	0	0	0	0	0.000	0.000	0.000	
MA Total:	58,118	0	2	0	11,214	0	12,753	23,968	0.193	0.219	0.412	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.210	0.456	.
(14) Massachusetts Credibility:	0.100	0.140	.
(15) Countrywide Pure Premium:	1.492	0.923	2.416
(16) Countrywide Indicated Relativity:	1.780	2.113	.
(17) Countrywide Credibility:	0.450	0.430	.
(18) Countrywide Lost-Time Claims:	262.00	.	.
(19) Pure Premium Underlying Present Rate:	1.516	0.807	2.323
(20) Relativity to Underlying Present Rate:	1.857	1.919	.
(21) Credibility to Underlying Relativity:	0.450	0.430	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.657	1.798	.
(24) Balanced Formula Relativity:	1.651	1.785	1.697

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
4024 REFRACTORY PRODUCTS MFG & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	5,869	0	1	0	5,852	0	5,573	11,425	0.997	0.949	1.946
2015	42	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	49	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	1,593	0	1	0	0	0	1,573	1,573	0.000	0.987	0.987
MA Total:	7,555	0	2	0	5,852	0	7,146	12,998	0.775	0.946	1.721

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.843	1.964	.
(14) Massachusetts Credibility:	0.040	0.060	.
(15) Countrywide Pure Premium:	2.223	1.086	3.310
(16) Countrywide Indicated Relativity:	2.652	2.487	.
(17) Countrywide Credibility:	0.420	0.440	.
(18) Countrywide Lost-Time Claims:	132.00	.	.
(19) Pure Premium Underlying Present Rate:	1.449	0.686	2.135
(20) Relativity to Underlying Present Rate:	1.775	1.631	.
(21) Credibility to Underlying Relativity:	0.540	0.500	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	2.106	2.027	.
(24) Balanced Formula Relativity:	2.098	2.013	2.068

Class(es):		Effective: 7/1/2022							Manufacturing		
4034 CONCRETE PRODUCTS MFG & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	175,307	2	48	199,730	456,041	136,674	257,838	1,050,283	3,741	2,250	5,991
2015	198,757	0	38	0	379,665	0	209,795	589,460	1,910	1,056	2,966
2016	213,542	1	28	416,666	40,098	88,855	74,074	619,693	2,139	0,763	2,902
2017	204,441	0	36	0	434,013	0	219,812	653,825	2,123	1,075	3,198
2018	235,778	4	37	1,206,128	53,792	696,290	112,999	2,069,209	5,344	3,432	8,776
MA Total:	1,027,825	7	187	1,822,524	1,363,609	921,819	874,518	4,982,470	3,100	1,748	4,848

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.375	3.629	.
(14) Massachusetts Credibility:	0.370	0.530	.
(15) Countrywide Pure Premium:	2.571	1.365	3.936
(16) Countrywide Indicated Relativity:	3.067	3.124	.
(17) Countrywide Credibility:	0.320	0.240	.
(18) Countrywide Lost-Time Claims:	2788.0	.	.
(19) Pure Premium Underlying Present Rate:	2.289	1.297	3.586
(20) Relativity to Underlying Present Rate:	2.803	3.084	.
(21) Credibility to Underlying Relativity:	0.310	0.230	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	3.099	3.383	.
(24) Balanced Formula Relativity:	3.087	3.358	3.180

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Calculation of Class Relativities

Class(es): 4036 PLASTERBOARD OR PLASTER BLOCK MFG & DRIVERS									Effective: 7/1/2022			Manufacturing		
Converted Unlimited Losses														
Amount														
Claim Count				Indemnity		Medical		MA Indicated Pure Premiums						
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)			
2014	10,463	0	2	0	11,509	0	16,709	28,217	1.100	1.597	2.697			
2015	10,394	0	1	0	608	0	4,530	5,138	0.059	0.436	0.494			
2016	12,550	0	0	0	0	0	0	0	0.000	0.000	0.000			
2017	11,931	0	0	0	0	0	0	0	0.000	0.000	0.000			
2018	11,361	0	1	0	0	0	1,048	1,048	0.000	0.092	0.092			
MA Total:	56,699	0	4	0	12,117	0	22,286	34,403	0.214	0.393	0.607			

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.233	0.816	.
(14) Massachusetts Credibility:	0.080	0.110	.
(15) Countrywide Pure Premium:	0.880	0.455	1.335
(16) Countrywide Indicated Relativity:	1.050	1.042	.
(17) Countrywide Credibility:	0.460	0.450	.
(18) Countrywide Lost-Time Claims:	272.00	.	.
(19) Pure Premium Underlying Present Rate:	0.856	0.463	1.318
(20) Relativity to Underlying Present Rate:	1.048	1.100	.
(21) Credibility to Underlying Relativity:	0.460	0.440	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.984	1.043	.
(24) Balanced Formula Relativity:	0.980	1.035	0.999

Class(es): 4038 PLASTER STATUARY OR ORNAMENT MFG									Effective: 7/1/2022			Manufacturing		
Converted Unlimited Losses														
Amount														
Claim Count				Indemnity		Medical		MA Indicated Pure Premiums						
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)			
2014	15,837	0	0	0	0	0	0	0	0.000	0.000	0.000			
2015	15,537	0	0	0	0	0	0	0	0.000	0.000	0.000			
2016	13,856	0	0	0	0	0	0	0	0.000	0.000	0.000			
2017	14,182	0	0	0	0	0	0	0	0.000	0.000	0.000			
2018	14,055	0	0	0	0	0	0	0	0.000	0.000	0.000			
MA Total:	73,467	0	0	0	0	0	0	0	0.000	0.000	0.000			

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.110	0.120	.
(15) Countrywide Pure Premium:	1.360	0.528	1.888
(16) Countrywide Indicated Relativity:	1.622	1.209	.
(17) Countrywide Credibility:	0.280	0.300	.
(18) Countrywide Lost-Time Claims:	48.000	.	.
(19) Pure Premium Underlying Present Rate:	1.521	0.449	1.970
(20) Relativity to Underlying Present Rate:	1.863	1.068	.
(21) Credibility to Underlying Relativity:	0.610	0.580	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.590	0.982	.
(24) Balanced Formula Relativity:	1.584	0.975	1.375

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
4053 POTTERY MFG: CHINA OR TABLEWARE											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	71,577	3	6	468,759	0	123,513	3,478	595,750	6,549	1,774	8,323
2015	78,068	0	11	0	63,276	0	32,498	95,775	0,811	0,416	1,227
2016	81,111	0	5	0	5,721	0	11,598	17,318	0,071	0,143	0,214
2017	83,652	0	12	0	26,852	0	16,680	43,532	0,321	0,199	0,520
2018	87,442	0	18	0	134,059	0	119,588	253,647	1,533	1,368	2,901
MA Total:	401,849	3	52	468,759	229,908	123,513	183,842	1,006,022	1,739	0,765	2,503

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.893	1.588	.
(14) Massachusetts Credibility:	0.180	0.250	.
(15) Countrywide Pure Premium:	0.000	0.056	0.056
(16) Countrywide Indicated Relativity:	0.000	0.127	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	0.938	0.515	1.453
(20) Relativity to Underlying Present Rate:	1.149	1.226	.
(21) Credibility to Underlying Relativity:	0.820	0.750	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.283	1.316	.
(24) Balanced Formula Relativity:	1.278	1.307	1.288

Class(es):		Effective: 7/1/2022							Manufacturing		
4062 POTTERY MFG: PORCELAIN WARE-MECHANICAL PRESS FORMING											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	58,612	0	2	0	749	0	5,331	6,080	0,013	0,091	0,104
2015	69,316	0	1	0	0	0	214	214	0,000	0,003	0,003
2016	73,394	0	1	0	0	0	169	169	0,000	0,002	0,002
2017	84,799	0	3	0	54,475	0	50,105	104,580	0,642	0,591	1,233
2018	85,131	1	6	180,631	5,319	34,466	6,190	226,606	2,184	0,478	2,662
MA Total:	371,252	1	13	180,631	60,542	34,466	62,009	337,649	0,650	0,260	0,909

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.707	0.540	.
(14) Massachusetts Credibility:	0.160	0.220	.
(15) Countrywide Pure Premium:	1.088	0.539	1.627
(16) Countrywide Indicated Relativity:	1.297	1.234	.
(17) Countrywide Credibility:	0.420	0.390	.
(18) Countrywide Lost-Time Claims:	308.00	.	.
(19) Pure Premium Underlying Present Rate:	0.783	0.399	1.182
(20) Relativity to Underlying Present Rate:	0.958	0.949	.
(21) Credibility to Underlying Relativity:	0.420	0.390	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.061	0.970	.
(24) Balanced Formula Relativity:	1.056	0.963	1.024

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
4112 INCANDESCENT LAMP MFG											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	55,027	0	5	0	3,502	0	11,571	15,073	0.064	0.210	0.274
2015	54,906	0	8	0	2,464	0	5,863	8,327	0.045	0.107	0.152
2016	44,168	0	2	0	1,361	0	6,328	7,688	0.031	0.143	0.174
2017	62,700	0	2	0	354	0	2,535	2,890	0.006	0.040	0.046
2018	99,209	0	7	0	0	0	10,671	10,671	0.000	0.108	0.108
MA Total:	316,010	0	24	0	7,682	0	36,967	44,649	0.024	0.117	0.141

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.026	0.243	.
(14) Massachusetts Credibility:	0.080	0.120	.
(15) Countrywide Pure Premium:	0.147	0.094	0.241
(16) Countrywide Indicated Relativity:	0.175	0.215	.
(17) Countrywide Credibility:	0.130	0.140	.
(18) Countrywide Lost-Time Claims:	7.000	.	.
(19) Pure Premium Underlying Present Rate:	0.170	0.093	0.263
(20) Relativity to Underlying Present Rate:	0.209	0.220	.
(21) Credibility to Underlying Relativity:	0.790	0.740	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.190	0.222	.
(24) Balanced Formula Relativity:	0.189	0.221	0.200

Class(es):		Effective: 7/1/2022							Manufacturing		
4114 GLASSWARE MFG-NOC											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	157,682	0	17	0	201,342	0	95,343	296,685	1.277	0.605	1.882
2015	188,417	0	22	0	57,827	0	42,078	99,905	0.307	0.223	0.530
2016	145,591	0	20	0	443,657	0	143,635	587,293	3.047	0.987	4.034
2017	39,083	1	10	124,374	102,819	75,293	13,102	315,588	5.813	2.262	8.075
2018	25,005	0	9	0	22,254	0	61,582	83,836	0.890	2.463	3.353
MA Total:	555,778	1	78	124,374	827,900	75,293	355,740	1,383,307	1.713	0.776	2.489

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.865	1.610	.
(14) Massachusetts Credibility:	0.220	0.270	.
(15) Countrywide Pure Premium:	1.269	0.535	1.804
(16) Countrywide Indicated Relativity:	1.514	1.224	.
(17) Countrywide Credibility:	0.390	0.370	.
(18) Countrywide Lost-Time Claims:	320.00	.	.
(19) Pure Premium Underlying Present Rate:	1.192	0.440	1.632
(20) Relativity to Underlying Present Rate:	1.460	1.047	.
(21) Credibility to Underlying Relativity:	0.390	0.360	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.570	1.265	.
(24) Balanced Formula Relativity:	1.564	1.255	1.458

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Calculation of Class Relativities

Class(es): 4130 GLASS MERCHANT		Effective: 7/1/2022							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	217,144	1	30	219,559	18,786	100,454	42,399	381,198	1,098	0,658	1,756
2015	211,918	1	19	187,403	69,395	31,072	91,547	379,417	1,212	0,579	1,790
2016	256,142	1	42	393,129	302,072	257,341	109,866	1,062,407	2,714	1,434	4,148
2017	293,894	0	45	0	285,102	0	126,852	411,954	0,970	0,432	1,402
2018	294,747	4	33	741,452	819,714	237,316	516,904	2,315,386	5,297	2,559	7,855
MA Total:	1,273,845	7	169	1,541,543	1,495,069	626,183	887,567	4,550,363	2,384	1,188	3,572

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.595	2.467	.
(14) Massachusetts Credibility:	0.320	0.430	.
(15) Countrywide Pure Premium:	1.234	0.700	1.934
(16) Countrywide Indicated Relativity:	1.472	1.602	.
(17) Countrywide Credibility:	0.340	0.290	.
(18) Countrywide Lost-Time Claims:	935.00	.	.
(19) Pure Premium Underlying Present Rate:	1.311	0.608	1.919
(20) Relativity to Underlying Present Rate:	1.606	1.445	.
(21) Credibility to Underlying Relativity:	0.340	0.280	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.877	1.930	.
(24) Balanced Formula Relativity:	1.870	1.916	1.886

Class(es): 4133 CATHEDRAL OR ART GLASS WINDOW MFG		Effective: 7/1/2022							Manufacturing		
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	14,947	0	1	0	0	0	1,137	1,137	0.000	0.076	0.076
2015	11,759	0	2	0	0	0	1,336	1,336	0.000	0.114	0.114
2016	11,922	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	11,462	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	10,877	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	60,967	0	3	0	0	0	2,473	2,473	0.000	0.041	0.041

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.084	.
(14) Massachusetts Credibility:	0.070	0.090	.
(15) Countrywide Pure Premium:	1.098	0.649	1.746
(16) Countrywide Indicated Relativity:	1.309	1.485	.
(17) Countrywide Credibility:	0.220	0.230	.
(18) Countrywide Lost-Time Claims:	26.000	.	.
(19) Pure Premium Underlying Present Rate:	0.644	0.290	0.934
(20) Relativity to Underlying Present Rate:	0.788	0.690	.
(21) Credibility to Underlying Relativity:	0.710	0.680	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.848	0.819	.
(24) Balanced Formula Relativity:	0.845	0.813	0.834

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Calculation of Class Relativities

Class(es): 4150 OPTICAL GOODS MFG-NOC		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	1,889,441	1	102	111,435	317,983	26,054	171,161	626,633	0.227	0.104	0.332
2015	2,135,133	2	102	214,544	313,488	37,854	193,856	759,742	0.247	0.109	0.356
2016	2,271,241	2	84	390,038	299,444	43,728	161,501	894,711	0.304	0.090	0.394
2017	1,724,522	3	71	248,565	518,229	64,480	147,461	978,735	0.445	0.123	0.568
2018	1,919,466	2	58	45,973	311,952	93,214	189,270	640,410	0.186	0.147	0.334
MA Total:	9,939,802	10	417	1,010,555	1,761,096	265,330	863,250	3,900,230	0.279	0.114	0.392

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.304	0.236	.
(14) Massachusetts Credibility:	0.440	0.540	.
(15) Countrywide Pure Premium:	0.828	0.329	1.157
(16) Countrywide Indicated Relativity:	0.988	0.753	.
(17) Countrywide Credibility:	0.280	0.230	.
(18) Countrywide Lost-Time Claims:	99,000	.	.
(19) Pure Premium Underlying Present Rate:	0.364	0.141	0.504
(20) Relativity to Underlying Present Rate:	0.445	0.334	.
(21) Credibility to Underlying Relativity:	0.280	0.230	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.535	0.377	.
(24) Balanced Formula Relativity:	0.533	0.375	0.478

Class(es): 4239 PAPER MFG		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	171,243	1	43	49,755	64,273	5,398	88,794	208,220	0.666	0.550	1.216
2015	192,752	0	34	0	81,284	0	85,340	166,624	0.422	0.443	0.864
2016	163,690	0	26	0	124,168	0	74,818	198,985	0.759	0.457	1.216
2017	155,440	2	18	271,488	254,294	103,213	111,381	740,376	3.383	1.381	4.763
2018	143,099	1	34	374,822	297,049	133,370	93,112	898,353	4.695	1.583	6.278
MA Total:	826,224	4	155	696,065	821,068	241,981	453,444	2,212,558	1.836	0.842	2.678

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.999	1.748	.
(14) Massachusetts Credibility:	0.230	0.320	.
(15) Countrywide Pure Premium:	1.036	0.465	1.501
(16) Countrywide Indicated Relativity:	1.236	1.065	.
(17) Countrywide Credibility:	0.390	0.340	.
(18) Countrywide Lost-Time Claims:	1733.0	.	.
(19) Pure Premium Underlying Present Rate:	0.902	0.455	1.357
(20) Relativity to Underlying Present Rate:	1.105	1.083	.
(21) Credibility to Underlying Relativity:	0.380	0.340	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.362	1.289	.
(24) Balanced Formula Relativity:	1.356	1.280	1.330

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
4243 BOX MFG-FOLDING PAPER-NOC											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	243.323	1	27	180.264	279.565	21.436	129.595	610.859	1.890	0.621	2.510
2015	213.373	1	36	32.591	491.699	1.506	164.297	690.092	2.457	0.777	3.234
2016	254.426	0	40	0	604.223	0	297.163	901.385	2.375	1.168	3.543
2017	257.211	2	27	30.278	270.426	16.523	73.334	390.561	1.169	0.349	1.518
2018	325.489	0	37	0	206.655	0	188.254	394.910	0.635	0.578	1.213
MA Total:	1,293.822	4	167	243,133	1,852,568	39,464	852,643	2,987,808	1.620	0.690	2.309

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.764	1.432	.
(14) Massachusetts Credibility:	0.330	0.420	.
(15) Countrywide Pure Premium:	0.975	0.487	1.463
(16) Countrywide Indicated Relativity:	1.163	1.116	.
(17) Countrywide Credibility:	0.340	0.290	.
(18) Countrywide Lost-Time Claims:	959.00	.	.
(19) Pure Premium Underlying Present Rate:	1.319	0.563	1.882
(20) Relativity to Underlying Present Rate:	1.615	1.339	.
(21) Credibility to Underlying Relativity:	0.330	0.290	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.510	1.313	.
(24) Balanced Formula Relativity:	1.505	1.304	1.435

Class(es):		Effective: 7/1/2022							Manufacturing		
4244 CORRUGATED OR FIBERBOARD CONTAINER MFG											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	325.214	5	37	217.238	312.750	66.637	149.505	746.131	1.630	0.665	2.294
2015	205.715	0	29	0	184.951	0	50.394	235.345	0.899	0.245	1.144
2016	211.914	2	27	116.485	542.364	80.387	144.314	883.551	3.109	1.060	4.169
2017	247.774	0	35	0	288.588	0	120.172	408.760	1.165	0.485	1.650
2018	273.166	2	41	131.821	718.679	49.215	633.256	1,532.972	3.113	2.498	5.612
MA Total:	1,263.783	9	169	465,544	2,047,333	196,240	1,097,642	3,806,759	1.988	1.024	3.012

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.165	2.126	.
(14) Massachusetts Credibility:	0.310	0.390	.
(15) Countrywide Pure Premium:	1.049	0.538	1.587
(16) Countrywide Indicated Relativity:	1.251	1.232	.
(17) Countrywide Credibility:	0.350	0.310	.
(18) Countrywide Lost-Time Claims:	1237.0	.	.
(19) Pure Premium Underlying Present Rate:	1.165	0.485	1.650
(20) Relativity to Underlying Present Rate:	1.426	1.154	.
(21) Credibility to Underlying Relativity:	0.340	0.300	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.594	1.557	.
(24) Balanced Formula Relativity:	1.588	1.546	1.573

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Calculation of Class Relativities

Class(es): 4250 PAPER COATING		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	923,429	2	92	476,869	439,298	113,341	252,928	1,282,436	0.992	0.397	1.389
2015	945,444	0	78	0	546,930	0	271,969	818,899	0.578	0.288	0.866
2016	848,955	5	61	804,786	385,493	303,569	207,468	1,701,316	1.402	0.602	2.004
2017	677,713	2	55	207,572	461,485	79,446	261,895	1,010,397	0.987	0.504	1.491
2018	702,306	5	74	1,589,291	801,868	388,921	755,163	3,535,243	3.405	1.629	5.034
MA Total:	4,097,847	14	360	3,078,518	2,635,073	885,277	1,749,423	8,348,291	1.394	0.643	2.037

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.518	1.335	.
(14) Massachusetts Credibility:	0.410	0.570	.
(15) Countrywide Pure Premium:	0.761	0.441	1.202
(16) Countrywide Indicated Relativity:	0.908	1.008	.
(17) Countrywide Credibility:	0.300	0.220	.
(18) Countrywide Lost-Time Claims:	748.00	.	.
(19) Pure Premium Underlying Present Rate:	0.748	0.383	1.130
(20) Relativity to Underlying Present Rate:	0.915	0.910	.
(21) Credibility to Underlying Relativity:	0.290	0.210	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.160	1.174	.
(24) Balanced Formula Relativity:	1.156	1.165	1.159

Class(es): 4251 STATIONERY MFG		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	109,254	0	3	0	497,428	0	56,666	554,094	4.553	0.519	5.072
2015	113,382	0	7	0	15,631	0	11,504	27,135	0.138	0.101	0.239
2016	108,686	0	10	0	29,343	0	33,997	63,340	0.270	0.313	0.583
2017	102,812	0	6	0	1,137	0	6,037	7,174	0.011	0.059	0.070
2018	92,536	0	4	0	115,097	0	32,873	147,970	1.244	0.355	1.599
MA Total:	526,669	0	30	0	658,636	0	141,077	799,713	1.251	0.268	1.518

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.362	0.556	.
(14) Massachusetts Credibility:	0.200	0.240	.
(15) Countrywide Pure Premium:	1.126	0.565	1.692
(16) Countrywide Indicated Relativity:	1.343	1.294	.
(17) Countrywide Credibility:	0.400	0.380	.
(18) Countrywide Lost-Time Claims:	299.00	.	.
(19) Pure Premium Underlying Present Rate:	0.979	0.355	1.334
(20) Relativity to Underlying Present Rate:	1.199	0.845	.
(21) Credibility to Underlying Relativity:	0.400	0.380	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.289	0.946	.
(24) Balanced Formula Relativity:	1.284	0.939	1.166

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Calculation of Class Relativities

Class(es): 4273 BAG MFG-PAPER OR PLASTIC		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	48,334	0	12	0	172,297	0	84,868	257,166	3,565	1,756	5,321
2015	46,720	2	15	233,074	24,715	23,771	27,969	309,528	5,518	1,107	6,625
2016	50,284	1	22	53,028	69,579	10,518	58,885	192,011	2,438	1,380	3,819
2017	52,552	0	8	0	124,775	0	27,981	152,755	2,374	0,532	2,907
2018	36,584	0	10	0	22,852	0	25,132	47,984	0,625	0,687	1,312
MA Total:	234,474	3	67	286,102	414,219	34,289	224,835	959,444	2,987	1,105	4,092

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.252	2.295	.
(14) Massachusetts Credibility:	0.170	0.220	.
(15) Countrywide Pure Premium:	0.969	0.512	1.481
(16) Countrywide Indicated Relativity:	1.156	1.172	.
(17) Countrywide Credibility:	0.420	0.390	.
(18) Countrywide Lost-Time Claims:	705.00	.	.
(19) Pure Premium Underlying Present Rate:	1.324	0.631	1.955
(20) Relativity to Underlying Present Rate:	1.621	1.501	.
(21) Credibility to Underlying Relativity:	0.410	0.390	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.703	1.547	.
(24) Balanced Formula Relativity:	1.696	1.536	1.641

Class(es): 4279 PAPER GOODS MFG NOC		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	407,010	3	74	65,310	173,325	47,562	153,107	439,304	0,586	0,493	1,079
2015	478,342	2	57	505,666	119,774	64,800	187,208	877,448	1,308	0,527	1,834
2016	423,740	1	44	233,524	652,978	30,946	299,262	1,216,710	2,092	0,779	2,871
2017	511,109	3	66	233,250	302,456	36,719	197,892	770,318	1,048	0,459	1,507
2018	600,635	1	55	16,860	569,750	35,564	407,792	1,029,966	0,977	0,738	1,715
MA Total:	2,420,836	10	296	1,054,610	1,818,283	215,592	1,245,262	4,333,746	1,187	0,603	1,790

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.292	1.253	.
(14) Massachusetts Credibility:	0.370	0.490	.
(15) Countrywide Pure Premium:	0.989	0.502	1.490
(16) Countrywide Indicated Relativity:	1.179	1.149	.
(17) Countrywide Credibility:	0.320	0.260	.
(18) Countrywide Lost-Time Claims:	1486.0	.	.
(19) Pure Premium Underlying Present Rate:	0.942	0.443	1.385
(20) Relativity to Underlying Present Rate:	1.154	1.053	.
(21) Credibility to Underlying Relativity:	0.310	0.250	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.213	1.176	.
(24) Balanced Formula Relativity:	1.209	1.167	1.194

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
4283 BUILDING OR ROOFING PAPER OR FELT PREPARATION-NO INSTALLATION											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	6.683	0	1	0	11.285	0	632	11.918	1.689	0.095	1.783
2015	10.701	0	2	0	45.161	0	10.913	56.073	4.220	1.020	5.240
2016	6.369	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	15.363	0	2	0	474	0	2.582	3.056	0.031	0.168	0.199
2018	22.803	0	6	0	0	0	7.633	7.633	0.000	0.335	0.335
MA Total:	61,919	0	11	0	56,920	0	21,760	78,680	0.919	0.351	1.271

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.001	0.730	.
(14) Massachusetts Credibility:	0.080	0.100	.
(15) Countrywide Pure Premium:	0.553	0.234	0.786
(16) Countrywide Indicated Relativity:	0.659	0.535	.
(17) Countrywide Credibility:	0.410	0.430	.
(18) Countrywide Lost-Time Claims:	124.00	.	.
(19) Pure Premium Underlying Present Rate:	0.778	0.346	1.124
(20) Relativity to Underlying Present Rate:	0.953	0.822	.
(21) Credibility to Underlying Relativity:	0.510	0.470	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.836	0.690	.
(24) Balanced Formula Relativity:	0.833	0.685	0.782

Class(es):		Effective: 7/1/2022							Manufacturing		
4299 PRINTING											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	2.209.793	14	190	1.414.195	650.970	233.582	496.184	2.794.931	0.935	0.330	1.265
2015	2.441.677	14	238	1.459.101	597.245	926.804	699.763	3.682.912	0.842	0.666	1.508
2016	2.216.317	5	179	459.974	1.698.449	68.343	672.173	2.898.939	0.974	0.334	1.308
2017	2.279.712	5	181	638.383	1.296.626	83.694	1.030.317	3.049.019	0.849	0.489	1.337
2018	2.106.049	6	164	732.420	762.931	436.913	508.292	2.440.557	0.710	0.449	1.159
MA Total:	11,253,549	44	952	4,704,072	5,006,221	1,749,336	3,406,728	14,866,358	0.863	0.458	1.321

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.939	0.951	.
(14) Massachusetts Credibility:	0.620	0.870	.
(15) Countrywide Pure Premium:	0.767	0.423	1.190
(16) Countrywide Indicated Relativity:	0.915	0.968	.
(17) Countrywide Credibility:	0.190	0.070	.
(18) Countrywide Lost-Time Claims:	4871.0	.	.
(19) Pure Premium Underlying Present Rate:	0.757	0.399	1.156
(20) Relativity to Underlying Present Rate:	0.927	0.949	.
(21) Credibility to Underlying Relativity:	0.190	0.060	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.932	0.952	.
(24) Balanced Formula Relativity:	0.929	0.945	0.934

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Calculation of Class Relativities

Class(es): 4304 NEWSPAPER PUBLISHING		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	598.084	1	76	92.183	589.055	12.205	341.761	1,035.204	1.139	0.592	1.731
2015	694.569	5	68	481.120	811.287	104.453	556.812	1,953.672	1.861	0.952	2.813
2016	484.125	0	84	0	816.913	0	570.289	1,387.201	1.687	1.178	2.865
2017	333.639	4	49	524.851	923.386	231.173	402.634	2,082.044	4.341	1.900	6.240
2018	292.900	2	45	235.406	655.598	558.737	373.809	1,823.549	3.042	3.184	6.226
MA Total:	2,403,317	12	322	1,333,560	3,796,238	906,568	2,245,305	8,281,671	2.134	1.311	3.446

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.324	2.723	.
(14) Massachusetts Credibility:	0.480	0.680	.
(15) Countrywide Pure Premium:	1.888	1.040	2.928
(16) Countrywide Indicated Relativity:	2.252	2.380	.
(17) Countrywide Credibility:	0.260	0.160	.
(18) Countrywide Lost-Time Claims:	1139.0	.	.
(19) Pure Premium Underlying Present Rate:	1.896	1.006	2.902
(20) Relativity to Underlying Present Rate:	2.322	2.393	.
(21) Credibility to Underlying Relativity:	0.260	0.160	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	2.305	2.615	.
(24) Balanced Formula Relativity:	2.296	2.596	2.399

Class(es): 4307 BOOKBINDING		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	159.570	0	12	0	10.762	0	31.771	42.533	0.067	0.199	0.267
2015	156.716	1	13	83.151	2.276	18.672	17.332	121.430	0.545	0.230	0.775
2016	173.267	1	14	6.271	35.796	202	133.712	175.982	0.243	0.773	1.016
2017	156.740	0	10	0	30.773	0	45.230	76.004	0.196	0.289	0.485
2018	121.094	1	9	274.345	8.708	47.515	20.744	351.312	2.337	0.564	2.901
MA Total:	767,386	3	58	363,767	88,315	66,389	248,789	767,261	0.589	0.411	1.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.641	0.853	.
(14) Massachusetts Credibility:	0.200	0.290	.
(15) Countrywide Pure Premium:	0.840	0.425	1.266
(16) Countrywide Indicated Relativity:	1.002	0.974	.
(17) Countrywide Credibility:	0.400	0.360	.
(18) Countrywide Lost-Time Claims:	178.00	.	.
(19) Pure Premium Underlying Present Rate:	0.634	0.366	1.000
(20) Relativity to Underlying Present Rate:	0.776	0.871	.
(21) Credibility to Underlying Relativity:	0.400	0.350	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.840	0.903	.
(24) Balanced Formula Relativity:	0.837	0.896	0.857

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Calculation of Class Relativities

Class(es): 4308 LINOTYPE OR HAND COMPOSITION		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	105	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	106	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	104	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	323	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	118	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	756	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.020	0.010	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	1.524	0.379	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	1.260	0.161	1.421
(20) Relativity to Underlying Present Rate:	1.543	0.384	.
(21) Credibility to Underlying Relativity:	0.980	0.990	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.512	0.380	.
(24) Balanced Formula Relativity:	1.506	0.377	1.118

Class(es): 4351 PHOTOENGRAVING		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	270.241	1	29	127.134	34.701	5.874	46.659	214.368	0.599	0.194	0.793
2015	285.673	1	25	32.946	21.633	1.522	48.157	104.257	0.191	0.174	0.365
2016	305.322	0	38	0	82.064	0	79.548	161.613	0.269	0.261	0.529
2017	328.065	0	36	0	20.133	0	26.021	46.155	0.061	0.079	0.141
2018	345.870	0	44	0	233.817	0	74.647	308.463	0.676	0.216	0.892
MA Total:	1,535,170	2	172	160,080	392,348	7,396	275,033	834,856	0.360	0.184	0.544

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.392	0.382	.
(14) Massachusetts Credibility:	0.210	0.300	.
(15) Countrywide Pure Premium:	0.477	0.237	0.714
(16) Countrywide Indicated Relativity:	0.569	0.542	.
(17) Countrywide Credibility:	0.240	0.260	.
(18) Countrywide Lost-Time Claims:	34.000	.	.
(19) Pure Premium Underlying Present Rate:	0.384	0.197	0.582
(20) Relativity to Underlying Present Rate:	0.471	0.469	.
(21) Credibility to Underlying Relativity:	0.550	0.440	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.478	0.462	.
(24) Balanced Formula Relativity:	0.476	0.459	0.470

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Calculation of Class Relativities

Class(es): 4352 ENGRAVING		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	50,295	0	2	0	0	0	531	531	0.000	0.011	0.011
2015	64,195	0	2	0	0	0	693	693	0.000	0.011	0.011
2016	63,939	0	3	0	1,048	0	1,676	2,724	0.016	0.026	0.043
2017	71,041	0	4	0	0	0	3,497	3,497	0.000	0.049	0.049
2018	65,726	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	315,197	0	11	0	1,048	0	6,396	7,444	0.003	0.020	0.024

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.004	0.042	.
(14) Massachusetts Credibility:	0.140	0.170	.
(15) Countrywide Pure Premium:	0.668	0.351	1.019
(16) Countrywide Indicated Relativity:	0.797	0.802	.
(17) Countrywide Credibility:	0.370	0.390	.
(18) Countrywide Lost-Time Claims:	95,000	.	.
(19) Pure Premium Underlying Present Rate:	0.601	0.238	0.839
(20) Relativity to Underlying Present Rate:	0.736	0.566	.
(21) Credibility to Underlying Relativity:	0.490	0.440	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.656	0.569	.
(24) Balanced Formula Relativity:	0.654	0.565	0.623

Class(es): 4360 MOTION PICTURE: DEVLPMNT OF NEGATIVES, PRINTING & ALL SUB OP		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	574,511	0	6	0	1,523	0	5,657	7,180	0.003	0.010	0.012
2015	573,042	0	1	0	0	0	261	261	0.000	0.000	0.000
2016	541,230	0	3	0	310	0	4,689	4,999	0.001	0.009	0.009
2017	576,657	0	1	0	0	0	204	204	0.000	0.000	0.000
2018	614,549	0	2	0	3,375	0	674	4,049	0.005	0.001	0.007
MA Total:	2,879,989	0	13	0	5,208	0	11,485	16,693	0.002	0.004	0.006

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.002	0.008	.
(14) Massachusetts Credibility:	0.240	0.320	.
(15) Countrywide Pure Premium:	0.463	0.245	0.707
(16) Countrywide Indicated Relativity:	0.552	0.560	.
(17) Countrywide Credibility:	0.380	0.340	.
(18) Countrywide Lost-Time Claims:	137.00	.	.
(19) Pure Premium Underlying Present Rate:	0.265	0.126	0.391
(20) Relativity to Underlying Present Rate:	0.324	0.300	.
(21) Credibility to Underlying Relativity:	0.380	0.340	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.333	0.295	.
(24) Balanced Formula Relativity:	0.332	0.293	0.319

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Office and Clerical		
4361 PHOTOGRAPHER - ALL EMP & CLERICAL, SALES, DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	610,340	0	24	0	43,099	0	88,548	131,648	0.071	0.145	0.216
2015	611,325	1	13	135,702	7,084	78,621	11,180	232,587	0.234	0.147	0.380
2016	633,866	3	21	190,066	8,105	92,844	32,487	323,503	0.313	0.198	0.510
2017	590,655	1	19	113,087	2,520	74,400	21,349	211,356	0.196	0.162	0.358
2018	623,696	0	20	0	132,750	0	89,528	222,278	0.213	0.144	0.356
MA Total:	3,069,882	5	97	438,855	193,560	245,865	243,092	1,121,372	0.206	0.159	0.365

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.176	4.099	.
(14) Massachusetts Credibility:	0.240	0.390	.
(15) Countrywide Pure Premium:	0.214	0.164	0.378
(16) Countrywide Indicated Relativity:	3.893	4.586	.
(17) Countrywide Credibility:	0.380	0.310	.
(18) Countrywide Lost-Time Claims:	447.00	.	.
(19) Pure Premium Underlying Present Rate:	0.268	0.204	0.471
(20) Relativity to Underlying Present Rate:	4.554	5.676	.
(21) Credibility to Underlying Relativity:	0.380	0.300	.
(22) Industry Group Converted Pure Premium:	0.065	0.039	0.104
(23) Formula Relativity:	3.972	4.723	.
(24) Balanced Formula Relativity:	3.970	4.728	4.254

Class(es):		Effective: 7/1/2022							Goods and Services		
4362 MOTION PICTURE: FILM EXCH & PROJECTION RMS, CL											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	5,625	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	4,486	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	1,769	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	2,697	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	4,317	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	18,893	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.030	0.040	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	0.326	0.299	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	0.228	0.115	0.343
(20) Relativity to Underlying Present Rate:	0.329	0.301	.
(21) Credibility to Underlying Relativity:	0.970	0.960	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	0.319	0.289	.
(24) Balanced Formula Relativity:	0.317	0.289	0.307

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
4410 RUBBER GOODS MFG NOC											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	482,606	5	68	525,525	750,861	310,457	390,984	1,977,827	2,645	1,453	4,098
2015	457,932	1	77	3,401	455,613	13,801	311,927	784,742	1,002	0,711	1,714
2016	387,605	0	49	0	705,714	0	973,961	1,679,675	1,821	2,513	4,333
2017	427,530	1	43	137,637	187,575	30,408	182,894	538,514	0,761	0,499	1,260
2018	455,267	0	58	0	616,495	0	228,330	844,825	1,354	0,502	1,856
MA Total:	2,210,941	7	295	666,563	2,716,258	354,666	2,088,096	5,825,582	1,530	1,105	2,635

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.666	2.294	.
(14) Massachusetts Credibility:	0.380	0.590	.
(15) Countrywide Pure Premium:	1.151	0.633	1.784
(16) Countrywide Indicated Relativity:	1.373	1.449	.
(17) Countrywide Credibility:	0.310	0.210	.
(18) Countrywide Lost-Time Claims:	2585.0	.	.
(19) Pure Premium Underlying Present Rate:	1.135	0.788	1.923
(20) Relativity to Underlying Present Rate:	1.390	1.875	.
(21) Credibility to Underlying Relativity:	0.310	0.200	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.490	2.033	.
(24) Balanced Formula Relativity:	1.484	2.018	1.668

Class(es):		Effective: 7/1/2022							Manufacturing		
4432 FOUNTAIN PEN MFG											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	60,186	0	3	0	4,569	0	11,206	15,775	0,076	0,186	0,262
2015	73,496	0	4	0	8,450	0	1,516	9,966	0,115	0,021	0,136
2016	63,230	0	5	0	6,951	0	1,402	8,353	0,110	0,022	0,132
2017	63,484	0	10	0	2,606	0	5,075	7,681	0,041	0,080	0,121
2018	68,230	0	3	0	0	0	590	590	0,000	0,009	0,009
MA Total:	328,627	0	25	0	22,577	0	19,789	42,365	0,069	0,060	0,129

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.075	0.125	.
(14) Massachusetts Credibility:	0.100	0.160	.
(15) Countrywide Pure Premium:	0.347	0.253	0.600
(16) Countrywide Indicated Relativity:	0.414	0.578	.
(17) Countrywide Credibility:	0.260	0.270	.
(18) Countrywide Lost-Time Claims:	39,000	.	.
(19) Pure Premium Underlying Present Rate:	0.283	0.187	0.470
(20) Relativity to Underlying Present Rate:	0.346	0.446	.
(21) Credibility to Underlying Relativity:	0.640	0.570	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.337	0.430	.
(24) Balanced Formula Relativity:	0.335	0.427	0.367

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
4439 LACQUER OR SPIRIT VARNISH MFG											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	38,754	1	4	334,566	0	214,339	4,717	553,622	8,633	5,653	14,286
2015	41,771	0	10	0	446,895	0	236,571	683,467	10,699	5,664	16,362
2016	42,107	0	10	0	43,823	0	64,741	108,564	1,041	1,538	2,578
2017	44,734	0	6	0	30,534	0	12,944	43,479	0,683	0,289	0,972
2018	39,787	0	4	0	13,485	0	6,797	20,282	0,339	0,171	0,510
MA Total:	207,153	1	34	334,566	534,737	214,339	325,771	1,409,413	4,196	2,607	6,804

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	4.569	5.414	.
(14) Massachusetts Credibility:	0.190	0.290	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	2.531	3.348	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	2.093	1.425	3.518
(20) Relativity to Underlying Present Rate:	2.563	3.389	.
(21) Credibility to Underlying Relativity:	0.810	0.710	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	2.944	3.976	.
(24) Balanced Formula Relativity:	2.933	3.947	3.282

Class(es):		Effective: 7/1/2022							Manufacturing		
4452 PLASTICS MFG: FABRICATED PRODUCTS NOC											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	697,898	4	87	264,161	494,703	163,320	220,571	1,142,755	1,087	0,550	1,637
2015	694,402	6	106	769,076	534,044	151,629	318,851	1,773,600	1,877	0,678	2,554
2016	777,658	2	91	181,978	858,813	146,076	340,926	1,527,793	1,338	0,626	1,965
2017	772,863	2	103	204,294	520,369	100,691	257,131	1,082,485	0,938	0,463	1,401
2018	867,990	2	117	321,984	1,660,529	51,770	549,204	2,583,487	2,284	0,692	2,976
MA Total:	3,810,811	16	504	1,741,493	4,068,458	613,485	1,686,684	8,110,120	1,525	0,604	2,128

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.660	1.253	.
(14) Massachusetts Credibility:	0.480	0.640	.
(15) Countrywide Pure Premium:	0.994	0.564	1.558
(16) Countrywide Indicated Relativity:	1.185	1.292	.
(17) Countrywide Credibility:	0.260	0.180	.
(18) Countrywide Lost-Time Claims:	2096.0	.	.
(19) Pure Premium Underlying Present Rate:	1.179	0.556	1.735
(20) Relativity to Underlying Present Rate:	1.444	1.322	.
(21) Credibility to Underlying Relativity:	0.260	0.180	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.480	1.273	.
(24) Balanced Formula Relativity:	1.474	1.263	1.402

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
4459 PLASTICS MFG: SHEETS, RODS OR TUBES											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	658,725	2	118	176,571	575,684	39,742	336,453	1,128,450	1,142	0,571	1,713
2015	499,031	2	68	118,093	696,500	37,603	444,037	1,296,234	1,632	0,965	2,598
2016	553,511	0	83	0	762,418	0	347,649	1,110,067	1,377	0,628	2,005
2017	533,736	3	80	602,172	743,959	181,682	349,544	1,877,356	2,522	0,995	3,517
2018	657,597	5	75	356,619	881,409	112,814	591,331	1,942,173	1,883	1,071	2,953
MA Total:	2,902,600	12	424	1,253,455	3,659,971	371,841	2,069,013	7,354,280	1,693	0,841	2,534

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.843	1.746	.
(14) Massachusetts Credibility:	0.430	0.590	.
(15) Countrywide Pure Premium:	0.969	0.536	1.505
(16) Countrywide Indicated Relativity:	1.156	1.227	.
(17) Countrywide Credibility:	0.290	0.210	.
(18) Countrywide Lost-Time Claims:	2598.0	.	.
(19) Pure Premium Underlying Present Rate:	1.185	0.585	1.770
(20) Relativity to Underlying Present Rate:	1.451	1.391	.
(21) Credibility to Underlying Relativity:	0.280	0.200	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.534	1.566	.
(24) Balanced Formula Relativity:	1.528	1.554	1.537

Class(es):		Effective: 7/1/2022							Manufacturing		
4470 CABLE MFG - INSULATED ELECTRICAL											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	423,595	4	51	718,270	313,840	484,870	158,881	1,675,860	2,437	1,520	3,956
2015	475,096	1	39	316,943	110,339	44,015	82,325	553,623	0,899	0,266	1,165
2016	480,077	0	44	0	228,013	0	79,928	307,941	0,475	0,166	0,641
2017	577,543	1	60	198,986	521,939	83,038	227,139	1,031,102	1,248	0,537	1,785
2018	652,433	1	52	73,723	340,458	26,574	165,366	606,121	0,635	0,294	0,929
MA Total:	2,608,744	7	246	1,307,922	1,514,589	638,497	713,639	4,174,647	1,082	0,518	1,600

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.178	1.076	.
(14) Massachusetts Credibility:	0.370	0.500	.
(15) Countrywide Pure Premium:	0.848	0.369	1.217
(16) Countrywide Indicated Relativity:	1.011	0.845	.
(17) Countrywide Credibility:	0.320	0.250	.
(18) Countrywide Lost-Time Claims:	389.00	.	.
(19) Pure Premium Underlying Present Rate:	0.883	0.444	1.327
(20) Relativity to Underlying Present Rate:	1.081	1.056	.
(21) Credibility to Underlying Relativity:	0.310	0.250	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.095	1.013	.
(24) Balanced Formula Relativity:	1.090	1.006	1.061

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
4484 PLASTICS MFG: MOLDED PRODUCTS NOC											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	2,005,823	11	221	1,185,890	660,599	747,112	605,888	3,199,490	0.921	0.675	1,595
2015	2,374,062	4	336	137,783	1,798,829	237,836	1,275,561	3,450,009	0.816	0.637	1,453
2016	2,207,444	11	274	659,660	1,796,996	512,207	1,050,990	4,019,853	1.113	0.708	1,821
2017	1,807,574	6	241	318,942	1,259,133	151,282	731,574	2,460,931	0.873	0.488	1,361
2018	2,083,549	6	253	606,490	1,346,028	149,662	768,588	2,870,767	0.937	0.441	1,378
MA Total:	10,478,452	38	1,325	2,908,764	6,861,585	1,798,100	4,432,601	16,001,050	0.932	0.595	1,527

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.015	1.235	.
(14) Massachusetts Credibility:	0.620	0.920	.
(15) Countrywide Pure Premium:	0.950	0.549	1.499
(16) Countrywide Indicated Relativity:	1.133	1.256	.
(17) Countrywide Credibility:	0.190	0.040	.
(18) Countrywide Lost-Time Claims:	9793.0	.	.
(19) Pure Premium Underlying Present Rate:	0.813	0.490	1.303
(20) Relativity to Underlying Present Rate:	0.995	1.166	.
(21) Credibility to Underlying Relativity:	0.190	0.040	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.034	1.233	.
(24) Balanced Formula Relativity:	1.030	1.224	1.097

Class(es):		Effective: 7/1/2022							Manufacturing		
4493 FABRIC COATING OR IMPREGNATING NOC											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	402,658	1	61	218,579	428,210	18,968	388,789	1,054,545	1.606	1.013	2,619
2015	336,120	1	43	112,413	41,383	5,195	64,168	223,158	0.458	0.206	0,664
2016	294,171	0	36	0	123,437	0	70,713	194,150	0.420	0.240	0,660
2017	330,057	1	37	65,862	112,237	38,513	121,556	338,168	0.540	0.485	1,025
2018	313,226	0	33	0	106,896	0	96,255	203,151	0.341	0.307	0,649
MA Total:	1,676,232	3	210	396,854	812,163	62,675	741,481	2,013,173	0.721	0.480	1,201

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.785	0.996	.
(14) Massachusetts Credibility:	0.300	0.410	.
(15) Countrywide Pure Premium:	1.018	0.496	1.514
(16) Countrywide Indicated Relativity:	1.214	1.136	.
(17) Countrywide Credibility:	0.350	0.300	.
(18) Countrywide Lost-Time Claims:	187.00	.	.
(19) Pure Premium Underlying Present Rate:	0.821	0.413	1.234
(20) Relativity to Underlying Present Rate:	1.005	0.982	.
(21) Credibility to Underlying Relativity:	0.350	0.290	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.012	1.034	.
(24) Balanced Formula Relativity:	1.008	1.027	1.015

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services		
4511 ANALYTICAL CHEMIST											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	6,578,399	4	100	572,906	146,110	90,872	297,758	1,107,647	0.109	0.059	0.168
2015	5,356,765	1	74	13,726	428,677	29,012	225,883	697,298	0.083	0.048	0.130
2016	5,592,906	3	92	364,345	287,180	85,418	379,998	1,116,942	0.116	0.083	0.200
2017	5,818,529	2	85	632,815	186,063	108,038	246,601	1,173,517	0.141	0.061	0.202
2018	5,849,931	3	89	271,370	1,086,299	205,902	410,069	1,973,640	0.232	0.105	0.337
MA Total:	29,196,531	13	440	1,855,162	2,134,329	519,243	1,560,310	6,069,044	0.137	0.071	0.208

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.179	0.167	.
(14) Massachusetts Credibility:	0.440	0.600	.
(15) Countrywide Pure Premium:	0.225	0.124	0.349
(16) Countrywide Indicated Relativity:	0.299	0.293	.
(17) Countrywide Credibility:	0.280	0.200	.
(18) Countrywide Lost-Time Claims:	1724.0	.	.
(19) Pure Premium Underlying Present Rate:	0.123	0.062	0.185
(20) Relativity to Underlying Present Rate:	0.178	0.163	.
(21) Credibility to Underlying Relativity:	0.280	0.200	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	0.212	0.192	.
(24) Balanced Formula Relativity:	0.211	0.192	0.204

Class(es):		Effective: 7/1/2022							Goods and Services		
4512 BIOMEDICAL RESEARCH LABS-INCL OUTSIDE OPERATNS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	10,031,372	0	90	0	271,471	0	144,707	416,178	0.027	0.014	0.041
2015	12,206,041	2	121	223,462	258,241	27,167	309,627	818,497	0.039	0.028	0.067
2016	14,024,024	2	99	140,715	453,033	60,711	238,518	892,977	0.042	0.021	0.064
2017	15,409,103	1	116	76,620	1,113,039	3,540	332,746	1,525,945	0.077	0.022	0.099
2018	19,053,947	3	144	225,223	358,511	160,637	485,773	1,230,145	0.031	0.034	0.065
MA Total:	70,724,486	8	570	666,020	2,454,295	252,055	1,511,372	4,883,741	0.044	0.025	0.069

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.058	0.059	.
(14) Massachusetts Credibility:	0.400	0.560	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	0.059	0.055	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	0.041	0.021	0.062
(20) Relativity to Underlying Present Rate:	0.060	0.055	.
(21) Credibility to Underlying Relativity:	0.600	0.440	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	0.059	0.057	.
(24) Balanced Formula Relativity:	0.059	0.057	0.058

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Calculation of Class Relativities

Class(es): 4557 INK MFG		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	412,269	0	33	0	297,864	0	85,735	383,600	0.722	0.208	0.930
2015	832,698	1	52	210,268	264,322	43,177	140,308	658,075	0.570	0.220	0.790
2016	397,721	1	30	17,494	163,967	778	67,369	249,610	0.456	0.171	0.628
2017	459,827	3	23	441,510	380,145	151,130	98,675	1,071,460	1.787	0.543	2.330
2018	496,570	1	44	222,439	652,335	29,048	137,589	1,041,411	1.762	0.336	2.097
MA Total:	2,599,085	6	182	891,711	1,758,633	224,134	529,676	3,404,155	1.020	0.290	1.310

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.110	0.602	.
(14) Massachusetts Credibility:	0.350	0.450	.
(15) Countrywide Pure Premium:	0.967	0.444	1.411
(16) Countrywide Indicated Relativity:	1.153	1.017	.
(17) Countrywide Credibility:	0.330	0.280	.
(18) Countrywide Lost-Time Claims:	563.00	.	.
(19) Pure Premium Underlying Present Rate:	0.756	0.343	1.099
(20) Relativity to Underlying Present Rate:	0.925	0.816	.
(21) Credibility to Underlying Relativity:	0.320	0.270	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.065	0.776	.
(24) Balanced Formula Relativity:	1.061	0.770	0.961

Class(es): 4558 PAINT MFG		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	90,338	0	5	0	43,001	0	70,115	113,116	0.476	0.776	1.252
2015	79,244	1	7	123,813	131	62,129	3,764	189,837	1.564	0.832	2.396
2016	129,470	0	9	0	2,607	0	9,412	12,019	0.020	0.073	0.093
2017	149,941	1	12	95,442	14,515	51,826	27,113	188,896	0.733	0.526	1.260
2018	133,252	0	12	0	0	0	25,598	25,598	0.000	0.192	0.192
MA Total:	582,246	2	45	219,255	60,254	113,955	136,002	529,466	0.480	0.429	0.909

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.523	0.891	.
(14) Massachusetts Credibility:	0.170	0.260	.
(15) Countrywide Pure Premium:	0.825	0.395	1.220
(16) Countrywide Indicated Relativity:	0.984	0.905	.
(17) Countrywide Credibility:	0.420	0.370	.
(18) Countrywide Lost-Time Claims:	556.00	.	.
(19) Pure Premium Underlying Present Rate:	0.609	0.363	0.973
(20) Relativity to Underlying Present Rate:	0.746	0.864	.
(21) Credibility to Underlying Relativity:	0.410	0.370	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.808	0.886	.
(24) Balanced Formula Relativity:	0.805	0.880	0.831

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
4583 FERTILIZER MFG & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	44,430	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	53,919	0	2	0	3,582	0	9,848	13,430	0.066	0.183	0.249
2016	55,189	0	2	0	2,399	0	1,620	4,019	0.043	0.029	0.073
2017	55,074	0	7	0	32,674	0	70,220	102,894	0.593	1.275	1.868
2018	51,235	0	10	0	81,345	0	34,519	115,864	1.588	0.674	2.261
MA Total:	259,848	0	21	0	119,999	0	116,208	236,207	0.462	0.447	0.909

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.503	0.929	.
(14) Massachusetts Credibility:	0.160	0.220	.
(15) Countrywide Pure Premium:	1.320	0.757	2.077
(16) Countrywide Indicated Relativity:	1.574	1.733	.
(17) Countrywide Credibility:	0.420	0.390	.
(18) Countrywide Lost-Time Claims:	493.00	.	.
(19) Pure Premium Underlying Present Rate:	1.169	0.535	1.705
(20) Relativity to Underlying Present Rate:	1.432	1.273	.
(21) Credibility to Underlying Relativity:	0.420	0.390	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.343	1.377	.
(24) Balanced Formula Relativity:	1.338	1.367	1.348

Class(es):		Effective: 7/1/2022							Manufacturing		
4611 DRUG MEDICINE OR PHARMACEUTICAL PREP-NO MFG OF INGREDIENTS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	907,425	0	28	0	271,206	0	136,837	408,043	0.299	0.151	0.450
2015	1,129,420	3	43	259,325	211,303	115,630	69,410	655,667	0.417	0.164	0.581
2016	658,535	1	57	215,856	230,086	55,474	83,676	585,092	0.677	0.211	0.888
2017	575,535	2	32	78,203	417,574	23,622	114,044	633,444	0.861	0.239	1.101
2018	657,547	0	39	0	386,458	0	205,099	591,557	0.588	0.312	0.900
MA Total:	3,928,461	6	199	553,384	1,516,627	194,726	609,065	2,873,803	0.527	0.205	0.732

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.574	0.425	.
(14) Massachusetts Credibility:	0.290	0.400	.
(15) Countrywide Pure Premium:	0.367	0.220	0.588
(16) Countrywide Indicated Relativity:	0.438	0.504	.
(17) Countrywide Credibility:	0.360	0.300	.
(18) Countrywide Lost-Time Claims:	2102.0	.	.
(19) Pure Premium Underlying Present Rate:	0.317	0.162	0.478
(20) Relativity to Underlying Present Rate:	0.388	0.384	.
(21) Credibility to Underlying Relativity:	0.350	0.300	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.460	0.436	.
(24) Balanced Formula Relativity:	0.458	0.433	0.450

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
4635 OXYGEN OR HYDROGEN MFG & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	159,756	0	25	0	221,317	0	173,538	394,854	1,385	1,086	2,472
2015	112,404	1	18	26,403	455,929	5,329	446,320	933,981	4,291	4,018	8,309
2016	163,269	1	24	96,703	260,936	36,431	285,208	679,277	2,190	1,970	4,160
2017	167,372	0	11	0	371,872	0	288,414	660,286	2,222	1,723	3,945
2018	157,648	1	20	25,091	573,136	44,693	429,601	1,072,521	3,795	3,009	6,803
MA Total:	760,449	3	98	148,196	1,883,190	86,453	1,623,081	3,740,919	2,671	2,248	4,919

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.908	4.668	.
(14) Massachusetts Credibility:	0.310	0.470	.
(15) Countrywide Pure Premium:	1.388	0.634	2.022
(16) Countrywide Indicated Relativity:	1.655	1.451	.
(17) Countrywide Credibility:	0.350	0.270	.
(18) Countrywide Lost-Time Claims:	694.00	.	.
(19) Pure Premium Underlying Present Rate:	1.898	1.275	3.173
(20) Relativity to Underlying Present Rate:	2.324	3.032	.
(21) Credibility to Underlying Relativity:	0.340	0.260	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	2.271	3.374	.
(24) Balanced Formula Relativity:	2.262	3.349	2.636

Class(es):		Effective: 7/1/2022							Manufacturing		
4653 GLUE MFG & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	39,196	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	43,331	0	8	0	269,772	0	82,314	352,086	6,226	1,900	8,125
2016	46,606	0	7	0	8,719	0	23,516	32,235	0.187	0.505	0.692
2017	46,048	0	5	0	149,114	0	53,336	202,450	3,238	1,158	4,397
2018	52,645	0	3	0	0	0	1,531	1,531	0.000	0.029	0.029
MA Total:	227,827	0	23	0	427,604	0	160,698	588,302	1,877	0,705	2,582

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.043	1.465	.
(14) Massachusetts Credibility:	0.130	0.170	.
(15) Countrywide Pure Premium:	0.870	0.334	1.203
(16) Countrywide Indicated Relativity:	1.037	0.764	.
(17) Countrywide Credibility:	0.340	0.360	.
(18) Countrywide Lost-Time Claims:	79.000	.	.
(19) Pure Premium Underlying Present Rate:	0.775	0.345	1.120
(20) Relativity to Underlying Present Rate:	0.949	0.820	.
(21) Credibility to Underlying Relativity:	0.530	0.470	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.121	0.909	.
(24) Balanced Formula Relativity:	1.117	0.902	1.043

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Calculation of Class Relativities

Class(es): 4665 RENDERING WORKS NOC & DR		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	51,440	2	17	379,818	448,915	111,753	173,224	1,113,710	16,111	5,540	21,651
2015	53,466	2	10	252,397	158,251	86,896	34,455	531,999	7,681	2,270	9,950
2016	55,468	1	11	463,305	44,867	141,742	65,449	715,364	9,162	3,735	12,897
2017	57,365	0	9	0	311,774	0	60,348	372,123	5,435	1,052	6,487
2018	61,497	1	18	1,086,855	61,865	101,857	84,214	1,334,791	18,679	3,026	21,705
MA Total:	279,235	6	65	2,182,376	1,025,672	442,248	417,690	4,067,987	11,489	3,080	14,568

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	12.508	6.394	.
(14) Massachusetts Credibility:	0.270	0.370	.
(15) Countrywide Pure Premium:	2.932	1.333	4.266
(16) Countrywide Indicated Relativity:	3.497	3.052	.
(17) Countrywide Credibility:	0.370	0.320	.
(18) Countrywide Lost-Time Claims:	423.00	.	.
(19) Pure Premium Underlying Present Rate:	3.833	1.858	5.691
(20) Relativity to Underlying Present Rate:	4.693	4.420	.
(21) Credibility to Underlying Relativity:	0.360	0.310	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	6.361	4.713	.
(24) Balanced Formula Relativity:	6.336	4.678	5.766

Class(es): 4692 DENTAL LABORATORY		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	274,992	0	4	0	10,767	0	15,750	26,517	0.039	0.057	0.096
2015	320,551	0	3	0	3,285	0	6,149	9,434	0.010	0.019	0.029
2016	414,821	0	7	0	46,542	0	19,219	65,762	0.112	0.046	0.159
2017	405,304	0	5	0	318	0	4,656	4,975	0.001	0.011	0.012
2018	397,799	3	6	67,107	40,780	38,111	53,144	199,143	0.271	0.229	0.501
MA Total:	1,813,467	3	25	67,107	101,693	38,111	98,919	305,831	0.093	0.076	0.169

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.101	0.157	.
(14) Massachusetts Credibility:	0.180	0.240	.
(15) Countrywide Pure Premium:	0.319	0.149	0.468
(16) Countrywide Indicated Relativity:	0.380	0.342	.
(17) Countrywide Credibility:	0.410	0.380	.
(18) Countrywide Lost-Time Claims:	204.00	.	.
(19) Pure Premium Underlying Present Rate:	0.226	0.101	0.327
(20) Relativity to Underlying Present Rate:	0.277	0.239	.
(21) Credibility to Underlying Relativity:	0.410	0.380	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.288	0.259	.
(24) Balanced Formula Relativity:	0.286	0.257	0.276

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
4693 PHARMACEUTICAL OR SURGICAL GOODS MFG NOC											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	835.735	2	27	72.875	27.800	13.092	56.268	170.035	0.120	0.083	0.203
2015	491.780	1	44	9.787	125.837	10.344	127.560	273.528	0.276	0.280	0.556
2016	492.297	1	42	77.100	152.730	37.867	100.123	367.821	0.467	0.280	0.747
2017	612.234	2	31	205.151	159.791	65.883	88.044	518.868	0.596	0.251	0.847
2018	548.286	2	21	59.333	65.208	61.283	84.685	270.510	0.227	0.266	0.493
MA Total:	2,980,332	8	165	424,245	531,366	188,470	456,680	1,600,761	0.321	0.216	0.537

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.349	0.449	.
(14) Massachusetts Credibility:	0.270	0.390	.
(15) Countrywide Pure Premium:	0.379	0.211	0.591
(16) Countrywide Indicated Relativity:	0.452	0.484	.
(17) Countrywide Credibility:	0.370	0.310	.
(18) Countrywide Lost-Time Claims:	737.00	.	.
(19) Pure Premium Underlying Present Rate:	0.346	0.199	0.546
(20) Relativity to Underlying Present Rate:	0.424	0.474	.
(21) Credibility to Underlying Relativity:	0.360	0.300	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.414	0.467	.
(24) Balanced Formula Relativity:	0.413	0.464	0.430

Class(es):		Effective: 7/1/2022							Manufacturing		
4720 SOAP OR SYNTHETIC DETERGENT MFG											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	214.134	0	24	0	74.600	0	41.825	116.425	0.348	0.195	0.544
2015	224.363	1	12	110.675	89.224	21.056	66.970	287.926	0.891	0.392	1.283
2016	219.466	0	20	0	118.436	0	64.240	182.676	0.540	0.293	0.832
2017	250.194	1	14	25.925	19.928	10.086	39.235	95.174	0.183	0.197	0.380
2018	225.676	0	20	0	185.972	0	160.867	346.839	0.824	0.713	1.537
MA Total:	1,133,833	2	90	136,601	488,160	31,142	373,137	1,029,039	0.551	0.357	0.908

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.600	0.740	.
(14) Massachusetts Credibility:	0.250	0.340	.
(15) Countrywide Pure Premium:	0.803	0.454	1.257
(16) Countrywide Indicated Relativity:	0.957	1.039	.
(17) Countrywide Credibility:	0.380	0.330	.
(18) Countrywide Lost-Time Claims:	394.00	.	.
(19) Pure Premium Underlying Present Rate:	0.748	0.378	1.126
(20) Relativity to Underlying Present Rate:	0.916	0.899	.
(21) Credibility to Underlying Relativity:	0.370	0.330	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.853	0.891	.
(24) Balanced Formula Relativity:	0.850	0.885	0.862

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
4740 OIL REFINING - PETROLEUM & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	20.625	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	19.582	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	16.503	0	2	0	203	0	1,800	2,003	0.012	0.109	0.121
2017	14.478	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	13.676	0	1	0	0	0	115	115	0.000	0.008	0.008
MA Total:	84,864	0	3	0	203	0	1,914	2,117	0.002	0.023	0.025

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.003	0.047	.
(14) Massachusetts Credibility:	0.070	0.090	.
(15) Countrywide Pure Premium:	0.348	0.154	0.501
(16) Countrywide Indicated Relativity:	0.414	0.352	.
(17) Countrywide Credibility:	0.470	0.460	.
(18) Countrywide Lost-Time Claims:	502.00	.	.
(19) Pure Premium Underlying Present Rate:	0.396	0.191	0.588
(20) Relativity to Underlying Present Rate:	0.485	0.455	.
(21) Credibility to Underlying Relativity:	0.460	0.450	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.418	0.371	.
(24) Balanced Formula Relativity:	0.417	0.368	0.400

Class(es):		Effective: 7/1/2022							Manufacturing		
4741 ASPHALT OR TAR DISTILLING OR REFINING & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	3.660	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	2.905	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	3.033	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	3.531	0	1	0	5,028	0	3,531	8,559	1.424	1.000	2.424
2018	77.043	1	0	296.565	0	137.863	0	434.428	3.849	1.789	5.639
MA Total:	90,172	1	1	296.565	5,028	137.863	3,531	442.987	3.345	1.568	4.913

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.641	3.256	.
(14) Massachusetts Credibility:	0.100	0.130	.
(15) Countrywide Pure Premium:	0.941	0.478	1.418
(16) Countrywide Indicated Relativity:	1.122	1.094	.
(17) Countrywide Credibility:	0.380	0.400	.
(18) Countrywide Lost-Time Claims:	103.00	.	.
(19) Pure Premium Underlying Present Rate:	0.980	0.398	1.378
(20) Relativity to Underlying Present Rate:	1.200	0.948	.
(21) Credibility to Underlying Relativity:	0.520	0.470	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.414	1.306	.
(24) Balanced Formula Relativity:	1.409	1.297	1.370

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Calculation of Class Relativities

Class(es): 4771 EXPLOSIVES OR AMMUNITION MFG: NOC - & DRIVERS									Effective: 7/1/2022			Manufacturing		
Converted Unlimited Losses														
Amount														
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)			
2014	3,997	0	1	0	0	0	1,863	1,863	0.000	0.466	0.466			
2015	5,140	0	0	0	0	0	0	0	0.000	0.000	0.000			
2016	11,970	0	1	0	0	0	95	95	0.000	0.008	0.008			
2017	0	0	0	0	0	0	0	0	0.000	0.000	0.000			
2018	2,704	0	0	0	0	0	0	0	0.000	0.000	0.000			
MA Total:	23,811	0	2	0	0	0	1,957	1,957	0.000	0.082	0.082			

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.171	.
(14) Massachusetts Credibility:	0.070	0.080	.
(15) Countrywide Pure Premium:	1.041	0.463	1.504
(16) Countrywide Indicated Relativity:	1.241	1.059	.
(17) Countrywide Credibility:	0.470	0.460	.
(18) Countrywide Lost-Time Claims:	300.00	.	.
(19) Pure Premium Underlying Present Rate:	1.458	0.448	1.906
(20) Relativity to Underlying Present Rate:	1.786	1.065	.
(21) Credibility to Underlying Relativity:	0.460	0.460	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.405	0.991	.
(24) Balanced Formula Relativity:	1.399	0.983	1.256

Class(es): 4825 DRUG, MEDICINE OR PHARM PREP MFG & INCIDENTAL MFG INGREDIENTS									Effective: 7/1/2022			Manufacturing		
Converted Unlimited Losses														
Amount														
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)			
2014	2,606,420	2	33	12,956	513,871	28,422	139,967	695,215	0.202	0.065	0.267			
2015	2,587,699	0	34	0	18,507	0	35,363	53,871	0.007	0.014	0.021			
2016	3,803,048	3	51	415,456	285,528	110,667	153,626	965,277	0.184	0.069	0.254			
2017	3,383,372	0	51	0	174,380	0	101,207	275,587	0.052	0.030	0.081			
2018	3,785,747	2	61	351,448	151,572	136,283	204,452	843,755	0.133	0.090	0.223			
MA Total:	16,166,285	7	230	779,860	1,143,858	275,371	634,615	2,833,705	0.119	0.056	0.175			

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.130	0.117	.
(14) Massachusetts Credibility:	0.430	0.560	.
(15) Countrywide Pure Premium:	0.319	0.170	0.489
(16) Countrywide Indicated Relativity:	0.380	0.389	.
(17) Countrywide Credibility:	0.290	0.220	.
(18) Countrywide Lost-Time Claims:	791.00	.	.
(19) Pure Premium Underlying Present Rate:	0.212	0.092	0.304
(20) Relativity to Underlying Present Rate:	0.259	0.219	.
(21) Credibility to Underlying Relativity:	0.280	0.220	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.239	0.199	.
(24) Balanced Formula Relativity:	0.238	0.198	0.224

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Manufacturing		
4828 CHEMICAL BLENDING OR MIXING NOC- ALL OPERS & DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	935.225	1	21	343.859	183.639	35.677	107.413	670.587	0.564	0.153	0.717
2015	1,034.967	2	29	246.793	427.749	24.600	395.429	1,094.570	0.652	0.406	1.058
2016	1,083.705	0	32	0	206.598	0	172.522	379.119	0.191	0.159	0.350
2017	1,155.740	0	23	0	92.789	0	106.294	199.083	0.080	0.092	0.172
2018	810.784	0	23	0	61.984	0	143.507	205.491	0.076	0.177	0.253
MA Total:	5,020.421	3	128	590.652	972.758	60.277	925.163	2,548.850	0.311	0.196	0.508

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.339	0.408	.
(14) Massachusetts Credibility:	0.350	0.480	.
(15) Countrywide Pure Premium:	0.502	0.254	0.756
(16) Countrywide Indicated Relativity:	0.599	0.581	.
(17) Countrywide Credibility:	0.330	0.260	.
(18) Countrywide Lost-Time Claims:	2226.0	.	.
(19) Pure Premium Underlying Present Rate:	0.414	0.200	0.614
(20) Relativity to Underlying Present Rate:	0.508	0.475	.
(21) Credibility to Underlying Relativity:	0.320	0.260	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.479	0.470	.
(24) Balanced Formula Relativity:	0.477	0.467	0.473

Class(es):		Effective: 7/1/2022							Construction		
5020 CEILING INSTALLATION-SUSPENDED ACOUSTICAL GRID											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	218.297	1	17	16.087	572.857	2.579	180.645	772.168	2.698	0.839	3.537
2015	210.962	2	17	480.093	416.291	178.577	113.589	1,188.549	4.249	1.385	5.634
2016	224.390	0	14	0	677.062	0	186.240	863.302	3.017	0.830	3.847
2017	242.102	0	14	0	34.057	0	27.118	61.175	0.141	0.112	0.253
2018	285.125	1	21	136.455	132.935	42.016	89.938	401.344	0.945	0.463	1.408
MA Total:	1,180.876	4	83	632.635	1,833.203	223.171	597.529	3,286.538	2.088	0.695	2.783

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.860	0.622	.
(14) Massachusetts Credibility:	0.390	0.460	.
(15) Countrywide Pure Premium:	2.466	1.072	3.537
(16) Countrywide Indicated Relativity:	1.031	0.985	.
(17) Countrywide Credibility:	0.310	0.270	.
(18) Countrywide Lost-Time Claims:	259.00	.	.
(19) Pure Premium Underlying Present Rate:	2.239	0.768	3.007
(20) Relativity to Underlying Present Rate:	1.023	0.789	.
(21) Credibility to Underlying Relativity:	0.300	0.270	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	0.962	0.765	.
(24) Balanced Formula Relativity:	0.971	0.765	0.906

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Calculation of Class Relativities

Class(es): 5022 MASONRY NOC		Effective: 7/1/2022							Construction		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	1,163,398	15	111	3,426,051	3,026,364	1,224,835	1,607,358	9,284,608	5,546	2,434	7,981
2015	1,278,963	15	110	3,003,467	3,409,775	1,284,141	1,696,735	9,394,119	5,014	2,331	7,345
2016	1,374,214	12	120	1,926,887	5,557,958	1,181,448	1,453,522	10,119,815	5,447	1,917	7,364
2017	1,502,670	13	121	3,306,380	5,178,590	1,560,424	1,856,600	11,901,993	5,647	2,274	7,921
2018	1,675,209	7	109	2,897,734	5,628,925	1,311,528	2,553,833	12,392,021	5,090	2,307	7,397
MA Total:	6,994,454	62	571	14,560,518	22,801,613	6,562,377	9,168,048	53,092,556	5,342	2,249	7,591

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.200	2.011	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	3.653	1.525	5.178
(16) Countrywide Indicated Relativity:	1.528	1.401	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	5015.0	.	.
(19) Pure Premium Underlying Present Rate:	4.666	1.947	6.613
(20) Relativity to Underlying Present Rate:	2.131	2.000	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	2.200	2.011	.
(24) Balanced Formula Relativity:	2.221	2.011	2.155

Class(es): 5037 PAINTING: METAL STRUCTURES-OVER 2 STORIES IN HEIGHT & DRIVERS		Effective: 7/1/2022							Construction		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	105,650	2	11	136,784	957,848	21,037	342,260	1,457,930	10,361	3,439	13,800
2015	80,013	4	6	847,954	132,526	372,152	20,787	1,373,419	12,254	4,911	17,165
2016	61,101	0	5	0	0	0	5,051	5,051	0,000	0,083	0,083
2017	89,725	0	8	0	416,411	0	193,881	610,293	4,641	2,161	6,802
2018	66,499	2	8	885,024	168,094	493,691	61,311	1,608,121	15,837	8,346	24,183
MA Total:	402,987	8	38	1,869,762	1,674,879	886,880	623,291	5,054,812	8,796	3,747	12,543

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.623	3.352	.
(14) Massachusetts Credibility:	0.430	0.520	.
(15) Countrywide Pure Premium:	6.264	3.021	9.285
(16) Countrywide Indicated Relativity:	2.620	2.776	.
(17) Countrywide Credibility:	0.290	0.240	.
(18) Countrywide Lost-Time Claims:	94.000	.	.
(19) Pure Premium Underlying Present Rate:	8.273	3.087	11.360
(20) Relativity to Underlying Present Rate:	3.779	3.171	.
(21) Credibility to Underlying Relativity:	0.280	0.240	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	3.376	3.170	.
(24) Balanced Formula Relativity:	3.408	3.169	3.333

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Construction			
5040 IRON OR STEEL: ERECTION: ERECTION-FRAME STRUCTURES												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2014	282,222	7	63	2,017,489	1,434,341	587,092	733,351	4,772,273	12,231	4,679	16,910	
2015	255,712	3	60	1,037,878	2,691,432	888,308	852,079	5,469,697	14,584	6,806	21,390	
2016	243,004	1	46	432,771	2,735,595	77,930	991,120	4,237,416	13,038	4,399	17,438	
2017	302,183	6	56	1,643,333	2,502,468	432,246	885,029	5,463,076	13,720	4,359	18,079	
2018	259,680	3	34	675,453	1,264,579	441,891	492,093	2,874,016	7,471	3,597	11,068	
MA Total:	1,342,800	20	259	5,806,925	10,628,415	2,427,466	3,953,672	22,816,478	12,240	4,752	16,992	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	5.041	4.250	.
(14) Massachusetts Credibility:	0.770	0.930	.
(15) Countrywide Pure Premium:	3.368	1.344	4.712
(16) Countrywide Indicated Relativity:	1.409	1.235	.
(17) Countrywide Credibility:	0.120	0.040	.
(18) Countrywide Lost-Time Claims:	913.00	.	.
(19) Pure Premium Underlying Present Rate:	10.779	3.933	14.712
(20) Relativity to Underlying Present Rate:	4.924	4.040	.
(21) Credibility to Underlying Relativity:	0.110	0.030	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	4.592	4.123	.
(24) Balanced Formula Relativity:	4.636	4.122	4.474

Class(es):		Effective: 7/1/2022							Construction			
5057 IRON OR STEEL: ERECTION-NOC												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2014	11,700	0	8	0	202,367	0	86,872	289,239	17,296	7,425	24,721	
2015	20,352	0	2	0	396,655	0	159,085	555,740	19,489	7,817	27,306	
2016	21,372	1	7	181,970	357,443	607,230	76,310	1,222,953	25,239	31,983	57,223	
2017	32,070	0	8	0	101,395	0	58,305	159,699	3,162	1,818	4,980	
2018	23,087	0	5	0	89,469	0	23,541	113,010	3,875	1,020	4,895	
MA Total:	108,581	1	30	181,970	1,147,329	607,230	404,113	2,340,642	12,242	9,314	21,557	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	5.042	8.330	.
(14) Massachusetts Credibility:	0.260	0.410	.
(15) Countrywide Pure Premium:	2.349	0.896	3.245
(16) Countrywide Indicated Relativity:	0.982	0.823	.
(17) Countrywide Credibility:	0.370	0.300	.
(18) Countrywide Lost-Time Claims:	886.00	.	.
(19) Pure Premium Underlying Present Rate:	9.141	6.344	15.485
(20) Relativity to Underlying Present Rate:	4.176	6.517	.
(21) Credibility to Underlying Relativity:	0.370	0.290	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	3.219	5.552	.
(24) Balanced Formula Relativity:	3.250	5.551	3.976

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Construction		
5059 IRON OR STEEL: ERECTION: FRAME STRUCT NOT OVER 2 STRS IN HGT											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	67,619	1	15	502,907	106,952	161,619	73,392	844,869	9,019	3,476	12,495
2015	102,691	5	12	1,571,641	1,276,567	518,441	642,071	4,008,721	27,736	11,301	39,037
2016	126,683	1	16	512,963	1,318,930	236,745	581,310	2,649,948	14,460	6,457	20,918
2017	135,109	2	17	513,903	1,038,445	634,516	376,855	2,563,719	11,490	7,486	18,975
2018	151,869	6	24	1,936,169	984,784	507,218	1,742,663	5,170,834	19,233	14,815	34,048
MA Total:	583,971	15	84	5,037,583	4,725,677	2,058,540	3,416,291	15,238,091	16,719	9,375	26,094

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	6.886	8.385	.
(14) Massachusetts Credibility:	0.560	0.760	.
(15) Countrywide Pure Premium:	8.741	4.149	12.890
(16) Countrywide Indicated Relativity:	3.656	3.812	.
(17) Countrywide Credibility:	0.220	0.120	.
(18) Countrywide Lost-Time Claims:	407.00	.	.
(19) Pure Premium Underlying Present Rate:	11.045	5.500	16.546
(20) Relativity to Underlying Present Rate:	5.046	5.650	.
(21) Credibility to Underlying Relativity:	0.220	0.120	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	5.770	7.508	.
(24) Balanced Formula Relativity:	5.826	7.506	6.355

Class(es):		Effective: 7/1/2022							Construction		
5102 DOOR, DOOR FRAME OR SASH ERECTION - METAL OR METAL COVERED											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	688,510	8	68	1,521,165	1,542,089	340,564	591,150	3,994,967	4,449	1,353	5,802
2015	767,734	7	95	848,575	2,584,449	169,587	678,529	4,281,141	4,472	1,105	5,576
2016	787,109	4	65	893,113	1,401,548	221,726	633,426	3,149,814	2,915	1,086	4,002
2017	830,919	7	79	1,363,069	2,584,520	410,584	1,099,149	5,457,321	4,751	1,817	6,568
2018	891,637	2	88	27,430	1,238,594	16,216	775,997	2,058,237	1,420	0,888	2,308
MA Total:	3,965,909	28	395	4,653,353	9,351,199	1,158,678	3,778,250	18,941,480	3,531	1,245	4,776

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.454	1.113	.
(14) Massachusetts Credibility:	0.750	0.870	.
(15) Countrywide Pure Premium:	2.960	1.263	4.222
(16) Countrywide Indicated Relativity:	1.238	1.160	.
(17) Countrywide Credibility:	0.130	0.070	.
(18) Countrywide Lost-Time Claims:	2034.0	.	.
(19) Pure Premium Underlying Present Rate:	3.410	1.126	4.536
(20) Relativity to Underlying Present Rate:	1.557	1.157	.
(21) Credibility to Underlying Relativity:	0.120	0.060	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	1.439	1.119	.
(24) Balanced Formula Relativity:	1.452	1.119	1.347

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Construction		
5146 FURNITURE OR FIXTURES INSTALLATION - PORTABLE - NOC											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	611.666	6	110	1,353,229	1,555,361	257,673	591,914	3,758,177	4,755	1,389	6,144
2015	692,972	3	83	536,017	1,668,693	93,464	943,298	3,241,472	3,182	1,496	4,678
2016	681,527	4	103	341,558	2,079,331	63,925	747,503	3,232,316	3,552	1,191	4,743
2017	697,578	9	89	2,044,387	1,599,533	1,047,391	832,203	5,523,514	5,224	2,694	7,918
2018	651,501	2	74	645,008	816,907	152,070	377,639	1,991,623	2,244	0,813	3,057
MA Total:	3,335,243	24	459	4,920,199	7,719,825	1,614,523	3,492,556	17,747,102	3,790	1,531	5,321

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.561	1.369	.
(14) Massachusetts Credibility:	0.690	0.900	.
(15) Countrywide Pure Premium:	2.477	1.032	3.509
(16) Countrywide Indicated Relativity:	1.036	0.948	.
(17) Countrywide Credibility:	0.160	0.050	.
(18) Countrywide Lost-Time Claims:	1797.0	.	.
(19) Pure Premium Underlying Present Rate:	3.343	1.468	4.811
(20) Relativity to Underlying Present Rate:	1.527	1.508	.
(21) Credibility to Underlying Relativity:	0.150	0.050	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	1.472	1.355	.
(24) Balanced Formula Relativity:	1.486	1.355	1.445

Class(es):		Effective: 7/1/2022							Construction		
5160 ELEVATOR ERECTION OR REPAIR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	859,239	4	34	886,845	631,100	445,611	290,277	2,253,833	1,767	0,856	2,623
2015	901,781	5	48	621,669	812,170	199,957	428,637	2,062,433	1,590	0,697	2,287
2016	991,153	2	51	62,851	286,144	71,096	280,795	700,885	0,352	0,355	0,707
2017	1,071,737	6	48	1,923,599	1,143,534	529,673	466,742	4,063,548	2,862	0,930	3,792
2018	1,159,864	3	44	1,519,260	1,090,988	354,108	520,840	3,485,196	2,250	0,754	3,005
MA Total:	4,983,774	20	225	5,014,223	3,963,937	1,600,446	1,987,291	12,565,896	1,801	0,720	2,521

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.742	0.644	.
(14) Massachusetts Credibility:	0.540	0.690	.
(15) Countrywide Pure Premium:	1.180	0.418	1.598
(16) Countrywide Indicated Relativity:	0.494	0.384	.
(17) Countrywide Credibility:	0.230	0.160	.
(18) Countrywide Lost-Time Claims:	495.00	.	.
(19) Pure Premium Underlying Present Rate:	1.180	0.504	1.684
(20) Relativity to Underlying Present Rate:	0.539	0.517	.
(21) Credibility to Underlying Relativity:	0.230	0.150	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	0.638	0.583	.
(24) Balanced Formula Relativity:	0.644	0.583	0.625

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Construction		
5183 PLUMBING NOC & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	6,792,025	27	607	4,899,901	5,247,302	1,170,970	2,512,126	13,830,299	1,494	0,542	2,036
2015	7,447,701	30	627	4,972,183	7,902,086	1,883,819	3,375,191	18,133,278	1,729	0,706	2,435
2016	8,047,797	35	631	6,342,293	9,652,740	2,156,626	4,489,066	22,640,725	1,988	0,826	2,813
2017	8,707,603	26	699	4,062,135	9,590,487	1,820,257	4,647,544	20,120,424	1,568	0,743	2,311
2018	9,220,318	30	634	4,637,372	9,211,001	1,690,710	4,583,218	20,122,301	1,502	0,680	2,182
MA Total:	40,215,445	148	3,198	24,913,884	41,603,617	8,722,381	19,607,145	94,847,027	1,654	0,704	2,358

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.681	0.630	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	1.547	0.616	2.164
(16) Countrywide Indicated Relativity:	0.647	0.566	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	10872	.	.
(19) Pure Premium Underlying Present Rate:	1.462	0.625	2.087
(20) Relativity to Underlying Present Rate:	0.668	0.642	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	0.681	0.630	.
(24) Balanced Formula Relativity:	0.688	0.630	0.669

Class(es):		Effective: 7/1/2022							Construction		
5188 AUTOMATIC SPRINKLER INSTALLATION & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	877,910	8	66	2,051,156	1,117,928	648,712	465,833	4,283,630	3,610	1,270	4,879
2015	932,903	6	70	1,085,539	1,798,728	333,612	423,392	3,641,271	3,092	0,811	3,903
2016	959,116	2	84	525,664	969,996	523,907	408,632	2,428,200	1,559	0,972	2,532
2017	987,922	2	67	349,927	1,439,071	171,268	322,599	2,282,865	1,811	0,500	2,311
2018	1,053,476	3	76	201,423	1,338,864	160,222	517,540	2,218,048	1,462	0,643	2,105
MA Total:	4,811,327	21	363	4,213,709	6,664,588	1,837,721	2,137,994	14,854,013	2,261	0,826	3,087

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.931	0.739	.
(14) Massachusetts Credibility:	0.660	0.760	.
(15) Countrywide Pure Premium:	1.471	0.635	2.106
(16) Countrywide Indicated Relativity:	0.615	0.584	.
(17) Countrywide Credibility:	0.170	0.120	.
(18) Countrywide Lost-Time Claims:	1038.0	.	.
(19) Pure Premium Underlying Present Rate:	2.047	0.661	2.708
(20) Relativity to Underlying Present Rate:	0.935	0.679	.
(21) Credibility to Underlying Relativity:	0.170	0.120	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	0.878	0.713	.
(24) Balanced Formula Relativity:	0.887	0.713	0.832

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Construction		
5190 ELECTRICAL WIRING - WITHIN BUILDINGS & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	8,121,662	23	637	3,588,658	5,733,779	1,999,085	3,163,297	14,484,820	1,148	0,636	1,783
2015	8,551,833	20	625	4,098,956	5,150,052	963,440	3,392,337	13,604,786	1,082	0,509	1,591
2016	9,200,049	30	599	5,873,886	5,775,749	2,153,692	3,501,687	17,305,014	1,266	0,615	1,881
2017	10,010,570	24	662	3,694,593	9,454,492	1,515,674	4,204,760	18,869,520	1,314	0,571	1,885
2018	10,927,421	24	691	5,637,761	6,794,902	3,248,852	4,388,496	20,070,010	1,138	0,699	1,837
MA Total:	46,811,536	121	3,214	22,893,854	32,908,974	9,880,744	18,650,576	84,334,149	1,192	0,609	1,802

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.491	0.545	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	1.369	0.616	1.985
(16) Countrywide Indicated Relativity:	0.573	0.566	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	11128	.	.
(19) Pure Premium Underlying Present Rate:	1.018	0.499	1.517
(20) Relativity to Underlying Present Rate:	0.465	0.513	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	0.491	0.545	.
(24) Balanced Formula Relativity:	0.496	0.545	0.511

Class(es):		Effective: 7/1/2022							Goods and Services		
5191 OFFICE MACHICE OR APPLIANCE INSTALL, INSP, ADJSTMT OR REPAIR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	4,630,329	7	158	986,234	853,646	407,445	532,752	2,780,076	0,397	0,203	0,600
2015	4,422,734	5	175	872,079	1,790,391	242,649	799,013	3,704,131	0,602	0,236	0,838
2016	4,414,102	5	120	346,727	1,075,733	118,011	1,099,468	2,639,939	0,322	0,276	0,598
2017	4,613,313	4	123	442,531	654,453	109,041	545,164	1,751,189	0,238	0,142	0,380
2018	4,840,562	2	131	96,364	958,044	36,211	861,971	1,952,590	0,218	0,186	0,403
MA Total:	22,921,040	23	707	2,743,935	5,332,266	913,357	3,838,368	12,827,926	0,352	0,207	0,560

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.461	0.487	.
(14) Massachusetts Credibility:	0.610	0.840	.
(15) Countrywide Pure Premium:	0.431	0.190	0.621
(16) Countrywide Indicated Relativity:	0.574	0.448	.
(17) Countrywide Credibility:	0.200	0.080	.
(18) Countrywide Lost-Time Claims:	3366.0	.	.
(19) Pure Premium Underlying Present Rate:	0.357	0.178	0.535
(20) Relativity to Underlying Present Rate:	0.516	0.466	.
(21) Credibility to Underlying Relativity:	0.190	0.080	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	0.494	0.483	.
(24) Balanced Formula Relativity:	0.491	0.483	0.488

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services		
5192 VENDING OR COIN OPERTD MACHINES-INSTALL, SRVC OR RPR &SALES, DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	376.378	5	49	820.255	438.656	248.341	230.459	1.737.712	3.345	1.272	4.617
2015	391.274	1	42	20.410	178.956	10.972	251.124	461.461	0.510	0.670	1.179
2016	383.815	2	33	33.115	78.446	52.762	48.189	212.513	0.291	0.263	0.554
2017	455.133	3	43	27.548	892.603	37.160	306.515	1.263.827	2.022	0.755	2.777
2018	402.028	6	50	221.324	327.404	79.925	339.490	968.143	1.365	1.043	2.408
MA Total:	2,008,628	17	217	1,122,652	1,916,066	429,161	1,175,778	4,643,657	1.513	0.799	2.312

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.978	1.879	.
(14) Massachusetts Credibility:	0.370	0.520	.
(15) Countrywide Pure Premium:	1.242	0.613	1.855
(16) Countrywide Indicated Relativity:	1.652	1.450	.
(17) Countrywide Credibility:	0.320	0.240	.
(18) Countrywide Lost-Time Claims:	1659.0	.	.
(19) Pure Premium Underlying Present Rate:	1.170	0.613	1.782
(20) Relativity to Underlying Present Rate:	1.689	1.604	.
(21) Credibility to Underlying Relativity:	0.310	0.240	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	1.784	1.710	.
(24) Balanced Formula Relativity:	1.773	1.711	1.751

Class(es):		Effective: 7/1/2022							Construction		
5213 CONCRETE CONSTRUCTION-NOC											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	557.158	9	135	3.353.378	2.795.338	1.217.361	965.531	8.331.609	11.036	3.918	14.954
2015	611.599	8	101	1.235.766	2.403.215	569.804	1.051.024	5.259.810	5.950	2.650	8.600
2016	749.509	7	108	953.234	2.620.129	279.352	1.038.438	4.891.153	4.768	1.758	6.526
2017	951.809	6	121	2.351.849	3.258.041	970.619	1.175.466	7.755.976	5.894	2.255	8.149
2018	786.359	4	113	614.367	3.352.669	167.061	1.780.754	5.914.850	5.045	2.477	7.522
MA Total:	3,656,433	34	578	8,508,595	14,429,392	3,204,197	6,011,213	32,153,398	6.273	2.520	8.794

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.584	2.254	.
(14) Massachusetts Credibility:	0.870	1.000	.
(15) Countrywide Pure Premium:	2.865	1.264	4.129
(16) Countrywide Indicated Relativity:	1.198	1.162	.
(17) Countrywide Credibility:	0.070	0.000	.
(18) Countrywide Lost-Time Claims:	5096.0	.	.
(19) Pure Premium Underlying Present Rate:	5.494	2.225	7.718
(20) Relativity to Underlying Present Rate:	2.509	2.285	.
(21) Credibility to Underlying Relativity:	0.060	0.000	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	2.482	2.254	.
(24) Balanced Formula Relativity:	2.506	2.253	2.426

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Construction		
5215 CONCRETE WORK - INCIDENTAL TO CONSTRUCTION OF PRIVATE RES											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	265,067	1	26	95,183	184,934	13,005	105,077	398,198	1,057	0,445	1,502
2015	315,915	0	21	0	224,981	0	63,141	288,122	0,712	0,200	0,912
2016	339,385	1	21	339,232	565,623	152,872	248,038	1,305,765	2,666	1,181	3,847
2017	363,706	3	23	194,095	451,954	31,710	247,507	925,266	1,776	0,768	2,544
2018	364,972	1	35	164,638	533,974	25,119	595,964	1,319,695	1,914	1,702	3,616
MA Total:	1,649,045	6	126	793,148	1,961,466	222,705	1,259,727	4,237,046	1,670	0,899	2,569

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.688	0.804	.
(14) Massachusetts Credibility:	0.430	0.530	.
(15) Countrywide Pure Premium:	2.870	1.269	4.139
(16) Countrywide Indicated Relativity:	1.200	1.166	.
(17) Countrywide Credibility:	0.290	0.240	.
(18) Countrywide Lost-Time Claims:	1607.0	.	.
(19) Pure Premium Underlying Present Rate:	2.003	0.780	2.784
(20) Relativity to Underlying Present Rate:	0.915	0.802	.
(21) Credibility to Underlying Relativity:	0.280	0.230	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	0.900	0.890	.
(24) Balanced Formula Relativity:	0.909	0.890	0.903

Class(es):		Effective: 7/1/2022							Construction		
5221 CONCRETE OR CEMENT WORK-FLOORS DRIVEWAYS YRDS OR SIDEWALKS &DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	1,524,186	19	164	4,139,796	3,945,139	1,061,297	1,261,149	10,407,381	5,304	1,524	6,828
2015	1,826,243	10	151	2,555,751	2,044,399	1,032,809	972,896	6,605,855	2,519	1,098	3,617
2016	1,845,388	18	186	3,487,246	3,949,602	972,703	1,746,362	10,155,913	4,030	1,473	5,503
2017	2,094,173	22	153	5,355,775	2,426,844	2,009,437	1,254,321	11,046,376	3,716	1,558	5,275
2018	2,360,563	8	202	720,755	5,625,893	385,958	3,047,565	9,780,171	2,689	1,455	4,143
MA Total:	9,650,554	77	856	16,259,322	17,991,878	5,462,203	8,282,293	47,995,696	3,549	1,424	4,973

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.462	1.274	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	2.427	1.011	3.439
(16) Countrywide Indicated Relativity:	1.015	0.929	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	8330.0	.	.
(19) Pure Premium Underlying Present Rate:	3.326	1.209	4.535
(20) Relativity to Underlying Present Rate:	1.519	1.242	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	1.462	1.274	.
(24) Balanced Formula Relativity:	1.476	1.273	1.412

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Construction		
5222 CONCRETE CONSTRUCTION IN CONNECTION WITH BRIDGES OR CULVERTS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	257,758	2	29	266,119	847,560	82,019	176,729	1,372,427	4,321	1,004	5,324
2015	325,326	3	52	1,096,417	597,922	126,300	217,774	2,038,413	5,208	1,058	6,266
2016	271,967	2	30	482,501	1,192,187	418,191	272,064	2,364,942	6,158	2,538	8,696
2017	260,958	1	23	35,196	2,564,315	9,230	505,120	3,113,861	9,961	1,971	11,932
2018	176,174	1	12	157,410	102,783	34,864	48,692	343,750	1,477	0,474	1,951
MA Total:	1,292,183	9	146	2,037,643	5,304,767	670,603	1,220,380	9,233,393	5,682	1,463	7,146

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.340	1.309	.
(14) Massachusetts Credibility:	0.560	0.650	.
(15) Countrywide Pure Premium:	3.944	1.614	5.558
(16) Countrywide Indicated Relativity:	1.650	1.483	.
(17) Countrywide Credibility:	0.220	0.180	.
(18) Countrywide Lost-Time Claims:	1072.0	.	.
(19) Pure Premium Underlying Present Rate:	5.132	1.699	6.831
(20) Relativity to Underlying Present Rate:	2.344	1.746	.
(21) Credibility to Underlying Relativity:	0.220	0.170	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	2.189	1.414	.
(24) Balanced Formula Relativity:	2.210	1.414	1.959

Class(es):		Effective: 7/1/2022							Construction		
5223 SWIMMING POOL CONSTRUCTN-NOT IRON OR STEEL &DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	199,032	2	21	346,973	178,625	62,989	95,303	683,891	2,641	0,795	3,436
2015	218,059	1	41	259,724	127,668	26,428	204,132	617,951	1,777	1,057	2,834
2016	235,970	2	19	242,221	230,040	45,214	109,263	626,738	2,001	0,655	2,656
2017	238,937	1	22	71,465	124,912	40,763	89,066	326,205	0,822	0,543	1,365
2018	273,294	1	26	146,371	599,568	16,529	237,983	1,000,450	2,729	0,931	3,661
MA Total:	1,165,291	7	129	1,066,753	1,260,813	191,923	735,747	3,255,235	1,997	0,796	2,793

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.823	0.712	.
(14) Massachusetts Credibility:	0.360	0.470	.
(15) Countrywide Pure Premium:	2.383	1.069	3.452
(16) Countrywide Indicated Relativity:	0.997	0.982	.
(17) Countrywide Credibility:	0.320	0.270	.
(18) Countrywide Lost-Time Claims:	727.00	.	.
(19) Pure Premium Underlying Present Rate:	1.870	0.835	2.705
(20) Relativity to Underlying Present Rate:	0.854	0.857	.
(21) Credibility to Underlying Relativity:	0.320	0.260	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	0.889	0.823	.
(24) Balanced Formula Relativity:	0.897	0.823	0.874

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Construction		
5348 STONE, MOSAIC, TERRAZZO OR CERAMIC TILE WORK - INSIDE											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	722,384	7	65	1,029,235	831,613	339,193	260,882	2,460,923	2,576	0,831	3,407
2015	743,716	7	66	954,699	1,049,352	198,746	369,301	2,572,097	2,695	0,764	3,458
2016	810,337	8	59	490,459	1,187,930	91,259	417,425	2,187,072	2,071	0,628	2,699
2017	938,536	8	49	1,472,340	1,081,890	296,187	668,322	3,518,738	2,722	1,028	3,749
2018	1,199,844	6	76	1,748,727	3,113,813	443,750	1,051,102	6,357,393	4,053	1,246	5,299
MA Total:	4,414,817	36	315	5,695,459	7,264,599	1,369,135	2,767,031	17,096,223	2,936	0,937	3,872

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.209	0.838	.
(14) Massachusetts Credibility:	0.650	0.760	.
(15) Countrywide Pure Premium:	2.255	0.893	3.148
(16) Countrywide Indicated Relativity:	0.943	0.820	.
(17) Countrywide Credibility:	0.180	0.120	.
(18) Countrywide Lost-Time Claims:	1968.0	.	.
(19) Pure Premium Underlying Present Rate:	2.127	0.730	2.857
(20) Relativity to Underlying Present Rate:	0.971	0.750	.
(21) Credibility to Underlying Relativity:	0.170	0.120	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	1.121	0.825	.
(24) Balanced Formula Relativity:	1.132	0.825	1.035

Class(es):		Effective: 7/1/2022							Construction		
5402 HOTHOUSE ERECTION - ALL OPERATIONS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	2,571	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	4,016	0	2	0	0	0	3,531	3,531	0.000	0.879	0.879
2016	4,179	0	1	0	0	0	1,670	1,670	0.000	0.400	0.400
2017	6,876	0	1	0	9,075	0	8,204	17,279	1,320	1,193	2,513
2018	6,068	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	23,709	0	4	0	9,075	0	13,404	22,479	0,383	0,565	0,948

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.158	0.506	.
(14) Massachusetts Credibility:	0.090	0.120	.
(15) Countrywide Pure Premium:	5.718	1.913	7.631
(16) Countrywide Indicated Relativity:	2.392	1.757	.
(17) Countrywide Credibility:	0.230	0.240	.
(18) Countrywide Lost-Time Claims:	28.000	.	.
(19) Pure Premium Underlying Present Rate:	2.819	1.239	4.058
(20) Relativity to Underlying Present Rate:	1.288	1.273	.
(21) Credibility to Underlying Relativity:	0.680	0.640	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	1.440	1.297	.
(24) Balanced Formula Relativity:	1.454	1.297	1.404

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Construction		
5403 CARPENTRY NOC											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	1,563,166	21	221	2,063,676	4,101,496	649,925	1,741,792	8,556,889	3,944	1,530	5,474
2015	1,766,647	17	228	3,653,377	3,937,819	855,787	1,943,691	10,390,674	4,297	1,585	5,882
2016	2,018,759	25	257	6,845,641	8,026,564	2,931,676	3,143,910	20,947,790	7,367	3,010	10,377
2017	2,236,847	17	285	4,257,070	6,344,830	1,923,511	3,354,869	15,880,279	4,740	2,360	7,099
2018	2,362,336	17	281	3,384,956	5,284,000	663,352	2,320,482	11,652,790	3,670	1,263	4,933
MA Total:	9,947,754	97	1,272	20,204,721	27,694,709	7,024,251	12,504,744	67,428,424	4,815	1,963	6,778

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.983	1.756	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	2.908	1.409	4.318
(16) Countrywide Indicated Relativity:	1.216	1.295	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	7236.0	.	.
(19) Pure Premium Underlying Present Rate:	4.066	1.689	5.755
(20) Relativity to Underlying Present Rate:	1.857	1.735	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	1.983	1.756	.
(24) Balanced Formula Relativity:	2.002	1.755	1.924

Class(es):		Effective: 7/1/2022							Construction		
5437 CARPENTRY-INSTALL OF CABINET WORK OR INT TRIM											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	2,591,020	16	247	2,526,387	4,221,196	755,261	1,700,678	9,203,523	2,604	0,948	3,552
2015	2,828,533	10	233	1,432,334	4,290,246	466,471	2,141,578	8,330,628	2,023	0,922	2,945
2016	2,951,470	7	228	1,804,107	3,206,467	752,138	1,874,851	7,637,563	1,698	0,890	2,588
2017	3,171,563	17	277	3,101,101	4,522,786	824,068	2,251,533	10,699,489	2,404	0,970	3,374
2018	3,349,407	8	217	1,132,255	2,574,798	295,668	1,478,311	5,481,032	1,107	0,530	1,636
MA Total:	14,891,993	58	1,202	9,996,185	18,815,493	3,093,606	9,446,951	41,352,235	1,935	0,842	2,777

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.797	0.753	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	3.003	1.312	4.316
(16) Countrywide Indicated Relativity:	1.256	1.206	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	4979.0	.	.
(19) Pure Premium Underlying Present Rate:	2.004	0.842	2.847
(20) Relativity to Underlying Present Rate:	0.916	0.865	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	0.797	0.753	.
(24) Balanced Formula Relativity:	0.804	0.753	0.788

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Construction		
5443 LATHING & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	977	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	431	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	133	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	671	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	567	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	2,779	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.030	0.040	.
(15) Countrywide Pure Premium:	1.978	0.817	2.795
(16) Countrywide Indicated Relativity:	0.827	0.751	.
(17) Countrywide Credibility:	0.420	0.440	.
(18) Countrywide Lost-Time Claims:	132.00	.	.
(19) Pure Premium Underlying Present Rate:	1.703	0.732	2.435
(20) Relativity to Underlying Present Rate:	0.778	0.752	.
(21) Credibility to Underlying Relativity:	0.550	0.520	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	0.775	0.721	.
(24) Balanced Formula Relativity:	0.783	0.721	0.763

Class(es):		Effective: 7/1/2022							Construction		
5445 WALLBOARD INSTALLATION WITHIN BUILDINGS & DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	2,480,893	14	231	2,763,739	5,621,162	900,639	2,262,732	11,548,271	3,380	1,275	4,655
2015	2,270,227	15	156	4,018,292	5,184,934	1,313,598	2,102,616	12,619,440	4,054	1,505	5,559
2016	2,105,057	9	159	2,592,789	4,299,824	1,012,595	1,741,535	9,646,743	3,274	1,308	4,583
2017	2,808,670	15	175	3,478,489	6,896,929	905,044	2,679,034	13,959,496	3,694	1,276	4,970
2018	3,112,195	4	194	1,595,485	8,699,876	758,910	2,667,571	13,721,841	3,308	1,101	4,409
MA Total:	12,777,043	57	915	14,448,793	30,702,725	4,890,786	11,453,487	61,495,792	3,534	1,279	4,813

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.455	1.144	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	2.882	1.175	4.058
(16) Countrywide Indicated Relativity:	1.206	1.080	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	4546.0	.	.
(19) Pure Premium Underlying Present Rate:	3.088	1.065	4.152
(20) Relativity to Underlying Present Rate:	1.410	1.094	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	1.455	1.144	.
(24) Balanced Formula Relativity:	1.469	1.144	1.367

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Construction			
5462 GLAZIER-AWAY FROM SHOP & DRIVERS												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2014	626,525	2	79	729,398	709,553	213,084	321,493	1,973,528	2,297	0,853	3,150	
2015	647,221	5	91	1,285,412	1,430,422	357,616	516,120	3,589,571	4,196	1,350	5,546	
2016	666,300	3	77	991,986	1,076,639	130,986	439,154	2,638,765	3,105	0,856	3,960	
2017	726,425	5	88	950,164	1,274,407	311,246	839,450	3,375,267	3,062	1,584	4,646	
2018	845,400	1	82	556,906	1,684,822	101,324	517,164	2,860,216	2,652	0,732	3,383	
MA Total:	3,511,872	16	417	4,513,866	6,175,844	1,114,257	2,633,381	14,437,347	3,044	1,067	4,111	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.254	0.954	.
(14) Massachusetts Credibility:	0.660	0.800	.
(15) Countrywide Pure Premium:	3.089	1.346	4.435
(16) Countrywide Indicated Relativity:	1.292	1.237	.
(17) Countrywide Credibility:	0.170	0.100	.
(18) Countrywide Lost-Time Claims:	1593.0	.	.
(19) Pure Premium Underlying Present Rate:	2.786	1.057	3.843
(20) Relativity to Underlying Present Rate:	1.273	1.086	.
(21) Credibility to Underlying Relativity:	0.170	0.100	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	1.263	0.996	.
(24) Balanced Formula Relativity:	1.275	0.996	1.187

Class(es):		Effective: 7/1/2022							Construction			
5472 ASBESTOS REMOVAL OP: ASBESTOS CONTR-PIPE&BOILER WORK EXCL &DR												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2014	144,765	2	10	142,675	119,788	66,608	46,613	375,683	1,813	0,782	2,595	
2015	158,535	2	15	489,319	581,624	119,705	120,159	1,310,808	6,755	1,513	8,268	
2016	130,859	3	5	354,426	759,568	247,908	103,654	1,465,556	8,513	2,687	11,199	
2017	135,187	0	6	0	375,693	0	158,793	534,486	2,779	1,175	3,954	
2018	116,980	1	3	742,573	58,218	264,267	38,190	1,103,247	6,846	2,586	9,431	
MA Total:	686,326	8	39	1,728,993	1,894,891	698,488	467,409	4,789,780	5,280	1,699	6,979	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.175	1.519	.
(14) Massachusetts Credibility:	0.400	0.480	.
(15) Countrywide Pure Premium:	2.666	1.080	3.746
(16) Countrywide Indicated Relativity:	1.115	0.992	.
(17) Countrywide Credibility:	0.300	0.260	.
(18) Countrywide Lost-Time Claims:	104.00	.	.
(19) Pure Premium Underlying Present Rate:	4.084	1.477	5.561
(20) Relativity to Underlying Present Rate:	1.866	1.517	.
(21) Credibility to Underlying Relativity:	0.300	0.260	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	1.764	1.382	.
(24) Balanced Formula Relativity:	1.781	1.381	1.655

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Construction		
5473 ASBESTOS REMOVAL OP: ASBESTOS CONTRCTR-NOC &DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	307,431	4	21	478,495	491,648	153,354	183,784	1,307,281	3,156	1,097	4,252
2015	330,037	10	30	1,767,723	1,088,451	1,218,215	336,818	4,411,207	8,654	4,712	13,366
2016	371,681	1	19	471,400	622,239	74,372	363,533	1,531,544	2,942	1,178	4,121
2017	414,488	4	42	731,068	1,215,910	259,627	520,658	2,727,262	4,697	1,883	6,580
2018	365,344	2	23	229,504	1,135,681	49,926	589,516	2,004,627	3,737	1,750	5,487
MA Total:	1,788,981	21	135	3,678,189	4,553,929	1,755,493	1,994,309	11,981,921	4,602	2,096	6,698

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.895	1.875	.
(14) Massachusetts Credibility:	0.620	0.820	.
(15) Countrywide Pure Premium:	4.177	2.057	6.234
(16) Countrywide Indicated Relativity:	1.747	1.890	.
(17) Countrywide Credibility:	0.190	0.090	.
(18) Countrywide Lost-Time Claims:	467.00	.	.
(19) Pure Premium Underlying Present Rate:	4.695	2.193	6.889
(20) Relativity to Underlying Present Rate:	2.145	2.253	.
(21) Credibility to Underlying Relativity:	0.190	0.090	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	1.915	1.910	.
(24) Balanced Formula Relativity:	1.933	1.910	1.925

Class(es):		Effective: 7/1/2022							Construction		
5474 PAINTING OR PAPERHANGING NOC & SHOP OPERS, DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	3,220,069	18	163	2,029,085	4,397,155	929,488	2,171,958	9,527,686	1,996	0,963	2,959
2015	3,778,719	21	187	3,213,044	4,704,882	977,838	2,781,142	11,676,906	2,095	0,995	3,090
2016	3,779,556	22	146	3,552,026	3,723,006	1,695,617	1,601,649	10,572,299	1,925	0,872	2,797
2017	4,087,094	19	202	4,021,669	6,609,042	977,704	2,802,351	14,410,766	2,601	0,925	3,526
2018	4,394,158	21	176	3,404,535	4,841,601	1,581,248	2,964,941	12,792,325	1,877	1,035	2,911
MA Total:	19,259,596	101	874	16,220,360	24,275,686	6,161,895	12,322,041	58,979,982	2,103	0,960	3,062

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.866	0.858	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	2.776	1.272	4.048
(16) Countrywide Indicated Relativity:	1.161	1.169	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	5755.0	.	.
(19) Pure Premium Underlying Present Rate:	1.927	0.819	2.747
(20) Relativity to Underlying Present Rate:	0.880	0.842	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	0.866	0.858	.
(24) Balanced Formula Relativity:	0.874	0.858	0.869

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Construction		
5478 CARPET, LINOLEUM, VINYL, ASPHALT OR RUBBER FLOOR TILE INSTAL											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	713.435	6	58	661.397	655.102	217.709	282.331	1,816.540	1.845	0.701	2.546
2015	816.410	3	53	310.034	1,243.394	113.148	335.090	2,001.666	1.903	0.549	2.452
2016	765.897	4	62	319.675	1,950.773	154.385	557.040	2,981.873	2.964	0.929	3.893
2017	837.586	1	46	74.302	1,409.630	40.025	638.292	2,162.249	1.772	0.810	2.582
2018	1,045.096	3	58	122.789	883.422	22.760	443.789	1,472.761	0.963	0.446	1.409
MA Total:	4,178,423	17	277	1,488,198	6,142,321	548,027	2,256,543	10,435,090	1.826	0.671	2.497

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.752	0.600	.
(14) Massachusetts Credibility:	0.620	0.710	.
(15) Countrywide Pure Premium:	1.984	0.708	2.692
(16) Countrywide Indicated Relativity:	0.830	0.651	.
(17) Countrywide Credibility:	0.190	0.150	.
(18) Countrywide Lost-Time Claims:	1177.0	.	.
(19) Pure Premium Underlying Present Rate:	2.033	0.657	2.690
(20) Relativity to Underlying Present Rate:	0.929	0.675	.
(21) Credibility to Underlying Relativity:	0.190	0.140	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	0.800	0.618	.
(24) Balanced Formula Relativity:	0.808	0.618	0.748

Class(es):		Effective: 7/1/2022							Construction		
5479 INSULATION WORK NOC & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	489.797	8	101	1,288.335	448.900	313.030	270.710	2,320.975	3.547	1.192	4.739
2015	552.591	1	89	111.234	767.955	37.450	415.345	1,331.984	1.591	0.819	2.410
2016	535.612	2	66	199.575	1,453.561	79.602	412.227	2,144.967	3.086	0.918	4.005
2017	593.183	0	86	0	1,283.785	0	537.210	1,820.995	2.164	0.906	3.070
2018	704.445	9	93	977.778	1,254.691	999.748	804.701	4,036.918	3.169	2.562	5.731
MA Total:	2,875,629	20	435	2,576,923	5,208,892	1,429,830	2,440,193	11,655,838	2.708	1.346	4.053

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.115	1.204	.
(14) Massachusetts Credibility:	0.590	0.720	.
(15) Countrywide Pure Premium:	2.908	1.408	4.316
(16) Countrywide Indicated Relativity:	1.216	1.294	.
(17) Countrywide Credibility:	0.210	0.140	.
(18) Countrywide Lost-Time Claims:	1658.0	.	.
(19) Pure Premium Underlying Present Rate:	2.641	0.996	3.637
(20) Relativity to Underlying Present Rate:	1.206	1.023	.
(21) Credibility to Underlying Relativity:	0.200	0.140	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	1.155	1.191	.
(24) Balanced Formula Relativity:	1.166	1.191	1.174

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Construction			
5480 PLASTERING NOC & DRIVERS												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2014	422,667	3	19	285,264	99,655	61,728	56,520	503,168	0,911	0,280	1,190	
2015	475,665	1	27	311,996	1,641,191	53,156	486,252	2,492,594	4,106	1,134	5,240	
2016	549,716	1	27	232,906	1,202,800	43,207	470,483	1,949,397	2,612	0,934	3,546	
2017	554,717	2	26	87,085	763,371	189,516	425,479	1,465,452	1,533	1,109	2,642	
2018	578,392	1	24	37,404	683,131	31,198	228,969	980,703	1,246	0,450	1,696	
MA Total:	2,581,157	8	123	954,656	4,390,148	378,805	1,667,703	7,391,313	2,071	0,793	2,864	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.853	0.709	.
(14) Massachusetts Credibility:	0.550	0.670	.
(15) Countrywide Pure Premium:	3.503	1.341	4.844
(16) Countrywide Indicated Relativity:	1.465	1.232	.
(17) Countrywide Credibility:	0.230	0.170	.
(18) Countrywide Lost-Time Claims:	149.00	.	.
(19) Pure Premium Underlying Present Rate:	2.458	0.927	3.385
(20) Relativity to Underlying Present Rate:	1.123	0.952	.
(21) Credibility to Underlying Relativity:	0.220	0.160	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	1.053	0.837	.
(24) Balanced Formula Relativity:	1.063	0.837	0.992

Class(es):		Effective: 7/1/2022							Construction			
5506 STREET OR ROAD CONSTRUCTION: PAVING OR REPAVING & DRIVERS												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2014	603,616	5	47	863,882	459,564	174,993	500,600	1,999,039	2,193	1,119	3,312	
2015	648,708	2	37	662,339	628,832	152,112	253,072	1,696,355	1,990	0,625	2,615	
2016	668,156	3	32	1,038,437	1,113,696	275,486	490,915	2,918,535	3,221	1,147	4,368	
2017	682,294	7	49	1,596,397	690,170	603,196	264,103	3,153,866	3,351	1,271	4,622	
2018	694,347	5	40	2,398,297	1,661,089	1,154,409	557,369	5,771,165	5,846	2,465	8,312	
MA Total:	3,297,120	22	205	6,559,350	4,553,351	2,360,197	2,066,061	15,538,959	3,370	1,342	4,713	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.388	1.201	.
(14) Massachusetts Credibility:	0.590	0.740	.
(15) Countrywide Pure Premium:	2.854	1.349	4.202
(16) Countrywide Indicated Relativity:	1.194	1.239	.
(17) Countrywide Credibility:	0.210	0.130	.
(18) Countrywide Lost-Time Claims:	4432.0	.	.
(19) Pure Premium Underlying Present Rate:	2.303	0.904	3.208
(20) Relativity to Underlying Present Rate:	1.052	0.929	.
(21) Credibility to Underlying Relativity:	0.200	0.130	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	1.280	1.170	.
(24) Balanced Formula Relativity:	1.292	1.170	1.254

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Construction		
5507 STREET OR ROAD CONSTRUCTION: SUB-SURFACE WORK & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	238,372	0	19	0	594,059	0	98,983	693,041	2,492	0,415	2,907
2015	286,570	0	20	0	413,821	0	162,023	575,844	1,444	0,565	2,009
2016	185,186	0	14	0	1,667,739	0	496,063	2,163,802	9,006	2,679	11,684
2017	211,419	2	20	735,007	129,031	379,780	146,228	1,390,046	4,087	2,488	6,575
2018	180,905	0	17	0	206,578	0	101,727	308,305	1,142	0,562	1,704
MA Total:	1,102,453	2	90	735,007	3,011,228	379,780	1,005,023	5,131,038	3,398	1,256	4,654

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.400	1.123	.
(14) Massachusetts Credibility:	0.420	0.490	.
(15) Countrywide Pure Premium:	2.203	0.927	3.130
(16) Countrywide Indicated Relativity:	0.921	0.852	.
(17) Countrywide Credibility:	0.290	0.260	.
(18) Countrywide Lost-Time Claims:	1422.0	.	.
(19) Pure Premium Underlying Present Rate:	2.860	0.996	3.855
(20) Relativity to Underlying Present Rate:	1.306	1.023	.
(21) Credibility to Underlying Relativity:	0.290	0.250	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	1.234	1.028	.
(24) Balanced Formula Relativity:	1.246	1.027	1.177

Class(es):		Effective: 7/1/2022							Construction		
5509 STREET OR ROAD MAINTENANCE BY COUNTY OR MUNICIPAL EMP & DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	62,924	0	8	0	9,331	0	16,312	25,643	0,148	0,259	0,408
2015	62,088	1	17	8,995	252,361	16,313	151,345	429,014	4,209	2,700	6,910
2016	69,565	0	17	0	314,130	0	79,753	393,883	4,516	1,146	5,662
2017	52,477	1	6	264,606	429,554	352,837	143,108	1,190,105	13,228	9,451	22,679
2018	39,799	0	8	0	1,556	0	3,617	5,173	0,039	0,091	0,130
MA Total:	286,853	2	56	273,601	1,006,933	369,149	394,135	2,043,818	4,464	2,661	7,125

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.839	2.380	.
(14) Massachusetts Credibility:	0.220	0.300	.
(15) Countrywide Pure Premium:	2.297	1.421	3.718
(16) Countrywide Indicated Relativity:	0.961	1.306	.
(17) Countrywide Credibility:	0.390	0.350	.
(18) Countrywide Lost-Time Claims:	471.00	.	.
(19) Pure Premium Underlying Present Rate:	2.193	1.127	3.320
(20) Relativity to Underlying Present Rate:	1.002	1.157	.
(21) Credibility to Underlying Relativity:	0.390	0.350	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	1.170	1.576	.
(24) Balanced Formula Relativity:	1.181	1.576	1.305

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Construction		
5538 SHEET METAL WORK-SHOP & OUTSIDE-NOC & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	2,228,226	17	284	2,921,710	2,451,715	1,067,203	1,733,424	8,174,052	2,412	1,257	3,668
2015	2,519,534	7	284	1,904,364	2,776,707	330,723	1,586,741	6,598,535	1,858	0,761	2,619
2016	2,629,911	9	250	2,085,051	3,795,744	518,599	1,828,507	8,227,902	2,236	0,892	3,129
2017	2,810,244	13	317	2,116,361	4,578,364	1,467,289	2,166,715	10,328,728	2,382	1,293	3,675
2018	3,171,352	8	316	1,926,169	3,363,129	1,293,231	1,687,610	8,270,138	1,668	0,940	2,608
MA Total:	13,359,267	54	1,451	10,953,655	16,965,659	4,677,045	9,002,996	41,599,355	2,090	1,024	3,114

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.861	0.916	.
(14) Massachusetts Credibility:	0.980	1.000	.
(15) Countrywide Pure Premium:	3.362	1.383	4.744
(16) Countrywide Indicated Relativity:	1.406	1.271	.
(17) Countrywide Credibility:	0.010	0.000	.
(18) Countrywide Lost-Time Claims:	292.00	.	.
(19) Pure Premium Underlying Present Rate:	1.994	0.889	2.883
(20) Relativity to Underlying Present Rate:	0.911	0.913	.
(21) Credibility to Underlying Relativity:	0.010	0.000	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	0.867	0.916	.
(24) Balanced Formula Relativity:	0.875	0.916	0.888

Class(es):		Effective: 7/1/2022							Construction		
5545 ROOFING NOC & YARD EMP, DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	140,274	11	42	2,208,149	1,059,926	1,878,374	763,185	5,909,633	23,298	18,831	42,129
2015	212,936	13	31	2,135,522	1,889,422	1,255,282	972,384	6,252,610	18,902	10,462	29,364
2016	212,391	9	50	2,283,241	2,531,641	2,007,631	1,723,720	8,546,234	22,670	17,568	40,238
2017	183,929	11	35	1,700,986	1,312,159	1,358,413	740,543	5,112,101	16,382	11,412	27,794
2018	200,624	5	58	981,264	5,825,280	483,670	3,349,559	10,639,773	33,927	19,107	53,033
MA Total:	950,155	49	216	9,309,162	12,618,427	6,983,370	7,549,392	36,460,351	23,078	15,295	38,373

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	9.505	13.679	.
(14) Massachusetts Credibility:	0.790	1.000	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	7.238	10.864	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	16.588	11.267	27.855
(20) Relativity to Underlying Present Rate:	7.577	11.574	.
(21) Credibility to Underlying Relativity:	0.210	0.000	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	9.100	13.679	.
(24) Balanced Formula Relativity:	9.187	13.675	10.602

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Construction		
5547 ROOFING-BUILT UP - YARD EMP & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	613,151	13	64	2,730,872	538,621	1,726,592	439,930	5,436,015	5,332	3,533	8,866
2015	646,862	8	70	2,189,843	1,526,289	2,196,053	638,451	6,550,635	5,745	4,382	10,127
2016	662,932	9	66	1,533,727	3,000,303	762,266	1,895,387	7,191,683	6,839	4,009	10,848
2017	679,113	1	72	88,539	3,041,628	24,723	826,785	3,981,675	4,609	1,254	5,863
2018	749,605	0	76	0	3,486,687	0	1,581,340	5,068,027	4,651	2,110	6,761
MA Total:	3,351,664	31	348	6,542,981	11,593,528	4,709,634	5,381,893	28,228,035	5,411	3,011	8,422

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.229	2.693	.
(14) Massachusetts Credibility:	0.790	1.000	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	2.022	2.663	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	4.634	2.761	7.395
(20) Relativity to Underlying Present Rate:	2.117	2.837	.
(21) Credibility to Underlying Relativity:	0.210	0.000	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	2.205	2.693	.
(24) Balanced Formula Relativity:	2.226	2.692	2.373

Class(es):		Effective: 7/1/2022							Construction		
5606 CONTRACTOR-EXECUTIVE SUPERVISOR OR CONSTRUCT SUPERINTENDENT											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	6,622,213	10	181	1,961,224	1,858,351	877,936	1,133,359	5,830,870	0.577	0.304	0.881
2015	7,544,618	14	177	2,538,499	1,779,999	1,201,669	1,598,177	7,118,343	0.572	0.371	0.943
2016	8,108,505	14	131	2,461,631	2,851,700	892,152	1,547,413	7,752,896	0.655	0.301	0.956
2017	8,738,048	11	151	2,432,485	4,268,374	1,040,060	2,689,417	10,430,337	0.767	0.427	1.194
2018	8,953,921	4	190	421,207	4,434,635	192,182	2,457,895	7,505,918	0.542	0.296	0.838
MA Total:	39,967,306	53	830	9,815,046	15,193,059	4,203,999	9,426,260	38,638,365	0.626	0.341	0.967

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.258	0.305	.
(14) Massachusetts Credibility:	0.930	1.000	.
(15) Countrywide Pure Premium:	0.498	0.233	0.731
(16) Countrywide Indicated Relativity:	0.208	0.214	.
(17) Countrywide Credibility:	0.040	0.000	.
(18) Countrywide Lost-Time Claims:	3751.0	.	.
(19) Pure Premium Underlying Present Rate:	0.582	0.322	0.904
(20) Relativity to Underlying Present Rate:	0.266	0.331	.
(21) Credibility to Underlying Relativity:	0.030	0.000	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	0.256	0.305	.
(24) Balanced Formula Relativity:	0.258	0.305	0.273

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Construction		
5610 CLEANER - DEBRIS REMOVAL											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	503,061	4	43	779,298	671,901	94,671	234,592	1,780,463	2,885	0,655	3,539
2015	584,074	2	48	155,811	1,604,394	8,958	387,123	2,156,285	3,014	0,678	3,692
2016	653,024	6	38	1,179,357	141,748	409,671	141,210	1,871,986	2,023	0,844	2,867
2017	644,611	1	39	329,712	616,911	159,200	246,254	1,352,077	1,469	0,629	2,098
2018	642,257	1	44	11,443	3,279,507	6,831	998,383	4,296,163	5,124	1,565	6,689
MA Total:	3,027,028	14	212	2,455,621	6,314,460	679,331	2,007,561	11,456,973	2,897	0,888	3,785

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.193	0.794	.
(14) Massachusetts Credibility:	0.560	0.640	.
(15) Countrywide Pure Premium:	1.847	0.899	2.746
(16) Countrywide Indicated Relativity:	0.773	0.826	.
(17) Countrywide Credibility:	0.220	0.180	.
(18) Countrywide Lost-Time Claims:	476.00	.	.
(19) Pure Premium Underlying Present Rate:	2.223	0.695	2.918
(20) Relativity to Underlying Present Rate:	1.015	0.714	.
(21) Credibility to Underlying Relativity:	0.220	0.180	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	1.062	0.785	.
(24) Balanced Formula Relativity:	1.072	0.785	0.981

Class(es):		Effective: 7/1/2022							Construction		
5645 CARPENTRY-DETACHED ONE OR TWO FAMILY DWELLINGS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	5,446,345	50	669	7,731,818	10,708,912	4,063,786	6,754,497	29,259,013	3,386	1,986	5,372
2015	6,233,901	64	711	9,128,740	12,057,161	4,976,382	7,409,566	33,571,848	3,398	1,987	5,385
2016	6,636,015	39	677	5,461,413	13,805,796	2,607,331	9,320,422	31,194,962	2,903	1,797	4,701
2017	7,033,189	50	691	6,591,029	13,034,631	4,302,623	8,084,801	32,013,084	2,790	1,761	4,552
2018	7,584,024	51	697	6,983,835	17,163,368	5,828,266	10,597,801	40,573,269	3,184	2,166	5,350
MA Total:	32,933,474	254	3,445	35,896,834	66,769,867	21,778,388	42,167,088	166,612,177	3,117	1,942	5,059

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.284	1.737	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	5.246	2.630	7.876
(16) Countrywide Indicated Relativity:	2.194	2.416	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	13360	.	.
(19) Pure Premium Underlying Present Rate:	3.012	1.686	4.698
(20) Relativity to Underlying Present Rate:	1.376	1.732	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	1.284	1.737	.
(24) Balanced Formula Relativity:	1.296	1.736	1.435

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Construction		
5701 WRECKING: BUILDING OR STRUCTURES-NOT MARINE- ALL OPERATIONS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	38.041	0	10	0	154,688	0	92,955	247,643	4,066	2,444	6,510
2015	62,379	3	4	952,345	422,389	738,819	120,038	2,233,592	22,038	13,768	35,807
2016	50,768	0	4	0	47,659	0	26,179	73,838	0,939	0,516	1,454
2017	49,330	0	6	0	774,452	0	180,953	955,405	15,700	3,668	19,368
2018	40,801	0	2	0	196,151	0	60,270	256,421	4,808	1,477	6,285
MA Total:	241,318	3	26	952,345	1,595,340	738,819	480,395	3,766,899	10,557	5,052	15,610

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	4.348	4.519	.
(14) Massachusetts Credibility:	0.350	0.520	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	3.760	4.970	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	8.617	5.155	13.772
(20) Relativity to Underlying Present Rate:	3.936	5.295	.
(21) Credibility to Underlying Relativity:	0.650	0.480	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	4.081	4.891	.
(24) Balanced Formula Relativity:	4.119	4.890	4.362

Class(es):		Effective: 7/1/2022							Construction		
5703 BUILDING RAISING OR MOVING & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	12,331	0	1	0	0	0	1,413	1,413	0,000	0,115	0,115
2015	11,512	0	0	0	0	0	0	0	0,000	0,000	0,000
2016	15,821	0	0	0	0	0	0	0	0,000	0,000	0,000
2017	14,884	0	1	0	9,629	0	6,385	16,014	0,647	0,429	1,076
2018	16,729	0	0	0	0	0	0	0	0,000	0,000	0,000
MA Total:	71,277	0	2	0	9,629	0	7,797	17,427	0,135	0,109	0,244

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.056	0.098	.
(14) Massachusetts Credibility:	0.180	0.220	.
(15) Countrywide Pure Premium:	10.789	4.761	15.550
(16) Countrywide Indicated Relativity:	4.513	4.374	.
(17) Countrywide Credibility:	0.230	0.250	.
(18) Countrywide Lost-Time Claims:	30.000	.	.
(19) Pure Premium Underlying Present Rate:	5.186	2.065	7.250
(20) Relativity to Underlying Present Rate:	2.369	2.121	.
(21) Credibility to Underlying Relativity:	0.590	0.530	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	2.445	2.239	.
(24) Balanced Formula Relativity:	2.469	2.239	2.396

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Construction		
5705 SALVAGE OPERATION - NO WRECKING OR ANY STRUCTURAL OPERATIONS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	242	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	1,927	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	1,952	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	247	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	270	0	1	0	0	0	945	945	0.000	3.501	3.501
MA Total:	4,638	0	1	0	0	0	945	945	0.000	0.204	0.204

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.182	.
(14) Massachusetts Credibility:	0.060	0.070	.
(15) Countrywide Pure Premium:	4.817	1.386	6.203
(16) Countrywide Indicated Relativity:	2.015	1.273	.
(17) Countrywide Credibility:	0.180	0.190	.
(18) Countrywide Lost-Time Claims:	16.000	.	.
(19) Pure Premium Underlying Present Rate:	4.889	2.123	7.012
(20) Relativity to Underlying Present Rate:	2.233	2.181	.
(21) Credibility to Underlying Relativity:	0.760	0.740	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	2.060	1.869	.
(24) Balanced Formula Relativity:	2.080	1.868	2.013

Class(es):		Effective: 7/1/2022							Construction		
6003 PILE DRIVING & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	67,323	1	9	437,527	41,100	126,928	13,155	618,709	7,109	2,081	9,190
2015	105,183	1	6	502,354	242,369	174,320	113,114	1,032,156	7,080	2,733	9,813
2016	89,447	2	10	564,374	44,674	132,055	66,845	807,948	6,809	2,224	9,033
2017	66,365	0	1	0	0	0	107	107	0.000	0.002	0.002
2018	95,002	0	6	0	58,528	0	17,699	76,226	0.616	0.186	0.802
MA Total:	423,321	4	32	1,504,254	386,670	433,302	210,919	2,535,146	4.467	1.522	5.989

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.840	1.361	.
(14) Massachusetts Credibility:	0.330	0.410	.
(15) Countrywide Pure Premium:	3.382	1.400	4.783
(16) Countrywide Indicated Relativity:	1.415	1.287	.
(17) Countrywide Credibility:	0.340	0.300	.
(18) Countrywide Lost-Time Claims:	115.00	.	.
(19) Pure Premium Underlying Present Rate:	4.193	1.600	5.792
(20) Relativity to Underlying Present Rate:	1.915	1.643	.
(21) Credibility to Underlying Relativity:	0.330	0.290	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	1.720	1.421	.
(24) Balanced Formula Relativity:	1.737	1.420	1.637

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Calculation of Class Relativities

Class(es): 6204 DRILLING NOC & DRIVERS		Effective: 7/1/2022							Construction		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	139,839	2	16	8,519	76,778	10,568	64,176	160,041	0.610	0.534	1.144
2015	195,434	2	21	91,515	1,064,170	52,043	429,369	1,637,097	5.913	2.463	8.377
2016	170,168	1	10	17,006	340,099	6,347	62,375	425,826	2.099	0.404	2.502
2017	194,706	0	10	0	70,249	0	40,703	110,952	0.361	0.209	0.570
2018	174,316	0	16	0	392,125	0	214,076	606,201	2.250	1.228	3.478
MA Total:	874,463	5	73	117,041	1,943,420	68,958	810,699	2,940,118	2.356	1.006	3.362

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.970	0.900	.
(14) Massachusetts Credibility:	0.360	0.450	.
(15) Countrywide Pure Premium:	3.225	1.475	4.700
(16) Countrywide Indicated Relativity:	1.349	1.355	.
(17) Countrywide Credibility:	0.320	0.280	.
(18) Countrywide Lost-Time Claims:	769.00	.	.
(19) Pure Premium Underlying Present Rate:	2.550	0.998	3.548
(20) Relativity to Underlying Present Rate:	1.165	1.025	.
(21) Credibility to Underlying Relativity:	0.320	0.270	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	1.154	1.061	.
(24) Balanced Formula Relativity:	1.165	1.061	1.132

Class(es): 6217 EXCAVATION & DRIVERS		Effective: 7/1/2022							Construction		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	3,613,062	25	257	4,138,417	3,733,963	1,569,899	1,949,492	11,391,772	2.179	0.974	3.153
2015	4,100,009	19	268	3,998,048	5,367,038	1,271,594	2,187,884	12,824,564	2.284	0.844	3.128
2016	4,213,076	26	223	4,903,466	6,227,551	1,947,402	2,950,156	16,028,574	2.642	1.162	3.804
2017	4,579,789	27	266	7,350,884	7,628,649	2,214,781	2,828,021	20,022,336	3.271	1.101	4.372
2018	5,126,668	16	207	3,906,292	4,094,480	1,272,641	2,002,163	11,275,576	1.561	0.639	2.199
MA Total:	21,632,603	113	1,221	24,297,107	27,051,682	8,276,317	11,917,716	71,542,822	2.374	0.933	3.307

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.978	0.835	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	2.096	0.902	2.998
(16) Countrywide Indicated Relativity:	0.877	0.829	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	6212.0	.	.
(19) Pure Premium Underlying Present Rate:	2.064	0.870	2.933
(20) Relativity to Underlying Present Rate:	0.943	0.893	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	0.978	0.835	.
(24) Balanced Formula Relativity:	0.987	0.835	0.939

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Construction		
6229 IRRIGATION OR DRAINAGE SYSTEM CONSTRUCTION &DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	338,517	4	22	594,490	309,023	154,751	235,496	1,293,760	2,669	1,153	3,822
2015	390,871	1	21	51,652	778,972	5,055	181,790	1,017,469	2,125	0,478	2,603
2016	415,897	2	15	215,377	196,813	193,756	119,418	725,364	0,991	0,753	1,744
2017	458,887	0	34	0	533,536	0	287,850	821,386	1,163	0,627	1,790
2018	473,397	2	42	208,983	984,252	78,337	504,391	1,775,962	2,521	1,231	3,752
MA Total:	2,077,569	9	134	1,070,502	2,802,597	431,899	1,328,945	5,633,942	1,864	0,848	2,712

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.768	0.758	.
(14) Massachusetts Credibility:	0.450	0.580	.
(15) Countrywide Pure Premium:	2.146	1.121	3.267
(16) Countrywide Indicated Relativity:	0.897	1.030	.
(17) Countrywide Credibility:	0.280	0.210	.
(18) Countrywide Lost-Time Claims:	627.00	.	.
(19) Pure Premium Underlying Present Rate:	1.852	0.784	2.637
(20) Relativity to Underlying Present Rate:	0.846	0.806	.
(21) Credibility to Underlying Relativity:	0.270	0.210	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	0.825	0.825	.
(24) Balanced Formula Relativity:	0.833	0.825	0.831

Class(es):		Effective: 7/1/2022							Construction		
6233 OIL OR GAS PIPELINE CONSTRUCTION & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	13,405	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	45,365	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	72,927	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	36,379	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	29,922	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	197,997	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.150	0.170	.
(15) Countrywide Pure Premium:	1.510	0.528	2.039
(16) Countrywide Indicated Relativity:	0.632	0.486	.
(17) Countrywide Credibility:	0.430	0.420	.
(18) Countrywide Lost-Time Claims:	527.00	.	.
(19) Pure Premium Underlying Present Rate:	1.140	0.388	1.528
(20) Relativity to Underlying Present Rate:	0.521	0.399	.
(21) Credibility to Underlying Relativity:	0.420	0.410	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	0.490	0.367	.
(24) Balanced Formula Relativity:	0.495	0.367	0.455

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Construction		
6251 TUNNELING - NOT PNEUMATIC - ALL OPERATIONS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	0	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	235	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	250	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	485	0	0	0	0	0	0	0	0.000	0.000	0.000

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.020	0.020	.
(15) Countrywide Pure Premium:	1.944	1.062	3.006
(16) Countrywide Indicated Relativity:	0.813	0.976	.
(17) Countrywide Credibility:	0.240	0.250	.
(18) Countrywide Lost-Time Claims:	31.000	.	.
(19) Pure Premium Underlying Present Rate:	2.412	0.649	3.062
(20) Relativity to Underlying Present Rate:	1.102	0.667	.
(21) Credibility to Underlying Relativity:	0.740	0.730	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	1.011	0.731	.
(24) Balanced Formula Relativity:	1.020	0.731	0.929

Class(es):		Effective: 7/1/2022							Construction		
6252 SHAFT SINKING - ALL OPERATIONS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	34.212	0	2	0	0	0	3.300	3.300	0.000	0.096	0.096
2015	26.212	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	80.775	1	6	14.561	141.853	1.811	114.090	272.315	1.936	1.435	3.371
2017	50.464	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	90.317	0	1	0	112.046	0	55.414	167.460	1.241	0.614	1.854
MA Total:	281.980	1	9	14.561	253.899	1.811	172.804	443.075	0.952	0.619	1.571

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.392	0.554	.
(14) Massachusetts Credibility:	0.230	0.280	.
(15) Countrywide Pure Premium:	2.212	0.541	2.753
(16) Countrywide Indicated Relativity:	0.925	0.497	.
(17) Countrywide Credibility:	0.310	0.320	.
(18) Countrywide Lost-Time Claims:	60.000	.	.
(19) Pure Premium Underlying Present Rate:	2.585	0.919	3.504
(20) Relativity to Underlying Present Rate:	1.181	0.944	.
(21) Credibility to Underlying Relativity:	0.460	0.400	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	0.920	0.692	.
(24) Balanced Formula Relativity:	0.929	0.691	0.854

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Calculation of Class Relativities

Class(es): 6306 SEWER CONSTRUCTION - ALL OPERATIONS & DRIVERS									Effective: 7/1/2022			Construction	
Converted Unlimited Losses													
Amount													
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums					
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)		
2014	245,910	3	30	583,700	508,112	360,285	241,985	1,694,082	4,440	2,449	6,889		
2015	264,977	3	29	524,635	987,419	69,164	215,845	1,797,063	5,706	1,076	6,782		
2016	276,051	6	26	1,802,284	903,072	353,257	209,629	3,268,241	9,800	2,039	11,839		
2017	254,204	2	21	531,143	556,712	71,840	264,780	1,424,476	4,279	1,324	5,604		
2018	268,633	2	29	812,401	1,148,699	694,015	359,734	3,014,849	7,300	3,923	11,223		
MA Total:	1,309,775	16	135	4,254,163	4,104,013	1,548,560	1,291,974	11,198,711	6,381	2,169	8,550		

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.628	1.940	.
(14) Massachusetts Credibility:	0.490	0.610	.
(15) Countrywide Pure Premium:	2.612	1.114	3.726
(16) Countrywide Indicated Relativity:	1.093	1.024	.
(17) Countrywide Credibility:	0.260	0.200	.
(18) Countrywide Lost-Time Claims:	1379.0	.	.
(19) Pure Premium Underlying Present Rate:	3.569	1.405	4.973
(20) Relativity to Underlying Present Rate:	1.630	1.443	.
(21) Credibility to Underlying Relativity:	0.250	0.190	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	1.979	1.662	.
(24) Balanced Formula Relativity:	1.998	1.662	1.892

Class(es): 6319 GAS MAIN OR CONNECTION CONSTRUCTION & DRIVERS									Effective: 7/1/2022			Construction	
Converted Unlimited Losses													
Amount													
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums					
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)		
2014	707,483	3	30	250,469	551,861	108,456	217,685	1,128,470	1,134	0,461	1,595		
2015	833,223	3	35	641,467	1,429,465	343,954	528,403	2,943,290	2,485	1,047	3,532		
2016	969,608	2	53	444,968	915,739	95,045	470,268	1,926,019	1,403	0,583	1,986		
2017	910,626	2	23	354,422	857,859	36,800	461,748	1,710,829	1,331	0,547	1,879		
2018	1,205,269	0	31	0	716,868	0	277,064	993,932	0,595	0,230	0,825		
MA Total:	4,626,210	10	172	1,691,326	4,471,792	584,255	1,955,169	8,702,541	1,332	0,549	1,881		

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.549	0.491	.
(14) Massachusetts Credibility:	0.570	0.720	.
(15) Countrywide Pure Premium:	1.685	0.763	2.448
(16) Countrywide Indicated Relativity:	0.705	0.701	.
(17) Countrywide Credibility:	0.220	0.140	.
(18) Countrywide Lost-Time Claims:	1474.0	.	.
(19) Pure Premium Underlying Present Rate:	1.477	0.606	2.083
(20) Relativity to Underlying Present Rate:	0.675	0.623	.
(21) Credibility to Underlying Relativity:	0.210	0.140	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	0.609	0.539	.
(24) Balanced Formula Relativity:	0.615	0.539	0.591

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Construction		
6325 CONDUIT CONSTRUCTION - FOR CABLES OR WIRES & DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	245,517	1	14	93,840	293,801	22,579	166,989	577,209	1,579	0,772	2,351
2015	263,217	0	10	0	599,129	0	279,968	879,097	2,276	1,064	3,340
2016	261,444	2	8	177,707	723	13,820	17,405	209,655	0,682	0,119	0,802
2017	281,605	0	12	0	42,246	0	72,069	114,315	0,150	0,256	0,406
2018	357,945	0	4	0	99,460	0	18,580	118,040	0,278	0,052	0,330
MA Total:	1,409,728	3	48	271,547	1,035,359	36,399	555,011	1,898,316	0,927	0,420	1,347

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.382	0.375	.
(14) Massachusetts Credibility:	0.340	0.430	.
(15) Countrywide Pure Premium:	1.641	0.794	2.435
(16) Countrywide Indicated Relativity:	0.686	0.729	.
(17) Countrywide Credibility:	0.330	0.290	.
(18) Countrywide Lost-Time Claims:	1311.0	.	.
(19) Pure Premium Underlying Present Rate:	1.335	0.560	1.895
(20) Relativity to Underlying Present Rate:	0.610	0.576	.
(21) Credibility to Underlying Relativity:	0.330	0.280	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	0.557	0.534	.
(24) Balanced Formula Relativity:	0.563	0.534	0.554

Class(es):		Effective: 7/1/2022							Construction		
6400 FENCE ERECTION - ALL TYPES											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	314,443	1	42	332,659	247,683	203,976	114,383	898,701	1,846	1,012	2,858
2015	356,043	3	39	605,276	276,283	205,319	257,897	1,344,776	2,476	1,301	3,777
2016	387,076	4	45	825,800	134,084	843,611	179,209	1,982,703	2,480	2,642	5,122
2017	430,680	2	60	77,302	1,003,214	13,732	323,399	1,417,647	2,509	0,783	3,292
2018	461,014	2	51	255,587	389,435	42,560	360,706	1,048,288	1,399	0,875	2,274
MA Total:	1,949,257	12	237	2,096,624	2,050,699	1,309,198	1,235,594	6,692,115	2,128	1,306	3,433

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.876	1.168	.
(14) Massachusetts Credibility:	0.470	0.650	.
(15) Countrywide Pure Premium:	2.616	1.231	3.847
(16) Countrywide Indicated Relativity:	1.094	1.131	.
(17) Countrywide Credibility:	0.270	0.180	.
(18) Countrywide Lost-Time Claims:	1024.0	.	.
(19) Pure Premium Underlying Present Rate:	2.152	1.115	3.266
(20) Relativity to Underlying Present Rate:	0.983	1.145	.
(21) Credibility to Underlying Relativity:	0.260	0.170	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	0.963	1.157	.
(24) Balanced Formula Relativity:	0.972	1.157	1.030

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Miscellaneous		
6834 BOAT BUILDING OR REPAIRING & DRIVERS: MA ACT											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums		
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	219,374	0	19	0	10,879	0	22,312	33,191	0.050	0.102	0.151
2015	245,659	0	28	0	35,887	0	113,263	149,150	0.146	0.461	0.607
2016	266,057	2	29	52,629	558,157	134,751	292,232	1,037,770	2.296	1.605	3.901
2017	279,223	1	25	13,330	79,878	5,525	96,829	195,562	0.334	0.367	0.700
2018	289,798	0	27	0	17,598	0	44,680	62,278	0.061	0.154	0.215
MA Total:	1,300,111	3	128	65,959	702,399	140,276	569,316	1,477,951	0.591	0.546	1.137

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.266	0.474	.
(14) Massachusetts Credibility:	0.290	0.450	.
(15) Countrywide Pure Premium:	1.170	0.767	1.936
(16) Countrywide Indicated Relativity:	0.551	0.711	.
(17) Countrywide Credibility:	0.360	0.280	.
(18) Countrywide Lost-Time Claims:	948.00	.	.
(19) Pure Premium Underlying Present Rate:	0.993	0.669	1.663
(20) Relativity to Underlying Present Rate:	0.489	0.652	.
(21) Credibility to Underlying Relativity:	0.350	0.270	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	0.447	0.589	.
(24) Balanced Formula Relativity:	0.446	0.592	0.496

Class(es):		Effective: 7/1/2022							Miscellaneous		
6836 MARINA & DRIVERS: MA ACT											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums		
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	448,125	3	46	230,958	223,289	347,409	194,136	995,793	1.014	1.208	2.222
2015	480,536	0	58	0	194,888	0	226,588	421,476	0.406	0.472	0.877
2016	483,859	3	49	645,986	98,492	271,315	184,212	1,200,004	1.539	0.941	2.480
2017	543,485	1	86	34,012	269,594	108,491	370,201	782,297	0.559	0.881	1.439
2018	563,590	1	58	58,441	375,340	22,679	595,566	1,052,027	0.770	1.097	1.867
MA Total:	2,519,595	8	297	969,397	1,161,602	749,894	1,570,702	4,451,596	0.846	0.921	1.767

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.380	0.801	.
(14) Massachusetts Credibility:	0.440	0.690	.
(15) Countrywide Pure Premium:	1.542	1.072	2.614
(16) Countrywide Indicated Relativity:	0.727	0.994	.
(17) Countrywide Credibility:	0.280	0.160	.
(18) Countrywide Lost-Time Claims:	656.00	.	.
(19) Pure Premium Underlying Present Rate:	1.433	1.010	2.443
(20) Relativity to Underlying Present Rate:	0.706	0.984	.
(21) Credibility to Underlying Relativity:	0.280	0.150	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	0.568	0.859	.
(24) Balanced Formula Relativity:	0.567	0.865	0.668

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Miscellaneous		
7219 TRUCKING: NOC - ALL EMP & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums		
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	2,841,923	34	462	4,479,459	7,380,064	1,178,205	3,553,627	16,591,354	4,173	1,665	5,838
2015	3,113,096	44	412	6,801,091	7,374,904	2,227,775	3,556,399	19,960,170	4,554	1,858	6,412
2016	3,106,943	32	366	4,221,514	7,061,050	3,100,557	3,689,801	18,072,922	3,631	2,186	5,817
2017	3,199,943	32	406	5,163,850	7,655,668	1,494,816	3,419,828	17,734,162	4,006	1,536	5,542
2018	3,026,301	29	303	4,427,496	6,364,150	1,708,344	3,797,531	16,297,521	3,566	1,819	5,385
MA Total:	15,288,206	171	1,949	25,093,410	35,835,836	9,709,697	18,017,186	88,656,129	3,985	1,814	5,799

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.791	1.577	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	3.876	1.596	5.472
(16) Countrywide Indicated Relativity:	1.826	1.479	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	51660	.	.
(19) Pure Premium Underlying Present Rate:	4.019	1.733	5.751
(20) Relativity to Underlying Present Rate:	1.980	1.687	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	1.791	1.577	.
(24) Balanced Formula Relativity:	1.787	1.587	1.719

Class(es):		Effective: 7/1/2022							Miscellaneous		
7230 TRUCKING: PARCEL OR PACKAGE DELIVERY - ALL EMP & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums		
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	53,922	1	11	42,660	276,850	26,193	47,818	393,520	5,925	1,373	7,298
2015	52,121	2	9	274,349	160,562	39,110	55,325	529,346	8,344	1,812	10,156
2016	73,897	2	11	59,075	140,932	13,703	117,527	331,236	2,707	1,776	4,482
2017	92,075	0	28	0	339,742	0	166,044	505,786	3,690	1,803	5,493
2018	110,087	1	34	45,388	465,286	35,079	211,194	756,947	4,639	2,237	6,876
MA Total:	382,102	6	93	421,472	1,383,371	114,085	597,908	2,516,836	4,723	1,863	6,587

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.122	1.620	.
(14) Massachusetts Credibility:	0.330	0.420	.
(15) Countrywide Pure Premium:	4.014	1.928	5.942
(16) Countrywide Indicated Relativity:	1.891	1.788	.
(17) Countrywide Credibility:	0.340	0.290	.
(18) Countrywide Lost-Time Claims:	576.00	.	.
(19) Pure Premium Underlying Present Rate:	4.548	1.876	6.424
(20) Relativity to Underlying Present Rate:	2.240	1.827	.
(21) Credibility to Underlying Relativity:	0.330	0.290	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	2.083	1.729	.
(24) Balanced Formula Relativity:	2.078	1.740	1.963

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Miscellaneous		
7231 TRUCKING: MAIL, PARCEL OR PACKAGE DELIVERY-ALL EMP & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	484.082	18	95	1,438.637	1,226.368	397.402	539.406	3,601.813	5.505	1.935	7.440
2015	554.065	12	128	1,794.659	1,699.980	1,600.634	726.083	5,821.357	6.307	4.199	10.507
2016	668.100	26	125	3,395.625	2,002.741	1,451.942	1,055.961	7,906.270	8.080	3.754	11.834
2017	701.798	17	160	1,452.330	2,888.624	463.528	1,413.854	6,218.335	6.185	2.675	8.861
2018	901.235	19	193	1,598.708	2,922.701	753.129	1,247.765	6,522.303	5.017	2.220	7.237
MA Total:	3,309,279	92	701	9,679,959	10,740,415	4,666,635	4,983,068	30,070,077	6.171	2.916	9.087

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.772	2.535	.
(14) Massachusetts Credibility:	0.820	1.000	.
(15) Countrywide Pure Premium:	3.997	1.758	5.755
(16) Countrywide Indicated Relativity:	1.883	1.630	.
(17) Countrywide Credibility:	0.090	0.000	.
(18) Countrywide Lost-Time Claims:	5095.0	.	.
(19) Pure Premium Underlying Present Rate:	5.153	2.835	7.988
(20) Relativity to Underlying Present Rate:	2.539	2.761	.
(21) Credibility to Underlying Relativity:	0.090	0.000	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	2.671	2.535	.
(24) Balanced Formula Relativity:	2.666	2.551	2.627

Class(es):		Effective: 7/1/2022							Miscellaneous		
7360 FREIGHT HANDLING NOC: MA ACT											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	103.693	0	20	0	26.979	0	39.720	66.699	0.260	0.383	0.643
2015	114.101	0	13	0	19.873	0	12.542	32.415	0.174	0.110	0.284
2016	108.313	0	14	0	245.641	0	46.421	292.062	2.268	0.429	2.696
2017	116.769	2	18	61.998	505.345	17.260	150.667	735.269	4.859	1.438	6.297
2018	134.299	1	31	130.806	538.401	56.229	228.219	953.654	4.983	2.118	7.101
MA Total:	577,176	3	96	192,804	1,336,239	73,488	477,569	2,080,100	2.649	0.955	3.604

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.190	0.830	.
(14) Massachusetts Credibility:	0.270	0.360	.
(15) Countrywide Pure Premium:	2.058	1.038	3.096
(16) Countrywide Indicated Relativity:	0.969	0.962	.
(17) Countrywide Credibility:	0.370	0.320	.
(18) Countrywide Lost-Time Claims:	1548.0	.	.
(19) Pure Premium Underlying Present Rate:	1.766	0.881	2.647
(20) Relativity to Underlying Present Rate:	0.870	0.858	.
(21) Credibility to Underlying Relativity:	0.360	0.320	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	0.993	0.881	.
(24) Balanced Formula Relativity:	0.991	0.887	0.956

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Miscellaneous			
7370 TAXICAB CO: ALL OTHER EMP & DRIVERS												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2014	1,346,353	12	387	206,177	1,048,829	175,872	1,007,745	2,438,622	0.932	0.879	1.811	
2015	1,397,906	13	298	661,560	1,066,962	298,604	873,572	2,900,698	1.237	0.839	2.075	
2016	1,477,483	22	446	2,020,915	2,049,930	867,182	1,454,300	6,392,327	2.755	1.571	4.326	
2017	1,792,415	15	527	1,377,393	2,019,230	445,538	1,327,005	5,169,166	1.895	0.989	2.884	
2018	1,827,016	15	498	869,573	2,597,401	378,630	1,826,928	5,672,532	1.898	1.207	3.105	
MA Total:	7,841,173	77	2,156	5,135,618	8,782,352	2,165,826	6,489,550	22,573,346	1.775	1.104	2.879	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.797	0.960	.
(14) Massachusetts Credibility:	0.730	1.000	.
(15) Countrywide Pure Premium:	1.922	1.173	3.096
(16) Countrywide Indicated Relativity:	0.906	1.088	.
(17) Countrywide Credibility:	0.140	0.000	.
(18) Countrywide Lost-Time Claims:	2309.0	.	.
(19) Pure Premium Underlying Present Rate:	1.644	1.011	2.656
(20) Relativity to Underlying Present Rate:	0.810	0.985	.
(21) Credibility to Underlying Relativity:	0.130	0.000	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	0.814	0.960	.
(24) Balanced Formula Relativity:	0.813	0.966	0.865

Class(es):		Effective: 7/1/2022							Miscellaneous			
7380 DRIVERS, CHAUFFEURS AND HELPERS-NOC-COMMERCIAL												
		Converted Unlimited Losses										
		Amount										
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2014	3,945,618	53	815	6,462,708	5,810,536	2,094,704	3,551,992	17,919,940	3.111	1.431	4.542	
2015	4,159,835	55	770	4,644,618	5,616,172	1,826,132	3,305,662	15,392,584	2.467	1.234	3.700	
2016	4,100,698	55	744	4,978,407	7,506,788	2,248,390	4,826,451	19,560,037	3.045	1.725	4.770	
2017	4,338,798	36	755	5,471,709	8,352,284	1,782,955	4,831,396	20,438,344	3.186	1.524	4.711	
2018	4,334,122	42	761	6,790,035	8,001,948	2,543,661	4,705,614	22,041,258	3.413	1.673	5.086	
MA Total:	20,879,072	241	3,845	28,347,478	35,287,728	10,495,842	21,221,115	95,352,162	3.048	1.519	4.567	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.369	1.321	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	2.556	1.251	3.806
(16) Countrywide Indicated Relativity:	1.204	1.160	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	27386	.	.
(19) Pure Premium Underlying Present Rate:	2.717	1.320	4.037
(20) Relativity to Underlying Present Rate:	1.339	1.285	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	1.369	1.321	.
(24) Balanced Formula Relativity:	1.366	1.329	1.354

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Miscellaneous		
7382 BUS CO: ALL OTHER EMPLOYEES & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	3,263,260	46	655	2,905,977	2,379,376	1,533,190	1,773,487	8,592,030	1,620	1,013	2,633
2015	3,574,756	32	632	2,626,565	3,793,960	849,075	2,128,851	9,398,451	1,796	0,833	2,629
2016	3,839,451	40	713	3,457,091	3,777,817	1,404,394	2,538,909	11,178,211	1,884	1,027	2,911
2017	3,875,344	42	616	2,274,724	4,671,223	837,844	2,564,131	10,347,923	1,792	0,878	2,670
2018	4,141,900	57	598	4,877,439	5,050,262	1,720,991	2,710,599	14,359,291	2,397	1,070	3,467
MA Total:	18,694,711	217	3,214	16,141,797	19,672,638	6,345,494	11,715,977	53,875,906	1,916	0,966	2,882

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.861	0.840	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	1.803	1.047	2.850
(16) Countrywide Indicated Relativity:	0.850	0.971	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	7589.0	.	.
(19) Pure Premium Underlying Present Rate:	1.609	0.859	2.468
(20) Relativity to Underlying Present Rate:	0.793	0.837	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	0.861	0.840	.
(24) Balanced Formula Relativity:	0.859	0.845	0.854

Class(es):		Effective: 7/1/2022							Miscellaneous		
7403 AIRCRAFT OR HELICOP OP: AIR CARRIER-SCHD/ SUPPL: A/O EMP & DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	1,314,032	11	247	1,266,630	1,685,440	842,508	1,209,615	5,004,193	2,247	1,562	3,808
2015	1,837,252	14	342	1,091,164	2,235,009	593,069	1,620,455	5,539,698	1,810	1,205	3,015
2016	1,793,979	5	255	365,215	1,376,138	135,313	1,329,716	3,206,383	0,971	0,817	1,787
2017	1,935,320	13	258	1,178,273	1,520,510	530,810	1,215,205	4,444,799	1,394	0,902	2,297
2018	1,444,009	5	198	457,092	1,153,277	158,514	653,066	2,421,949	1,115	0,562	1,677
MA Total:	8,324,592	48	1,300	4,358,374	7,970,375	2,260,214	6,028,058	20,617,021	1,481	0,996	2,477

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.665	0.866	.
(14) Massachusetts Credibility:	0.760	1.000	.
(15) Countrywide Pure Premium:	2.024	1.065	3.089
(16) Countrywide Indicated Relativity:	0.953	0.988	.
(17) Countrywide Credibility:	0.120	0.000	.
(18) Countrywide Lost-Time Claims:	17139	.	.
(19) Pure Premium Underlying Present Rate:	1.677	1.016	2.693
(20) Relativity to Underlying Present Rate:	0.826	0.990	.
(21) Credibility to Underlying Relativity:	0.120	0.000	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	0.719	0.866	.
(24) Balanced Formula Relativity:	0.718	0.871	0.770

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Calculation of Class Relativities

Class(es):									Effective: 7/1/2022			Miscellaneous	
7405 AIRCRAFT OR HELICOP OP: AIR CARRIER-SCHD/ SUPPL: FLYING CREW													
Converted Unlimited Losses													
Amount													
		Claim Count		Indemnity		Medical		Total	MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)		
2014	2,062,734	6	68	44,075	925,417	42,087	427,904	1,439,483	0.470	0.228	0.698		
2015	3,120,307	8	103	1,108,118	425,545	385,953	502,811	2,422,427	0.492	0.285	0.776		
2016	2,924,810	1	94	13,836	580,363	4,140	433,066	1,031,404	0.203	0.149	0.353		
2017	3,158,686	10	154	1,637,375	1,671,538	471,816	669,262	4,449,990	1.048	0.361	1.409		
2018	950,567	1	34	51,527	689,620	23,736	365,171	1,130,054	0.780	0.409	1.189		
MA Total:	12,217,103	26	453	2,854,930	4,292,484	927,732	2,398,213	10,473,358	0.585	0.272	0.857		

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.263	0.237	.
(14) Massachusetts Credibility:	0.570	0.760	.
(15) Countrywide Pure Premium:	0.675	0.259	0.934
(16) Countrywide Indicated Relativity:	0.318	0.240	.
(17) Countrywide Credibility:	0.220	0.120	.
(18) Countrywide Lost-Time Claims:	5442.0	.	.
(19) Pure Premium Underlying Present Rate:	0.553	0.262	0.815
(20) Relativity to Underlying Present Rate:	0.272	0.255	.
(21) Credibility to Underlying Relativity:	0.210	0.120	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	0.277	0.239	.
(24) Balanced Formula Relativity:	0.276	0.241	0.264

Class(es):									Effective: 7/1/2022			Miscellaneous	
7420 AIRCRAFT OR HELICOP OP: PUBLIC EXHIB STUNT FLYING: FLY CREW													
Converted Unlimited Losses													
Amount													
		Claim Count		Indemnity		Medical		Total	MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)		
2014	3,164	0	0	0	0	0	0	0	0.000	0.000	0.000		
2015	4,438	0	1	0	2,554	0	7,009	9,562	0.575	1.579	2.155		
2016	3,623	1	0	282,086	0	530,129	0	812,216	77.865	146.33	224.20		
2017	3,061	0	1	0	242,147	0	30,121	272,268	79.102	9.839	88.941		
2018	1,832	0	0	0	0	0	0	0	0.000	0.000	0.000		
MA Total:	16,117	1	2	282,086	244,701	530,129	37,129	1,094,046	32.684	35.195	67.879		

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	14.685	30.595	.
(14) Massachusetts Credibility:	0.110	0.150	.
(15) Countrywide Pure Premium:	4.643	0.733	5.376
(16) Countrywide Indicated Relativity:	2.188	0.679	.
(17) Countrywide Credibility:	0.220	0.230	.
(18) Countrywide Lost-Time Claims:	25.000	.	.
(19) Pure Premium Underlying Present Rate:	6.386	3.563	9.949
(20) Relativity to Underlying Present Rate:	3.146	3.470	.
(21) Credibility to Underlying Relativity:	0.670	0.620	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	4.204	6.897	.
(24) Balanced Formula Relativity:	4.196	6.941	5.131

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Miscellaneous		
7421 AIRCRAFT OR HELICOP OP: TRANSPORT PERS IN EMPLR BUS: FLY CRW											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	271,060	0	3	0	0	0	4,109	4,109	0.000	0.015	0.015
2015	328,713	1	1	204,848	4,977	69,802	592	280,219	0.638	0.214	0.852
2016	380,964	0	3	0	233,819	0	35,145	268,964	0.614	0.092	0.706
2017	405,138	0	8	0	0	0	16,087	16,087	0.000	0.040	0.040
2018	460,095	1	4	392,850	38,923	46,745	15,796	494,314	0.938	0.136	1.074
MA Total:	1,845,970	2	19	597,698	277,719	116,547	71,729	1,063,694	0.474	0.102	0.576

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.213	0.089	.
(14) Massachusetts Credibility:	0.270	0.350	.
(15) Countrywide Pure Premium:	0.642	0.280	0.922
(16) Countrywide Indicated Relativity:	0.302	0.260	.
(17) Countrywide Credibility:	0.370	0.330	.
(18) Countrywide Lost-Time Claims:	427.00	.	.
(19) Pure Premium Underlying Present Rate:	0.584	0.244	0.828
(20) Relativity to Underlying Present Rate:	0.288	0.237	.
(21) Credibility to Underlying Relativity:	0.360	0.320	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	0.273	0.193	.
(24) Balanced Formula Relativity:	0.272	0.194	0.246

Class(es):		Effective: 7/1/2022							Miscellaneous		
7425 AIRCRAFT OR HELICOP OP: NOC- HELICOPTERS: FLYING CREW											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	70,934	0	2	0	1,967	0	2,812	4,779	0.028	0.040	0.067
2015	75,437	0	6	0	168,386	0	153,132	321,518	2.232	2.030	4.262
2016	83,601	0	3	0	0	0	3,308	3,308	0.000	0.040	0.040
2017	27,763	1	0	187,680	0	216,073	0	403,753	6.760	7.783	14.543
2018	33,732	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	291,466	1	11	187,680	170,353	216,073	159,251	733,358	1.228	1.288	2.516

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.552	1.119	.
(14) Massachusetts Credibility:	0.180	0.200	.
(15) Countrywide Pure Premium:	1.471	0.350	1.821
(16) Countrywide Indicated Relativity:	0.693	0.324	.
(17) Countrywide Credibility:	0.410	0.400	.
(18) Countrywide Lost-Time Claims:	156.00	.	.
(19) Pure Premium Underlying Present Rate:	1.262	0.393	1.655
(20) Relativity to Underlying Present Rate:	0.622	0.383	.
(21) Credibility to Underlying Relativity:	0.410	0.400	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	0.638	0.507	.
(24) Balanced Formula Relativity:	0.637	0.510	0.594

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Calculation of Class Relativities

Class(es): 7502 GAS COMPANY: GAS CO-NATURAL GAS-LOCAL DISTRIBUTION & DR									Effective: 7/1/2022			Miscellaneous	
Converted Unlimited Losses													
Amount													
Claim Count				Indemnity		Medical		MA Indicated Pure Premiums					
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)		
2014	262,467	0	11	0	105,186	0	59,703	164,889	0.401	0.227	0.628		
2015	219,283	2	12	317,372	66,310	71,629	84,367	539,678	1.750	0.711	2.461		
2016	227,480	0	17	0	218,015	0	61,936	279,950	0.958	0.272	1.231		
2017	267,378	1	22	89,035	153,790	5,934	109,549	358,308	0.908	0.432	1.340		
2018	257,535	0	15	0	62,980	0	69,475	132,455	0.245	0.270	0.514		
MA Total:	1,234,143	3	77	406,407	606,280	77,563	385,031	1,475,281	0.821	0.375	1.195		

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.369	0.326	.
(14) Massachusetts Credibility:	0.260	0.350	.
(15) Countrywide Pure Premium:	0.885	0.409	1.293
(16) Countrywide Indicated Relativity:	0.417	0.379	.
(17) Countrywide Credibility:	0.370	0.330	.
(18) Countrywide Lost-Time Claims:	377.00	.	.
(19) Pure Premium Underlying Present Rate:	0.789	0.371	1.160
(20) Relativity to Underlying Present Rate:	0.389	0.361	.
(21) Credibility to Underlying Relativity:	0.370	0.320	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	0.394	0.355	.
(24) Balanced Formula Relativity:	0.393	0.357	0.381

Class(es): 7515 OIL OR GAS PIPELINE OPERATION & DRIVERS									Effective: 7/1/2022			Miscellaneous	
Converted Unlimited Losses													
Amount													
Claim Count				Indemnity		Medical		MA Indicated Pure Premiums					
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)		
2014	7,723	2	11	173,278	24,328	246,080	46,556	490,242	25.587	37.892	63.478		
2015	8,561	0	0	0	0	0	0	0	0.000	0.000	0.000		
2016	9,407	0	1	0	0	0	1,297	1,297	0.000	0.138	0.138		
2017	4,220	0	0	0	0	0	0	0	0.000	0.000	0.000		
2018	5,649	0	1	0	0	0	245	245	0.000	0.043	0.043		
MA Total:	35,560	2	13	173,278	24,328	246,080	48,099	491,785	5.557	8.273	13.830		

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.497	7.191	.
(14) Massachusetts Credibility:	0.070	0.150	.
(15) Countrywide Pure Premium:	0.609	0.251	0.861
(16) Countrywide Indicated Relativity:	0.287	0.233	.
(17) Countrywide Credibility:	0.470	0.430	.
(18) Countrywide Lost-Time Claims:	355.00	.	.
(19) Pure Premium Underlying Present Rate:	1.019	1.524	2.543
(20) Relativity to Underlying Present Rate:	0.502	1.484	.
(21) Credibility to Underlying Relativity:	0.460	0.420	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	0.541	1.802	.
(24) Balanced Formula Relativity:	0.539	1.814	0.974

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Miscellaneous		
7520 WATERWORKS OPERATION & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	193.082	1	25	2,865	24,501	24,639	50,596	102,600	0.142	0.390	0.531
2015	241.367	0	34	0	114,677	0	228,638	343,315	0.475	0.947	1,422
2016	263.036	2	30	212,049	108,613	24,304	113,228	458,194	1.219	0.523	1,742
2017	167.354	2	22	894,096	27,442	157,543	59,776	1,138,856	5.507	1,299	6,805
2018	159.320	0	26	0	120,235	0	123,198	243,432	0.755	0.773	1,528
MA Total:	1,024,157	5	137	1,109,010	395,468	206,486	575,435	2,286,398	1.469	0.763	2,232

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.660	0.664	.
(14) Massachusetts Credibility:	0.300	0.410	.
(15) Countrywide Pure Premium:	1.320	0.821	2,141
(16) Countrywide Indicated Relativity:	0.622	0.761	.
(17) Countrywide Credibility:	0.350	0.300	.
(18) Countrywide Lost-Time Claims:	1877.0	.	.
(19) Pure Premium Underlying Present Rate:	1.337	0.667	2,004
(20) Relativity to Underlying Present Rate:	0.659	0.650	.
(21) Credibility to Underlying Relativity:	0.350	0.290	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3,376
(23) Formula Relativity:	0.646	0.689	.
(24) Balanced Formula Relativity:	0.645	0.693	0.661

Class(es):		Effective: 7/1/2022							Construction		
7538 ELECTRIC LIGHT OR POWER LINE CONSTRUCTION & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	89.415	0	14	0	702,534	0	314,152	1,016,687	7,857	3,513	11,370
2015	123.894	1	13	168,975	1,032,428	47,875	368,170	1,617,448	9,697	3,358	13,055
2016	228.924	1	9	208,255	621,175	63,412	204,410	1,097,252	3,623	1,170	4,793
2017	237.828	0	9	0	30,540	0	17,207	47,747	0.128	0.072	0.201
2018	306.010	2	32	43,542	257,976	36,336	298,955	636,808	0.985	1.096	2,081
MA Total:	986,072	4	77	420,772	2,644,654	147,623	1,202,894	4,415,942	3.109	1.370	4,478

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.280	1.225	.
(14) Massachusetts Credibility:	0.410	0.530	.
(15) Countrywide Pure Premium:	2.022	0.881	2,904
(16) Countrywide Indicated Relativity:	0.846	0.810	.
(17) Countrywide Credibility:	0.300	0.240	.
(18) Countrywide Lost-Time Claims:	1282.0	.	.
(19) Pure Premium Underlying Present Rate:	2.980	1.339	4,319
(20) Relativity to Underlying Present Rate:	1.361	1.375	.
(21) Credibility to Underlying Relativity:	0.290	0.230	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3,546
(23) Formula Relativity:	1.173	1.160	.
(24) Balanced Formula Relativity:	1.185	1.160	1.177

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Miscellaneous		
7539 ELECTRIC LIGHT OR POWER CO NOC-ALL EMP & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	1,003,814	0	29	0	106,448	0	154,356	260,804	0.106	0.154	0.260
2015	1,128,567	2	40	189,393	514,588	225,273	184,676	1,113,930	0.624	0.363	0.987
2016	1,274,073	2	58	446,780	384,847	366,409	483,022	1,681,059	0.653	0.667	1.319
2017	1,128,701	2	41	109,640	324,045	54,868	228,286	716,839	0.384	0.251	0.635
2018	1,038,994	1	35	228,668	1,309,028	57,811	812,064	2,407,572	1.480	0.837	2.317
MA Total:	5,574,149	7	203	974,482	2,638,956	704,362	1,862,403	6,180,204	0.648	0.460	1.109

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.291	0.400	.
(14) Massachusetts Credibility:	0.410	0.590	.
(15) Countrywide Pure Premium:	0.751	0.401	1.152
(16) Countrywide Indicated Relativity:	0.354	0.371	.
(17) Countrywide Credibility:	0.300	0.210	.
(18) Countrywide Lost-Time Claims:	1193.0	.	.
(19) Pure Premium Underlying Present Rate:	0.528	0.304	0.833
(20) Relativity to Underlying Present Rate:	0.260	0.296	.
(21) Credibility to Underlying Relativity:	0.290	0.200	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	0.301	0.373	.
(24) Balanced Formula Relativity:	0.300	0.376	0.326

Class(es):		Effective: 7/1/2022							Miscellaneous		
7580 SEWAGE DISPOSAL PLANT OPERATION & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	296,448	4	23	249,493	74,531	64,932	44,740	433,697	1.093	0.370	1.463
2015	276,182	1	30	207,355	1,052,940	116,900	297,645	1,674,839	4.563	1.501	6.064
2016	221,081	2	25	469,435	80,182	56,068	82,370	688,055	2.486	0.626	3.112
2017	209,456	0	21	0	212,776	0	127,885	340,662	1.016	0.611	1.626
2018	188,385	1	11	506,440	65,444	43,877	34,030	649,791	3.036	0.414	3.449
MA Total:	1,191,551	8	110	1,432,722	1,485,874	281,777	586,670	3,787,044	2.449	0.729	3.178

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.101	0.634	.
(14) Massachusetts Credibility:	0.330	0.430	.
(15) Countrywide Pure Premium:	1.243	0.812	2.055
(16) Countrywide Indicated Relativity:	0.586	0.753	.
(17) Countrywide Credibility:	0.340	0.290	.
(18) Countrywide Lost-Time Claims:	747.00	.	.
(19) Pure Premium Underlying Present Rate:	1.529	0.659	2.188
(20) Relativity to Underlying Present Rate:	0.753	0.642	.
(21) Credibility to Underlying Relativity:	0.330	0.280	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	0.811	0.670	.
(24) Balanced Formula Relativity:	0.809	0.675	0.763

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Miscellaneous		
7590 GARBAGE WORKS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	29,485	1	8	24,369	23,177	7,779	17,056	72,381	1,613	0,842	2,455
2015	27,464	0	18	0	143,613	0	72,218	215,831	5,229	2,630	7,859
2016	26,800	4	21	254,981	446,515	169,438	352,995	1,223,929	26,176	19,494	45,670
2017	49,989	1	23	259,380	31,365	53,252	36,250	380,247	5,816	1,790	7,607
2018	39,609	0	6	0	203,054	0	101,994	305,049	5,126	2,575	7,702
MA Total:	173,346	6	76	538,730	847,725	230,469	580,514	2,197,437	7,998	4,678	12,677

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.594	4.067	.
(14) Massachusetts Credibility:	0.180	0.270	.
(15) Countrywide Pure Premium:	1.540	0.891	2.431
(16) Countrywide Indicated Relativity:	0.726	0.826	.
(17) Countrywide Credibility:	0.410	0.370	.
(18) Countrywide Lost-Time Claims:	487.00	.	.
(19) Pure Premium Underlying Present Rate:	2.348	1.365	3.713
(20) Relativity to Underlying Present Rate:	1.157	1.330	.
(21) Credibility to Underlying Relativity:	0.410	0.360	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	1.419	1.883	.
(24) Balanced Formula Relativity:	1.416	1.895	1.579

Class(es):		Effective: 7/1/2022							Miscellaneous		
7600 TELEPHONE OR TELEGRAPH CO: ALL OTHER EMP & DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	3,550,290	10	128	1,749,245	1,325,079	525,267	823,252	4,422,842	0,866	0,380	1,246
2015	3,070,547	16	165	2,062,050	3,433,058	729,993	1,490,415	7,715,516	1,790	0,723	2,513
2016	3,592,825	23	227	4,251,891	4,776,709	1,447,004	1,967,024	12,442,628	2,513	0,950	3,463
2017	3,738,832	19	266	3,567,031	5,342,494	981,107	2,523,752	12,414,385	2,383	0,937	3,320
2018	3,897,068	20	264	3,526,733	6,316,826	1,374,546	2,381,890	13,599,996	2,526	0,964	3,490
MA Total:	17,849,562	88	1,050	15,156,950	21,194,166	5,057,917	9,186,334	50,595,366	2,037	0,798	2,835

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.915	0.694	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	2.273	0.989	3.263
(16) Countrywide Indicated Relativity:	1.071	0.917	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	12295	.	.
(19) Pure Premium Underlying Present Rate:	1.748	0.668	2.417
(20) Relativity to Underlying Present Rate:	0.861	0.651	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	0.915	0.694	.
(24) Balanced Formula Relativity:	0.913	0.698	0.840

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Construction		
7601 TELEPHONE, TELEGRAPH OR FIRE ALARM LINE CONSTRUCTION & DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	271,376	0	22	0	297,950	0	119,492	417,442	1,098	0,440	1,538
2015	236,265	5	27	703,216	202,882	878,345	88,710	1,873,153	3,835	4,093	7,928
2016	272,846	0	13	0	20,107	0	122,481	142,588	0,074	0,449	0,523
2017	268,280	1	9	144,707	21,254	48,269	17,431	231,662	0,619	0,245	0,864
2018	252,633	1	11	344,656	45,245	65,690	41,534	497,125	1,543	0,424	1,968
MA Total:	1,301,400	7	82	1,192,579	587,439	992,305	389,647	3,161,970	1,368	1,062	2,430

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.563	0.950	.
(14) Massachusetts Credibility:	0.420	0.600	.
(15) Countrywide Pure Premium:	4.606	2.051	6.657
(16) Countrywide Indicated Relativity:	1.927	1.884	.
(17) Countrywide Credibility:	0.190	0.200	.
(18) Countrywide Lost-Time Claims:	19.000	.	.
(19) Pure Premium Underlying Present Rate:	2.529	1.358	3.887
(20) Relativity to Underlying Present Rate:	1.155	1.395	.
(21) Credibility to Underlying Relativity:	0.390	0.200	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	1.053	1.226	.
(24) Balanced Formula Relativity:	1.063	1.225	1.114

Class(es):		Effective: 7/1/2022							Office and Clerical		
7610 RADIO OR TV BROADCAST STATION-ALL EMP & CL, DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	4,074,549	3	76	365,622	247,197	58,917	275,002	946,739	0.150	0.082	0.232
2015	4,393,347	6	56	1,393,918	1,551,661	384,291	296,423	3,626,292	0.670	0.155	0.825
2016	3,730,805	2	69	425,198	1,208,735	301,969	433,969	2,369,871	0.438	0.197	0.635
2017	4,294,239	4	82	335,264	875,314	53,642	400,528	1,664,747	0.282	0.106	0.388
2018	4,165,769	1	52	533,237	769,533	137,399	358,530	1,798,699	0.313	0.119	0.432
MA Total:	20,658,709	16	335	3,053,238	4,652,439	936,219	1,764,451	10,406,348	0.373	0.131	0.504

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	5.751	3.365	.
(14) Massachusetts Credibility:	0.520	0.640	.
(15) Countrywide Pure Premium:	0.176	0.095	0.271
(16) Countrywide Indicated Relativity:	3.198	2.662	.
(17) Countrywide Credibility:	0.240	0.180	.
(18) Countrywide Lost-Time Claims:	1878.0	.	.
(19) Pure Premium Underlying Present Rate:	0.261	0.100	0.361
(20) Relativity to Underlying Present Rate:	4.435	2.799	.
(21) Credibility to Underlying Relativity:	0.240	0.180	.
(22) Industry Group Converted Pure Premium:	0.065	0.039	0.104
(23) Formula Relativity:	4.823	3.136	.
(24) Balanced Formula Relativity:	4.820	3.139	4.191

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Section IX - Classification Pricing
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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Miscellaneous		
7704 FIREFIGHTERS & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	15.028	0	4	0	2,770	0	6,953	9,723	0.184	0.463	0.647
2015	15.131	0	3	0	193,968	0	56,662	250,630	12.819	3.745	16.564
2016	15.648	0	2	0	280	0	2,497	2,777	0.018	0.160	0.177
2017	15.353	0	2	0	0	0	3,623	3,623	0.000	0.236	0.236
2018	20	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	61,179	0	11	0	197,018	0	69,735	266,753	3.220	1.140	4.360

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.447	0.991	.
(14) Massachusetts Credibility:	0.110	0.170	.
(15) Countrywide Pure Premium:	1.694	1.419	3.113
(16) Countrywide Indicated Relativity:	0.798	1.316	.
(17) Countrywide Credibility:	0.450	0.420	.
(18) Countrywide Lost-Time Claims:	881.00	.	.
(19) Pure Premium Underlying Present Rate:	1.757	1.171	2.928
(20) Relativity to Underlying Present Rate:	0.865	1.141	.
(21) Credibility to Underlying Relativity:	0.440	0.410	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	0.899	1.189	.
(24) Balanced Formula Relativity:	0.897	1.196	0.999

Class(es):		Effective: 7/1/2022							Miscellaneous		
7720 POLICE OFFICERS & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	1,667,253	4	133	146,702	367,342	116,698	281,557	912,299	0.308	0.239	0.547
2015	1,822,447	7	108	381,773	229,443	569,505	228,634	1,409,354	0.335	0.438	0.773
2016	1,811,493	8	101	670,258	330,093	425,793	361,339	1,787,484	0.552	0.435	0.987
2017	2,038,848	7	118	510,848	740,468	73,306	606,537	1,931,160	0.614	0.333	0.947
2018	2,310,854	5	117	263,122	959,534	130,481	661,289	2,014,425	0.529	0.343	0.872
MA Total:	9,650,896	31	577	1,972,703	2,626,880	1,315,783	2,139,356	8,054,721	0.477	0.358	0.835

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.214	0.311	.
(14) Massachusetts Credibility:	0.540	0.770	.
(15) Countrywide Pure Premium:	1.226	0.786	2.012
(16) Countrywide Indicated Relativity:	0.578	0.728	.
(17) Countrywide Credibility:	0.230	0.120	.
(18) Countrywide Lost-Time Claims:	11750	.	.
(19) Pure Premium Underlying Present Rate:	0.624	0.350	0.974
(20) Relativity to Underlying Present Rate:	0.308	0.341	.
(21) Credibility to Underlying Relativity:	0.230	0.110	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	0.319	0.365	.
(24) Balanced Formula Relativity:	0.319	0.367	0.335

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 Subsection G - Class Relativities
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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Construction		
7855 RAILROAD CONSTR: LAYING/RELAYING TRACK OR MAINT BY CONTR & DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	19,919	0	1	0	3,567	0	1,480	5,048	0.179	0.074	0.253
2015	60,790	0	6	0	92,215	0	22,786	115,000	1.517	0.375	1.892
2016	33,601	0	4	0	91,066	0	54,507	145,573	2.710	1.622	4.332
2017	55,224	0	1	0	0	0	13,774	13,774	0.000	0.249	0.249
2018	189,866	1	9	147,555	4,953	20,910	16,109	189,526	0.803	0.195	0.998
MA Total:	359,400	1	21	147,555	191,800	20,910	108,655	468,920	0.944	0.361	1.305

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.389	0.322	.
(14) Massachusetts Credibility:	0.220	0.270	.
(15) Countrywide Pure Premium:	2.035	0.772	2.807
(16) Countrywide Indicated Relativity:	0.851	0.709	.
(17) Countrywide Credibility:	0.390	0.370	.
(18) Countrywide Lost-Time Claims:	259.00	.	.
(19) Pure Premium Underlying Present Rate:	1.745	0.674	2.419
(20) Relativity to Underlying Present Rate:	0.797	0.692	.
(21) Credibility to Underlying Relativity:	0.390	0.360	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	0.728	0.599	.
(24) Balanced Formula Relativity:	0.735	0.599	0.692

Class(es):		Effective: 7/1/2022							Goods and Services		
8001 STORE: FLORISTS & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	624,081	5	52	496,523	216,192	380,540	103,775	1,197,028	1.142	0.776	1.918
2015	628,959	6	53	158,891	89,048	140,641	71,075	459,655	0.394	0.337	0.731
2016	654,573	6	83	145,842	350,754	102,752	284,897	884,244	0.759	0.592	1.351
2017	645,307	0	65	0	199,956	0	193,154	393,110	0.310	0.299	0.609
2018	632,809	1	69	1,857	316,687	3,490	287,896	609,930	0.503	0.460	0.964
MA Total:	3,185,728	18	322	803,112	1,172,636	627,423	940,797	3,543,967	0.620	0.492	1.112

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.811	1.158	.
(14) Massachusetts Credibility:	0.350	0.560	.
(15) Countrywide Pure Premium:	0.871	0.588	1.459
(16) Countrywide Indicated Relativity:	1.159	1.389	.
(17) Countrywide Credibility:	0.330	0.220	.
(18) Countrywide Lost-Time Claims:	1240.0	.	.
(19) Pure Premium Underlying Present Rate:	0.656	0.467	1.123
(20) Relativity to Underlying Present Rate:	0.948	1.221	.
(21) Credibility to Underlying Relativity:	0.320	0.220	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	0.970	1.223	.
(24) Balanced Formula Relativity:	0.964	1.223	1.056

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services		
8002 AUTOMOBILE RENTAL CO: ALL OTHER EMP & COUNTER PERSONNEL, DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	98,640	1	26	2,704	35,214	125	125,838	163,881	0.384	1.277	1.661
2015	81,010	1	17	112,733	4,984	155,568	12,520	285,806	1.453	2.075	3.528
2016	73,750	0	15	0	45,873	0	70,636	116,509	0.622	0.958	1.580
2017	86,443	0	12	0	141,382	0	110,720	252,102	1.636	1.281	2.916
2018	93,373	0	10	0	10,299	0	13,054	23,353	0.110	0.140	0.250
MA Total:	433,216	2	80	115,437	237,752	155,693	332,769	841,651	0.815	1.128	1.943

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.066	2.651	.
(14) Massachusetts Credibility:	0.160	0.280	.
(15) Countrywide Pure Premium:	0.795	0.572	1.367
(16) Countrywide Indicated Relativity:	1.058	1.351	.
(17) Countrywide Credibility:	0.420	0.360	.
(18) Countrywide Lost-Time Claims:	1883.0	.	.
(19) Pure Premium Underlying Present Rate:	0.678	0.604	1.282
(20) Relativity to Underlying Present Rate:	0.979	1.581	.
(21) Credibility to Underlying Relativity:	0.420	0.360	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	1.026	1.798	.
(24) Balanced Formula Relativity:	1.020	1.799	1.298

Class(es):		Effective: 7/1/2022							Goods and Services		
8006 STORE: GROCERY STORES-RETAIL-NO HANDLING OF FRESH MEATS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	2,787,588	4	301	358,842	1,021,855	482,012	1,118,276	2,980,985	0.495	0.574	1.069
2015	3,015,638	9	269	417,856	1,093,957	410,306	1,031,913	2,954,033	0.501	0.478	0.980
2016	3,162,048	6	234	263,109	411,876	79,170	519,712	1,273,866	0.213	0.189	0.403
2017	3,370,263	10	274	585,261	801,258	144,181	940,381	2,471,081	0.411	0.322	0.733
2018	3,421,190	10	260	293,068	1,473,696	188,443	857,576	2,812,784	0.516	0.306	0.822
MA Total:	15,756,727	39	1,338	1,918,137	4,802,642	1,304,112	4,467,858	12,492,749	0.427	0.366	0.793

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.558	0.861	.
(14) Massachusetts Credibility:	0.600	0.930	.
(15) Countrywide Pure Premium:	0.825	0.476	1.301
(16) Countrywide Indicated Relativity:	1.097	1.125	.
(17) Countrywide Credibility:	0.200	0.040	.
(18) Countrywide Lost-Time Claims:	11630	.	.
(19) Pure Premium Underlying Present Rate:	0.488	0.339	0.826
(20) Relativity to Underlying Present Rate:	0.705	0.886	.
(21) Credibility to Underlying Relativity:	0.200	0.030	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	0.695	0.873	.
(24) Balanced Formula Relativity:	0.691	0.873	0.756

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services		
8008 STORE: CLOTHING, WEARING APPAREL OR DRY GOODS - RETAIL											
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	3,472,316	13	227	595,209	779,870	597,936	482,146	2,455,161	0.396	0.311	0.707
2015	3,408,450	5	210	92,813	627,614	133,618	440,255	1,294,301	0.211	0.168	0.380
2016	3,319,676	5	178	414,394	861,132	177,190	608,786	2,061,501	0.384	0.237	0.621
2017	3,277,596	5	174	233,265	738,837	185,569	348,157	1,505,827	0.297	0.163	0.459
2018	3,607,837	6	159	410,821	805,059	91,686	686,575	1,994,140	0.337	0.216	0.553
MA Total:	17,085,874	34	948	1,746,502	3,812,511	1,186,000	2,565,919	9,310,931	0.325	0.220	0.545

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.425	0.516	.
(14) Massachusetts Credibility:	0.520	0.750	.
(15) Countrywide Pure Premium:	0.454	0.289	0.743
(16) Countrywide Indicated Relativity:	0.604	0.683	.
(17) Countrywide Credibility:	0.240	0.130	.
(18) Countrywide Lost-Time Claims:	8663.0	.	.
(19) Pure Premium Underlying Present Rate:	0.314	0.180	0.494
(20) Relativity to Underlying Present Rate:	0.454	0.471	.
(21) Credibility to Underlying Relativity:	0.240	0.120	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	0.475	0.533	.
(24) Balanced Formula Relativity:	0.472	0.533	0.494

Class(es):		Effective: 7/1/2022							Goods and Services		
8010 STORE: HARDWARE											
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	1,944,579	7	176	1,400,214	921,830	502,177	661,925	3,486,147	1.194	0.599	1.793
2015	1,984,003	2	178	136,114	1,010,907	80,298	776,660	2,003,980	0.578	0.432	1.010
2016	1,986,255	8	180	765,292	877,001	413,024	883,235	2,938,551	0.827	0.653	1.479
2017	2,172,752	7	187	562,041	1,294,822	187,023	651,034	2,694,919	0.855	0.386	1.240
2018	2,177,222	3	142	223,725	1,084,179	40,035	677,184	2,025,123	0.601	0.329	0.930
MA Total:	10,264,811	27	863	3,087,387	5,188,739	1,222,557	3,650,038	13,148,720	0.806	0.475	1.281

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.054	1.116	.
(14) Massachusetts Credibility:	0.580	0.860	.
(15) Countrywide Pure Premium:	0.700	0.430	1.130
(16) Countrywide Indicated Relativity:	0.931	1.017	.
(17) Countrywide Credibility:	0.210	0.070	.
(18) Countrywide Lost-Time Claims:	5486.0	.	.
(19) Pure Premium Underlying Present Rate:	0.702	0.433	1.135
(20) Relativity to Underlying Present Rate:	1.014	1.133	.
(21) Credibility to Underlying Relativity:	0.210	0.070	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	1.020	1.110	.
(24) Balanced Formula Relativity:	1.013	1.111	1.048

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services		
8013 STORE: JEWELRY STORES											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	1,389,400	2	30	27,538	198,320	44,497	111,489	381,844	0.163	0.112	0.275
2015	1,429,703	0	9	0	830	0	5,323	6,154	0.001	0.004	0.004
2016	1,346,721	0	20	0	73,637	0	102,337	175,974	0.055	0.076	0.131
2017	1,380,473	2	17	299,660	17,079	623,843	60,935	1,001,517	0.229	0.496	0.725
2018	1,439,816	0	13	0	197,042	0	84,639	281,681	0.137	0.059	0.196
MA Total:	6,986,112	4	89	327,198	486,908	668,340	364,724	1,847,170	0.117	0.148	0.264

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.152	0.348	.
(14) Massachusetts Credibility:	0.260	0.410	.
(15) Countrywide Pure Premium:	0.190	0.086	0.276
(16) Countrywide Indicated Relativity:	0.252	0.204	.
(17) Countrywide Credibility:	0.370	0.300	.
(18) Countrywide Lost-Time Claims:	785.00	.	.
(19) Pure Premium Underlying Present Rate:	0.138	0.101	0.239
(20) Relativity to Underlying Present Rate:	0.200	0.264	.
(21) Credibility to Underlying Relativity:	0.370	0.290	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	0.207	0.280	.
(24) Balanced Formula Relativity:	0.206	0.280	0.232

Class(es):		Effective: 7/1/2022							Goods and Services		
8017 STORE: RETAIL NOC											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	13,397,505	35	1,128	1,984,827	3,127,085	1,129,620	2,709,615	8,951,147	0.382	0.287	0.668
2015	14,138,596	38	1,159	3,062,140	3,255,193	2,269,561	2,387,575	10,974,470	0.447	0.329	0.776
2016	11,568,547	16	784	1,222,655	3,270,667	481,965	2,565,753	7,541,040	0.388	0.263	0.652
2017	12,156,724	21	825	1,702,303	3,711,554	382,534	2,198,023	7,994,414	0.445	0.212	0.658
2018	14,674,715	33	1,079	2,492,724	5,478,791	899,523	4,401,254	13,272,292	0.543	0.361	0.904
MA Total:	65,936,086	143	4,975	10,464,648	18,843,292	5,163,204	14,262,219	48,733,363	0.444	0.295	0.739

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.581	0.693	.
(14) Massachusetts Credibility:	0.970	1.000	.
(15) Countrywide Pure Premium:	0.541	0.335	0.876
(16) Countrywide Indicated Relativity:	0.720	0.793	.
(17) Countrywide Credibility:	0.020	0.000	.
(18) Countrywide Lost-Time Claims:	28136	.	.
(19) Pure Premium Underlying Present Rate:	0.392	0.251	0.643
(20) Relativity to Underlying Present Rate:	0.566	0.656	.
(21) Credibility to Underlying Relativity:	0.010	0.000	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	0.584	0.693	.
(24) Balanced Formula Relativity:	0.580	0.693	0.621

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Calculation of Class Relativities

Class(es): 8018 STORE: WHOLESALE NOC		Effective: 7/1/2022							Goods and Services		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	3,353,450	16	673	1,870,809	4,231,751	521,425	2,420,663	9,044,648	1,820	0,877	2,697
2015	3,665,517	21	617	1,434,763	4,241,705	540,040	2,156,559	8,373,067	1,549	0,736	2,284
2016	3,935,244	23	710	2,937,942	5,542,037	894,942	3,075,108	12,450,029	2,155	1,009	3,164
2017	4,444,242	38	872	2,492,307	6,440,492	823,777	3,140,478	12,897,053	2,010	0,892	2,902
2018	4,689,366	49	691	3,209,944	5,784,497	871,652	2,589,510	12,455,603	1,918	0,738	2,656
MA Total:	20,087,819	147	3,563	11,945,765	26,240,482	3,651,836	13,382,317	55,220,400	1,901	0,848	2,749

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.485	1.994	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	1.233	0.621	1.854
(16) Countrywide Indicated Relativity:	1.641	1.468	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	26623	.	.
(19) Pure Premium Underlying Present Rate:	1.641	0.775	2.416
(20) Relativity to Underlying Present Rate:	2.371	2.027	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	2.485	1.994	.
(24) Balanced Formula Relativity:	2.470	1.995	2.300

Class(es): 8021 STORE: MEAT, FISH OR POULTRY DEALER- WHOLESALE		Effective: 7/1/2022							Goods and Services		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	909,778	8	125	355,070	987,755	66,912	467,635	1,877,371	1,476	0,588	2,064
2015	964,794	7	144	547,837	1,385,703	358,963	587,948	2,880,451	2,004	0,981	2,986
2016	1,084,915	8	157	724,713	2,506,181	160,774	736,946	4,128,615	2,978	0,827	3,805
2017	1,084,462	8	131	622,141	1,495,670	197,847	912,245	3,227,903	1,953	1,024	2,977
2018	1,184,565	7	144	331,545	1,397,737	208,011	688,582	2,625,875	1,460	0,757	2,217
MA Total:	5,228,515	38	701	2,581,306	7,773,045	992,507	3,393,356	14,740,214	1,980	0,839	2,819

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.589	1.972	.
(14) Massachusetts Credibility:	0.610	0.810	.
(15) Countrywide Pure Premium:	1.127	0.688	1.815
(16) Countrywide Indicated Relativity:	1.499	1.627	.
(17) Countrywide Credibility:	0.200	0.100	.
(18) Countrywide Lost-Time Claims:	2998.0	.	.
(19) Pure Premium Underlying Present Rate:	1.576	0.728	2.304
(20) Relativity to Underlying Present Rate:	2.276	1.905	.
(21) Credibility to Underlying Relativity:	0.190	0.090	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	2.312	1.932	.
(24) Balanced Formula Relativity:	2.297	1.933	2.167

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services		
8031 STORE: MEAT, FISH OR POULTRY - RETAIL											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	199,354	0	23	0	22,178	0	40,015	62,193	0.111	0.201	0.312
2015	206,367	1	16	298,024	28,373	72,936	42,171	441,505	1.582	0.558	2.139
2016	195,125	1	24	103,394	2,589	21,577	28,580	156,140	0.543	0.257	0.800
2017	218,153	0	17	0	6,006	0	16,413	22,419	0.028	0.075	0.103
2018	247,316	0	18	0	237,887	0	159,266	397,153	0.962	0.644	1.606
MA Total:	1,066,314	2	98	401,418	297,032	94,513	286,445	1,079,409	0.655	0.357	1.012

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.856	0.840	.
(14) Massachusetts Credibility:	0.240	0.350	.
(15) Countrywide Pure Premium:	0.873	0.531	1.404
(16) Countrywide Indicated Relativity:	1.161	1.255	.
(17) Countrywide Credibility:	0.380	0.330	.
(18) Countrywide Lost-Time Claims:	581.00	.	.
(19) Pure Premium Underlying Present Rate:	0.733	0.449	1.182
(20) Relativity to Underlying Present Rate:	1.059	1.176	.
(21) Credibility to Underlying Relativity:	0.380	0.320	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	1.049	1.085	.
(24) Balanced Formula Relativity:	1.043	1.085	1.058

Class(es):		Effective: 7/1/2022							Goods and Services		
8032 STORE: CLOTHING, WEARING APPAREL OR DRY GOODS - WHOLESALE											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	321,832	0	27	0	70,636	0	103,331	173,967	0.219	0.321	0.541
2015	255,498	0	29	0	14,544	0	38,543	53,087	0.057	0.151	0.208
2016	282,589	0	27	0	57,491	0	126,077	183,568	0.203	0.446	0.650
2017	283,334	1	15	85,222	32,989	8,445	80,777	207,432	0.417	0.315	0.732
2018	308,687	1	28	17,823	5,630	8,870	23,921	56,245	0.076	0.106	0.182
MA Total:	1,451,940	2	126	103,045	181,290	17,315	372,649	674,299	0.196	0.269	0.464

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.256	0.632	.
(14) Massachusetts Credibility:	0.240	0.340	.
(15) Countrywide Pure Premium:	0.897	0.500	1.396
(16) Countrywide Indicated Relativity:	1.193	1.182	.
(17) Countrywide Credibility:	0.380	0.330	.
(18) Countrywide Lost-Time Claims:	1379.0	.	.
(19) Pure Premium Underlying Present Rate:	0.525	0.303	0.828
(20) Relativity to Underlying Present Rate:	0.758	0.793	.
(21) Credibility to Underlying Relativity:	0.380	0.330	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	0.803	0.866	.
(24) Balanced Formula Relativity:	0.798	0.867	0.823

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services			
8033 STORE: MEAT, GROCERY & PROVISION COMBINED RETAIL-NOC												
Converted Unlimited Losses												
Amount												
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2014	893,772	2	122	85,924	875,306	40,111	329,386	1,330,727	1,075	0,413	1,489	
2015	878,415	3	113	191,603	287,503	27,832	233,795	740,732	0,545	0,298	0,843	
2016	748,645	3	67	133,943	286,366	27,361	218,093	685,763	0,561	0,328	0,889	
2017	795,289	1	58	38,252	326,254	14,294	176,604	555,404	0,458	0,240	0,698	
2018	845,270	2	62	53,575	320,196	22,579	204,440	600,790	0,442	0,269	0,711	
MA Total:	4,161,392	11	422	503,297	2,095,624	132,177	1,162,318	3,893,416	0,625	0,311	0,936	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.817	0.731	.
(14) Massachusetts Credibility:	0.400	0.550	.
(15) Countrywide Pure Premium:	0.783	0.480	1.263
(16) Countrywide Indicated Relativity:	1.042	1.135	.
(17) Countrywide Credibility:	0.300	0.230	.
(18) Countrywide Lost-Time Claims:	21505	.	.
(19) Pure Premium Underlying Present Rate:	0.686	0.349	1.035
(20) Relativity to Underlying Present Rate:	0.991	0.912	.
(21) Credibility to Underlying Relativity:	0.300	0.220	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	0.937	0.864	.
(24) Balanced Formula Relativity:	0.931	0.864	0.907

Class(es):		Effective: 7/1/2022							Goods and Services			
8034 STORE: GROCERY STORES - WHOLESALE												
Converted Unlimited Losses												
Amount												
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2014	648,976	5	97	333,325	777,859	31,111	400,164	1,542,459	1,712	0,665	2,377	
2015	535,081	8	61	795,804	757,867	187,288	372,970	2,113,929	2,904	1,047	3,951	
2016	355,404	1	45	88,881	256,488	9,098	209,325	563,793	0,972	0,615	1,586	
2017	443,606	0	70	0	498,311	0	168,303	666,615	1,123	0,379	1,503	
2018	368,301	0	33	0	653,017	0	123,773	776,790	1,773	0,336	2,109	
MA Total:	2,351,369	14	306	1,218,010	2,943,543	227,497	1,274,535	5,663,585	1,770	0,639	2,409	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.314	1.502	.
(14) Massachusetts Credibility:	0.430	0.550	.
(15) Countrywide Pure Premium:	1.519	0.510	2.029
(16) Countrywide Indicated Relativity:	2.021	1.206	.
(17) Countrywide Credibility:	0.290	0.230	.
(18) Countrywide Lost-Time Claims:	217.00	.	.
(19) Pure Premium Underlying Present Rate:	1.405	0.600	2.005
(20) Relativity to Underlying Present Rate:	2.030	1.569	.
(21) Credibility to Underlying Relativity:	0.280	0.220	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	2.149	1.449	.
(24) Balanced Formula Relativity:	2.136	1.449	1.891

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Calculation of Class Relativities

Class(es): 8039 STORE: DEPARTMENT - RETAIL		Effective: 7/1/2022							Goods and Services		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	612.113	2	80	108.122	158.046	52.587	193.183	511.939	0.435	0.402	0.836
2015	617.977	2	72	74.939	292.049	42.578	226.702	636.268	0.594	0.436	1.030
2016	3.688.344	19	447	1.373.337	1.124.534	342.654	968.615	3.809.141	0.677	0.356	1.033
2017	3.343.672	10	419	634.641	1.482.592	315.520	1.216.764	3.649.516	0.633	0.458	1.091
2018	190.376	2	16	397.051	22.483	125.597	69.571	614.701	2.204	1.025	3.229
MA Total:	8.452.481	35	1.034	2.588.090	3.079.704	878.935	2,674.835	9,221,564	0.671	0.420	1.091

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.877	0.989	.
(14) Massachusetts Credibility:	0.460	0.760	.
(15) Countrywide Pure Premium:	0.515	0.400	0.916
(16) Countrywide Indicated Relativity:	0.686	0.946	.
(17) Countrywide Credibility:	0.270	0.120	.
(18) Countrywide Lost-Time Claims:	4361.0	.	.
(19) Pure Premium Underlying Present Rate:	0.486	0.379	0.865
(20) Relativity to Underlying Present Rate:	0.703	0.992	.
(21) Credibility to Underlying Relativity:	0.270	0.120	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	0.778	0.984	.
(24) Balanced Formula Relativity:	0.773	0.984	0.849

Class(es): 8044 STORE: FURNITURE & DRIVERS		Effective: 7/1/2022							Goods and Services		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	846.396	9	103	513.673	576.958	189.486	438.211	1,718.328	1.289	0.742	2.030
2015	875.763	6	127	679.416	607.476	388.786	522.007	2,197.686	1.469	1.040	2.509
2016	818.434	5	115	638.082	1.152.672	146.456	442.335	2,379.544	2.188	0.719	2.907
2017	1.222.162	7	121	789.913	920.111	390.127	598.734	2,698.885	1.399	0.809	2.208
2018	1.436.137	3	160	378.130	801.371	101.922	728.192	2,009.615	0.821	0.578	1.399
MA Total:	5.198.892	30	626	2,999.214	4,058.588	1,216.777	2,729.479	11,004.058	1.358	0.759	2.117

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.775	1.785	.
(14) Massachusetts Credibility:	0.560	0.790	.
(15) Countrywide Pure Premium:	1.207	0.606	1.813
(16) Countrywide Indicated Relativity:	1.606	1.433	.
(17) Countrywide Credibility:	0.220	0.110	.
(18) Countrywide Lost-Time Claims:	7006.0	.	.
(19) Pure Premium Underlying Present Rate:	1.262	0.673	1.935
(20) Relativity to Underlying Present Rate:	1.823	1.761	.
(21) Credibility to Underlying Relativity:	0.220	0.100	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	1.748	1.744	.
(24) Balanced Formula Relativity:	1.737	1.745	1.740

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services		
8046 STORE: AUTOMOBILE ACCESSORIES-RETAIL-NOC & DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	312,083	3	33	246,182	275,963	124,963	151,781	798,889	1,673	0,887	2,560
2015	293,392	4	33	284,856	47,665	34,499	90,138	457,158	1,133	0,425	1,558
2016	309,996	2	29	273,042	14,586	387,925	39,328	714,880	0,928	1,378	2,306
2017	293,065	1	26	162,623	144,772	56,843	152,389	516,628	1,049	0,714	1,763
2018	355,155	2	29	118,153	255,959	115,742	201,349	691,203	1,053	0,893	1,946
MA Total:	1,563,690	12	150	1,084,857	738,945	719,971	634,986	3,178,758	1,166	0,867	2,033

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.525	2.038	.
(14) Massachusetts Credibility:	0.290	0.440	.
(15) Countrywide Pure Premium:	0.892	0.557	1.449
(16) Countrywide Indicated Relativity:	1.187	1.316	.
(17) Countrywide Credibility:	0.360	0.280	.
(18) Countrywide Lost-Time Claims:	6100.0	.	.
(19) Pure Premium Underlying Present Rate:	0.836	0.532	1.368
(20) Relativity to Underlying Present Rate:	1.208	1.391	.
(21) Credibility to Underlying Relativity:	0.350	0.280	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	1.292	1.655	.
(24) Balanced Formula Relativity:	1.284	1.656	1.417

Class(es):		Effective: 7/1/2022							Goods and Services		
8048 STORE: FRUIT OR VEGETABLE -WHOLESALE											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	362,325	2	48	53,547	42,652	39,554	43,226	178,979	0,266	0,228	0,494
2015	417,111	2	47	231,300	1,257,814	141,074	620,832	2,251,020	3,570	1,827	5,397
2016	478,144	2	54	343,097	250,397	110,879	178,395	882,767	1,241	0,605	1,846
2017	525,899	3	73	177,777	278,145	51,639	299,498	807,060	0,867	0,668	1,535
2018	540,838	1	72	71,377	651,552	13,034	326,688	1,062,652	1,337	0,628	1,965
MA Total:	2,324,317	10	294	877,097	2,480,561	356,180	1,468,639	5,182,477	1,445	0,785	2,230

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.889	1.846	.
(14) Massachusetts Credibility:	0.390	0.550	.
(15) Countrywide Pure Premium:	0.600	0.404	1.005
(16) Countrywide Indicated Relativity:	0.799	0.956	.
(17) Countrywide Credibility:	0.250	0.230	.
(18) Countrywide Lost-Time Claims:	37,000	.	.
(19) Pure Premium Underlying Present Rate:	1.160	0.605	1.764
(20) Relativity to Underlying Present Rate:	1.675	1.583	.
(21) Credibility to Underlying Relativity:	0.360	0.220	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	1.539	1.583	.
(24) Balanced Formula Relativity:	1.530	1.584	1.549

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services			
8058 BUILDING MATERIAL DEALER-NEW MATERIALS ONLY-STORE EMP												
Converted Unlimited Losses												
Amount												
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2014	311,996	4	52	195,177	75,128	132,101	100,909	503,313	0.866	0.747	1.613	
2015	311,612	0	38	0	60,295	0	154,583	214,878	0.193	0.496	0.690	
2016	299,558	1	35	43,154	557,755	19,228	430,786	1,050,923	2.006	1.502	3.508	
2017	330,077	1	46	50,381	286,365	48,583	240,803	626,131	1.020	0.877	1.897	
2018	374,175	1	31	195,373	83,082	100,858	109,419	488,733	0.744	0.562	1.306	
MA Total:	1,627,418	7	202	484,084	1,062,625	300,770	1,036,500	2,883,979	0.950	0.822	1.772	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.243	1.932	.
(14) Massachusetts Credibility:	0.300	0.490	.
(15) Countrywide Pure Premium:	0.952	0.699	1.651
(16) Countrywide Indicated Relativity:	1.266	1.652	.
(17) Countrywide Credibility:	0.350	0.260	.
(18) Countrywide Lost-Time Claims:	5340.0	.	.
(19) Pure Premium Underlying Present Rate:	0.858	0.666	1.523
(20) Relativity to Underlying Present Rate:	1.239	1.741	.
(21) Credibility to Underlying Relativity:	0.350	0.250	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	1.250	1.812	.
(24) Balanced Formula Relativity:	1.242	1.813	1.446

Class(es):		Effective: 7/1/2022							Goods and Services			
8103 WOOL MERCHANT												
Converted Unlimited Losses												
Amount												
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2014	0	0	0	0	0	0	0	0	0.000	0.000	0.000	
2015	991	0	0	0	0	0	0	0	0.000	0.000	0.000	
2016	1,075	0	0	0	0	0	0	0	0.000	0.000	0.000	
2017	1,660	0	0	0	0	0	0	0	0.000	0.000	0.000	
2018	2,268	0	0	0	0	0	0	0	0.000	0.000	0.000	
MA Total:	5,993	0	0	0	0	0	0	0	0.000	0.000	0.000	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.000	0.000	.
(14) Massachusetts Credibility:	0.040	0.050	.
(15) Countrywide Pure Premium:	1.539	1.115	2.654
(16) Countrywide Indicated Relativity:	2.048	2.635	.
(17) Countrywide Credibility:	0.270	0.290	.
(18) Countrywide Lost-Time Claims:	45.000	.	.
(19) Pure Premium Underlying Present Rate:	1.094	0.593	1.687
(20) Relativity to Underlying Present Rate:	1.581	1.551	.
(21) Credibility to Underlying Relativity:	0.690	0.660	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	1.644	1.788	.
(24) Balanced Formula Relativity:	1.634	1.789	1.689

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services		
8105 STORE: HIDE OR LEATHER DEALERS OR STORES											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	7.022	1	3	108.179	178.900	34.180	74.306	395.564	40.883	15.450	56.332
2015	7.057	0	1	0	113	0	208	322	0.016	0.029	0.046
2016	10.188	0	1	0	35.787	0	6.489	42.276	3.513	0.637	4.150
2017	10.092	1	1	292.908	84.886	46.310	8.601	432.704	37.436	5.441	42.877
2018	8.931	0	1	0	546	0	160	706	0.061	0.018	0.079
MA Total:	43,289	2	7	401,086	300,231	80,489	89,765	871,571	16.201	3.933	20.134

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	21.181	9.248	.
(14) Massachusetts Credibility:	0.170	0.210	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	11.787	7.689	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	8.233	2.964	11.197
(20) Relativity to Underlying Present Rate:	11.892	7.756	.
(21) Credibility to Underlying Relativity:	0.830	0.790	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	13.471	8.069	.
(24) Balanced Formula Relativity:	13.388	8.073	11.489

Class(es):		Effective: 7/1/2022							Goods and Services		
8106 IRON OR STEEL MERCHANT & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	168.963	3	44	655.424	171.425	148.282	132.548	1,107.679	4.894	1.662	6.556
2015	153.954	1	43	353.241	340.620	117.949	288.489	1,100.298	4.507	2.640	7.147
2016	162.483	0	42	0	293.980	0	183.224	477.204	1.809	1.128	2.937
2017	152.996	1	34	141.521	201.663	87.676	228.502	659.361	2.243	2.067	4.310
2018	170.213	1	31	22.989	98.606	8.306	91.508	221.409	0.714	0.586	1.301
MA Total:	808,609	6	194	1,173,175	1,106,293	362,213	924,271	3,565,951	2,819	1,591	4,410

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.686	3.741	.
(14) Massachusetts Credibility:	0.340	0.520	.
(15) Countrywide Pure Premium:	1.913	1.050	2.962
(16) Countrywide Indicated Relativity:	2.545	2.481	.
(17) Countrywide Credibility:	0.330	0.240	.
(18) Countrywide Lost-Time Claims:	2448.0	.	.
(19) Pure Premium Underlying Present Rate:	2.297	1.507	3.805
(20) Relativity to Underlying Present Rate:	3.319	3.944	.
(21) Credibility to Underlying Relativity:	0.330	0.240	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	3.188	3.487	.
(24) Balanced Formula Relativity:	3.168	3.489	3.283

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services		
8107 MACHINERY DEALER- NOC- STORE OR YARD & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	741.608	4	98	1,095.952	1,280.219	219.641	619.037	3,214.850	3.204	1.131	4.335
2015	830.069	1	114	216.860	868.950	19.811	731.128	1,836.749	1.308	0.905	2.213
2016	880.557	4	94	1,122.102	574.819	475.216	588.541	2,760.678	1.927	1.208	3.135
2017	954.873	1	74	40.637	498.138	85.694	421.786	1,046.255	0.564	0.531	1.096
2018	1,013.426	5	91	870.402	711.931	246.077	482.406	2,310.816	1.561	0.719	2.280
MA Total:	4,420,532	15	471	3,345,953	3,934,057	1,046,440	2,842,898	11,169,348	1.647	0.880	2.527

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.153	2.069	.
(14) Massachusetts Credibility:	0.510	0.750	.
(15) Countrywide Pure Premium:	1.238	0.592	1.830
(16) Countrywide Indicated Relativity:	1.647	1.400	.
(17) Countrywide Credibility:	0.250	0.130	.
(18) Countrywide Lost-Time Claims:	5451.0	.	.
(19) Pure Premium Underlying Present Rate:	1.184	0.696	1.880
(20) Relativity to Underlying Present Rate:	1.710	1.822	.
(21) Credibility to Underlying Relativity:	0.240	0.120	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	1.920	1.952	.
(24) Balanced Formula Relativity:	1.908	1.953	1.924

Class(es):		Effective: 7/1/2022							Goods and Services		
8111 PLUMBERS SUPPLIES DEALERS & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	739.162	6	110	327.454	636.778	149.441	446.009	1,559.683	1.304	0.806	2.110
2015	811.891	5	122	537.447	1,055.205	247.512	854.457	2,694.622	1.962	1.357	3.319
2016	835.578	5	110	548.047	477.879	436.043	401.352	1,863.321	1.228	1.002	2.230
2017	1,003.914	3	126	466.955	994.259	151.029	576.861	2,189.103	1.456	0.725	2.181
2018	1,001.355	6	129	504.124	534.878	158.593	510.036	1,707.631	1.038	0.668	1.705
MA Total:	4,391,900	25	597	2,384,027	3,699,000	1,142,618	2,788,714	10,014,359	1.385	0.895	2.280

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.811	2.105	.
(14) Massachusetts Credibility:	0.510	0.760	.
(15) Countrywide Pure Premium:	0.808	0.439	1.247
(16) Countrywide Indicated Relativity:	1.075	1.037	.
(17) Countrywide Credibility:	0.250	0.120	.
(18) Countrywide Lost-Time Claims:	1304.0	.	.
(19) Pure Premium Underlying Present Rate:	1.179	0.742	1.921
(20) Relativity to Underlying Present Rate:	1.703	1.941	.
(21) Credibility to Underlying Relativity:	0.240	0.120	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	1.601	1.957	.
(24) Balanced Formula Relativity:	1.591	1.958	1.722

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Calculation of Class Relativities

Class(es): 8203 ICE DEALER & DRIVERS		Effective: 7/1/2022							Goods and Services		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	39,245	0	13	0	283,090	0	202,802	485,893	7,213	5,168	12,381
2015	42,651	1	10	232,618	199,182	37,665	118,415	587,880	10,124	3,659	13,784
2016	45,974	0	5	0	3,760	0	7,718	11,478	0,082	0,168	0,250
2017	44,402	0	14	0	153,846	0	37,376	191,222	3,465	0,842	4,307
2018	45,955	1	5	8,683	16,824	17,811	15,946	59,264	0,555	0,735	1,290
MA Total:	218,228	2	47	241,301	656,702	55,475	382,258	1,335,736	4,115	2,006	6,121

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	5.380	4.717	.
(14) Massachusetts Credibility:	0.220	0.300	.
(15) Countrywide Pure Premium:	2.486	1.142	3.628
(16) Countrywide Indicated Relativity:	3.308	2.700	.
(17) Countrywide Credibility:	0.390	0.350	.
(18) Countrywide Lost-Time Claims:	384.00	.	.
(19) Pure Premium Underlying Present Rate:	2.778	1.421	4.199
(20) Relativity to Underlying Present Rate:	4.013	3.719	.
(21) Credibility to Underlying Relativity:	0.390	0.350	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	4.039	3.662	.
(24) Balanced Formula Relativity:	4.014	3.664	3.889

Class(es): 8204 BUILDING MATERIAL YARD & LOCAL MANAGERS, DRIVERS		Effective: 7/1/2022							Goods and Services		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	28,429	0	2	0	629	0	12,038	12,667	0,022	0,423	0,446
2015	56,005	5	8	958,847	60,921	583,083	61,168	1,664,018	18,209	11,504	29,712
2016	58,540	1	9	180,796	14,608	32,598	40,574	268,576	3,338	1,250	4,588
2017	63,555	1	7	21,985	14,536	13,908	8,251	58,681	0,575	0,349	0,923
2018	66,861	1	4	324,846	673	79,299	2,547	407,364	4,869	1,224	6,093
MA Total:	273,390	8	30	1,486,474	91,366	708,888	124,578	2,411,305	5,771	3,049	8,820

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	7.545	7.169	.
(14) Massachusetts Credibility:	0.230	0.370	.
(15) Countrywide Pure Premium:	2.229	0.961	3.190
(16) Countrywide Indicated Relativity:	2.966	2.272	.
(17) Countrywide Credibility:	0.390	0.320	.
(18) Countrywide Lost-Time Claims:	189.00	.	.
(19) Pure Premium Underlying Present Rate:	2.616	2.010	4.626
(20) Relativity to Underlying Present Rate:	3.779	5.259	.
(21) Credibility to Underlying Relativity:	0.380	0.310	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	4.328	5.010	.
(24) Balanced Formula Relativity:	4.302	5.012	4.555

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services		
8215 HAY, GRAIN OR FEED DEALER & LOCAL MANAGERS, DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	71,516	0	11	0	11,653	0	29,081	40,733	0.163	0.407	0.570
2015	77,051	0	6	0	41,172	0	77,669	118,840	0.534	1.008	1.542
2016	79,200	0	19	0	273,466	0	127,792	401,259	3.453	1.614	5.066
2017	75,007	0	5	0	40,398	0	42,007	82,405	0.539	0.560	1.099
2018	68,328	0	10	0	158,751	0	65,778	224,529	2.323	0.963	3.286
MA Total:	371,102	0	51	0	525,440	0	342,327	867,767	1.416	0.922	2.338

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.851	2.169	.
(14) Massachusetts Credibility:	0.210	0.310	.
(15) Countrywide Pure Premium:	1.411	0.783	2.194
(16) Countrywide Indicated Relativity:	1.878	1.851	.
(17) Countrywide Credibility:	0.400	0.350	.
(18) Countrywide Lost-Time Claims:	1739.0	.	.
(19) Pure Premium Underlying Present Rate:	1.516	0.917	2.433
(20) Relativity to Underlying Present Rate:	2.189	2.399	.
(21) Credibility to Underlying Relativity:	0.390	0.340	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	1.994	2.136	.
(24) Balanced Formula Relativity:	1.981	2.137	2.037

Class(es):		Effective: 7/1/2022							Construction		
8227 CONTRACTORS PERMANENT YARD											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	1,080,540	6	96	1,722,347	1,114,168	1,065,962	641,068	4,543,544	2,625	1,580	4,205
2015	1,213,527	9	75	1,399,867	1,028,414	769,385	449,881	3,647,547	2,001	1,005	3,006
2016	1,247,134	2	75	748,963	1,096,765	190,275	551,610	2,587,614	1,480	0.595	2,075
2017	1,319,605	6	91	1,391,250	3,811,628	780,462	2,472,286	8,455,625	3,943	2,465	6,408
2018	1,364,404	4	96	1,778,287	2,062,452	1,280,817	1,459,564	6,581,120	2,815	2,008	4,823
MA Total:	6,225,211	27	433	7,040,714	9,113,428	4,086,900	5,574,409	25,815,451	2,595	1,552	4,147

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.069	1.388	.
(14) Massachusetts Credibility:	0.740	1.000	.
(15) Countrywide Pure Premium:	1.650	0.786	2.436
(16) Countrywide Indicated Relativity:	0.690	0.722	.
(17) Countrywide Credibility:	0.130	0.000	.
(18) Countrywide Lost-Time Claims:	2850.0	.	.
(19) Pure Premium Underlying Present Rate:	2.087	1.068	3.155
(20) Relativity to Underlying Present Rate:	0.953	1.097	.
(21) Credibility to Underlying Relativity:	0.130	0.000	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	1.005	1.388	.
(24) Balanced Formula Relativity:	1.014	1.388	1.132

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services		
8232 LUMBER YARD-NEW MATERIALS ONLY: A/O EMP INCL YRD & WHSE & DR											
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums		
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	1,292,201	12	222	1,714,857	2,206,070	611,094	1,484,966	6,016,987	3,034	1,622	4,656
2015	1,352,846	18	233	2,614,696	1,300,010	1,363,031	1,009,744	6,287,481	2,894	1,754	4,648
2016	1,395,745	7	232	2,205,613	3,293,434	606,844	1,505,849	7,611,740	3,940	1,514	5,454
2017	1,527,191	7	237	826,680	2,111,841	558,607	1,501,912	4,999,040	1,924	1,349	3,273
2018	1,702,179	5	233	1,023,733	2,569,866	396,563	1,715,099	5,705,261	2,111	1,241	3,352
MA Total:	7,270,162	49	1,157	8,385,579	11,481,220	3,536,139	7,217,570	30,620,509	2,733	1,479	4,212

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.573	3.478	.
(14) Massachusetts Credibility:	0.840	1.000	.
(15) Countrywide Pure Premium:	2.121	1.054	3.175
(16) Countrywide Indicated Relativity:	2.822	2.493	.
(17) Countrywide Credibility:	0.080	0.000	.
(18) Countrywide Lost-Time Claims:	10496	.	.
(19) Pure Premium Underlying Present Rate:	2.530	1.366	3.896
(20) Relativity to Underlying Present Rate:	3.654	3.575	.
(21) Credibility to Underlying Relativity:	0.080	0.000	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	3.519	3.478	.
(24) Balanced Formula Relativity:	3.497	3.480	3.491

Class(es):		Effective: 7/1/2022							Goods and Services		
8233 COAL MERCHANT & LOCAL MANAGERS & DRIVERS											
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums		
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	275,466	1	19	559,625	367,408	45,136	140,358	1,112,527	3,365	0,673	4,039
2015	273,834	4	26	419,351	554,411	301,688	238,209	1,513,659	3,556	1,972	5,528
2016	276,760	3	23	263,105	122,943	593,251	88,139	1,067,438	1,395	2,462	3,857
2017	316,862	2	30	99,345	944,550	24,517	663,194	1,731,606	3,294	2,170	5,465
2018	363,388	1	28	11,820	741,614	5,135	448,848	1,207,417	2,073	1,249	3,323
MA Total:	1,506,309	11	126	1,353,244	2,730,927	969,727	1,578,748	6,632,646	2,711	1,692	4,403

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.545	3.978	.
(14) Massachusetts Credibility:	0.440	0.650	.
(15) Countrywide Pure Premium:	2.351	1.158	3.508
(16) Countrywide Indicated Relativity:	3.128	2.737	.
(17) Countrywide Credibility:	0.280	0.180	.
(18) Countrywide Lost-Time Claims:	1677.0	.	.
(19) Pure Premium Underlying Present Rate:	2.404	1.421	3.826
(20) Relativity to Underlying Present Rate:	3.473	3.719	.
(21) Credibility to Underlying Relativity:	0.280	0.170	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	3.408	3.711	.
(24) Balanced Formula Relativity:	3.387	3.713	3.503

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services		
8235 SASH, DOOR OR ASSEMBLED MILLWORK DEALER & DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	140,195	0	27	0	218,670	0	79,879	298,549	1,560	0,570	2,130
2015	115,249	0	29	0	113,295	0	168,707	282,003	0,983	1,464	2,447
2016	125,943	1	39	2,002	458,222	7,239	293,272	760,734	3,654	2,386	6,040
2017	130,561	0	14	0	277,131	0	179,478	456,610	2,123	1,375	3,497
2018	138,451	1	15	16,807	99,994	49,427	67,351	233,580	0,844	0,843	1,687
MA Total:	650,399	2	124	18,809	1,167,313	56,666	788,687	2,031,475	1,824	1,300	3,123

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.384	3.056	.
(14) Massachusetts Credibility:	0.280	0.390	.
(15) Countrywide Pure Premium:	1.975	0.994	2.969
(16) Countrywide Indicated Relativity:	2.628	2.350	.
(17) Countrywide Credibility:	0.360	0.310	.
(18) Countrywide Lost-Time Claims:	592.00	.	.
(19) Pure Premium Underlying Present Rate:	1.790	0.934	2.723
(20) Relativity to Underlying Present Rate:	2.585	2.443	.
(21) Credibility to Underlying Relativity:	0.360	0.300	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	2.544	2.653	.
(24) Balanced Formula Relativity:	2.529	2.655	2.574

Class(es):		Effective: 7/1/2022							Goods and Services		
8263 JUNK DEALERS & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	93,772	1	23	30,433	344,979	9,523	113,564	498,499	4,003	1,313	5,316
2015	94,041	0	25	0	236,985	0	90,951	327,936	2,520	0,967	3,487
2016	91,393	0	13	0	190,026	0	131,764	321,790	2,079	1,442	3,521
2017	88,879	1	14	18,340	111,375	1,587	122,418	253,720	1,459	1,395	2,855
2018	92,324	1	16	127,081	224,594	34,162	93,379	479,216	3,809	1,381	5,191
MA Total:	460,409	3	91	175,855	1,107,958	45,272	552,075	1,881,160	2,788	1,297	4,086

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.646	3.051	.
(14) Massachusetts Credibility:	0.250	0.370	.
(15) Countrywide Pure Premium:	2.860	1.577	4.436
(16) Countrywide Indicated Relativity:	3.805	3.727	.
(17) Countrywide Credibility:	0.380	0.320	.
(18) Countrywide Lost-Time Claims:	193.00	.	.
(19) Pure Premium Underlying Present Rate:	1.897	1.150	3.047
(20) Relativity to Underlying Present Rate:	2.741	3.008	.
(21) Credibility to Underlying Relativity:	0.370	0.310	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	3.371	3.254	.
(24) Balanced Formula Relativity:	3.350	3.256	3.317

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Calculation of Class Relativities

Class(es): 8264 BOTTLE DEALER-USED & DRIVERS		Effective: 7/1/2022							Goods and Services		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	271,367	4	45	348,952	205,385	195,914	202,250	952,501	2,043	1,467	3,510
2015	314,761	3	51	345,967	295,122	77,925	199,458	918,472	2,037	0,881	2,918
2016	344,271	3	66	560,718	503,632	274,525	334,120	1,672,994	3,092	1,768	4,860
2017	406,758	3	52	578,345	135,471	349,712	94,448	1,157,977	1,755	1,092	2,847
2018	417,139	2	67	334,009	1,367,939	150,755	715,627	2,568,330	4,080	2,077	6,157
MA Total:	1,754,297	15	281	2,167,991	2,507,549	1,048,831	1,545,904	7,270,275	2,665	1,479	4,144

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.484	3.478	.
(14) Massachusetts Credibility:	0.440	0.640	.
(15) Countrywide Pure Premium:	1.903	1.197	3.100
(16) Countrywide Indicated Relativity:	2.531	2.831	.
(17) Countrywide Credibility:	0.280	0.180	.
(18) Countrywide Lost-Time Claims:	1251.0	.	.
(19) Pure Premium Underlying Present Rate:	2.102	1.187	3.289
(20) Relativity to Underlying Present Rate:	3.036	3.107	.
(21) Credibility to Underlying Relativity:	0.280	0.180	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	3.092	3.295	.
(24) Balanced Formula Relativity:	3.073	3.296	3.153

Class(es): 8279 STABLE OR BREEDING FARM & DRIVERS		Effective: 7/1/2022							Goods and Services		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	170,754	1	14	80,726	75,114	18,660	115,695	290,195	0,913	0,787	1,699
2015	167,040	1	24	107,522	18,039	44,317	61,204	231,083	0,752	0,632	1,383
2016	178,452	1	27	61,168	111,316	7,945	239,545	419,973	0,967	1,387	2,353
2017	191,411	1	25	1,144	46,503	10,169	198,888	256,703	0,249	1,092	1,341
2018	198,464	0	24	0	358,944	0	157,657	516,602	1,809	0,794	2,603
MA Total:	906,122	4	114	250,560	609,916	81,090	772,990	1,714,556	0,950	0,943	1,892

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.242	2.216	.
(14) Massachusetts Credibility:	0.300	0.480	.
(15) Countrywide Pure Premium:	2.105	1.646	3.751
(16) Countrywide Indicated Relativity:	2.801	3.892	.
(17) Countrywide Credibility:	0.350	0.260	.
(18) Countrywide Lost-Time Claims:	939.00	.	.
(19) Pure Premium Underlying Present Rate:	1.572	1.132	2.704
(20) Relativity to Underlying Present Rate:	2.271	2.963	.
(21) Credibility to Underlying Relativity:	0.350	0.260	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	2.147	2.846	.
(24) Balanced Formula Relativity:	2.134	2.848	2.389

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Calculation of Class Relativities

Class(es): 8291 STORAGE WAREHOUSE-COLD		Effective: 7/1/2022							Goods and Services		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	156.632	0	27	0	26.556	0	63.500	90.056	0.170	0.405	0.575
2015	156.003	1	29	18.894	92.679	8.714	107.027	227.313	0.715	0.742	1.457
2016	157.651	2	28	254.444	404.218	63.560	216.904	939.126	4.178	1.779	5.957
2017	187.322	1	32	69.966	299.447	122.294	381.570	873.276	1.972	2.690	4.662
2018	204.486	1	20	19.589	91.637	24.511	80.000	215.737	0.544	0.511	1.055
MA Total:	862.094	5	136	362.892	914.535	219.078	849.001	2,345.506	1.482	1.239	2.721

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.937	2.913	.
(14) Massachusetts Credibility:	0.310	0.440	.
(15) Countrywide Pure Premium:	1.291	0.748	2.040
(16) Countrywide Indicated Relativity:	1.718	1.769	.
(17) Countrywide Credibility:	0.350	0.280	.
(18) Countrywide Lost-Time Claims:	1011.0	.	.
(19) Pure Premium Underlying Present Rate:	1.675	0.946	2.622
(20) Relativity to Underlying Present Rate:	2.420	2.476	.
(21) Credibility to Underlying Relativity:	0.340	0.280	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	2.025	2.470	.
(24) Balanced Formula Relativity:	2.012	2.472	2.176

Class(es): 8292 STORAGE WAREHOUSE NOC		Effective: 7/1/2022							Goods and Services		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	689.589	4	107	275.944	1,149.969	60.936	683.500	2,170.349	2.068	1.080	3.147
2015	768.405	7	106	300.266	1,129.654	84.328	429.170	1,943.417	1.861	0.668	2.529
2016	711.629	6	125	571.392	529.447	311.917	456.445	1,869.201	1.547	1.080	2.627
2017	766.331	7	153	480.894	898.529	188.278	466.131	2,033.832	1.800	0.854	2.654
2018	871.993	3	111	363.866	850.009	80.763	496.657	1,791.296	1.392	0.662	2.054
MA Total:	3,807.947	27	602	1,992.362	4,557.608	726.222	2,531.903	9,808.095	1.720	0.856	2.576

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.249	2.012	.
(14) Massachusetts Credibility:	0.540	0.770	.
(15) Countrywide Pure Premium:	1.549	0.813	2.362
(16) Countrywide Indicated Relativity:	2.061	1.921	.
(17) Countrywide Credibility:	0.230	0.120	.
(18) Countrywide Lost-Time Claims:	7287.0	.	.
(19) Pure Premium Underlying Present Rate:	1.556	0.862	2.419
(20) Relativity to Underlying Present Rate:	2.248	2.256	.
(21) Credibility to Underlying Relativity:	0.230	0.110	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	2.206	2.028	.
(24) Balanced Formula Relativity:	2.192	2.029	2.134

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services		
8293 STORAGE WAREHOUSE-FURNITURE & DRIVERS											
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	578,115	13	149	861,378	2,045,548	331,766	1,364,472	4,603,164	5,028	2,934	7,962
2015	594,044	15	121	2,034,436	1,178,133	751,594	617,327	4,581,490	5,408	2,304	7,712
2016	737,773	13	165	1,606,764	955,100	786,398	597,160	3,945,422	3,472	1,875	5,348
2017	761,834	12	144	1,239,534	979,470	524,044	1,000,818	3,743,866	2,913	2,002	4,914
2018	773,664	2	181	64,154	1,837,572	88,183	939,463	2,929,372	2,458	1,328	3,786
MA Total:	3,445,429	55	760	5,806,267	6,995,822	2,481,985	4,519,240	19,803,313	3,716	2,032	5,748

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	4.858	4.778	.
(14) Massachusetts Credibility:	0.720	1.000	.
(15) Countrywide Pure Premium:	3.942	1.966	5.907
(16) Countrywide Indicated Relativity:	5.244	4.647	.
(17) Countrywide Credibility:	0.140	0.000	.
(18) Countrywide Lost-Time Claims:	4230.0	.	.
(19) Pure Premium Underlying Present Rate:	3.539	1.918	5.457
(20) Relativity to Underlying Present Rate:	5.112	5.018	.
(21) Credibility to Underlying Relativity:	0.140	0.000	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	4.948	4.778	.
(24) Balanced Formula Relativity:	4.917	4.781	4.868

Class(es):		Effective: 7/1/2022							Goods and Services		
8350 GASOLINE OR OIL DEALER & DRIVERS											
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	1,605,704	20	273	1,772,834	3,096,248	726,722	1,708,770	7,304,574	3,032	1,517	4,549
2015	1,581,981	16	211	3,813,879	3,286,164	1,384,375	1,511,114	9,995,532	4,488	1,830	6,318
2016	1,603,213	14	203	3,079,183	2,231,523	794,155	1,479,909	7,584,770	3,313	1,418	4,731
2017	1,610,610	11	226	1,521,808	4,118,903	779,651	1,870,125	8,290,488	3,502	1,645	5,147
2018	1,528,148	12	170	1,541,143	4,094,655	430,472	1,746,786	7,813,055	3,688	1,425	5,113
MA Total:	7,929,655	73	1,083	11,728,847	16,827,493	4,115,374	8,316,704	40,988,419	3,601	1,568	5,169

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	4.708	3.687	.
(14) Massachusetts Credibility:	0.940	1.000	.
(15) Countrywide Pure Premium:	2.857	1.161	4.018
(16) Countrywide Indicated Relativity:	3.802	2.744	.
(17) Countrywide Credibility:	0.030	0.000	.
(18) Countrywide Lost-Time Claims:	3786.0	.	.
(19) Pure Premium Underlying Present Rate:	3.039	1.423	4.463
(20) Relativity to Underlying Present Rate:	4.390	3.724	.
(21) Credibility to Underlying Relativity:	0.030	0.000	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	4.671	3.687	.
(24) Balanced Formula Relativity:	4.643	3.689	4.302

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services		
8380 AUTOMOBILE SERVICE OR REPAIR CENTER & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	8,080,581	36	999	3,498,921	5,559,990	1,220,994	3,796,643	14,076,548	1,121	0,621	1,742
2015	8,509,752	46	1,000	5,282,772	6,866,767	2,010,569	3,753,651	17,913,759	1,428	0,677	2,105
2016	8,598,379	27	931	4,043,455	6,152,128	1,690,170	3,941,026	15,826,779	1,186	0,655	1,841
2017	8,853,121	29	908	2,746,330	8,029,304	1,622,828	4,053,975	16,452,437	1,217	0,641	1,858
2018	9,297,159	38	883	4,084,742	9,780,914	1,477,552	5,389,513	20,732,722	1,491	0,739	2,230
MA Total:	43,338,992	176	4,721	19,656,220	36,389,104	8,022,113	20,934,809	85,002,245	1,293	0,668	1,961

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.691	1.571	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	1.112	0.548	1.660
(16) Countrywide Indicated Relativity:	1.480	1.297	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	26124	.	.
(19) Pure Premium Underlying Present Rate:	1.177	0.604	1.782
(20) Relativity to Underlying Present Rate:	1.701	1.581	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	1.691	1.571	.
(24) Balanced Formula Relativity:	1.680	1.572	1.642

Class(es):		Effective: 7/1/2022							Goods and Services		
8381 GASOLINE STATION-RETAIL-SELF SERVICE											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	200,391	1	18	28,731	26,025	10,151	35,670	100,577	0,273	0,229	0,502
2015	179,806	1	6	3,241	111,485	195	88,487	203,408	0,638	0,493	1,131
2016	190,054	2	14	19,153	46,131	7,155	75,159	147,598	0,344	0,433	0,777
2017	169,424	1	8	48,481	109,261	19,345	51,040	228,127	0,931	0,415	1,346
2018	205,325	2	8	109,635	97,435	152,143	148,173	507,386	1,008	1,463	2,471
MA Total:	945,001	7	54	209,243	390,336	188,989	398,530	1,187,097	0,634	0,622	1,256

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.830	1.462	.
(14) Massachusetts Credibility:	0.230	0.350	.
(15) Countrywide Pure Premium:	0.751	0.396	1.148
(16) Countrywide Indicated Relativity:	1.000	0.937	.
(17) Countrywide Credibility:	0.390	0.330	.
(18) Countrywide Lost-Time Claims:	475.00	.	.
(19) Pure Premium Underlying Present Rate:	0.755	0.474	1.229
(20) Relativity to Underlying Present Rate:	1.090	1.241	.
(21) Credibility to Underlying Relativity:	0.380	0.320	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	0.995	1.218	.
(24) Balanced Formula Relativity:	0.989	1.218	1.071

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services		
8385 BUS CO: GARAGE EMPLOYEES											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	419,724	3	78	228,838	1,114,443	180,915	400,749	1,924,945	3,200	1,386	4,586
2015	446,275	5	44	837,628	276,223	214,786	114,018	1,442,655	2,496	0,737	3,233
2016	472,893	1	58	93,224	759,587	16,691	442,896	1,312,397	1,803	0,972	2,775
2017	515,950	5	103	836,527	1,027,708	225,280	556,643	2,646,158	3,613	1,516	5,129
2018	554,695	3	100	150,041	993,612	29,701	617,592	1,790,946	2,062	1,167	3,229
MA Total:	2,409,537	17	383	2,146,258	4,171,572	667,372	2,131,898	9,117,101	2,622	1,162	3,784

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.428	2.732	.
(14) Massachusetts Credibility:	0.430	0.600	.
(15) Countrywide Pure Premium:	1.090	0.507	1.597
(16) Countrywide Indicated Relativity:	1.450	1.199	.
(17) Countrywide Credibility:	0.290	0.200	.
(18) Countrywide Lost-Time Claims:	1354.0	.	.
(19) Pure Premium Underlying Present Rate:	1.384	0.728	2.112
(20) Relativity to Underlying Present Rate:	1.999	1.906	.
(21) Credibility to Underlying Relativity:	0.280	0.200	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	2.454	2.260	.
(24) Balanced Formula Relativity:	2.439	2.261	2.376

Class(es):		Effective: 7/1/2022							Goods and Services		
8392 AUTOMOBILE STORAGE GARAGE OR PARKING STATION & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	575,119	1	47	62,806	92,369	442,131	211,468	808,774	0,270	1,136	1,406
2015	611,938	3	46	274,982	55,575	57,691	106,666	494,916	0,540	0,269	0,809
2016	517,861	1	35	101,221	188,871	60,133	289,675	639,899	0,560	0,675	1,236
2017	452,944	2	46	319,739	280,449	28,141	198,970	827,300	1,325	0,501	1,826
2018	446,856	2	33	216,067	316,692	44,174	199,609	776,543	1,192	0,546	1,738
MA Total:	2,604,718	9	207	974,816	933,956	632,271	1,006,389	3,547,432	0,733	0,629	1,362

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.958	1.479	.
(14) Massachusetts Credibility:	0.310	0.490	.
(15) Countrywide Pure Premium:	0.812	0.536	1.348
(16) Countrywide Indicated Relativity:	1.080	1.266	.
(17) Countrywide Credibility:	0.350	0.260	.
(18) Countrywide Lost-Time Claims:	1382.0	.	.
(19) Pure Premium Underlying Present Rate:	0.593	0.419	1.012
(20) Relativity to Underlying Present Rate:	0.856	1.096	.
(21) Credibility to Underlying Relativity:	0.340	0.250	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	0.966	1.328	.
(24) Balanced Formula Relativity:	0.960	1.329	1.092

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Calculation of Class Relativities

Class(es): 8393 AUTOMOBILE BODY REPAIR		Effective: 7/1/2022							Goods and Services		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	2,193,528	7	175	670,400	676,524	76,930	529,402	1,953,256	0.614	0.276	0.890
2015	2,004,763	2	126	339,957	862,172	69,080	296,788	1,567,997	0.600	0.182	0.782
2016	2,020,089	4	113	160,200	769,705	86,771	569,011	1,585,687	0.460	0.325	0.785
2017	2,181,239	3	103	142,105	540,478	78,721	349,601	1,110,905	0.313	0.196	0.509
2018	2,251,211	4	100	829,395	1,110,731	198,147	526,267	2,664,540	0.862	0.322	1.184
MA Total:	10,650,829	20	617	2,142,056	3,959,610	509,649	2,271,069	8,882,386	0.573	0.261	0.834

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.749	0.614	.
(14) Massachusetts Credibility:	0.550	0.710	.
(15) Countrywide Pure Premium:	0.851	0.322	1.173
(16) Countrywide Indicated Relativity:	1.133	0.761	.
(17) Countrywide Credibility:	0.230	0.150	.
(18) Countrywide Lost-Time Claims:	2936.0	.	.
(19) Pure Premium Underlying Present Rate:	0.603	0.259	0.862
(20) Relativity to Underlying Present Rate:	0.871	0.679	.
(21) Credibility to Underlying Relativity:	0.220	0.140	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	0.864	0.645	.
(24) Balanced Formula Relativity:	0.859	0.645	0.782

Class(es): 8601 ARCHITECT OR ENGINEER-CONSULTING		Effective: 7/1/2022							Office and Clerical		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	14,257,801	8	160	438,514	923,339	112,570	560,929	2,035,352	0.096	0.047	0.143
2015	15,141,353	6	157	450,175	1,048,392	202,073	814,260	2,514,900	0.099	0.067	0.166
2016	15,296,734	6	157	734,384	1,633,178	178,078	898,803	3,444,442	0.155	0.070	0.225
2017	15,730,238	5	176	237,461	392,834	85,414	431,927	1,147,636	0.040	0.033	0.073
2018	16,653,816	2	129	438,494	505,211	114,821	648,245	1,706,771	0.057	0.046	0.102
MA Total:	77,079,941	27	779	2,299,028	4,502,953	692,956	3,354,164	10,849,101	0.088	0.053	0.141

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.361	1.351	.
(14) Massachusetts Credibility:	0.580	0.830	.
(15) Countrywide Pure Premium:	0.100	0.056	0.156
(16) Countrywide Indicated Relativity:	1.815	1.574	.
(17) Countrywide Credibility:	0.210	0.090	.
(18) Countrywide Lost-Time Claims:	2026.0	.	.
(19) Pure Premium Underlying Present Rate:	0.092	0.052	0.144
(20) Relativity to Underlying Present Rate:	1.567	1.439	.
(21) Credibility to Underlying Relativity:	0.210	0.080	.
(22) Industry Group Converted Pure Premium:	0.065	0.039	0.104
(23) Formula Relativity:	1.499	1.378	.
(24) Balanced Formula Relativity:	1.499	1.380	1.454

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services		
8710 FIELD BONDED WAREHOUSING - ALL EMP & CLERICAL											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	7,314	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	2,259	0	1	0	6,757	0	2,038	8,794	2,991	0.902	3,892
2016	1,000	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	1,453	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	3,181	0	1	0	0	0	1,210	1,210	0.000	0.380	0.380
MA Total:	15,208	0	2	0	6,757	0	3,248	10,004	0.444	0.214	0.658

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.581	0.502	.
(14) Massachusetts Credibility:	0.060	0.070	.
(15) Countrywide Pure Premium:	0.716	0.391	1.107
(16) Countrywide Indicated Relativity:	0.953	0.925	.
(17) Countrywide Credibility:	0.190	0.200	.
(18) Countrywide Lost-Time Claims:	18.000	.	.
(19) Pure Premium Underlying Present Rate:	1.514	0.634	2.149
(20) Relativity to Underlying Present Rate:	2.188	1.660	.
(21) Credibility to Underlying Relativity:	0.750	0.730	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	1.857	1.432	.
(24) Balanced Formula Relativity:	1.845	1.433	1.698

Class(es):		Effective: 7/1/2022							Goods and Services		
8720 INSPECTION OF RISKS FOR INSURANCE OR VALUATION PURPOSES NOC											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	1,789,738	2	42	102,304	118,536	7,374	142,391	370,604	0.123	0.084	0.207
2015	1,825,873	4	49	1,142,295	804,127	274,569	377,041	2,598,031	1.066	0.357	1.423
2016	1,811,281	2	44	215,850	212,611	35,692	208,702	672,855	0.237	0.135	0.371
2017	2,063,616	1	52	92,399	578,461	13,484	423,664	1,108,008	0.325	0.212	0.537
2018	2,068,704	2	52	86,401	285,462	57,228	401,530	830,622	0.180	0.222	0.402
MA Total:	9,559,212	11	239	1,639,249	1,999,197	388,346	1,553,327	5,580,120	0.381	0.203	0.584

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.498	0.478	.
(14) Massachusetts Credibility:	0.440	0.590	.
(15) Countrywide Pure Premium:	0.483	0.261	0.744
(16) Countrywide Indicated Relativity:	0.642	0.617	.
(17) Countrywide Credibility:	0.280	0.210	.
(18) Countrywide Lost-Time Claims:	1426.0	.	.
(19) Pure Premium Underlying Present Rate:	0.367	0.176	0.543
(20) Relativity to Underlying Present Rate:	0.530	0.462	.
(21) Credibility to Underlying Relativity:	0.280	0.200	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	0.547	0.504	.
(24) Balanced Formula Relativity:	0.544	0.504	0.530

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Office and Clerical		
8721 REAL ESTATE APPRAISAL CO - OUTSIDE EMPLOYEES											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	328,957	0	2	0	0	0	522	522	0.000	0.002	0.002
2015	284,195	0	1	0	0	0	42	42	0.000	0.000	0.000
2016	292,653	0	4	0	2,263	0	17,848	20,111	0.008	0.061	0.069
2017	325,926	0	0	0	0	0	0	0	0.000	0.000	0.000
2018	335,638	0	1	0	0	0	122	122	0.000	0.000	0.000
MA Total:	1,567,368	0	8	0	2,263	0	18,534	20,797	0.001	0.012	0.013

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.022	0.304	.
(14) Massachusetts Credibility:	0.130	0.200	.
(15) Countrywide Pure Premium:	0.072	0.044	0.115
(16) Countrywide Indicated Relativity:	1.301	1.216	.
(17) Countrywide Credibility:	0.360	0.380	.
(18) Countrywide Lost-Time Claims:	87.000	.	.
(19) Pure Premium Underlying Present Rate:	0.112	0.076	0.188
(20) Relativity to Underlying Present Rate:	1.910	2.115	.
(21) Credibility to Underlying Relativity:	0.510	0.420	.
(22) Industry Group Converted Pure Premium:	0.065	0.039	0.104
(23) Formula Relativity:	1.446	1.412	.
(24) Balanced Formula Relativity:	1.445	1.413	1.433

Class(es):		Effective: 7/1/2022							Office and Clerical		
8742 SALESPERSONS, COLLECTORS OR MESSENGERS-OUTSIDE											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	101,739,040	32	524	2,367,697	2,201,136	1,701,182	2,024,052	8,294,067	0.045	0.037	0.082
2015	107,244,305	19	570	1,152,732	3,809,389	815,958	2,967,450	8,745,529	0.046	0.035	0.082
2016	110,863,082	24	454	1,891,919	3,797,118	583,790	2,283,485	8,556,312	0.051	0.026	0.077
2017	115,944,896	18	531	1,268,285	1,837,576	1,020,188	2,345,005	6,471,054	0.027	0.029	0.056
2018	121,967,154	28	517	3,315,788	2,166,608	901,238	2,603,801	8,987,436	0.045	0.029	0.074
MA Total:	557,758,477	121	2,596	9,996,422	13,811,828	5,022,355	12,223,793	41,054,399	0.043	0.031	0.074

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.658	0.796	.
(14) Massachusetts Credibility:	0.940	1.000	.
(15) Countrywide Pure Premium:	0.093	0.053	0.146
(16) Countrywide Indicated Relativity:	1.686	1.492	.
(17) Countrywide Credibility:	0.030	0.000	.
(18) Countrywide Lost-Time Claims:	14660	.	.
(19) Pure Premium Underlying Present Rate:	0.044	0.029	0.073
(20) Relativity to Underlying Present Rate:	0.740	0.819	.
(21) Credibility to Underlying Relativity:	0.030	0.000	.
(22) Industry Group Converted Pure Premium:	0.065	0.039	0.104
(23) Formula Relativity:	0.691	0.796	.
(24) Balanced Formula Relativity:	0.691	0.797	0.731

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services			
8745 NEWS AGENT OR DISTRIB OF MAGAZINE-NOT RETAIL & SALES,DR												
Converted Unlimited Losses												
Amount												
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2014	124,555	4	21	300,984	93,722	491,799	132,960	1,019,465	3,169	5,016	8,185	
2015	129,116	1	30	11,686	825,232	703	290,119	1,127,740	6,482	2,252	8,734	
2016	113,391	1	15	46,827	102,328	7,154	41,074	197,383	1,315	0,425	1,741	
2017	81,736	0	12	0	798,913	0	126,684	925,597	9,774	1,550	11,324	
2018	61,447	1	14	134,378	152,453	21,566	230,087	538,484	4,668	4,095	8,763	
MA Total:	510,245	7	92	493,875	1,972,648	521,223	820,923	3,808,669	4,834	2,630	7,464	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	6.320	6.185	.
(14) Massachusetts Credibility:	0.280	0.460	.
(15) Countrywide Pure Premium:	1.315	0.719	2.034
(16) Countrywide Indicated Relativity:	1.749	1.699	.
(17) Countrywide Credibility:	0.360	0.270	.
(18) Countrywide Lost-Time Claims:	251.00	.	.
(19) Pure Premium Underlying Present Rate:	2.335	1.837	4.172
(20) Relativity to Underlying Present Rate:	3.373	4.807	.
(21) Credibility to Underlying Relativity:	0.360	0.270	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	3.614	4.602	.
(24) Balanced Formula Relativity:	3.591	4.604	3.953

Class(es):		Effective: 7/1/2022							Goods and Services			
8747 DISPLAY SHOWROOMS - ALL TYPES												
Converted Unlimited Losses												
Amount												
		Claim Count		Indemnity		Medical			MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2014	143,668	0	0	0	0	0	0	0	0.000	0.000	0.000	
2015	137,365	0	2	0	2,541	0	12,849	15,390	0.018	0.094	0.112	
2016	147,459	0	2	0	6,310	0	4,699	11,010	0.043	0.032	0.075	
2017	178,727	0	1	0	0	0	136	136	0.000	0.001	0.001	
2018	192,211	0	5	0	196,383	0	85,491	281,874	1.022	0.445	1.466	
MA Total:	799,429	0	10	0	205,234	0	103,175	308,409	0.257	0.129	0.386	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.336	0.303	.
(14) Massachusetts Credibility:	0.160	0.200	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	0.555	0.352	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	0.388	0.136	0.523
(20) Relativity to Underlying Present Rate:	0.560	0.355	.
(21) Credibility to Underlying Relativity:	0.840	0.800	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	0.524	0.345	.
(24) Balanced Formula Relativity:	0.521	0.345	0.458

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Calculation of Class Relativities

Class(es): 8748 AUTOMOBILE SALESPERSONS		Effective: 7/1/2022							Office and Clerical		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	3,099,126	10	93	1,323,295	739,557	308,870	571,799	2,943,522	0.666	0.284	0.950
2015	3,102,988	3	65	564,959	713,918	78,979	326,204	1,684,060	0.412	0.131	0.543
2016	3,131,553	1	61	95,597	576,769	35,989	312,795	1,021,150	0.215	0.111	0.326
2017	3,208,513	6	87	417,414	1,119,821	52,158	647,039	2,236,432	0.479	0.218	0.697
2018	3,315,375	6	61	640,485	584,163	206,068	274,677	1,705,392	0.369	0.145	0.514
MA Total:	15,857,554	26	367	3,041,751	3,734,228	682,064	2,132,514	9,590,557	0.427	0.177	0.605

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	6.589	4.568	.
(14) Massachusetts Credibility:	0.490	0.690	.
(15) Countrywide Pure Premium:	0.178	0.096	0.274
(16) Countrywide Indicated Relativity:	3.233	2.675	.
(17) Countrywide Credibility:	0.260	0.160	.
(18) Countrywide Lost-Time Claims:	1898.0	.	.
(19) Pure Premium Underlying Present Rate:	0.293	0.157	0.450
(20) Relativity to Underlying Present Rate:	4.977	4.389	.
(21) Credibility to Underlying Relativity:	0.250	0.150	.
(22) Industry Group Converted Pure Premium:	0.065	0.039	0.104
(23) Formula Relativity:	5.313	4.238	.
(24) Balanced Formula Relativity:	5.311	4.243	4.911

Class(es): 8800 MAILING OR ADDRESSING CO & CLERICAL		Effective: 7/1/2022							Office and Clerical		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	370,892	0	14	0	43,559	0	30,219	73,779	0.117	0.081	0.199
2015	404,358	2	15	138,366	35,494	18,396	44,322	236,579	0.430	0.155	0.585
2016	389,109	0	6	0	4,004	0	24,942	28,946	0.010	0.064	0.074
2017	344,130	0	14	0	255,634	0	111,645	367,279	0.743	0.324	1.067
2018	447,535	0	9	0	203,224	0	109,888	313,113	0.454	0.246	0.700
MA Total:	1,956,024	2	58	138,366	541,915	18,396	321,017	1,019,694	0.348	0.174	0.521

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	5.363	4.466	.
(14) Massachusetts Credibility:	0.250	0.350	.
(15) Countrywide Pure Premium:	0.501	0.321	0.821
(16) Countrywide Indicated Relativity:	9.093	8.960	.
(17) Countrywide Credibility:	0.380	0.330	.
(18) Countrywide Lost-Time Claims:	745.00	.	.
(19) Pure Premium Underlying Present Rate:	0.455	0.235	0.690
(20) Relativity to Underlying Present Rate:	7.734	6.550	.
(21) Credibility to Underlying Relativity:	0.370	0.320	.
(22) Industry Group Converted Pure Premium:	0.065	0.039	0.104
(23) Formula Relativity:	7.657	6.616	.
(24) Balanced Formula Relativity:	7.654	6.622	7.268

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Office and Clerical		
8803 AUDITORS, ACCOUNTANT OR FACTORY COST OR OFF SYSTEMZR-TRAV											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	30,897,285	4	46	877,625	298,511	395,171	233,935	1,805,244	0.038	0.020	0.058
2015	32,201,436	1	41	44,736	265,980	61,917	199,826	572,458	0.010	0.008	0.018
2016	30,800,724	0	48	0	388,536	0	382,218	770,754	0.013	0.012	0.025
2017	31,511,882	3	33	323,658	23,186	81,643	167,417	595,904	0.011	0.008	0.019
2018	36,513,306	5	63	1,254,398	362,194	372,069	348,753	2,337,414	0.044	0.020	0.064
MA Total:	161,924,633	13	231	2,500,417	1,338,408	910,800	1,332,148	6,081,774	0.024	0.014	0.038

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.366	0.357	.
(14) Massachusetts Credibility:	0.410	0.600	.
(15) Countrywide Pure Premium:	0.017	0.010	0.027
(16) Countrywide Indicated Relativity:	0.308	0.287	.
(17) Countrywide Credibility:	0.300	0.200	.
(18) Countrywide Lost-Time Claims:	843.00	.	.
(19) Pure Premium Underlying Present Rate:	0.018	0.011	0.030
(20) Relativity to Underlying Present Rate:	0.313	0.312	.
(21) Credibility to Underlying Relativity:	0.290	0.200	.
(22) Industry Group Converted Pure Premium:	0.065	0.039	0.104
(23) Formula Relativity:	0.333	0.334	.
(24) Balanced Formula Relativity:	0.333	0.334	0.333

Class(es):		Effective: 7/1/2022							Office and Clerical		
8810 CLERICAL OFFICE EMPLOYEES NOC											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	487,262,533	82	1,986	6,979,114	10,462,655	2,466,680	8,702,580	28,611,029	0.036	0.023	0.059
2015	529,753,955	78	1,722	7,652,060	7,610,591	3,093,598	6,824,488	25,180,736	0.029	0.019	0.048
2016	549,527,939	74	1,647	7,479,103	7,571,975	2,508,734	6,853,335	24,413,146	0.027	0.017	0.044
2017	581,527,732	71	1,825	6,280,372	10,703,587	2,338,579	8,823,989	28,146,527	0.029	0.019	0.048
2018	605,269,608	77	1,665	6,559,277	9,356,644	2,877,701	8,244,374	27,037,995	0.026	0.018	0.045
MA Total:	2,753,341,767	382	8,845	34,949,925	45,705,452	13,285,291	39,448,766	133,389,434	0.029	0.019	0.048

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.452	0.493	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	0.037	0.025	0.061
(16) Countrywide Indicated Relativity:	0.663	0.694	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	36120	.	.
(19) Pure Premium Underlying Present Rate:	0.027	0.018	0.045
(20) Relativity to Underlying Present Rate:	0.463	0.492	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.065	0.039	0.104
(23) Formula Relativity:	0.452	0.493	.
(24) Balanced Formula Relativity:	0.451	0.493	0.467

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Office and Clerical		
8820 ATTORNEY-ALL EMP & CLERICAL, MESSENGERS, DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	24,326,195	2	67	399,851	848,946	225,286	563,823	2,037,905	0.051	0.032	0.084
2015	24,386,482	6	65	611,726	224,033	236,506	412,792	1,485,057	0.034	0.027	0.061
2016	26,502,020	5	42	53,462	472,661	26,070	246,399	798,592	0.020	0.010	0.030
2017	27,648,035	5	55	26,575	672,139	39,449	218,770	956,933	0.025	0.009	0.035
2018	29,141,341	2	37	121,150	134,894	42,740	155,893	454,677	0.009	0.007	0.016
MA Total:	132,004,072	20	266	1,212,763	2,352,673	570,052	1,597,676	5,733,163	0.027	0.016	0.043

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.416	0.423	.
(14) Massachusetts Credibility:	0.480	0.690	.
(15) Countrywide Pure Premium:	0.035	0.022	0.057
(16) Countrywide Indicated Relativity:	0.641	0.613	.
(17) Countrywide Credibility:	0.260	0.160	.
(18) Countrywide Lost-Time Claims:	1441.0	.	.
(19) Pure Premium Underlying Present Rate:	0.033	0.019	0.052
(20) Relativity to Underlying Present Rate:	0.567	0.534	.
(21) Credibility to Underlying Relativity:	0.260	0.150	.
(22) Industry Group Converted Pure Premium:	0.065	0.039	0.104
(23) Formula Relativity:	0.514	0.470	.
(24) Balanced Formula Relativity:	0.514	0.470	0.497

Class(es):		Effective: 7/1/2022							Goods and Services		
8824 ASSISTED LIVING RESIDENCES: PERSONAL CARE EMPLOYEES											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	825,467	4	171	121,713	395,410	39,303	240,943	797,369	0.626	0.339	0.966
2015	907,845	2	216	93,967	911,045	85,573	619,769	1,710,355	1.107	0.777	1.884
2016	1,015,694	5	189	95,581	592,026	93,895	389,185	1,170,688	0.677	0.476	1.153
2017	1,313,722	6	280	385,132	700,325	183,619	602,009	1,871,086	0.826	0.598	1.424
2018	1,434,509	7	277	910,620	1,848,929	239,491	633,596	3,632,636	1.924	0.609	2.532
MA Total:	5,497,236	24	1,133	1,607,013	4,447,736	641,881	2,485,502	9,182,132	1.101	0.569	1.670

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.440	1.338	.
(14) Massachusetts Credibility:	0.470	0.690	.
(15) Countrywide Pure Premium:	1.143	0.708	1.851
(16) Countrywide Indicated Relativity:	1.521	1.674	.
(17) Countrywide Credibility:	0.270	0.160	.
(18) Countrywide Lost-Time Claims:	10720	.	.
(19) Pure Premium Underlying Present Rate:	0.779	0.465	1.243
(20) Relativity to Underlying Present Rate:	1.125	1.216	.
(21) Credibility to Underlying Relativity:	0.260	0.150	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	1.380	1.373	.
(24) Balanced Formula Relativity:	1.371	1.374	1.372

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services		
8826 ASSISTED LIVING RESIDENCES: ALL OTHER EMPLOYEES, SALESPERSONS &											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	825.117	3	136	267.528	182.441	68.150	173.956	692.076	0.545	0.293	0.839
2015	871.671	4	162	237.730	537.663	31.469	295.188	1,102.051	0.890	0.375	1.264
2016	986.402	3	146	318.061	268.951	160.815	240.868	988.696	0.595	0.407	1.002
2017	1,092.034	4	167	69.897	184.704	20.026	190.436	465.063	0.233	0.193	0.426
2018	1,190.679	2	196	252.651	1,141.779	95.257	534.520	2,024.208	1.171	0.529	1.700
MA Total:	4,965,903	16	807	1,145,868	2,315,539	375,718	1,434,969	5,272,093	0.697	0.365	1.062

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.911	0.857	.
(14) Massachusetts Credibility:	0.420	0.590	.
(15) Countrywide Pure Premium:	0.865	0.575	1.440
(16) Countrywide Indicated Relativity:	1.151	1.359	.
(17) Countrywide Credibility:	0.290	0.210	.
(18) Countrywide Lost-Time Claims:	3200.0	.	.
(19) Pure Premium Underlying Present Rate:	0.646	0.343	0.990
(20) Relativity to Underlying Present Rate:	0.934	0.899	.
(21) Credibility to Underlying Relativity:	0.290	0.200	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	0.987	0.971	.
(24) Balanced Formula Relativity:	0.981	0.971	0.978

Class(es):		Effective: 7/1/2022							Goods and Services		
8829 CONVALESCENT OR NURSING HOME-ALL EMPLOYEES											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	10,715.612	63	2,028	4,334.035	6,172.872	1,319.962	4,234.896	16,061.765	0.981	0.518	1.499
2015	9,520.491	41	1,676	2,937.895	6,437.335	1,256.469	3,767.162	14,398.861	0.985	0.528	1.512
2016	9,675.684	58	1,598	4,519.559	8,127.125	950.972	4,307.573	17,905.229	1.307	0.543	1.851
2017	10,382.503	34	1,518	4,532.032	7,639.673	2,046.557	4,405.116	18,623.377	1.172	0.621	1.794
2018	9,845.650	40	1,452	6,367.212	10,458.716	1,502.717	4,295.495	22,624.139	1.709	0.589	2.298
MA Total:	50,139,940	236	8,272	22,690,733	38,835,721	7,076,676	21,010,242	89,613,371	1.227	0.560	1.787

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.604	1.317	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	0.847	0.497	1.344
(16) Countrywide Indicated Relativity:	1.126	1.175	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	19465	.	.
(19) Pure Premium Underlying Present Rate:	1.000	0.470	1.471
(20) Relativity to Underlying Present Rate:	1.445	1.231	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	1.604	1.317	.
(24) Balanced Formula Relativity:	1.594	1.318	1.496

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Calculation of Class Relativities

Class(es): 8831 PET GROOMING & DRIVERS		Effective: 7/1/2022							Goods and Services		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	2,861,655	2	601	71,225	488,080	89,303	1,035,365	1,683,972	0.195	0.393	0.588
2015	3,125,595	13	629	922,133	287,264	292,285	1,063,858	2,565,540	0.387	0.434	0.821
2016	3,124,172	5	566	266,048	524,101	661,904	1,053,690	2,505,743	0.253	0.549	0.802
2017	3,717,012	9	708	332,630	878,528	181,344	1,236,681	2,629,183	0.326	0.381	0.707
2018	3,947,233	9	704	671,856	1,379,672	262,542	1,382,252	3,696,323	0.520	0.417	0.936
MA Total:	16,775,666	38	3,208	2,263,893	3,557,646	1,487,377	5,771,845	13,080,761	0.347	0.433	0.780

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.454	1.018	.
(14) Massachusetts Credibility:	0.520	0.970	.
(15) Countrywide Pure Premium:	0.387	0.361	0.748
(16) Countrywide Indicated Relativity:	0.515	0.855	.
(17) Countrywide Credibility:	0.240	0.020	.
(18) Countrywide Lost-Time Claims:	4862.0	.	.
(19) Pure Premium Underlying Present Rate:	0.322	0.357	0.678
(20) Relativity to Underlying Present Rate:	0.465	0.933	.
(21) Credibility to Underlying Relativity:	0.240	0.010	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	0.471	1.013	.
(24) Balanced Formula Relativity:	0.468	1.014	0.663

Class(es): 8832 PHYSICIAN & CLERICAL		Effective: 7/1/2022							Office and Clerical		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	54,379,947	33	1,191	3,217,162	2,968,527	1,189,100	2,456,562	9,831,352	0.114	0.067	0.181
2015	55,175,170	25	1,176	3,316,127	4,602,683	1,705,950	2,872,602	12,497,362	0.144	0.083	0.227
2016	56,765,637	35	1,292	4,001,452	6,095,748	1,262,043	3,284,871	14,644,114	0.178	0.080	0.258
2017	58,142,612	31	1,327	4,317,620	3,963,208	980,186	2,690,631	11,951,644	0.142	0.063	0.206
2018	60,819,768	26	1,214	2,290,378	4,782,261	885,149	3,265,348	11,223,136	0.116	0.068	0.185
MA Total:	285,283,135	150	6,200	17,142,739	22,412,426	6,022,429	14,570,015	60,147,608	0.139	0.072	0.211

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.138	1.858	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	0.089	0.053	0.142
(16) Countrywide Indicated Relativity:	1.618	1.468	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	13651	.	.
(19) Pure Premium Underlying Present Rate:	0.126	0.067	0.194
(20) Relativity to Underlying Present Rate:	2.148	1.878	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.065	0.039	0.104
(23) Formula Relativity:	2.138	1.858	.
(24) Balanced Formula Relativity:	2.137	1.860	2.033

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Office and Clerical		
8833 HOSPITAL: PROFESSIONAL EMPLOYEES											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	8,554,257	21	890	1,406,292	3,201,190	334,302	1,522,462	6,464,246	0.539	0.217	0.756
2015	8,862,942	16	826	1,457,243	2,765,165	340,405	1,754,319	6,317,131	0.476	0.236	0.713
2016	9,957,396	27	945	2,494,888	3,685,772	1,095,338	2,251,424	9,527,422	0.621	0.336	0.957
2017	10,814,357	19	860	2,148,417	3,251,388	602,356	1,688,084	7,690,246	0.499	0.212	0.711
2018	11,425,406	21	946	2,145,486	5,791,344	518,045	2,617,865	11,072,740	0.695	0.274	0.969
MA Total:	49,614,357	104	4,467	9,652,326	18,694,860	2,890,445	9,834,154	41,071,786	0.571	0.256	0.828

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	8.810	6.601	.
(14) Massachusetts Credibility:	0.980	1.000	.
(15) Countrywide Pure Premium:	0.264	0.160	0.425
(16) Countrywide Indicated Relativity:	4.802	4.481	.
(17) Countrywide Credibility:	0.010	0.000	.
(18) Countrywide Lost-Time Claims:	17741	.	.
(19) Pure Premium Underlying Present Rate:	0.532	0.237	0.769
(20) Relativity to Underlying Present Rate:	9.054	6.604	.
(21) Credibility to Underlying Relativity:	0.010	0.000	.
(22) Industry Group Converted Pure Premium:	0.065	0.039	0.104
(23) Formula Relativity:	8.772	6.601	.
(24) Balanced Formula Relativity:	8.768	6.607	7.959

Class(es):		Effective: 7/1/2022							Goods and Services		
8835 NURSING-HOME HEALTH, PUBLIC & TRAVELING-ALL EMPLOYEES											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	9,021,485	61	941	3,798,197	4,589,259	1,107,681	2,469,411	11,964,548	0.930	0.397	1.326
2015	10,618,857	58	965	4,165,663	5,878,170	1,719,397	3,158,477	14,921,706	0.946	0.459	1.405
2016	10,904,796	46	913	2,567,305	4,825,588	1,104,389	2,947,346	11,444,628	0.678	0.372	1.050
2017	10,401,774	46	849	4,497,183	6,430,250	1,007,777	2,810,641	14,745,851	1.051	0.367	1.418
2018	10,680,103	51	793	5,332,379	6,713,095	1,388,213	2,822,244	16,255,930	1.128	0.394	1.522
MA Total:	51,627,015	262	4,461	20,360,728	28,436,362	6,327,456	14,208,118	69,332,664	0.945	0.398	1.343

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.236	0.935	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	0.855	0.426	1.280
(16) Countrywide Indicated Relativity:	1.137	1.007	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	17131	.	.
(19) Pure Premium Underlying Present Rate:	0.882	0.368	1.251
(20) Relativity to Underlying Present Rate:	1.274	0.964	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	1.236	0.935	.
(24) Balanced Formula Relativity:	1.228	0.936	1.124

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Office and Clerical		
8868 COLLEGE: PROFESSIONAL EMPLOYEES & CLERICAL											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	39,541,748	98	3,233	5,396,097	6,433,979	2,060,634	6,105,948	19,996,658	0.299	0.207	0.506
2015	42,007,001	66	3,322	4,169,742	7,178,003	1,720,139	6,704,104	19,771,988	0.270	0.201	0.471
2016	43,567,105	72	3,333	6,450,892	7,239,869	2,629,460	6,627,194	22,947,414	0.314	0.212	0.527
2017	44,917,239	75	3,543	6,039,950	11,781,387	1,941,614	8,519,083	28,282,034	0.397	0.233	0.630
2018	46,162,760	99	3,976	8,343,093	10,358,368	2,391,570	7,872,647	28,965,678	0.405	0.222	0.627
MA Total:	216,195,853	410	17,407	30,399,774	42,991,606	10,743,417	35,828,975	119,963,772	0.339	0.215	0.555

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	5.234	5.544	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	0.093	0.081	0.174
(16) Countrywide Indicated Relativity:	1.685	2.260	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	17016	.	.
(19) Pure Premium Underlying Present Rate:	0.288	0.197	0.485
(20) Relativity to Underlying Present Rate:	4.901	5.478	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.065	0.039	0.104
(23) Formula Relativity:	5.234	5.544	.
(24) Balanced Formula Relativity:	5.232	5.550	5.351

Class(es):		Effective: 7/1/2022							Goods and Services		
9014 BUILDINGS - OPERATION BY CONTRACTORS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	6,088,993	27	450	2,912,039	2,974,848	1,098,555	1,519,170	8,504,613	0.967	0.430	1.397
2015	6,778,816	29	523	2,690,633	3,080,955	727,245	2,316,492	8,815,325	0.851	0.449	1.300
2016	7,053,485	36	587	2,144,879	4,399,843	619,737	2,930,372	10,094,831	0.928	0.503	1.431
2017	7,241,601	39	577	4,350,537	5,991,890	1,936,333	4,262,602	16,541,362	1.428	0.856	2.284
2018	7,660,956	28	568	2,004,151	4,776,349	889,521	2,698,322	10,368,342	0.885	0.468	1.353
MA Total:	34,823,851	159	2,705	14,102,239	21,223,886	5,271,391	13,726,957	54,324,473	1.014	0.546	1.560

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.326	1.283	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	1.236	0.667	1.903
(16) Countrywide Indicated Relativity:	1.645	1.577	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	18639	.	.
(19) Pure Premium Underlying Present Rate:	0.969	0.516	1.484
(20) Relativity to Underlying Present Rate:	1.399	1.349	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	1.326	1.283	.
(24) Balanced Formula Relativity:	1.318	1.284	1.306

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services		
9015 BUILDINGS-OPERATION BY OWNER OR LESSEE											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	5,881,366	44	821	5,683,433	4,603,755	2,507,326	3,232,296	16,026,810	1,749	0,976	2,725
2015	6,102,605	25	774	3,379,025	6,001,459	1,273,743	4,071,935	14,726,162	1,537	0,876	2,413
2016	6,406,483	36	663	4,028,368	4,376,091	839,884	2,765,982	12,010,326	1,312	0,563	1,875
2017	6,571,125	37	721	4,999,747	6,698,319	1,963,174	3,511,411	17,172,651	1,780	0,833	2,613
2018	6,619,640	26	714	2,343,880	4,772,988	1,105,359	3,346,617	11,568,844	1,075	0,673	1,748
MA Total:	31,581,220	168	3,693	20,434,452	26,452,612	7,689,487	16,928,241	71,504,792	1,485	0,780	2,264

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.941	1.833	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	1.315	0.670	1.985
(16) Countrywide Indicated Relativity:	1.749	1.584	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	14803	.	.
(19) Pure Premium Underlying Present Rate:	1.356	0.705	2.061
(20) Relativity to Underlying Present Rate:	1.959	1.844	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	1.941	1.833	.
(24) Balanced Formula Relativity:	1.929	1.834	1.895

Class(es):		Effective: 7/1/2022							Goods and Services		
9016 AMUSEMENT PARK OR EXHIBITION OPERATION & DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	610,525	0	97	0	256,492	0	404,544	661,035	0.420	0.663	1.083
2015	630,054	2	88	41,296	357,210	5,721	578,590	982,816	0.632	0.927	1.560
2016	689,510	1	81	17,192	281,714	7,383	271,070	577,360	0.434	0.404	0.837
2017	770,838	1	94	71,667	146,573	7,903	239,540	465,683	0.283	0.321	0.604
2018	795,942	2	87	37,134	434,862	20,769	509,985	1,002,750	0.593	0.667	1.260
MA Total:	3,496,868	6	447	167,289	1,476,850	41,775	2,003,729	3,689,643	0,470	0,585	1,055

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.615	1.376	.
(14) Massachusetts Credibility:	0.380	0.600	.
(15) Countrywide Pure Premium:	0.935	0.679	1.613
(16) Countrywide Indicated Relativity:	1.244	1.604	.
(17) Countrywide Credibility:	0.310	0.200	.
(18) Countrywide Lost-Time Claims:	1869.0	.	.
(19) Pure Premium Underlying Present Rate:	0.704	0.516	1.220
(20) Relativity to Underlying Present Rate:	1.017	1.351	.
(21) Credibility to Underlying Relativity:	0.310	0.200	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	0.934	1.416	.
(24) Balanced Formula Relativity:	0.929	1.417	1.103

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Calculation of Class Relativities

Class(es): 9019 BRIDGE OR VEHICULAR TUNNEL OPERATION & DRIVERS									Effective: 7/1/2022			Miscellaneous		
Converted Unlimited Losses														
Amount														
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)			
2014	28,412	0	0	0	0	0	0	0	0.000	0.000	0.000			
2015	32,438	0	0	0	0	0	0	0	0.000	0.000	0.000			
2016	34,723	0	0	0	0	0	0	0	0.000	0.000	0.000			
2017	31,783	0	0	0	0	0	0	0	0.000	0.000	0.000			
2018	31,703	0	1	0	33,648	0	5,953	39,601	1.061	0.188	1.249			
MA Total:	159,059	0	1	0	33,648	0	5,953	39,601	0.212	0.037	0.249			

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.095	0.033	.
(14) Massachusetts Credibility:	0.160	0.190	.
(15) Countrywide Pure Premium:	1.134	0.922	2.056
(16) Countrywide Indicated Relativity:	0.534	0.855	.
(17) Countrywide Credibility:	0.340	0.350	.
(18) Countrywide Lost-Time Claims:	75.000	.	.
(19) Pure Premium Underlying Present Rate:	1.705	0.675	2.380
(20) Relativity to Underlying Present Rate:	0.840	0.658	.
(21) Credibility to Underlying Relativity:	0.500	0.460	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	0.617	0.608	.
(24) Balanced Formula Relativity:	0.615	0.612	0.614

Class(es): 9033 HOUSING AUTHORITY & CLERICAL, SALES, DRIVERS									Effective: 7/1/2022			Goods and Services		
Converted Unlimited Losses														
Amount														
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)			
2014	217,562	0	35	0	29,625	0	61,846	91,471	0.136	0.284	0.420			
2015	217,398	2	25	296,431	444,762	67,124	145,748	954,065	3.409	0.979	4.389			
2016	230,630	0	17	0	114,062	0	68,537	182,599	0.495	0.297	0.792			
2017	225,817	1	19	117,820	373,552	7,933	159,129	658,434	2.176	0.740	2.916			
2018	229,189	1	29	27,463	406,084	3,159	200,235	636,941	1.892	0.887	2.779			
MA Total:	1,120,596	4	125	441,714	1,368,085	78,217	635,494	2,523,510	1.615	0.637	2.252			

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.111	1.498	.
(14) Massachusetts Credibility:	0.290	0.390	.
(15) Countrywide Pure Premium:	0.915	0.445	1.360
(16) Countrywide Indicated Relativity:	1.217	1.052	.
(17) Countrywide Credibility:	0.360	0.310	.
(18) Countrywide Lost-Time Claims:	694.00	.	.
(19) Pure Premium Underlying Present Rate:	1.156	0.553	1.709
(20) Relativity to Underlying Present Rate:	1.670	1.447	.
(21) Credibility to Underlying Relativity:	0.350	0.300	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	1.635	1.345	.
(24) Balanced Formula Relativity:	1.625	1.345	1.525

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services		
9040 HOSPITAL: ALL OTHER EMPLOYEES											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	673.405	5	172	598.992	280.723	242.323	305.199	1.427.238	1.306	0.813	2.119
2015	756.686	4	234	332.621	460.973	172.795	338.458	1.304.847	1.049	0.676	1.724
2016	758.763	2	175	570.319	721.188	217.259	411.236	1.920.002	1.702	0.828	2.530
2017	788.233	5	147	836.700	605.977	493.382	358.910	2.294.969	1.830	1.081	2.912
2018	843.714	6	164	491.324	1.701.578	127.815	605.841	2.926.557	2.599	0.870	3.469
MA Total:	3,820,802	22	892	2,829,955	3,770,440	1,253,574	2,019,644	9,873,613	1.727	0.857	2.584

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.258	2.014	.
(14) Massachusetts Credibility:	0.490	0.720	.
(15) Countrywide Pure Premium:	1.244	0.769	2.014
(16) Countrywide Indicated Relativity:	1.656	1.819	.
(17) Countrywide Credibility:	0.260	0.140	.
(18) Countrywide Lost-Time Claims:	6028.0	.	.
(19) Pure Premium Underlying Present Rate:	1.208	0.748	1.957
(20) Relativity to Underlying Present Rate:	1.746	1.957	.
(21) Credibility to Underlying Relativity:	0.250	0.140	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	1.974	1.979	.
(24) Balanced Formula Relativity:	1.961	1.980	1.968

Class(es):		Effective: 7/1/2022							Goods and Services		
9052 HOTEL: ALL OTHER EMPLOYEES & SALES, DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	6.297.026	26	646	1.202.176	3.143.378	386.310	1.910.079	6.641.942	0.690	0.365	1.055
2015	6.707.467	25	690	2.050.456	3.200.217	572.439	1.923.545	7.746.656	0.783	0.372	1.155
2016	6.905.740	27	628	1.686.476	3.279.328	584.274	1.772.094	7.322.172	0.719	0.341	1.060
2017	7.358.609	24	636	1.552.930	3.918.597	420.053	2.474.812	8.366.392	0.744	0.393	1.137
2018	7.451.123	28	681	2.108.654	3.164.511	662.360	2.441.949	8.377.474	0.708	0.417	1.124
MA Total:	34.719.965	130	3.281	8,600.692	16,706.030	2,625.436	10,522.479	38,454.636	0.729	0.379	1.108

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.953	0.890	.
(14) Massachusetts Credibility:	0.940	1.000	.
(15) Countrywide Pure Premium:	0.817	0.478	1.295
(16) Countrywide Indicated Relativity:	1.087	1.129	.
(17) Countrywide Credibility:	0.030	0.000	.
(18) Countrywide Lost-Time Claims:	18512	.	.
(19) Pure Premium Underlying Present Rate:	0.688	0.329	1.016
(20) Relativity to Underlying Present Rate:	0.993	0.860	.
(21) Credibility to Underlying Relativity:	0.030	0.000	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	0.958	0.890	.
(24) Balanced Formula Relativity:	0.952	0.891	0.930

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services		
9058 HOTEL: RESTAURANT EMPLOYEES											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	2,503,962	5	358	516,866	1,393,645	93,832	912,831	2,917,174	0.763	0.402	1.165
2015	2,550,024	9	362	408,833	1,529,130	129,898	725,241	2,793,103	0.760	0.335	1.095
2016	2,278,621	5	292	250,393	819,122	71,791	591,345	1,732,651	0.469	0.291	0.760
2017	2,290,950	14	347	1,058,455	1,293,811	208,146	1,027,753	3,588,165	1.027	0.539	1.566
2018	1,979,010	7	270	463,819	1,283,873	273,919	726,524	2,748,135	0.883	0.506	1.389
MA Total:	11,602,567	40	1,629	2,698,367	6,319,581	777,586	3,983,693	13,779,227	0.777	0.410	1.188

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.016	0.965	.
(14) Massachusetts Credibility:	0.580	0.830	.
(15) Countrywide Pure Premium:	0.551	0.347	0.899
(16) Countrywide Indicated Relativity:	0.733	0.821	.
(17) Countrywide Credibility:	0.210	0.090	.
(18) Countrywide Lost-Time Claims:	6539.0	.	.
(19) Pure Premium Underlying Present Rate:	0.616	0.343	0.960
(20) Relativity to Underlying Present Rate:	0.890	0.899	.
(21) Credibility to Underlying Relativity:	0.210	0.080	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	0.930	0.947	.
(24) Balanced Formula Relativity:	0.925	0.947	0.933

Class(es):		Effective: 7/1/2022							Goods and Services		
9060 CLUB-COUNTRY, GOLF, FISHING OR YACHT & CLERICAL											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	3,120,144	3	303	256,384	830,806	382,533	685,264	2,154,987	0.348	0.342	0.691
2015	3,281,438	5	281	383,240	820,391	271,721	951,054	2,426,405	0.367	0.373	0.739
2016	3,464,708	5	284	344,028	921,883	218,128	814,297	2,298,336	0.365	0.298	0.663
2017	3,622,771	4	295	229,744	1,184,002	230,382	1,133,731	2,777,859	0.390	0.377	0.767
2018	3,642,446	7	264	342,865	927,295	174,265	1,015,507	2,459,932	0.349	0.327	0.675
MA Total:	17,131,508	24	1,427	1,556,261	4,684,377	1,277,028	4,599,853	12,117,519	0.364	0.343	0.707

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.476	0.807	.
(14) Massachusetts Credibility:	0.550	0.930	.
(15) Countrywide Pure Premium:	0.555	0.381	0.936
(16) Countrywide Indicated Relativity:	0.738	0.901	.
(17) Countrywide Credibility:	0.230	0.040	.
(18) Countrywide Lost-Time Claims:	4789.0	.	.
(19) Pure Premium Underlying Present Rate:	0.372	0.313	0.684
(20) Relativity to Underlying Present Rate:	0.537	0.818	.
(21) Credibility to Underlying Relativity:	0.220	0.030	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	0.550	0.811	.
(24) Balanced Formula Relativity:	0.546	0.811	0.641

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services		
9061 CLUB NOC & CLERICAL											
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	744,555	0	48	0	499,711	0	626,015	1,125,726	0.671	0.841	1.512
2015	735,005	1	27	334,180	14,592	22,368	36,332	407,472	0.475	0.080	0.554
2016	734,364	2	23	169,831	158,217	43,521	181,824	553,394	0.447	0.307	0.754
2017	723,497	1	29	162	22,077	49	78,864	101,152	0.031	0.109	0.140
2018	725,086	2	21	258,477	180,166	103,396	154,297	696,336	0.605	0.355	0.960
MA Total:	3,662,507	6	148	762,649	874,762	169,335	1,077,332	2,884,079	0.447	0.340	0.787

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.584	0.800	.
(14) Massachusetts Credibility:	0.300	0.470	.
(15) Countrywide Pure Premium:	0.484	0.282	0.766
(16) Countrywide Indicated Relativity:	0.644	0.667	.
(17) Countrywide Credibility:	0.350	0.270	.
(18) Countrywide Lost-Time Claims:	610.00	.	.
(19) Pure Premium Underlying Present Rate:	0.391	0.261	0.652
(20) Relativity to Underlying Present Rate:	0.565	0.682	.
(21) Credibility to Underlying Relativity:	0.350	0.260	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	0.599	0.734	.
(24) Balanced Formula Relativity:	0.595	0.734	0.645

Class(es):		Effective: 7/1/2022							Goods and Services		
9063 YMCA, YWCA, YMHA OR YWHA, INSTITUTION-ALL EMPLOYEES & CLERICAL											
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	5,701,462	8	329	586,472	901,549	250,411	889,413	2,627,845	0.261	0.200	0.461
2015	6,258,640	4	383	88,010	449,884	90,202	1,059,549	1,687,645	0.086	0.184	0.270
2016	6,803,730	6	395	194,648	1,295,673	140,043	1,392,088	3,022,451	0.219	0.225	0.444
2017	6,957,125	7	358	367,482	1,301,342	157,118	1,329,646	3,155,588	0.240	0.214	0.454
2018	7,440,843	8	351	365,161	2,016,818	210,096	1,495,894	4,087,969	0.320	0.229	0.549
MA Total:	33,161,802	33	1,816	1,601,773	5,965,265	847,870	6,166,590	14,581,498	0.228	0.212	0.440

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.298	0.497	.
(14) Massachusetts Credibility:	0.580	0.990	.
(15) Countrywide Pure Premium:	0.305	0.237	0.541
(16) Countrywide Indicated Relativity:	0.405	0.559	.
(17) Countrywide Credibility:	0.210	0.010	.
(18) Countrywide Lost-Time Claims:	3787.0	.	.
(19) Pure Premium Underlying Present Rate:	0.214	0.190	0.404
(20) Relativity to Underlying Present Rate:	0.309	0.498	.
(21) Credibility to Underlying Relativity:	0.210	0.000	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	0.323	0.498	.
(24) Balanced Formula Relativity:	0.321	0.498	0.384

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Calculation of Class Relativities

Class(es): 9079 RESTAURANT NOC		Effective: 7/1/2022							Goods and Services		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	26,296,106	81	3,114	4,964,281	7,960,004	2,106,392	6,285,584	21,316,262	0.491	0.319	0.811
2015	28,404,042	76	3,079	5,454,821	8,742,464	2,506,999	6,809,273	23,513,557	0.500	0.328	0.828
2016	29,850,166	56	2,865	3,867,762	8,827,090	1,232,491	7,555,340	21,482,683	0.425	0.294	0.720
2017	31,232,219	62	2,826	3,651,359	10,293,004	1,357,397	7,689,740	22,991,500	0.446	0.290	0.736
2018	33,737,543	46	2,708	3,001,152	10,754,242	1,225,540	7,822,351	22,803,284	0.408	0.268	0.676
MA Total:	149,520,077	321	14,592	20,939,375	46,576,805	8,428,819	36,162,289	112,107,287	0.452	0.298	0.750

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.590	0.701	.
(14) Massachusetts Credibility:	1.000	1.000	.
(15) Countrywide Pure Premium:	0.418	0.303	0.721
(16) Countrywide Indicated Relativity:	0.556	0.717	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	3423.0	.	.
(19) Pure Premium Underlying Present Rate:	0.421	0.278	0.700
(20) Relativity to Underlying Present Rate:	0.608	0.729	.
(21) Credibility to Underlying Relativity:	0.000	0.000	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	0.590	0.701	.
(24) Balanced Formula Relativity:	0.587	0.702	0.628

Class(es): 9089 BILLIARD HALL		Effective: 7/1/2022							Goods and Services		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	3,744	0	0	0	0	0	0	0	0.000	0.000	0.000
2015	5,885	0	0	0	0	0	0	0	0.000	0.000	0.000
2016	3,488	0	0	0	0	0	0	0	0.000	0.000	0.000
2017	6,717	0	1	0	173	0	373	546	0.026	0.056	0.081
2018	8,984	0	0	0	0	0	0	0	0.000	0.000	0.000
MA Total:	28,817	0	1	0	173	0	373	546	0.006	0.013	0.019

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.008	0.030	.
(14) Massachusetts Credibility:	0.040	0.060	.
(15) Countrywide Pure Premium:	0.116	0.075	0.192
(16) Countrywide Indicated Relativity:	0.155	0.178	.
(17) Countrywide Credibility:	0.130	0.140	.
(18) Countrywide Lost-Time Claims:	7.000	.	.
(19) Pure Premium Underlying Present Rate:	0.329	0.231	0.560
(20) Relativity to Underlying Present Rate:	0.475	0.605	.
(21) Credibility to Underlying Relativity:	0.830	0.800	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	0.415	0.511	.
(24) Balanced Formula Relativity:	0.412	0.511	0.447

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Calculation of Class Relativities

Class(es): 9093 BOWLING LANE		Effective: 7/1/2022							Goods and Services		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	195.554	0	18	0	189.454	0	106.171	295.625	0.969	0.543	1.512
2015	236.174	2	24	68.633	44.746	63.858	30.545	207.781	0.480	0.400	0.880
2016	242.116	1	27	53.532	22.822	2.002	47.560	125.916	0.315	0.205	0.520
2017	262.917	3	29	77.063	9.905	66.004	38.002	190.974	0.331	0.396	0.726
2018	288.546	0	23	0	217.480	0	77.910	295.389	0.754	0.270	1.024
MA Total:	1,225,307	6	121	199,227	484,407	131,864	300,187	1,115,686	0.558	0.353	0.911

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.729	0.829	.
(14) Massachusetts Credibility:	0.200	0.340	.
(15) Countrywide Pure Premium:	0.412	0.358	0.769
(16) Countrywide Indicated Relativity:	0.548	0.846	.
(17) Countrywide Credibility:	0.400	0.330	.
(18) Countrywide Lost-Time Claims:	423.00	.	.
(19) Pure Premium Underlying Present Rate:	0.420	0.355	0.775
(20) Relativity to Underlying Present Rate:	0.607	0.928	.
(21) Credibility to Underlying Relativity:	0.400	0.330	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	0.608	0.867	.
(24) Balanced Formula Relativity:	0.604	0.868	0.698

Class(es): 9101 COLLEGE: ALL OTHER EMPLOYEES		Effective: 7/1/2022							Goods and Services		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	1.515.707	7	631	385.877	970.460	259.739	1,115.983	2,732.059	0.895	0.908	1.802
2015	1,538.033	14	635	634.956	2,348.491	241.601	1,509.234	4,734.282	1.940	1.138	3.078
2016	1,593.004	18	787	1,401.471	2,185.601	433.428	1,688.083	5,708.584	2.252	1.332	3.584
2017	1,733.407	19	787	1,871.431	2,089.334	582.941	1,552.291	6,095.997	2.285	1.232	3.517
2018	1,766.178	12	431	1,824.364	1,527.198	322.403	1,121.418	4,795.382	1.898	0.817	2.715
MA Total:	8,146,329	70	3,271	6,118,099	9,121,084	1,840,112	6,987,008	24,066,304	1.871	1.084	2.954

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.446	2.548	.
(14) Massachusetts Credibility:	0.710	1.000	.
(15) Countrywide Pure Premium:	1.300	0.856	2.156
(16) Countrywide Indicated Relativity:	1.730	2.024	.
(17) Countrywide Credibility:	0.150	0.000	.
(18) Countrywide Lost-Time Claims:	13246	.	.
(19) Pure Premium Underlying Present Rate:	1.442	0.944	2.386
(20) Relativity to Underlying Present Rate:	2.082	2.470	.
(21) Credibility to Underlying Relativity:	0.140	0.000	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	2.287	2.548	.
(24) Balanced Formula Relativity:	2.273	2.549	2.372

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Miscellaneous		
9102 PARK NOC- ALL EMPLOYEES & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	244,451	1	47	270,251	58,284	84,123	62,844	475,501	1,344	0,601	1,945
2015	271,296	1	28	74	37,461	5,485	66,982	110,003	0,138	0,267	0,405
2016	325,868	0	35	0	35,496	0	38,063	73,559	0,109	0,117	0,226
2017	349,426	0	51	0	66,614	0	79,364	145,978	0,191	0,227	0,418
2018	368,243	0	87	0	239,545	0	291,920	531,465	0,651	0,793	1,443
MA Total:	1,559,285	2	248	270,324	437,400	89,608	539,174	1,336,506	0,454	0,403	0,857

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.204	0.351	.
(14) Massachusetts Credibility:	0.310	0.460	.
(15) Countrywide Pure Premium:	1.234	0.877	2.112
(16) Countrywide Indicated Relativity:	0.582	0.813	.
(17) Countrywide Credibility:	0.350	0.270	.
(18) Countrywide Lost-Time Claims:	7970.0	.	.
(19) Pure Premium Underlying Present Rate:	0.953	0.575	1.527
(20) Relativity to Underlying Present Rate:	0.469	0.560	.
(21) Credibility to Underlying Relativity:	0.340	0.270	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	0.426	0.532	.
(24) Balanced Formula Relativity:	0.425	0.535	0.463

Class(es):		Effective: 7/1/2022							Miscellaneous		
9154 THEATER NOC: ALL OTHER EMPLOYEES											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	645,332	0	63	0	555,431	0	206,827	762,258	0,861	0,320	1,181
2015	662,833	2	61	386,384	54,541	187,455	164,332	792,713	0,665	0,531	1,196
2016	695,944	1	88	164,328	94,732	91,680	215,695	566,436	0,372	0,442	0,814
2017	846,248	1	104	336	239,533	260	278,484	518,613	0,283	0,329	0,613
2018	966,610	3	106	738,819	628,263	73,160	634,152	2,074,393	1,414	0,732	2,146
MA Total:	3,816,967	7	422	1,289,867	1,572,502	352,555	1,499,490	4,714,414	0,750	0,485	1,235

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.337	0.422	.
(14) Massachusetts Credibility:	0.360	0.560	.
(15) Countrywide Pure Premium:	0.667	0.484	1.151
(16) Countrywide Indicated Relativity:	0.314	0.449	.
(17) Countrywide Credibility:	0.320	0.220	.
(18) Countrywide Lost-Time Claims:	1576.0	.	.
(19) Pure Premium Underlying Present Rate:	0.579	0.401	0.980
(20) Relativity to Underlying Present Rate:	0.285	0.391	.
(21) Credibility to Underlying Relativity:	0.320	0.220	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	0.313	0.421	.
(24) Balanced Formula Relativity:	0.312	0.424	0.350

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Office and Clerical		
9156 THEATER NOC: PLAYERS, ENTERTAINERS OR MUSICIANS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	345,310	1	78	5,004	112,612	2,790	180,925	301,331	0.341	0.532	0.873
2015	339,749	1	87	6,407	126,371	24,447	201,314	358,540	0.391	0.664	1.055
2016	370,079	0	100	0	258,776	0	310,298	569,074	0.699	0.838	1.538
2017	361,353	1	85	9,282	758,111	2,625	415,576	1,185,594	2.124	1.157	3.281
2018	422,675	1	51	1,658	421,159	8,980	385,334	817,131	1.000	0.933	1.933
MA Total:	1,839,165	4	401	22,351	1,677,028	38,843	1,493,448	3,231,670	0.924	0.833	1.757

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	14.247	21.443	.
(14) Massachusetts Credibility:	0.280	0.470	.
(15) Countrywide Pure Premium:	0.724	0.510	1.234
(16) Countrywide Indicated Relativity:	13.150	14.256	.
(17) Countrywide Credibility:	0.360	0.270	.
(18) Countrywide Lost-Time Claims:	877.00	.	.
(19) Pure Premium Underlying Present Rate:	0.658	0.535	1.193
(20) Relativity to Underlying Present Rate:	11.193	14.906	.
(21) Credibility to Underlying Relativity:	0.360	0.260	.
(22) Industry Group Converted Pure Premium:	0.065	0.039	0.104
(23) Formula Relativity:	12.753	17.803	.
(24) Balanced Formula Relativity:	12.747	17.820	14.648

Class(es):		Effective: 7/1/2022							Miscellaneous		
9178 ATHLETIC TEAM OR PARK: NON-CONTACT SPORTS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	37,959	0	68	0	95,309	0	221,019	316,328	2.511	5.823	8.334
2015	36,469	1	66	69,595	143,352	2,244	194,535	409,726	5.839	5.396	11.235
2016	33,943	0	75	0	313,680	0	585,133	898,813	9.241	17.238	26.480
2017	16,735	0	81	0	109,624	0	350,008	459,632	6.551	20.915	27.466
2018	34,655	0	58	0	477,693	0	197,128	674,820	13.784	5.688	19.473
MA Total:	159,761	1	348	69,595	1,139,658	2,244	1,547,823	2,759,320	7.569	9.702	17.272

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	3.401	8.434	.
(14) Massachusetts Credibility:	0.190	0.480	.
(15) Countrywide Pure Premium:	1.003	1.824	2.827
(16) Countrywide Indicated Relativity:	0.473	1.691	.
(17) Countrywide Credibility:	0.410	0.260	.
(18) Countrywide Lost-Time Claims:	547.00	.	.
(19) Pure Premium Underlying Present Rate:	2.925	6.358	9.283
(20) Relativity to Underlying Present Rate:	1.441	6.193	.
(21) Credibility to Underlying Relativity:	0.400	0.260	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	1.416	6.098	.
(24) Balanced Formula Relativity:	1.413	6.137	3.023

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Miscellaneous		
9179 ATHLETIC TEAM OR PARK: CONTACT SPORTS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	30,667	1	111	26,265	1,027,581	982	747,412	1,802,240	34,364	24,404	58,769
2015	26,083	4	103	166,486	1,375,620	541,372	818,170	2,901,648	59,123	52,124	111,255
2016	18,213	1	55	666	477,180	25	429,756	907,627	26,237	23,598	49,835
2017	21,062	0	82	0	363,168	0	603,592	966,759	17,242	28,657	45,900
2018	25,157	1	64	24,705	377,991	11,278	425,594	839,567	16,007	17,366	33,373
MA Total:	121,182	7	415	218,121	3,621,540	553,657	3,024,524	7,417,842	31,685	29,527	61,213

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	14.236	25.668	.
(14) Massachusetts Credibility:	0.340	0.640	.
(15) Countrywide Pure Premium:	3.109	2.099	5.208
(16) Countrywide Indicated Relativity:	1.465	1.946	.
(17) Countrywide Credibility:	0.330	0.180	.
(18) Countrywide Lost-Time Claims:	1753.0	.	.
(19) Pure Premium Underlying Present Rate:	15.915	17.644	33.560
(20) Relativity to Underlying Present Rate:	7.840	17.184	.
(21) Credibility to Underlying Relativity:	0.330	0.180	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	7.911	19.871	.
(24) Balanced Formula Relativity:	7.894	19.998	12.018

Class(es):		Effective: 7/1/2022							Miscellaneous		
9180 AMUSEMENT DEVICE OPERATION NOC-NOT TRAV & DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	175,481	0	35	0	111,046	0	263,407	374,453	0.633	1,501	2,134
2015	198,278	1	39	23,161	174,243	1,544	400,587	599,535	0.996	2,028	3,024
2016	203,530	1	44	3,316	523,187	17,057	218,847	762,409	2,587	1,159	3,746
2017	217,602	2	54	19,254	127,208	51,568	228,871	426,901	0.673	1,289	1,962
2018	245,881	1	71	47,577	418,565	107,224	284,396	857,763	1.896	1,593	3,489
MA Total:	1,040,772	5	243	93,309	1,354,250	177,394	1,396,108	3,021,061	1.391	1,512	2,903

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.625	1.314	.
(14) Massachusetts Credibility:	0.320	0.570	.
(15) Countrywide Pure Premium:	2.077	2.032	4.109
(16) Countrywide Indicated Relativity:	0.978	1.884	.
(17) Countrywide Credibility:	0.340	0.220	.
(18) Countrywide Lost-Time Claims:	2039.0	.	.
(19) Pure Premium Underlying Present Rate:	1.523	1.504	3.027
(20) Relativity to Underlying Present Rate:	0.750	1.465	.
(21) Credibility to Underlying Relativity:	0.340	0.210	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	0.788	1.471	.
(24) Balanced Formula Relativity:	0.786	1.481	1.023

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Calculation of Class Relativities

Class(es): 9182 ATHLETIC TEAM OR PARK: OPERATIONS & DRIVERS									Effective: 7/1/2022			Miscellaneous	
Converted Unlimited Losses													
Amount													
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)		
2014	297.302	3	53	314.937	142.812	181.253	134.833	773.834	1.540	1.063	2.603		
2015	306.206	2	40	22.185	162.147	36.121	145.981	366.434	0.602	0.595	1.197		
2016	274.308	0	34	0	201.577	0	299.187	500.765	0.735	1.091	1.826		
2017	247.447	1	42	350.561	970.127	286.502	506.056	2,113.247	5.337	3.203	8.540		
2018	364.336	1	44	17.148	164.970	4.573	217.902	404.594	0.500	0.611	1.110		
MA Total:	1,489,599	7	213	704,831	1,641,634	508,449	1,303,959	4,158,873	1.575	1.217	2.792		

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.708	1.058	.
(14) Massachusetts Credibility:	0.330	0.550	.
(15) Countrywide Pure Premium:	0.615	0.618	1.233
(16) Countrywide Indicated Relativity:	0.290	0.573	.
(17) Countrywide Credibility:	0.340	0.230	.
(18) Countrywide Lost-Time Claims:	464.00	.	.
(19) Pure Premium Underlying Present Rate:	1.185	0.971	2.156
(20) Relativity to Underlying Present Rate:	0.584	0.945	.
(21) Credibility to Underlying Relativity:	0.330	0.220	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	0.525	0.922	.
(24) Balanced Formula Relativity:	0.524	0.928	0.661

Class(es): 9220 CEMETERY OPERATION & DRIVERS									Effective: 7/1/2022			Goods and Services	
Converted Unlimited Losses													
Amount													
		Claim Count		Indemnity		Medical				MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)		
2014	198.182	2	32	41.641	63.752	22.136	78.138	205.665	0.532	0.506	1.038		
2015	192.924	1	28	36.902	306.530	6.842	118.753	469.027	1.780	0.651	2.431		
2016	200.731	1	25	186.803	127.190	40.085	125.023	479.101	1.564	0.823	2.387		
2017	198.501	0	31	0	873.868	0	475.340	1,349.208	4.402	2.395	6.797		
2018	186.621	0	26	0	123.398	0	137.289	260.686	0.661	0.736	1.397		
MA Total:	976,959	4	142	265,346	1,494,737	69,063	934,542	2,763,688	1.802	1.027	2.829		

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.355	2.416	.
(14) Massachusetts Credibility:	0.300	0.420	.
(15) Countrywide Pure Premium:	2.044	1.129	3.172
(16) Countrywide Indicated Relativity:	2.719	2.668	.
(17) Countrywide Credibility:	0.350	0.290	.
(18) Countrywide Lost-Time Claims:	618.00	.	.
(19) Pure Premium Underlying Present Rate:	1.430	0.759	2.189
(20) Relativity to Underlying Present Rate:	2.065	1.987	.
(21) Credibility to Underlying Relativity:	0.350	0.290	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	2.381	2.364	.
(24) Balanced Formula Relativity:	2.366	2.366	2.366

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Miscellaneous		
9402 STREET CLEANING & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	963.185	8	68	243.659	1,868.033	106.785	521.671	2,740.148	2.192	0.652	2.845
2015	901.908	2	68	77.923	1,607.855	50.946	741.097	2,477.820	1.869	0.878	2.747
2016	953.184	1	70	1.693	965.151	3.283	877.386	1,847.512	1.014	0.924	1.938
2017	1,107.330	6	90	1,003.218	1,581.807	585.299	664.399	3,834.723	2.334	1.129	3.463
2018	1,089.405	11	80	1,557.419	953.312	402.642	581.689	3,495.062	2.305	0.904	3.208
MA Total:	5,015,012	28	376	2,883,912	6,976,157	1,148,954	3,386,242	14,395,265	1.966	0.904	2.870

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.883	0.786	.
(14) Massachusetts Credibility:	0.650	0.860	.
(15) Countrywide Pure Premium:	2.195	1.259	3.454
(16) Countrywide Indicated Relativity:	1.034	1.167	.
(17) Countrywide Credibility:	0.180	0.070	.
(18) Countrywide Lost-Time Claims:	2045.0	.	.
(19) Pure Premium Underlying Present Rate:	1.876	0.865	2.741
(20) Relativity to Underlying Present Rate:	0.924	0.843	.
(21) Credibility to Underlying Relativity:	0.170	0.070	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	0.917	0.817	.
(24) Balanced Formula Relativity:	0.915	0.822	0.884

Class(es):		Effective: 7/1/2022							Miscellaneous		
9403 GARBAGE, ASHES OR REFUSE COLLECTION & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	1,082.258	11	234	2,011.170	2,567.688	296.444	1,436.695	6,311.997	4.231	1.601	5.832
2015	1,146.923	11	262	1,530.340	3,171.365	833.810	1,900.903	7,436.417	4.099	2.384	6.484
2016	1,125.248	12	209	2,471.105	3,290.291	1,007.145	1,711.340	8,479.881	5.120	2.416	7.536
2017	1,250.254	19	276	3,124.460	4,953.694	1,350.463	2,012.106	11,440.723	6.461	2.690	9.151
2018	1,100.681	10	257	1,230.840	4,897.479	1,177.623	1,896.839	9,202.780	5.568	2.793	8.361
MA Total:	5,705,364	63	1,238	10,367,915	18,880,518	4,665,483	8,957,883	42,871,799	5.126	2.388	7.514

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	2.303	2.076	.
(14) Massachusetts Credibility:	0.970	1.000	.
(15) Countrywide Pure Premium:	3.721	1.871	5.593
(16) Countrywide Indicated Relativity:	1.753	1.735	.
(17) Countrywide Credibility:	0.020	0.000	.
(18) Countrywide Lost-Time Claims:	7816.0	.	.
(19) Pure Premium Underlying Present Rate:	4.610	2.051	6.661
(20) Relativity to Underlying Present Rate:	2.271	1.998	.
(21) Credibility to Underlying Relativity:	0.010	0.000	.
(22) Industry Group Converted Pure Premium:	2.226	1.150	3.376
(23) Formula Relativity:	2.292	2.076	.
(24) Balanced Formula Relativity:	2.287	2.089	2.220

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services		
9410 MUNICIPAL, TOWN, COUNTY OR STATE EMP NOC											
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	51,706	0	17	0	262,075	0	75,424	337,499	5,069	1,459	6,527
2015	49,238	1	23	288,849	60,371	151,961	72,020	573,200	7,093	4,549	11,641
2016	47,525	0	19	0	562,009	0	106,102	668,111	11,825	2,233	14,058
2017	51,803	0	21	0	64,940	0	81,931	146,871	1,254	1,582	2,835
2018	45,226	0	23	0	143,080	0	124,907	267,987	3,164	2,762	5,925
MA Total:	245,498	1	103	288,849	1,092,474	151,961	460,383	1,993,667	5,627	2,494	8,121

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	7.356	5.865	.
(14) Massachusetts Credibility:	0.180	0.270	.
(15) Countrywide Pure Premium:	0.875	0.505	1.380
(16) Countrywide Indicated Relativity:	1.164	1.194	.
(17) Countrywide Credibility:	0.410	0.370	.
(18) Countrywide Lost-Time Claims:	895.00	.	.
(19) Pure Premium Underlying Present Rate:	1.504	0.994	2.498
(20) Relativity to Underlying Present Rate:	2.172	2.602	.
(21) Credibility to Underlying Relativity:	0.410	0.360	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	2.692	2.962	.
(24) Balanced Formula Relativity:	2.675	2.964	2.778

Class(es):		Effective: 7/1/2022							Manufacturing		
9501 SIGN PAINTING OR LETTERING-INSIDE & DRIVERS											
Converted Unlimited Losses											
Amount											
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	304,396	0	37	0	48,851	0	84,048	132,899	0.160	0.276	0.437
2015	330,033	1	30	2,926	16,979	5,493	59,548	84,946	0.060	0.197	0.257
2016	369,499	2	39	270,735	235,559	19,640	119,463	645,397	1.370	0.376	1.747
2017	400,587	1	31	255,352	380,033	169,635	113,503	918,523	1.586	0.707	2.293
2018	402,791	2	21	77,533	52,336	23,545	45,860	199,275	0.322	0.172	0.495
MA Total:	1,807,306	6	158	606,547	733,758	218,313	422,422	1,981,038	0.742	0.355	1.096

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.807	0.736	.
(14) Massachusetts Credibility:	0.320	0.450	.
(15) Countrywide Pure Premium:	1.221	0.674	1.895
(16) Countrywide Indicated Relativity:	1.457	1.542	.
(17) Countrywide Credibility:	0.340	0.280	.
(18) Countrywide Lost-Time Claims:	1351.0	.	.
(19) Pure Premium Underlying Present Rate:	0.886	0.479	1.365
(20) Relativity to Underlying Present Rate:	1.085	1.139	.
(21) Credibility to Underlying Relativity:	0.340	0.270	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.123	1.070	.
(24) Balanced Formula Relativity:	1.118	1.063	1.099

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services			
9519 HOUSEHOLD APPLIANCES-ELECTRICAL-INSTALL, SERV OR REPAIR & DR												
Converted Unlimited Losses												
Amount												
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2014	791,848	4	76	509,853	325,664	82,033	281,340	1,198,889	1,055	0,459	1,514	
2015	920,171	8	79	635,134	274,445	176,597	289,811	1,375,987	0,988	0,507	1,495	
2016	860,679	1	49	1,949	131,550	1,890	201,925	337,314	0,155	0,237	0,392	
2017	876,724	1	67	1,353	985,667	2,463	685,601	1,675,085	1,126	0,785	1,911	
2018	936,316	3	61	545,982	734,840	325,630	360,593	1,967,045	1,368	0,733	2,101	
MA Total:	4,385,739	17	332	1,694,271	2,452,165	588,613	1,819,270	6,554,319	0,945	0,549	1,494	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.236	1.291	.
(14) Massachusetts Credibility:	0.520	0.660	.
(15) Countrywide Pure Premium:	2.006	0.811	2.816
(16) Countrywide Indicated Relativity:	2.669	1.917	.
(17) Countrywide Credibility:	0.240	0.170	.
(18) Countrywide Lost-Time Claims:	2303.0	.	.
(19) Pure Premium Underlying Present Rate:	1.228	0.521	1.749
(20) Relativity to Underlying Present Rate:	1.774	1.364	.
(21) Credibility to Underlying Relativity:	0.240	0.170	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	1.709	1.410	.
(24) Balanced Formula Relativity:	1.698	1.410	1.596

Class(es):		Effective: 7/1/2022							Manufacturing			
9521 HOUSE FURNISHINGS INSTALLATION-NOC												
Converted Unlimited Losses												
Amount												
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums				
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)	
2014	216,443	1	23	7,266	108,530	6,093	81,639	203,528	0,535	0,405	0,940	
2015	277,869	1	20	90,690	261,069	8,863	124,456	485,079	1,266	0,480	1,746	
2016	275,642	0	32	0	531,323	0	512,521	1,043,844	1,928	1,859	3,787	
2017	311,607	2	34	201,797	382,265	48,651	111,170	743,882	1,874	0,513	2,387	
2018	284,395	0	17	0	39,686	0	34,083	73,770	0,140	0,120	0,259	
MA Total:	1,365,955	4	126	299,753	1,322,873	63,607	863,868	2,550,102	1,188	0,679	1,867	

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.293	1.410	.
(14) Massachusetts Credibility:	0.330	0.460	.
(15) Countrywide Pure Premium:	1.746	0.747	2.493
(16) Countrywide Indicated Relativity:	2.083	1.709	.
(17) Countrywide Credibility:	0.340	0.270	.
(18) Countrywide Lost-Time Claims:	746.00	.	.
(19) Pure Premium Underlying Present Rate:	1.315	0.667	1.982
(20) Relativity to Underlying Present Rate:	1.610	1.588	.
(21) Credibility to Underlying Relativity:	0.330	0.270	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	1.666	1.539	.
(24) Balanced Formula Relativity:	1.660	1.527	1.614

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Calculation of Class Relativities

Class(es): 9522 UPHOLSTERING		Effective: 7/1/2022							Manufacturing		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	131,340	2	18	81,734	29,835	8,555	48,213	168,338	0.849	0.432	1.282
2015	145,716	0	13	0	1,074	0	3,409	4,483	0.007	0.023	0.031
2016	115,056	0	8	0	6,418	0	6,512	12,930	0.056	0.057	0.112
2017	122,488	0	6	0	14,370	0	26,864	41,234	0.117	0.219	0.337
2018	120,893	0	4	0	17,385	0	5,347	22,732	0.144	0.044	0.188
MA Total:	635,492	2	49	81,734	69,082	8,555	90,345	249,717	0.237	0.156	0.393

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.258	0.323	.
(14) Massachusetts Credibility:	0.190	0.260	.
(15) Countrywide Pure Premium:	1.015	0.488	1.503
(16) Countrywide Indicated Relativity:	1.211	1.117	.
(17) Countrywide Credibility:	0.410	0.370	.
(18) Countrywide Lost-Time Claims:	1909.0	.	.
(19) Pure Premium Underlying Present Rate:	0.724	0.348	1.072
(20) Relativity to Underlying Present Rate:	0.887	0.828	.
(21) Credibility to Underlying Relativity:	0.400	0.370	.
(22) Industry Group Converted Pure Premium:	0.918	0.482	1.400
(23) Formula Relativity:	0.900	0.804	.
(24) Balanced Formula Relativity:	0.897	0.798	0.863

Class(es): 9533 SCAFFOLDING: SCAFFOLD INST, RPR OR REMOVAL- BUILT UP FROM GROUN		Effective: 7/1/2022							Construction		
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	56,454	1	4	23,957	143,470	12,442	84,914	264,783	2,966	1,724	4,690
2015	59,658	0	10	0	260,578	0	70,114	330,692	4,368	1,175	5,543
2016	58,633	1	8	157,517	697,660	28,121	231,283	1,114,581	14,585	4,424	19,009
2017	65,778	0	10	0	1,380,018	0	247,012	1,627,030	20,980	3,755	24,735
2018	69,127	3	12	710,611	361,030	226,596	264,105	1,562,341	15,502	7,099	22,601
MA Total:	309,651	5	44	892,085	2,842,755	267,159	897,428	4,899,426	12.061	3.761	15.822

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	4.968	3.364	.
(14) Massachusetts Credibility:	0.350	0.450	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	2.800	2.780	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	6.416	2.883	9.299
(20) Relativity to Underlying Present Rate:	2.931	2.961	.
(21) Credibility to Underlying Relativity:	0.650	0.550	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	3.644	3.142	.
(24) Balanced Formula Relativity:	3.679	3.142	3.509

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Section IX - Classification Pricing
 Subsection G - Class Relativities
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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Construction		
9534 MOBILE CRANE & HOIST SERV CONTR-NOC-ALL OP -INCL YRD EMP &DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	272,846	4	15	1,558,384	347,091	360,449	194,446	2,460,370	6,984	2,034	9,017
2015	315,658	1	6	1,361	199,013	1,336	236,721	438,431	0,635	0,754	1,389
2016	362,160	3	20	779,033	1,156,925	212,931	325,660	2,474,549	5,346	1,487	6,833
2017	437,387	0	21	0	1,516,089	0	600,969	2,117,057	3,466	1,374	4,840
2018	504,473	2	22	180,773	371,654	48,826	195,215	796,469	1,095	0,484	1,579
MA Total:	1,892,523	10	84	2,519,552	3,590,772	623,543	1,553,010	8,286,876	3,229	1,150	4,379

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.330	1.029	.
(14) Massachusetts Credibility:	0.500	0.620	.
(15) Countrywide Pure Premium:	2.341	0.814	3.156
(16) Countrywide Indicated Relativity:	0.979	0.748	.
(17) Countrywide Credibility:	0.250	0.190	.
(18) Countrywide Lost-Time Claims:	508.00	.	.
(19) Pure Premium Underlying Present Rate:	2.656	1.031	3.687
(20) Relativity to Underlying Present Rate:	1.213	1.059	.
(21) Credibility to Underlying Relativity:	0.250	0.190	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	1.213	0.981	.
(24) Balanced Formula Relativity:	1.225	0.981	1.148

Class(es):		Effective: 7/1/2022							Construction		
9549 ADVERTISING CO & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	14,630	0	1	0	3,252	0	4,832	8,083	0,222	0,330	0,553
2015	15,820	0	2	0	0	0	1,186	1,186	0,000	0,075	0,075
2016	16,020	0	1	0	35,002	0	2,333	37,335	2,185	0,146	2,331
2017	6,455	0	1	0	0	0	581	581	0,000	0,090	0,090
2018	3,724	0	0	0	0	0	0	0	0,000	0,000	0,000
MA Total:	56,649	0	5	0	38,254	0	8,932	47,186	0,675	0,158	0,833

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.278	0.141	.
(14) Massachusetts Credibility:	0.120	0.130	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	0.974	0.712	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	2.233	0.738	2.971
(20) Relativity to Underlying Present Rate:	1.020	0.758	.
(21) Credibility to Underlying Relativity:	0.880	0.870	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	0.931	0.678	.
(24) Balanced Formula Relativity:	0.940	0.678	0.857

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Construction		
9552 SIGN MFG-ERECTION, REPAIR OR MAINT & SHOP, DR											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	165,766	4	26	693,439	53,544	385,361	63,608	1,195,952	4,506	2,708	7,215
2015	170,970	2	23	375,030	330,838	219,832	264,664	1,190,364	4,129	2,834	6,962
2016	166,687	1	13	474,441	84,830	185,796	43,010	788,077	3,355	1,373	4,728
2017	175,578	1	17	173,562	196,199	325,815	88,441	784,017	2,106	2,359	4,465
2018	185,946	0	21	0	58,722	0	46,637	105,358	0,316	0,251	0,567
MA Total:	864,948	8	100	1,716,472	724,132	1,116,804	506,360	4,063,768	2,822	1,877	4,698

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	1.162	1.678	.
(14) Massachusetts Credibility:	0.400	0.580	.
(15) Countrywide Pure Premium:	0.000	0.000	0.000
(16) Countrywide Indicated Relativity:	1.411	1.798	.
(17) Countrywide Credibility:	0.000	0.000	.
(18) Countrywide Lost-Time Claims:	0.000	.	.
(19) Pure Premium Underlying Present Rate:	3.234	1.864	5.099
(20) Relativity to Underlying Present Rate:	1.477	1.915	.
(21) Credibility to Underlying Relativity:	0.600	0.420	.
(22) Industry Group Converted Pure Premium:	2.428	1.118	3.546
(23) Formula Relativity:	1.351	1.778	.
(24) Balanced Formula Relativity:	1.364	1.777	1.494

Class(es):		Effective: 7/1/2022							Goods and Services		
9586 BARBER SHOP, BEAUTY PARLOR, HAIR STYLING SALON											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	4,604,409	2	67	407,036	404,831	88,193	202,388	1,102,447	0.176	0.063	0.239
2015	4,830,805	1	86	18,112	756,429	5,103	398,758	1,178,402	0.160	0.084	0.244
2016	5,079,146	3	82	71,912	249,937	21,197	300,583	643,630	0.063	0.063	0.127
2017	5,330,630	0	81	0	1,054,247	0	380,898	1,435,146	0.198	0.071	0.269
2018	5,710,822	3	70	160,820	579,285	30,388	250,870	1,021,363	0.130	0.049	0.179
MA Total:	25,555,811	9	386	657,881	3,044,729	144,880	1,533,496	5,380,987	0.145	0.066	0.211

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.189	0.154	.
(14) Massachusetts Credibility:	0.440	0.590	.
(15) Countrywide Pure Premium:	0.218	0.107	0.325
(16) Countrywide Indicated Relativity:	0.290	0.252	.
(17) Countrywide Credibility:	0.280	0.210	.
(18) Countrywide Lost-Time Claims:	1670.0	.	.
(19) Pure Premium Underlying Present Rate:	0.144	0.066	0.210
(20) Relativity to Underlying Present Rate:	0.207	0.174	.
(21) Credibility to Underlying Relativity:	0.280	0.200	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	0.223	0.179	.
(24) Balanced Formula Relativity:	0.221	0.179	0.206

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Section IX - Classification Pricing
 Subsection G - Class Relativities
 7/1/2022

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Calculation of Class Relativities

Class(es):		Effective: 7/1/2022							Goods and Services		
9620 FUNERAL DIRECTOR & DRIVERS											
		Converted Unlimited Losses									
		Amount									
		Claim Count		Indemnity		Medical		MA Indicated Pure Premiums			
Policy Period (1)	Exposure (2)	Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)	Likely (7)	Not-Likely (8)	Total (9)	Indemnity (10)	Medical (11)	Total (12)
2014	664,027	0	16	0	185,196	0	73,087	258,283	0.279	0.110	0.389
2015	655,499	2	14	17,541	197,981	6,166	179,402	401,091	0.329	0.283	0.612
2016	704,217	0	10	0	0	0	25,312	25,312	0.000	0.036	0.036
2017	711,317	2	13	67,916	14,948	19,306	83,491	185,662	0.116	0.145	0.261
2018	729,067	0	6	0	100,915	0	97,433	198,348	0.138	0.134	0.272
MA Total:	3,464,128	4	59	85,458	499,040	25,473	458,725	1,068,695	0.169	0.140	0.309

	Pure Premium Relativities		
	Indemnity	Medical	Total
(13) Massachusetts Indicated Relativity:	0.221	0.329	.
(14) Massachusetts Credibility:	0.270	0.410	.
(15) Countrywide Pure Premium:	0.452	0.317	0.769
(16) Countrywide Indicated Relativity:	0.602	0.749	.
(17) Countrywide Credibility:	0.370	0.300	.
(18) Countrywide Lost-Time Claims:	545.00	.	.
(19) Pure Premium Underlying Present Rate:	0.321	0.199	0.519
(20) Relativity to Underlying Present Rate:	0.464	0.519	.
(21) Credibility to Underlying Relativity:	0.360	0.290	.
(22) Industry Group Converted Pure Premium:	0.765	0.425	1.190
(23) Formula Relativity:	0.449	0.510	.
(24) Balanced Formula Relativity:	0.446	0.510	0.469

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Section IX - Classification Pricing
Subsection H - Industry Group Rate Change and Rate Level Factors
7/1/2022

Section IX - H
Exhibit 1

Calculation of Industry Group Rate Change and Limits

	Industry Group				
	Manufacturing	Construction	Office & Clerical	Goods & Services	Miscellaneous
(1) Industry Group Differential	1.015	1.007	0.985	0.995	0.993
(2) Experience and Benefit Level Change - Overall	2.7%	2.7%	2.7%	2.7%	2.7%
(3) Target Rate Change = (1) x [1.000 + (2)] - 1.000	4.2%	3.5%	1.1%	2.2%	2.0%
(4) Maximum Rate Change = (3) + 20.0%	24.2%	23.5%	21.1%	22.2%	22.0%
(5) Minimum Rate Change = (3) - 20.0%	-15.8%	-16.5%	-18.9%	-17.8%	-18.0%
(6) Present Average Rate	1.706	4.361	0.130	1.484	4.215
(7) Uncapped Rate Level Factor = [1.000 + (3)] x (6)	1.779	4.512	0.131	1.517	4.299
(8) Capped Rate Level Factor	1.781	4.521	0.133	1.518	4.312

In addition, the WCRIBMA is limiting the increase in average rates for any class to \$15.00 and no average rate shall exceed \$90.00 per \$100.00 of payroll.

Notes:

- (1): Exhibit 2.
- (2): Indicated Rate Change, from Section I-A, Exhibit 1.
- (6): Rates by class consistent with the 07/01/20 stipulation, weighted by five years of exposure.
- (8): Proposed average uncapped rates are capped by an iterative process using rate levels to determine if the required change is achieved.

Calculation of Massachusetts Industry Group Differentials
 Excluding Large Deductibles

Industry Group (1)	Expected Losses (2)	Converted Unlimited Losses (3)	Industry Group Differential = (3) / (2) (4)	Lost-Time Cases (5)	Full Standard for Credibility Lost-Time Cases (6)	Credibility (7)	Credibility Weighted (8)	Balanced Industry Group Differential = (8) / 1.113 (9)
Manufacturing	396,268,356	448,489,251	1.132	9,483	12,000	0.889	1.130	1.015
Construction	1,179,894,279	1,322,949,296	1.121	13,647	12,000	1.000	1.121	1.007
Office & Clerical	405,041,683	443,681,474	1.095	11,415	12,000	0.975	1.096	0.985
Goods & Services	1,058,684,499	1,172,677,981	1.108	31,120	12,000	1.000	1.108	0.995
Miscellaneous	480,066,799	530,221,457	1.104	9,978	12,000	0.912	1.105	0.993
All	3,519,955,616	3,918,019,459	1.113			1.000	1.113	1.000

Notes:

(2): Five Years of Exposure x Pure Premium Underlying Present Rate from Section IX - F.

(3): Section IX - C. Goods and Services includes Per Capita classes.

(7) = $\text{Min} (1.0 , [(5)/(6)]^{0.5})$

(8) = $[(7) \times (4)] + [(1.0 - (7)) \times (4) \text{ Total}]$

(8) Total = $\text{sum} [(2) \times (8)] / (2) \text{ Total}$

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Section IX - Classification Pricing
 Subsection I - Average Uncapped Rates
 7/1/2022

Section IX - I
 Exhibit 1

Calculation of Average Uncapped Rates All Industry Groups

Class (1)	Balanced Formula Relativity			Uncapped Rate Level Factor (5)	Proposed Average Uncapped Rate (6)
	Indemnity (2)	Medical (3)	Total (4)		
0005	1.569	1.498	1.543	1.517	2.34
0008	1.431	1.653	1.511	1.517	2.29
0016	2.182	2.194	2.186	1.517	3.32
0034	1.735	2.152	1.884	1.517	2.86
0035	1.007	1.080	1.033	1.517	1.57
0036	1.735	2.152	1.884	1.517	2.86
0042	2.019	2.260	2.105	1.517	3.19
0046	1.771	2.672	2.093	1.517	3.17
0050	0.897	0.921	0.904	4.512	4.08
0079	1.297	1.720	1.448	1.517	2.20
0083	2.262	2.237	2.253	1.517	3.42
0106	1.944	2.576	2.159	4.299	9.28
0113	1.735	2.152	1.884	1.517	2.86
0170	1.735	2.152	1.884	1.517	2.86
0908	112.443	95.929	106.542	1.517	80.79
0909	183.486	335.061	237.647	1.517	180.21
0912	183.486	335.061	237.647	1.517	360.41
0913	112.443	95.929	106.542	1.517	161.58
0917	1.566	1.310	1.474	1.517	2.24
0918	0.322	0.187	0.274	1.517	0.41
1430	1.969	1.926	1.954	1.779	3.48
1438	1.839	1.653	1.775	1.779	3.16
1463	6.023	8.766	6.967	1.779	12.39
1624	0.814	0.962	0.864	4.299	3.72
1655	0.504	0.473	0.494	4.299	2.12
1701	1.224	1.163	1.203	1.779	2.14
1710	0.814	0.962	0.864	4.299	3.72
1747	1.298	1.498	1.367	1.779	2.43
1748	1.489	2.170	1.723	1.779	3.07
1853	0.803	0.453	0.683	1.779	1.21
1924	1.189	1.198	1.192	1.779	2.12
1925	1.926	12.474	5.554	1.779	9.88
2003	2.041	1.763	1.946	1.779	3.46
2014	2.135	2.036	2.101	1.779	3.74
2021	1.397	1.463	1.419	1.779	2.52
2039	2.012	1.932	1.984	1.779	3.53
2041	1.290	1.118	1.231	1.779	2.19
2070	1.876	1.583	1.775	1.779	3.16
2081	1.241	1.741	1.413	1.779	2.51
2089	1.487	1.261	1.409	1.779	2.51
2095	1.503	1.286	1.428	1.779	2.54
2101	1.487	1.261	1.409	1.779	2.51

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Section IX - Classification Pricing
 Subsection I - Average Uncapped Rates
 7/1/2022

Section IX - I
 Exhibit 1

Calculation of Average Uncapped Rates All Industry Groups

Class (1)	Balanced Formula Relativity			Uncapped Rate Level Factor (5)	Proposed Average Uncapped Rate (6)
	Indemnity (2)	Medical (3)	Total (4)		
2111	1.142	1.195	1.160	1.779	2.06
2114	1.487	1.261	1.409	1.779	2.51
2115	3.559	2.805	3.300	1.779	5.87
2121	0.759	0.777	0.765	1.779	1.36
2130	0.776	0.804	0.785	1.779	1.40
2131	1.563	1.689	1.606	1.779	2.86
2143	1.545	1.091	1.389	1.779	2.47
2150	1.954	2.045	1.985	1.779	3.53
2156	1.917	2.046	1.961	1.779	3.49
2157	2.386	1.931	2.230	1.779	3.97
2172	1.021	0.753	0.929	1.779	1.65
2211	3.042	3.020	3.034	1.779	5.40
2220	1.296	1.466	1.355	1.779	2.41
2260	2.941	2.368	2.743	1.779	4.88
2288	2.034	1.968	2.011	1.779	3.58
2305	1.478	1.428	1.461	1.779	2.60
2362	0.911	1.189	1.007	1.779	1.79
2380	0.860	0.921	0.881	1.779	1.57
2402	1.156	1.249	1.188	1.779	2.11
2413	1.778	1.883	1.814	1.779	3.23
2416	1.142	1.356	1.216	1.779	2.16
2417	1.002	0.695	0.897	1.779	1.59
2501	1.185	1.112	1.160	1.779	2.06
2503	0.652	0.438	0.578	1.779	1.03
2570	1.930	1.558	1.802	1.779	3.20
2576	1.094	1.229	1.140	1.779	2.03
2585	1.436	1.537	1.470	1.779	2.62
2586	1.102	1.181	1.130	1.779	2.01
2587	1.384	1.113	1.287	1.517	1.95
2623	2.501	2.586	2.530	1.779	4.50
2651	0.779	0.913	0.825	1.779	1.47
2660	1.066	1.192	1.109	1.779	1.97
2683	1.103	1.317	1.177	1.779	2.09
2688	0.905	1.025	0.946	1.779	1.68
2702	2.681	3.402	2.926	4.299	12.58
2710	3.302	3.396	3.335	1.779	5.93
2731	1.439	1.725	1.537	1.779	2.73
2747	2.991	2.744	2.906	1.779	5.17
2790	1.210	1.068	1.161	1.779	2.07
2802	1.947	1.964	1.953	1.779	3.47
2835	1.010	0.854	0.956	1.779	1.70
2836	1.421	1.153	1.328	1.779	2.36

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Section IX - Classification Pricing
 Subsection I - Average Uncapped Rates
 7/1/2022

Section IX - I
 Exhibit 1

Calculation of Average Uncapped Rates All Industry Groups

Class (1)	Balanced Formula Relativity			Uncapped Rate Level Factor (5)	Proposed Average Uncapped Rate (6)
	Indemnity (2)	Medical (3)	Total (4)		
2841	1.771	2.360	1.974	1.779	3.51
2883	1.789	1.619	1.731	1.779	3.08
2923	0.765	0.772	0.767	1.779	1.36
2942	0.861	0.898	0.874	1.779	1.55
3018	1.336	1.225	1.298	1.779	2.31
3022	1.733	1.945	1.806	1.779	3.21
3027	1.299	1.509	1.371	1.779	2.44
3028	1.370	1.500	1.415	1.779	2.52
3030	2.546	2.793	2.631	1.779	4.68
3040	3.189	2.285	2.878	1.779	5.12
3041	1.507	1.287	1.431	1.779	2.55
3042	1.982	2.021	1.995	1.779	3.55
3066	1.245	1.251	1.247	1.779	2.22
3076	1.176	1.150	1.167	1.779	2.08
3081	2.448	2.749	2.551	1.779	4.54
3082	2.448	2.749	2.551	1.779	4.54
3085	2.423	2.588	2.480	1.779	4.41
3110	4.926	4.100	4.642	1.779	8.26
3111	1.144	1.017	1.100	1.779	1.96
3113	0.889	0.930	0.903	1.779	1.61
3114	1.555	1.438	1.515	1.779	2.69
3118	0.872	0.805	0.849	1.779	1.51
3119	0.547	0.580	0.558	1.779	0.99
3120	0.708	0.556	0.656	1.779	1.17
3122	1.179	1.235	1.199	1.779	2.13
3127	1.246	1.154	1.215	1.779	2.16
3131	0.620	0.786	0.677	1.779	1.20
3132	1.170	1.378	1.242	1.779	2.21
3145	0.848	0.867	0.855	1.779	1.52
3146	1.080	1.208	1.124	1.779	2.00
3169	1.197	1.740	1.384	1.779	2.46
3179	0.612	0.533	0.585	1.779	1.04
3180	1.376	1.161	1.302	1.779	2.32
3188	1.289	1.213	1.263	1.779	2.25
3200	1.133	1.163	1.143	1.779	2.03
3220	1.522	1.568	1.538	1.779	2.74
3255	1.006	1.012	1.008	1.779	1.79
3257	1.189	1.478	1.288	1.779	2.29
3270	1.148	1.173	1.156	1.779	2.06
3300	1.437	2.141	1.679	1.779	2.99
3315	1.603	1.487	1.563	1.779	2.78
3336	1.529	1.236	1.429	1.779	2.54

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Calculation of Average Uncapped Rates All Industry Groups

Class (1)	Balanced Formula Relativity			Uncapped Rate Level Factor (5)	Proposed Average Uncapped Rate (6)
	Indemnity (2)	Medical (3)	Total (4)		
3365	0.886	1.206	0.987	4.512	4.45
3372	1.107	1.106	1.107	1.779	1.97
3373	2.095	1.613	1.929	1.779	3.43
3381	1.015	0.935	0.988	1.779	1.76
3383	0.798	0.835	0.811	1.779	1.44
3385	0.423	0.418	0.421	1.779	0.75
3400	1.197	1.740	1.384	1.779	2.46
3507	1.511	1.343	1.453	1.779	2.59
3515	1.434	1.379	1.415	1.779	2.52
3558	0.332	0.532	0.401	1.779	0.71
3571	0.355	0.315	0.342	1.779	0.61
3574	0.881	0.859	0.874	1.779	1.55
3612	0.680	0.694	0.685	1.779	1.22
3620	1.932	1.886	1.916	1.779	3.41
3629	0.881	0.859	0.874	1.779	1.55
3632	0.881	0.859	0.874	1.779	1.55
3634	0.825	0.695	0.780	1.779	1.39
3635	1.137	1.803	1.366	1.779	2.43
3638	0.881	0.859	0.874	1.779	1.55
3642	0.548	0.534	0.543	1.779	0.97
3643	0.840	0.783	0.820	1.779	1.46
3647	1.255	1.190	1.233	1.779	2.19
3648	0.598	0.684	0.627	1.779	1.12
3681	0.327	0.319	0.324	1.779	0.58
3685	0.315	0.284	0.305	1.779	0.54
3724	0.950	0.963	0.954	4.512	4.31
3726	0.816	0.587	0.744	4.512	3.36
3807	1.197	1.740	1.384	1.779	2.46
3808	1.699	1.825	1.743	1.779	3.10
3821	3.007	3.265	3.099	1.517	4.70
3826	2.065	2.809	2.321	1.779	4.13
3830	0.881	0.859	0.874	1.779	1.55
3841	1.018	0.935	0.989	1.779	1.76
4000	1.259	1.291	1.270	4.299	5.46
4021	1.651	1.785	1.697	1.779	3.02
4024	2.098	2.013	2.068	1.779	3.68
4034	3.087	3.358	3.180	1.779	5.66
4036	0.980	1.035	0.999	1.779	1.78
4038	1.584	0.975	1.375	1.779	2.45
4053	1.278	1.307	1.288	1.779	2.29
4062	1.056	0.963	1.024	1.779	1.82
4112	0.189	0.221	0.200	1.779	0.36

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Calculation of Average Uncapped Rates All Industry Groups

Class (1)	Balanced Formula Relativity			Uncapped Rate Level Factor (5)	Proposed Average Uncapped Rate (6)
	Indemnity (2)	Medical (3)	Total (4)		
4113	1.278	1.307	1.288	1.779	2.29
4114	1.564	1.255	1.458	1.779	2.59
4130	1.870	1.916	1.886	1.779	3.35
4133	0.845	0.813	0.834	1.779	1.48
4150	0.533	0.375	0.478	1.779	0.85
4239	1.356	1.280	1.330	1.779	2.37
4243	1.505	1.304	1.435	1.779	2.55
4244	1.588	1.546	1.573	1.779	2.80
4250	1.156	1.165	1.159	1.779	2.06
4251	1.284	0.939	1.166	1.779	2.07
4273	1.696	1.536	1.641	1.779	2.92
4279	1.209	1.167	1.194	1.779	2.12
4283	0.833	0.685	0.782	1.779	1.39
4299	0.929	0.945	0.934	1.779	1.66
4304	2.296	2.596	2.399	1.779	4.27
4307	0.837	0.896	0.857	1.779	1.52
4308	1.506	0.377	1.118	1.779	1.99
4351	0.476	0.459	0.470	1.779	0.84
4352	0.654	0.565	0.623	1.779	1.11
4360	0.332	0.293	0.319	1.779	0.57
4361	3.970	4.728	4.254	0.131	0.56
4362	0.317	0.289	0.307	1.517	0.47
4410	1.484	2.018	1.668	1.779	2.97
4432	0.335	0.427	0.367	1.779	0.65
4439	2.933	3.947	3.282	1.779	5.84
4452	1.474	1.263	1.402	1.779	2.49
4459	1.528	1.554	1.537	1.779	2.73
4470	1.090	1.006	1.061	1.779	1.89
4484	1.030	1.224	1.097	1.779	1.95
4493	1.008	1.027	1.015	1.779	1.80
4511	0.211	0.192	0.204	1.517	0.31
4512	0.059	0.057	0.058	1.517	0.09
4557	1.061	0.770	0.961	1.779	1.71
4558	0.805	0.880	0.831	1.779	1.48
4583	1.338	1.367	1.348	1.779	2.40
4611	0.458	0.433	0.450	1.779	0.80
4635	2.262	3.349	2.636	1.779	4.69
4653	1.117	0.902	1.043	1.779	1.86
4665	6.336	4.678	5.766	1.779	10.26
4692	0.286	0.257	0.276	1.779	0.49
4693	0.413	0.464	0.430	1.779	0.77
4720	0.850	0.885	0.862	1.779	1.53

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Calculation of Average Uncapped Rates All Industry Groups

Class (1)	Balanced Formula Relativity			Uncapped Rate Level Factor (5)	Proposed Average Uncapped Rate (6)
	Indemnity (2)	Medical (3)	Total (4)		
4740	0.417	0.368	0.400	1.779	0.71
4741	1.409	1.297	1.370	1.779	2.44
4771	1.399	0.983	1.256	1.779	2.23
4777	1.338	1.367	1.348	1.779	2.40
4825	0.238	0.198	0.224	1.779	0.40
4828	0.477	0.467	0.473	1.779	0.84
4829	0.477	0.467	0.473	1.779	0.84
4902	0.861	0.898	0.874	1.779	1.55
4923	0.332	0.293	0.319	1.779	0.57
5020	0.971	0.765	0.906	4.512	4.09
5022	2.221	2.011	2.155	4.512	9.72
5037	3.408	3.169	3.333	4.512	15.04
5040	4.636	4.122	4.474	4.512	20.19
5057	3.250	5.551	3.976	4.512	17.94
5059	5.826	7.506	6.355	4.512	28.68
5102	1.452	1.119	1.347	4.512	6.08
5146	1.486	1.355	1.445	4.512	6.52
5160	0.644	0.583	0.625	4.512	2.82
5183	0.688	0.630	0.669	4.512	3.02
5188	0.887	0.713	0.832	4.512	3.75
5190	0.496	0.545	0.511	4.512	2.31
5191	0.491	0.483	0.488	1.517	0.74
5192	1.773	1.711	1.751	1.517	2.66
5213	2.506	2.253	2.426	4.512	10.95
5215	0.909	0.890	0.903	4.512	4.07
5221	1.476	1.273	1.412	4.512	6.37
5222	2.210	1.414	1.959	4.512	8.84
5223	0.897	0.823	0.874	4.512	3.94
5348	1.132	0.825	1.035	4.512	4.67
5402	1.454	1.297	1.404	4.512	6.34
5403	2.002	1.755	1.924	4.512	8.68
5437	0.804	0.753	0.788	4.512	3.56
5443	0.783	0.721	0.763	4.512	3.44
5445	1.469	1.144	1.367	4.512	6.17
5462	1.275	0.996	1.187	4.512	5.36
5472	1.781	1.381	1.655	4.512	7.47
5473	1.933	1.910	1.925	4.512	8.69
5474	0.874	0.858	0.869	4.512	3.92
5478	0.808	0.618	0.748	4.512	3.38
5479	1.166	1.191	1.174	4.512	5.29
5480	1.063	0.837	0.992	4.512	4.47
5506	1.292	1.170	1.254	4.512	5.66

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Calculation of Average Uncapped Rates All Industry Groups

Class (1)	Balanced Formula Relativity			Uncapped Rate Level Factor (5)	Proposed Average Uncapped Rate (6)
	Indemnity (2)	Medical (3)	Total (4)		
5507	1.246	1.027	1.177	4.512	5.31
5508	0.897	0.921	0.904	4.512	4.08
5509	1.181	1.576	1.305	4.512	5.89
5538	0.875	0.916	0.888	4.512	4.01
5545	9.187	13.675	10.602	4.512	47.84
5547	2.226	2.692	2.373	4.512	10.71
5606	0.258	0.305	0.273	4.512	1.23
5610	1.072	0.785	0.981	4.512	4.43
5645	1.296	1.736	1.435	4.512	6.47
5701	4.119	4.890	4.362	4.512	19.68
5703	2.469	2.239	2.396	4.512	10.81
5705	2.080	1.868	2.013	4.512	9.08
6003	1.737	1.420	1.637	4.512	7.39
6005	0.897	0.921	0.904	4.512	4.08
6204	1.165	1.061	1.132	4.512	5.11
6217	0.987	0.835	0.939	4.512	4.24
6229	0.833	0.825	0.831	4.512	3.75
6233	0.495	0.367	0.455	4.512	2.05
6251	1.020	0.731	0.929	4.512	4.19
6252	0.929	0.691	0.854	4.512	3.85
6306	1.998	1.662	1.892	4.512	8.54
6319	0.615	0.539	0.591	4.512	2.67
6325	0.563	0.534	0.554	4.512	2.50
6400	0.972	1.157	1.030	4.512	4.65
6504	1.487	1.261	1.409	1.779	2.51
6834	0.446	0.592	0.496	4.299	2.13
6836	0.567	0.865	0.668	4.299	2.87
7219	1.787	1.587	1.719	4.299	7.39
7230	2.078	1.740	1.963	4.299	8.44
7231	2.666	2.551	2.627	4.299	11.29
7360	0.991	0.887	0.956	4.299	4.11
7370	0.813	0.966	0.865	4.299	3.72
7380	1.366	1.329	1.354	4.299	5.82
7382	0.859	0.845	0.854	4.299	3.67
7403	0.718	0.871	0.770	4.299	3.31
7405	0.276	0.241	0.264	4.299	1.14
7420	4.196	6.941	5.131	4.299	22.06
7421	0.272	0.194	0.246	4.299	1.06
7422	0.272	0.194	0.246	4.299	1.06
7425	0.637	0.510	0.594	4.299	2.55
7431	0.272	0.194	0.246	4.299	1.06
7502	0.393	0.357	0.381	4.299	1.64

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Calculation of Average Uncapped Rates All Industry Groups

Class (1)	Balanced Formula Relativity			Uncapped Rate Level Factor (5)	Proposed Average Uncapped Rate (6)
	Indemnity (2)	Medical (3)	Total (4)		
7515	0.539	1.814	0.974	4.299	4.19
7520	0.645	0.693	0.661	4.299	2.84
7538	1.185	1.160	1.177	4.512	5.31
7539	0.300	0.376	0.326	4.299	1.40
7580	0.809	0.675	0.763	4.299	3.28
7590	1.416	1.895	1.579	4.299	6.79
7600	0.913	0.698	0.840	4.299	3.61
7601	1.063	1.225	1.114	4.512	5.03
7610	4.820	3.139	4.191	0.131	0.55
7704	0.897	1.196	0.999	4.299	4.30
7720	0.319	0.367	0.335	4.299	1.44
7855	0.735	0.599	0.692	4.512	3.12
8001	0.964	1.223	1.056	1.517	1.60
8002	1.020	1.799	1.298	1.517	1.97
8006	0.691	0.873	0.756	1.517	1.15
8008	0.472	0.533	0.494	1.517	0.75
8010	1.013	1.111	1.048	1.517	1.59
8013	0.206	0.280	0.232	1.517	0.35
8017	0.580	0.693	0.621	1.517	0.94
8018	2.470	1.995	2.300	1.517	3.49
8021	2.297	1.933	2.167	1.517	3.29
8031	1.043	1.085	1.058	1.517	1.60
8032	0.798	0.867	0.823	1.517	1.25
8033	0.931	0.864	0.907	1.517	1.38
8034	2.136	1.449	1.891	1.517	2.87
8039	0.773	0.984	0.849	1.517	1.29
8044	1.737	1.745	1.740	1.517	2.64
8046	1.284	1.656	1.417	1.517	2.15
8048	1.530	1.584	1.549	1.517	2.35
8058	1.242	1.813	1.446	1.517	2.19
8103	1.634	1.789	1.689	1.517	2.56
8105	13.388	8.073	11.489	1.517	17.42
8106	3.168	3.489	3.283	1.517	4.98
8107	1.908	1.953	1.924	1.517	2.92
8111	1.591	1.958	1.722	1.517	2.61
8203	4.014	3.664	3.889	1.517	5.90
8204	4.302	5.012	4.555	1.517	6.91
8215	1.981	2.137	2.037	1.517	3.09
8227	1.014	1.388	1.132	4.512	5.11
8232	3.497	3.480	3.491	1.517	5.29
8233	3.387	3.713	3.503	1.517	5.31
8235	2.529	2.655	2.574	1.517	3.90

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Class (1)	Balanced Formula Relativity			Uncapped Rate Level Factor (5)	Proposed Average Uncapped Rate (6)
	Indemnity (2)	Medical (3)	Total (4)		
8263	3.350	3.256	3.317	1.517	5.03
8264	3.073	3.296	3.153	1.517	4.78
8265	3.387	3.713	3.503	1.517	5.31
8279	2.134	2.848	2.389	1.517	3.62
8291	2.012	2.472	2.176	1.517	3.30
8292	2.192	2.029	2.134	1.517	3.24
8293	4.917	4.781	4.868	1.517	7.38
8350	4.643	3.689	4.302	1.517	6.52
8380	1.680	1.572	1.642	1.517	2.49
8381	0.989	1.218	1.071	1.517	1.62
8385	2.439	2.261	2.376	1.517	3.60
8392	0.960	1.329	1.092	1.517	1.66
8393	0.859	0.645	0.782	1.517	1.19
8500	3.387	3.713	3.503	1.517	5.31
8601	1.499	1.380	1.454	0.131	0.19
8710	1.845	1.433	1.698	1.517	2.57
8719	1.845	1.433	1.698	1.517	2.57
8720	0.544	0.504	0.530	1.517	0.80
8721	1.445	1.413	1.433	0.131	0.19
8742	0.691	0.797	0.731	0.131	0.10
8745	3.591	4.604	3.953	1.517	6.00
8747	0.521	0.345	0.458	1.517	0.69
8748	5.311	4.243	4.911	0.131	0.65
8800	7.654	6.622	7.268	0.131	0.96
8803	0.333	0.334	0.333	0.131	0.04
8810	0.451	0.493	0.467	0.131	0.06
8820	0.514	0.470	0.497	0.131	0.07
8824	1.371	1.374	1.372	1.517	2.08
8826	0.981	0.971	0.978	1.517	1.48
8829	1.594	1.318	1.496	1.517	2.27
8831	0.468	1.014	0.663	1.517	1.01
8832	2.137	1.860	2.033	0.131	0.27
8833	8.768	6.607	7.959	0.131	1.05
8835	1.228	0.936	1.124	1.517	1.70
8868	5.232	5.550	5.351	0.131	0.70
8901	0.451	0.493	0.467	0.131	0.06
9014	1.318	1.284	1.306	1.517	1.98
9015	1.929	1.834	1.895	1.517	2.87
9016	0.929	1.417	1.103	1.517	1.67
9019	0.615	0.612	0.614	4.299	2.64
9033	1.625	1.345	1.525	1.517	2.31
9040	1.961	1.980	1.968	1.517	2.98

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Class (1)	Balanced Formula Relativity			Uncapped Rate Level Factor (5)	Proposed Average Uncapped Rate (6)
	Indemnity (2)	Medical (3)	Total (4)		
9052	0.952	0.891	0.930	1.517	1.41
9058	0.925	0.947	0.933	1.517	1.41
9060	0.546	0.811	0.641	1.517	0.97
9061	0.595	0.734	0.645	1.517	0.98
9063	0.321	0.498	0.384	1.517	0.58
9079	0.587	0.702	0.628	1.517	0.95
9089	0.412	0.511	0.447	1.517	0.68
9093	0.604	0.868	0.698	1.517	1.06
9101	2.273	2.549	2.372	1.517	3.60
9102	0.425	0.535	0.463	4.299	1.99
9154	0.312	0.424	0.350	4.299	1.51
9156	12.747	17.820	14.648	0.131	1.93
9178	1.413	6.137	3.023	4.299	12.99
9179	7.894	19.998	12.018	4.299	51.67
9180	0.786	1.481	1.023	4.299	4.40
9182	0.524	0.928	0.661	4.299	2.84
9186	0.786	1.481	1.023	4.299	4.40
9220	2.366	2.366	2.366	1.517	3.59
9402	0.915	0.822	0.884	4.299	3.80
9403	2.287	2.089	2.220	4.299	9.54
9410	2.675	2.964	2.778	1.517	4.21
9501	1.118	1.063	1.099	1.779	1.96
9505	1.118	1.063	1.099	1.779	1.96
9519	1.698	1.410	1.596	1.517	2.42
9521	1.660	1.527	1.614	1.779	2.87
9522	0.897	0.798	0.863	1.779	1.53
9533	3.679	3.142	3.509	4.512	15.83
9534	1.225	0.981	1.148	4.512	5.18
9549	0.940	0.678	0.857	4.512	3.87
9552	1.364	1.777	1.494	4.512	6.74
9586	0.221	0.179	0.206	1.517	0.31
9620	0.446	0.510	0.469	1.517	0.71

Notes:

(2), (3), (4): Section IX - G.

(5): Section IX - H, Exhibit 1.

(6) = (4) x (5)

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Section IX - Classification Pricing
Subsection J - Average Rates and Proposed Premium Change
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Section IX - J
Exhibit 1

Comparison of Average Rates All Industry Groups

Class (1)	Present Average Capped Rate (2)	Proposed Average Uncapped Rate (3)	Proposed Average Capped Rate (4)
0005	2.16	2.34	2.34
0008	2.39	2.29	2.29
0016	3.27	3.32	3.32
0034	2.87	2.86	2.86
0035	1.73	1.57	1.57
0036	2.87	2.86	2.86
0042	3.32	3.19	3.20
0046	1.97	3.17	2.41
0050	3.83	4.08	4.09
0079	2.50	2.20	2.20
0083	3.24	3.42	3.42
0106	9.19	9.28	9.31
0113	2.87	2.86	2.86
0170	2.87	2.86	2.86
0908	74.50	80.79	80.86
0909	170.47	180.21	180.37
0912	340.94	360.41	360.74
0913	149.00	161.58	161.73
0917	2.36	2.24	2.24
0918	0.44	0.41	0.42
1430	5.07	3.48	4.27
1438	3.09	3.16	3.16
1463	10.16	12.39	12.41
1624	3.47	3.72	3.73
1655	2.75	2.12	2.25
1701	2.09	2.14	2.14
1710	3.47	3.72	3.73
1747	2.70	2.43	2.43
1748	2.84	3.07	3.07
1853	1.23	1.21	1.22
1924	2.09	2.12	2.12
1925	5.42	9.88	6.73
2003	3.37	3.46	3.47
2014	3.51	3.74	3.74
2021	2.19	2.52	2.53
2039	3.33	3.53	3.53
2041	2.24	2.19	2.19
2070	3.31	3.16	3.16
2081	2.52	2.51	2.52
2089	2.48	2.51	2.51
2095	2.75	2.54	2.54
2101	2.48	2.51	2.51
2111	2.00	2.06	2.07
2114	2.48	2.51	2.51
2115	4.75	5.87	5.88
2121	1.31	1.36	1.36
2130	1.34	1.40	1.40
2131	2.67	2.86	2.86

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Section IX - Classification Pricing
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Section IX - J
Exhibit 1

Comparison of Average Rates All Industry Groups

Class (1)	Present Average Capped Rate (2)	Proposed Average Uncapped Rate (3)	Proposed Average Capped Rate (4)
2143	2.03	2.47	2.47
2150	3.57	3.53	3.54
2156	3.98	3.49	3.49
2157	3.66	3.97	3.97
2172	1.62	1.65	1.65
2211	5.48	5.40	5.40
2220	2.07	2.41	2.41
2260	4.97	4.88	4.89
2288	3.19	3.58	3.58
2305	3.10	2.60	2.61
2362	1.50	1.79	1.79
2380	1.95	1.57	1.64
2402	2.06	2.11	2.12
2413	3.05	3.23	3.23
2416	2.29	2.16	2.17
2417	2.09	1.59	1.76
2501	1.82	2.06	2.07
2503	1.09	1.03	1.03
2570	4.28	3.20	3.61
2576	1.92	2.03	2.03
2585	2.56	2.62	2.62
2586	1.77	2.01	2.01
2587	2.63	1.95	2.16
2623	4.51	4.50	4.51
2651	1.42	1.47	1.47
2660	1.95	1.97	1.98
2683	1.93	2.09	2.10
2688	1.72	1.68	1.69
2702	11.57	12.58	12.62
2710	5.61	5.93	5.94
2731	2.78	2.73	2.74
2747	5.09	5.17	5.18
2790	1.53	2.07	1.90
2802	3.38	3.47	3.48
2835	1.37	1.70	1.70
2836	1.90	2.36	2.36
2841	3.49	3.51	3.52
2883	3.03	3.08	3.08
2923	1.49	1.36	1.37
2942	1.57	1.55	1.56
3018	2.33	2.31	2.31
3022	3.21	3.21	3.22
3027	3.92	2.44	3.30
3028	2.63	2.52	2.52
3030	5.49	4.68	4.69
3040	4.31	5.12	5.13
3041	2.76	2.55	2.55
3042	4.35	3.55	3.66

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Section IX - J
Exhibit 1

Comparison of Average Rates All Industry Groups

Class (1)	Present Average Capped Rate (2)	Proposed Average Uncapped Rate (3)	Proposed Average Capped Rate (4)
3066	2.11	2.22	2.22
3076	1.91	2.08	2.08
3081	4.57	4.54	4.54
3082	4.57	4.54	4.54
3085	4.13	4.41	4.42
3110	7.41	8.26	8.27
3111	1.72	1.96	1.96
3113	1.46	1.61	1.61
3114	2.82	2.69	2.70
3118	1.52	1.51	1.51
3119	0.70	0.99	0.87
3120	1.18	1.17	1.17
3122	2.13	2.13	2.13
3127	1.11	2.16	1.38
3131	1.30	1.20	1.21
3132	2.35	2.21	2.21
3145	1.50	1.52	1.52
3146	2.05	2.00	2.00
3169	2.50	2.46	2.46
3179	1.06	1.04	1.04
3180	2.06	2.32	2.32
3188	2.14	2.25	2.25
3200	1.87	2.03	2.04
3220	2.74	2.74	2.74
3255	1.80	1.79	1.80
3257	2.05	2.29	2.29
3270	2.15	2.06	2.06
3300	3.07	2.99	2.99
3315	2.63	2.78	2.78
3336	2.79	2.54	2.54
3365	4.52	4.45	4.46
3372	1.87	1.97	1.97
3373	3.35	3.43	3.44
3381	1.86	1.76	1.76
3383	1.51	1.44	1.44
3385	0.63	0.75	0.75
3400	2.50	2.46	2.46
3507	2.47	2.59	2.59
3515	2.59	2.52	2.52
3558	0.73	0.71	0.71
3571	0.66	0.61	0.61
3574	1.51	1.55	1.56
3612	1.29	1.22	1.22
3620	3.52	3.41	3.41
3629	1.51	1.55	1.56
3632	1.51	1.55	1.56
3634	1.28	1.39	1.39
3635	2.69	2.43	2.43

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Section IX - Classification Pricing
Subsection J - Average Rates and Proposed Premium Change
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Section IX - J
Exhibit 1

Comparison of Average Rates All Industry Groups

Class (1)	Present Average Capped Rate (2)	Proposed Average Uncapped Rate (3)	Proposed Average Capped Rate (4)
3638	1.51	1.55	1.56
3642	1.01	0.97	0.97
3643	1.39	1.46	1.46
3647	1.95	2.19	2.20
3648	1.10	1.12	1.12
3681	0.62	0.58	0.58
3685	0.59	0.54	0.54
3724	4.70	4.31	4.31
3726	6.35	3.36	5.30
3807	2.50	2.46	2.46
3808	2.96	3.10	3.10
3821	4.67	4.70	4.70
3826	3.80	4.13	4.13
3830	1.51	1.55	1.56
3841	1.27	1.76	1.58
4000	4.80	5.46	5.48
4021	3.27	3.02	3.02
4024	3.01	3.68	3.68
4034	5.06	5.66	5.66
4036	1.86	1.78	1.78
4038	2.77	2.45	2.45
4053	2.05	2.29	2.29
4062	1.67	1.82	1.82
4112	0.37	0.36	0.36
4113	2.05	2.29	2.29
4114	2.30	2.59	2.60
4130	2.70	3.35	3.36
4133	1.32	1.48	1.48
4150	0.68	0.85	0.84
4239	1.91	2.37	2.37
4243	2.65	2.55	2.56
4244	2.32	2.80	2.80
4250	1.59	2.06	1.98
4251	1.88	2.07	2.08
4273	2.75	2.92	2.92
4279	1.95	2.12	2.13
4283	1.58	1.39	1.39
4299	1.63	1.66	1.66
4304	4.09	4.27	4.27
4307	1.41	1.52	1.53
4308	1.50	1.99	1.86
4351	0.82	0.84	0.84
4352	1.18	1.11	1.11
4360	0.57	0.57	0.57
4361	0.65	0.56	0.56
4362	0.47	0.47	0.47
4410	2.71	2.97	2.97
4432	0.66	0.65	0.65

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Section IX - J
Exhibit 1

Comparison of Average Rates All Industry Groups

Class (1)	Present Average Capped Rate (2)	Proposed Average Uncapped Rate (3)	Proposed Average Capped Rate (4)
4439	3.84	5.84	4.78
4452	2.44	2.49	2.50
4459	2.49	2.73	2.74
4470	1.87	1.89	1.89
4484	1.84	1.95	1.95
4493	1.74	1.80	1.81
4511	0.26	0.31	0.31
4512	0.09	0.09	0.09
4557	1.55	1.71	1.71
4558	1.37	1.48	1.48
4583	2.40	2.40	2.40
4611	0.70	0.80	0.80
4635	4.48	4.69	4.70
4653	1.58	1.86	1.86
4665	7.98	10.26	9.92
4692	0.46	0.49	0.49
4693	0.77	0.77	0.77
4720	1.59	1.53	1.53
4740	0.87	0.71	0.74
4741	1.94	2.44	2.41
4771	5.02	2.23	4.23
4777	2.40	2.40	2.40
4825	0.43	0.40	0.40
4828	0.87	0.84	0.84
4829	0.87	0.84	0.84
4902	1.57	1.55	1.56
4923	0.57	0.57	0.57
5020	4.14	4.09	4.10
5022	9.11	9.72	9.74
5037	15.65	15.04	15.07
5040	20.26	20.19	20.23
5057	21.40	17.94	17.97
5059	18.50	28.68	22.84
5102	6.24	6.08	6.09
5146	6.63	6.52	6.53
5160	2.32	2.82	2.83
5183	2.88	3.02	3.03
5188	3.73	3.75	3.76
5190	2.09	2.31	2.31
5191	0.74	0.74	0.74
5192	2.46	2.66	2.66
5213	10.64	10.95	10.97
5215	3.84	4.07	4.08
5221	6.25	6.37	6.38
5222	9.40	8.84	8.86
5223	3.73	3.94	3.95
5348	3.93	4.67	4.68
5402	5.59	6.34	6.35

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Section IX - Classification Pricing
Subsection J - Average Rates and Proposed Premium Change
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Section IX - J
Exhibit 1

Comparison of Average Rates All Industry Groups

Class (1)	Present Average Capped Rate (2)	Proposed Average Uncapped Rate (3)	Proposed Average Capped Rate (4)
5403	7.93	8.68	8.70
5437	3.92	3.56	3.56
5443	3.36	3.44	3.45
5445	5.72	6.17	6.18
5462	5.29	5.36	5.37
5472	7.66	7.47	7.48
5473	9.50	8.69	8.70
5474	3.79	3.92	3.93
5478	3.70	3.38	3.38
5479	5.22	5.29	5.31
5480	4.47	4.47	4.48
5506	4.42	5.66	5.46
5507	5.31	5.31	5.32
5508	3.83	4.08	4.09
5509	4.23	5.89	5.23
5538	3.97	4.01	4.01
5545	38.49	47.84	47.52
5547	10.21	10.71	10.73
5606	1.25	1.23	1.23
5610	4.27	4.43	4.44
5645	6.49	6.47	6.49
5701	19.02	19.68	19.72
5703	11.00	10.81	10.83
5705	9.67	9.08	9.10
6003	7.98	7.39	7.40
6005	3.83	4.08	4.09
6204	4.89	5.11	5.12
6217	4.04	4.24	4.24
6229	3.63	3.75	3.75
6233	2.17	2.05	2.06
6251	4.21	4.19	4.20
6252	6.25	3.85	5.21
6306	6.85	8.54	8.46
6319	2.87	2.67	2.67
6325	2.61	2.50	2.50
6400	4.51	4.65	4.66
6504	2.48	2.51	2.51
6834	2.32	2.13	2.14
6836	3.41	2.87	2.88
7219	8.00	7.39	7.41
7230	8.93	8.44	8.46
7231	9.82	11.29	11.33
7360	3.68	4.11	4.12
7370	3.63	3.72	3.73
7380	5.62	5.82	5.84
7382	3.44	3.67	3.68
7403	3.84	3.31	3.32
7405	1.13	1.14	1.14

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Exhibit 1

Comparison of Average Rates All Industry Groups

Class (1)	Present Average Capped Rate (2)	Proposed Average Uncapped Rate (3)	Proposed Average Capped Rate (4)
7420	7.36	22.06	8.98
7421	1.15	1.06	1.06
7422	1.15	1.06	1.06
7425	2.30	2.55	2.56
7431	1.15	1.06	1.06
7502	1.73	1.64	1.64
7515	2.64	4.19	3.22
7520	2.79	2.84	2.85
7538	5.95	5.31	5.32
7539	1.16	1.40	1.41
7580	3.04	3.28	3.29
7590	4.04	6.79	4.93
7600	3.36	3.61	3.62
7601	5.36	5.03	5.04
7610	0.28	0.55	0.34
7704	2.80	4.30	3.41
7720	1.36	1.44	1.44
7855	3.33	3.12	3.13
8001	1.55	1.60	1.60
8002	1.56	1.97	1.91
8006	1.14	1.15	1.15
8008	0.68	0.75	0.75
8010	1.57	1.59	1.59
8013	0.33	0.35	0.35
8017	0.89	0.94	0.94
8018	3.33	3.49	3.49
8021	3.18	3.29	3.29
8031	1.63	1.60	1.61
8032	1.14	1.25	1.25
8033	1.43	1.38	1.38
8034	2.76	2.87	2.87
8039	1.20	1.29	1.29
8044	2.67	2.64	2.64
8046	1.89	2.15	2.15
8048	2.44	2.35	2.35
8058	2.11	2.19	2.19
8103	2.33	2.56	2.56
8105	6.38	17.42	7.79
8106	5.26	4.98	4.98
8107	2.60	2.92	2.92
8111	2.65	2.61	2.61
8203	5.80	5.90	5.90
8204	5.20	6.91	6.35
8215	3.36	3.09	3.09
8227	4.35	5.11	5.12
8232	5.38	5.29	5.30
8233	5.29	5.31	5.32
8235	3.76	3.90	3.91

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Section IX - Classification Pricing
Subsection J - Average Rates and Proposed Premium Change
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Section IX - J
Exhibit 1

Comparison of Average Rates All Industry Groups

Class (1)	Present Average Capped Rate (2)	Proposed Average Uncapped Rate (3)	Proposed Average Capped Rate (4)
8263	4.21	5.03	5.03
8264	4.54	4.78	4.79
8265	5.29	5.31	5.32
8279	3.74	3.62	3.63
8291	3.62	3.30	3.30
8292	3.34	3.24	3.24
8293	7.54	7.38	7.39
8350	6.16	6.52	6.53
8380	2.46	2.49	2.49
8381	1.70	1.62	1.63
8385	2.92	3.60	3.56
8392	1.40	1.66	1.66
8393	1.26	1.19	1.19
8500	5.29	5.31	5.32
8601	0.20	0.19	0.19
8710	2.96	2.57	2.58
8719	2.96	2.57	2.58
8720	0.75	0.80	0.80
8721	0.26	0.19	0.21
8742	0.10	0.10	0.10
8745	5.15	6.00	6.00
8747	0.72	0.69	0.70
8748	0.62	0.65	0.65
8800	0.96	0.96	0.96
8803	0.04	0.04	0.04
8810	0.06	0.06	0.06
8820	0.07	0.07	0.07
8824	1.72	2.08	2.08
8826	1.37	1.48	1.48
8829	2.03	2.27	2.27
8831	0.94	1.01	1.01
8832	0.27	0.27	0.27
8833	1.06	1.05	1.05
8835	1.72	1.70	1.71
8868	0.67	0.70	0.71
8901	0.06	0.06	0.06
9014	2.05	1.98	1.98
9015	2.85	2.87	2.88
9016	1.69	1.67	1.67
9019	2.97	2.64	2.65
9033	2.36	2.31	2.31
9040	2.70	2.98	2.99
9052	1.40	1.41	1.41
9058	1.33	1.41	1.42
9060	0.95	0.97	0.97
9061	0.90	0.98	0.98
9063	0.56	0.58	0.58
9079	0.97	0.95	0.95

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Section IX - Classification Pricing
Subsection J - Average Rates and Proposed Premium Change
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Section IX - J
Exhibit 1

Comparison of Average Rates All Industry Groups

Class (1)	Present Average Capped Rate (2)	Proposed Average Uncapped Rate (3)	Proposed Average Capped Rate (4)
9089	0.77	0.68	0.68
9093	1.07	1.06	1.06
9101	3.30	3.60	3.60
9102	2.13	1.99	2.00
9154	1.37	1.51	1.51
9156	1.63	1.93	1.94
9178	13.02	12.99	13.03
9179	32.92	51.67	40.15
9180	4.23	4.40	4.41
9182	3.01	2.84	2.85
9186	4.23	4.40	4.41
9220	3.02	3.59	3.59
9402	3.81	3.80	3.81
9403	9.27	9.54	9.57
9410	3.02	4.21	3.69
9501	1.92	1.96	1.96
9505	1.92	1.96	1.96
9519	2.66	2.42	2.42
9521	2.79	2.87	2.88
9522	1.51	1.53	1.54
9533	12.82	15.83	15.83
9534	5.08	5.18	5.19
9549	4.09	3.87	3.87
9552	7.04	6.74	6.76
9586	0.29	0.31	0.31
9620	0.72	0.71	0.71

Notes:

(2) = (4) from Section IX - J, Exhibit 1 of the 07/01/2020 stipulation.

(3): Section IX - I.

(4): Total Balanced Formula Relativity (from Section IX - I, Exhibit 1) x Capped Rate Level Factors and subject to maximum and minimum caps (from Section IX - H, Exhibit 1.)

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Section IX - Classification Pricing
Subsection J - Average Rates and Proposed Premium Change
7/1/2022

Section IX - J
Exhibit 2

Summary of Proposed Premium Change All Industry Groups

Industry Group (1)	Present Premium (2)	Proposed Premium (3)	Proposed Change (4)	Target Change (5)	Capped Rate Level Factor (6)
Manufacturing	546,612,656	569,789,773	4.2%	4.2%	1.781
Construction	1,627,019,502	1,683,303,251	3.5%	3.5%	4.521
Office & Clerical	556,358,978	562,561,133	1.1%	1.1%	0.133
Goods & Services	1,462,160,824	1,494,435,016	2.2%	2.2%	1.518
Miscellaneous	662,031,114	675,152,683	2.0%	2.0%	4.312
All Groups	4,854,183,074	4,985,241,856	2.7%		

Notes:

(2) = Exposure x Present Average Rates from Exhibit 1.

(3) = Exposure x Proposed Average Capped Rates from Exhibit 1.

(4) = [(3) - (2)] / (2)

(5): Section IX - H, Exhibit 1.

(6): Section IX - H, Exhibit 1. Proposed average uncapped rates are capped by an iterative process using rate levels to determine if the required change is achieved.

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Section IX - Classification Pricing
Subsection K - Adjustments to Derive Final Manual Rates
7/1/2022

Section IX - K
Exhibit 1

Calculation of Proposed Manual Rates

The proposed manual rates in Section IX - A, Exhibit 1 are derived from the proposed average capped rates in Section IX - J, Exhibit 1 as follows:

Proposed Manual Rate = [Proposed Average Rate / (Factor 1 x Factor 2 x Factor 3)] x [1.000 / (1.000 - Factor 4)]

(1)	Factor 1 =	0.997	The offset for Merit Rating and Average Experience Modification
(2)	Factor 2 =	1.054	The offset for ARAP
(3)	Factor 3 =	0.963	For eligible classes, the offset for the Construction Classification Premium Adjustment Program
(4)	Factor 4 =	0.0052	The loading from the filing of recoupment of amounts paid to the Insolvency Fund

Notes:

- (1): Exhibit 2.
- (2): Exhibit 3.
- (3): Exhibit 4.
- (4): Exhibit 5, Page 1.

Offset for Experience & Merit Rating

Policy Year (1)	Age (2)	Rating Category (3)	Number of Policies (4)	% of Policies = (4) / Total (4) (5)	Manual Premium (6)	% of Manual = (6) / Total (6) (7)	Standard Premium (8)	Historical Average Mod = (8) / (6) (9)	Selected Average Mod (10)
2014	78	Non Rated	93,335	44%	22,203,735	2%	22,197,610	1.000	
		Merit Rated	79,803	37%	150,882,034	14%	147,472,632	0.977	
		Intrastate Rated	20,621	10%	466,058,694	43%	470,135,942	1.009	
		Interstate Rated	20,332	9%	439,379,535	41%	403,095,166	0.917	
		Total	214,091	100%	1,078,523,998	100%	1,042,901,350	0.967	
2015	66	Non Rated	97,498	44%	23,297,444	2%	23,289,053	1.000	
		Merit Rated	80,244	36%	154,817,454	13%	151,328,259	0.977	
		Intrastate Rated	22,275	10%	498,410,125	43%	497,946,243	0.999	
		Interstate Rated	21,647	10%	477,393,043	41%	438,023,808	0.918	
		Total	221,664	100%	1,153,918,066	100%	1,110,587,363	0.962	
2016	54	Non Rated	100,800	44%	22,948,342	2%	22,941,961	1.000	
		Merit Rated	80,569	35%	157,256,464	13%	153,734,585	0.978	
		Intrastate Rated	23,436	10%	528,007,141	44%	527,729,144	0.999	
		Interstate Rated	23,395	10%	493,152,576	41%	454,090,243	0.921	
		Total	228,200	100%	1,201,364,523	100%	1,158,495,933	0.964	
2017	42	Non Rated	99,060	43%	23,300,981	2%	23,294,167	1.000	
		Merit Rated	79,706	35%	157,891,144	12%	154,357,803	0.978	
		Intrastate Rated	24,399	11%	561,408,722	44%	560,312,973	0.998	
		Interstate Rated	24,990	11%	537,810,384	42%	494,199,106	0.919	
		Total	228,155	100%	1,280,411,231	100%	1,232,164,049	0.962	
2018	30	Non Rated	102,470	44%	23,888,747	2%	23,882,207	1.000	
		Merit Rated	80,224	35%	158,147,121	13%	154,743,807	0.978	
		Intrastate Rated	24,345	10%	555,141,021	44%	554,812,928	0.999	
		Interstate Rated	24,962	11%	519,231,071	41%	480,574,439	0.926	
		Total	232,001	100%	1,256,407,960	100%	1,214,013,381	0.966	
Total		Non Rated	493,163	44%	115,639,249	2%	115,604,998	1.000	1.000
		Merit Rated	400,546	36%	778,994,217	13%	761,637,086	0.978	0.978
		Intrastate Rated	115,076	10%	2,609,025,703	44%	2,610,937,230	1.001	1.000
		Interstate Rated	115,326	10%	2,466,966,609	41%	2,269,982,762	0.920	1.000
		Total	1,124,111	100%	5,970,625,778	100%	5,758,162,076	0.964	0.997

Notes:

Unit Statistical Plan data, excluding Large Deductibles and SIGs.
 Non Rated, Merit Rated and Intrastate Rated categories are estimated based on manual premium.
 (10): Set to 1.000 for Non Rated and Interstate Rated and Intrastate Rated.

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Section IX - Classification Pricing
 Subsection K - Adjustments to Derive Final Manual Rates
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Section IX - K
 Exhibit 3

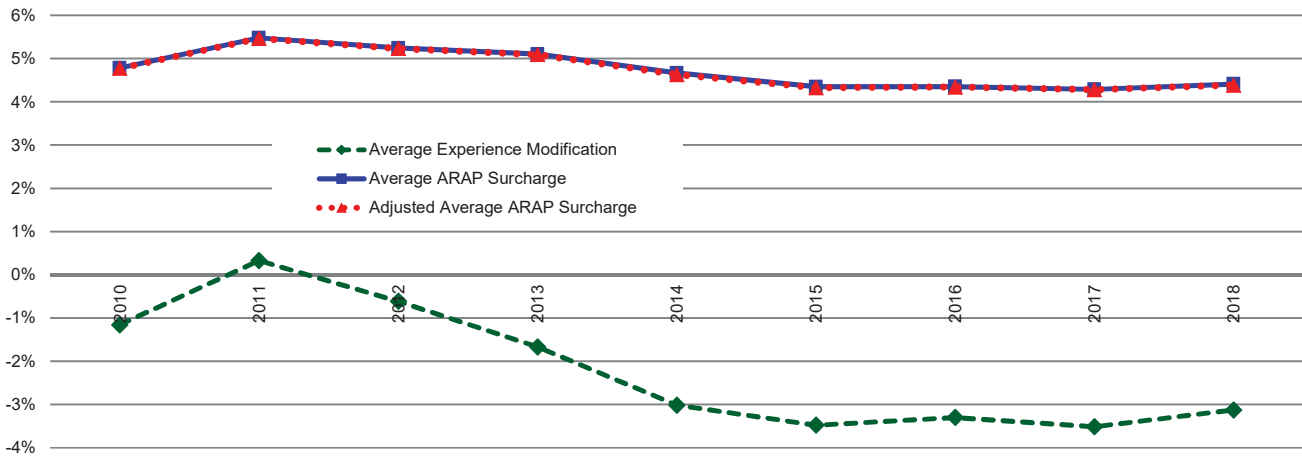
Offset for ARAP Estimate of Average ARAP Surcharge for Prospective Effective Period

Historical Average Experience Modification and ARAP Surcharge

Policy Year (1)	Manual Premium (2)	Standard Premium (3)	ARAP Premium (4)	Adjusted ARAP Premium (5)	Average ARAP Surcharge =(4) / (3) (6)	Average Experience Modification =(3) / (2) - 1.000 (7)	Adjusted Average ARAP Surcharge =(5) / [(3)+(4)-(5)] (8)
2010	870,437,515	860,366,123	41,141,500	41,054,589	4.8%	-1.2%	4.8%
2011	914,834,538	917,837,332	50,256,579	50,160,670	5.5%	0.3%	5.5%
2012	943,303,428	937,505,205	49,160,807	49,039,440	5.2%	-0.6%	5.2%
2013	1,001,395,712	984,687,596	50,230,559	50,125,534	5.1%	-1.7%	5.1%
2014	1,075,292,326	1,042,901,350	48,667,270	48,289,734	4.7%	-3.0%	4.6%
2015	1,150,582,309	1,110,587,363	48,301,566	48,034,744	4.3%	-3.5%	4.3%
2016	1,198,012,527	1,158,495,933	50,412,520	50,286,604	4.4%	-3.3%	4.3%
2017	1,277,035,869	1,232,164,049	52,815,889	52,740,333	4.3%	-3.5%	4.3%
2018	1,253,154,605	1,214,013,381	53,569,069	53,239,945	4.4%	-3.1%	4.4%

Regression of Average ARAP Surcharge on Average Experience Modification

(9) R-Squared	0.902
(10) Slope	0.292
(11) Intercept	0.054
(12) Projected Average ARAP Surcharge = (11)	0.054



Notes:

- (2)-(4): Unit Statistical Plan data, excluding Large Deductibles and SIGs. ARAP adjusted from company level to DSR level.
- (5): (4) adjusted to maximum ARAP surcharge factor of 1.25.

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Section IX - Classification Pricing
Subsection K - Adjustments to Derive Final Manual Rates
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Section IX - K
Exhibit 4

Construction Class Premium Adjustment Program

Policy Year (1)	Manual Premium for Eligible Class Codes (2)	Construction Credit (3)	Percent (4)
2017	460,975,842	15,529,533	3.4%
2018	456,295,035	17,064,014	3.7%
(5) Selected Average Credit for Eligible Class Codes in Prospective Effective Period			3.7%

Note:

(2),(3): Unit Statistical Plan data, excluding Large Deductibles and SIGs.

(4): (3) / (2)

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Section IX - Classification Pricing
Subsection K - Adjustments to Derive Final Manual Rates
7/1/2022

Section IX - K
Exhibit 5
Page 1

Loading for Recoupment of Insolvency Fund Assessments

Unanticipated Insolvency Assessment Recoupments

(1)	Estimated Written Premium for the Policy Period beginning 7/1/21 and ending 6/30/22, absent Insolvency loads	1,420,450,494
(2)	Unanticipated Insolvency Assessment Recoupment Rate (As a % of premium absent insolvency loads)	-0.54%
(3)	Unanticipated Insolvency Assessment Recoupments	(7,670,433)
(4)	Interest Adjustment Factor	1.004
(5)	Adjusted Unanticipated Insolvency Assessment Recoupments	(7,697,947)

Net Assessments

(6)	Amount Sufficient to Recoup Assessment	0
(7)	Net Assessments	7,697,947

Loading for Recoupment

(8)	Estimated Written Premium in the Prospective Effective Period, absent insolvency loads	1,458,802,657
(9)	Indicated Loading for Recoupment of Insolvency Fund Assessments	0.52%

Notes:

- (1): Page 2.
(2): loading for insolvency fund in 07/01/2020 effective rates.
(3) = (1) x (2)
(4): 0.4% is the risk-free rate of interest, shown in Section VII-J, Exhibit 1, Page 1 compounded from the expected collection date of the unanticipated insolvency assessment recoupments to the average date the assessment will be recouped or returned.
(5) = (3) x (4)
(6): No assessment or refund of assessment in 2020 or 2021.
(7) = (6) - (5)
(8): Page 2.
(9) = (7) / [(7) + (8)]

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Section IX - Classification Pricing
Subsection K - Adjustments to Derive Final Manual Rates
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Exhibit 5
Page 2

Expected Workers' Compensation Written Premium in Prospective Effective Period

(1)	2019 Calendar Year Written Premium, absent insolvency loads	1,524,088,513
(2)	Estimated Exposure Growth Factor from Calendar Year 2019 to Policy Period ending 6/30/22	1.000
(3)	Rate Change from Calendar Year 2019 Written to the Policy Period ending 6/30/22	-6.8%
(4)	Estimated Written Premium for the Policy Period ending 6/30/22, absent Insolvency Loads = (1) x (2) x [1.0 + (3)]	1,420,450,494
(5)	Estimated Exposure Growth Factor from the Policy Period ending 6/30/22 to the Prospective Effective Period	1.000
(6)	Average Indicated Rate Change	2.7%
(7)	Estimated Written Premium in Prospective Effective Period, absent insolvency loads = (4) x (5) x [1.0 + (6)]	1,458,802,657

Notes:

(1): Adjusted to remove any loading for recoupment of insolvency fund assessments.

(2): Assumes a 0.0% (from Section V-H, Exhibit 3).

(3): The 7/1/20 rate change was -6.8%.

(5): Assumes a 0.0% annual change (from Section V-H, Exhibit 3) compounded for 1 year.

(6): Section I-A, Exhibit 1.

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Section IX - Classification Pricing
 Subsection L - Pricing Example
 7/1/2022

Section IX - L
 Exhibit 1
 Page 1

Pricing Example for Class 2660 Boot Or Shoe Mfg Noc

Calculation of MA Indicated Relativity:

(A). Limited Losses (Unit Statistical Plan data, excluding Large Deductibles)									
	Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
		Indemnity	2014	0	0	0	0	0	3,528
2015	0		0	0	0	79,225	0	337	0
2016	0		0	0	0	0	0	427	0
2017	0		0	0	0	0	0	1,058	0
2018	0		0	0	0	32,800	0	31	0
Medical	2014	0	0	0	0	0	1,781	0	326
	2015	0	0	0	0	22,860	0	1,274	113
	2016	0	0	0	0	0	0	749	2,254
	2017	0	0	0	0	0	0	2,419	369
	2018	0	0	0	0	9,530	0	218	312

(B). Primary Conversion Factors (Section IX - B, Exhibit 1, Page 1)									
	Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
		Indemnity	2014	0.818	0.812	0.822	0.854	0.849	0.804
2015	0.889		0.889	0.899	0.930	0.929	0.881	0.880	0.000
2016	0.974		0.967	0.983	1.014	1.007	0.966	0.959	0.000
2017	1.101		1.082	1.111	1.141	1.121	1.094	1.075	0.000
2018	1.710		1.505	1.722	1.761	1.550	1.700	1.497	0.000
Medical	2014	0.705	0.750	0.705	0.705	0.750	0.705	0.750	0.705
	2015	0.779	0.833	0.779	0.779	0.833	0.779	0.833	0.735
	2016	0.804	0.861	0.804	0.804	0.861	0.804	0.861	0.780
	2017	0.822	0.857	0.822	0.822	0.857	0.822	0.857	0.774
	2018	0.894	0.899	0.894	0.894	0.899	0.894	0.899	0.814

(C). Converted Limited Losses [(A) x (B)]									
	Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
		Indemnity	2014	0	0	0	0	0	2,835
2015	0		0	0	0	73,628	0	297	0
2016	0		0	0	0	0	0	410	0
2017	0		0	0	0	0	0	1,137	0
2018	0		0	0	0	50,842	0	46	0
Medical	2014	0	0	0	0	0	1,255	0	230
	2015	0	0	0	0	19,052	0	1,062	83
	2016	0	0	0	0	0	0	645	1,758
	2017	0	0	0	0	0	0	2,074	286
	2018	0	0	0	0	8,566	0	196	254

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Section IX - Classification Pricing
 Subsection L - Pricing Example
 7/1/2022

Section IX - L
 Exhibit 1
 Page 2

Pricing Example for Class 2660 Boot Or Shoe Mfg Noc

Calculation of MA Indicated Relativity:

		(D). Unadjusted Excess Losses [(Excess Factor -1.0) x (C)]							
	Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2014	0	0	0	0	0	387	0	0
	2015	0	0	0	0	10,040	0	40	0
	2016	0	0	0	0	0	0	56	0
	2017	0	0	0	0	0	0	155	0
	2018	0	0	0	0	6,933	0	6	0
Medical	2014	0	0	0	0	0	171	0	31
	2015	0	0	0	0	2,598	0	145	11
	2016	0	0	0	0	0	0	88	240
	2017	0	0	0	0	0	0	283	39
	2018	0	0	0	0	1,168	0	27	35

		(E). Adjusted Excess Losses							
	Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2014	0	0	0	0	0	271	0	0
	2015	0	0	0	0	7,028	0	28	0
	2016	0	0	0	0	0	0	39	0
	2017	0	0	0	0	0	0	109	0
	2018	0	0	0	0	4,853	0	4	0
Medical	2014	0	0	0	0	0	287	0	31
	2015	0	0	0	0	5,610	0	157	11
	2016	0	0	0	0	0	0	105	240
	2017	0	0	0	0	0	0	329	39
	2018	0	0	0	0	3,248	0	29	35

		(F). Secondary Conversion Factors				
		Fatal	Permanent Total	Permanent Partial	Temporary Total	Medical Only
Indemnity		1.134	1.118	1.199	1.201	0.000
Medical		1.187	1.120	1.200	1.203	1.187

		(G). Converted Unlimited Losses							
	Policy Year	Fatal		Permanent Total	Permanent Partial		Temporary Total		Medical Only
		LD	NLD		LD	NLD	LD	NLD	
Indemnity	2014	0	0	0	0	0	3,730	0	0
	2015	0	0	0	0	96,687	0	390	0
	2016	0	0	0	0	0	0	539	0
	2017	0	0	0	0	0	0	1,496	0
	2018	0	0	0	0	66,765	0	61	0
Medical	2014	0	0	0	0	0	1,855	0	310
	2015	0	0	0	0	29,605	0	1,466	112
	2016	0	0	0	0	0	0	901	2,372
	2017	0	0	0	0	0	0	2,890	385
	2018	0	0	0	0	14,182	0	270	343

		(H). Total					
Policy Year	Exposure	Indemnity		Medical		Total	
		LD	NLD	LD	NLD		
2014	46,156	3,730	0	1,855	0	310	
2015	44,779	0	97,077	0	0	31,183	
2016	37,929	0	539	0	0	3,273	
2017	52,045	0	1,496	0	0	3,276	
2018	53,397	0	66,826	0	0	14,795	
Total	234,306	3,730	165,939	1,855	0	52,836	

	Indemnity	Medical
(I). Indicated Pure Premium	0.724	0.233
(J). Manufacturing Industry Group Pure Premium	0.918	0.482
(K). MA Indicated Relativity	0.789	0.484

Notes:

(E): Indemnity Adjusted Excess Losses = Indemnity Unadjusted Excess Losses x 0.7

Medical Adjusted Excess Losses = Medical Unadjusted Excess Losses + 0.3 x Indemnity Unadjusted Excess Losses

(F): Section IX-B, Exhibit 1, Page 3.

(G) = [(C) + (E)] x (F)

(I) = Total Losses / Total Exposure

(J): Industry Group Pure Premium from Section IX - C, Exhibit 1, Page 2.

(K) = (I) / (J)

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Section IX - Classification Pricing
 Subsection L - Pricing Example
 7/1/2022

Section IX - L
 Exhibit 2
 Page 1

Pricing Example for Class 2660
 Boot Or Shoe Mfg Noc

Calculation of Countrywide Relativity

State (1)	State Code (2)	Losses				Lost-Time Claims		Payroll (9)
		Indemnity		Medical		Likely (7)	Not-Likely (8)	
		Likely (3)	Not-Likely (4)	Likely (5)	Not-Likely (6)			
Alabama	1	0	0	0	0	0	0	713
Arizona	2	0	0	0	12,133	0	0	9,160,199
Arkansas	3	1,051	63,974	1,773	236,539	1	15	65,341,994
Colorado	5	0	3,182	0	9,755	0	1	4,897,598
Connecticut	6	0	0	0	0	0	0	286,534
D.C.	8	0	0	0	0	0	0	0
Florida	9	10,637	0	15,257	6,313	1	0	5,428,813
Georgia	10	0	31,586	0	12,240	0	1	2,864,840
Idaho	11	0	2,786	0	11,087	0	1	901,192
Illinois	12	57,222	148,804	62,145	261,003	3	15	18,527,490
Indiana	13	0	613	0	4,947	0	1	1,075,656
Iowa	14	0	0	0	0	0	0	674,753
Kansas	15	0	0	0	0	0	0	0
Kentucky	16	0	0	0	0	0	0	284,612
Louisiana	17	0	0	0	0	0	0	0
Maine	18	352,605	1,087,437	956,630	1,445,137	11	80	144,883,765
Maryland	19	0	0	0	0	0	0	294,610
Michigan	21	0	112,633	0	160,549	0	8	48,873,616
Minnesota	22	0	25,858	0	27,288	0	3	6,432,019
Mississippi	23	0	0	0	0	0	0	0
Missouri	24	55,075	453,069	132,010	1,212,718	2	40	69,694,751
Montana	25	0	0	0	0	0	0	660,674
Nebraska	26	0	0	0	0	0	0	796,853
Nevada	27	0	624	0	1,629	0	1	588,776
New Hampshire	28	0	0	0	0	0	0	525,160
New Mexico	30	0	0	0	0	0	0	0
North Carolina	32	23,339	59,098	8,611	103,123	2	7	25,348,208
Oklahoma	35	0	0	0	0	0	0	0
Oregon	36	151,944	446,297	49,431	464,658	3	46	87,256,074
Rhode Island	38	0	0	0	0	0	0	139,164
South Carolina	39	0	0	0	1,117	0	0	59,619
South Dakota	40	0	0	0	0	0	0	0
Tennessee	41	0	61,663	0	227,253	0	6	28,962,061
Utah	43	0	0	0	2,740	0	0	2,840,143
Vermont	44	0	0	0	0	0	0	0
Virginia	45	25,536	10,824	26,620	18,548	1	2	8,058,701
West Virginia	47	0	0	0	0	0	0	956,817
Wisconsin	48	172,957	433,129	842,962	1,770,113	6	38	87,494,839
Hawaii	52	0	174	0	2,905	0	2	2,417,768
Alaska	54	0	0	0	0	0	0	0
Total		850,366	2,941,751	2,095,439	5,991,795	30	267	625,728,012

Note:
 (3) - (9): Data are total for latest three policy years. See Section IX-D, Exhibit 3.

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Pricing Example for Class 2660 Boot Or Shoe Mfg Noc

Calculation of Countrywide Relativity

State (1)	State Code (2)	Manufacturing Pitch Factors		Pure Premiums, on MA Level		Total (7)
		Indemnity (3)	Medical (4)	Indemnity (5)	Medical (6)	
Alabama	1	2.483	0.635	0.000	0.000	
Arizona	2	3.235	0.435	0.000	0.058	
Arkansas	3	3.273	1.060	0.326	0.386	
Colorado	5	2.071	0.628	0.135	0.125	
Connecticut	6	0.938	0.504	0.000	0.000	
D.C.	8	0.780	0.429	0.000	0.000	
Florida	9	2.058	0.454	0.403	0.180	
Georgia	10	1.363	0.710	1.503	0.303	
Idaho	11	1.454	0.411	0.449	0.505	
Illinois	12	1.027	0.476	1.143	0.830	
Indiana	13	3.601	0.737	0.205	0.339	
Iowa	14	1.388	0.444	0.000	0.000	
Kansas	15	2.381	0.573	0.000	0.000	
Kentucky	16	2.057	0.899	0.000	0.000	
Louisiana	17	1.663	0.565	0.000	0.000	
Maine	18	1.068	0.509	1.061	0.844	
Maryland	19	1.574	0.795	0.000	0.000	
Michigan	21	2.261	0.813	0.521	0.267	
Minnesota	22	1.519	0.714	0.611	0.303	
Mississippi	23	1.719	0.684	0.000	0.000	
Missouri	24	1.442	0.495	1.051	0.956	
Montana	25	1.305	0.370	0.000	0.000	
Nebraska	26	1.728	0.495	0.000	0.000	
Nevada	27	0.803	0.468	0.085	0.129	
New Hampshire	28	1.850	0.409	0.000	0.000	
New Mexico	30	0.532	0.277	0.000	0.000	
North Carolina	32	1.785	1.069	0.580	0.471	
Oklahoma	35	1.269	0.579	0.000	0.000	
Oregon	36	2.089	0.847	1.433	0.499	
Rhode Island	38	0.717	0.700	0.000	0.000	
South Carolina	39	0.831	0.607	0.000	1.138	
South Dakota	40	3.117	0.581	0.000	0.000	
Tennessee	41	3.126	0.773	0.666	0.606	
Utah	43	4.459	0.924	0.000	0.089	
Vermont	44	1.048	0.457	0.000	0.000	
Virginia	45	2.553	0.553	1.152	0.310	
West Virginia	47	2.551	1.135	0.000	0.000	
Wisconsin	48	2.057	0.416	1.425	1.241	
Hawaii	52	0.854	0.386	0.006	0.046	
Alaska	54	1.017	0.165	0.000	0.000	
(8)	Average of (5), (6) weighted by Payroll from Page 1, respectively			0.958	0.692	1.650
(9)	CW Manufacturing Pure Premium			0.828	0.432	1.260
(10)	CW Relativity = (8) / (9)			1.157	1.603	1.310
(11)	CW Relativity, balanced to unity			1.143	1.584	

Notes:

- (3), (4) = (MA Total Unlimited Losses) / [(State Pure Premium) x (MA Total Exposure)] for Industry Code 1. See Section IX - D, Exhibit 2.
- (5) = 100 x [State Indemnity Losses / State Payroll] x (3), where State Indemnity Losses and State Payroll from page 1.
- (6) = 100 x [State Medical Losses / State Payroll] x (4), where State Medical Losses and State Payroll from page 1.
- (9) = (8) weighted by MA five year Manufacturing Exposure
- (11): Relativities balanced to unity (weighted by MA exposure) over Manufacturing Industry Group.

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Section IX - Classification Pricing
 Subsection L - Pricing Example
 7/1/2022

Section IX - L
 Exhibit 3

Pricing Example for Class 2660 Boot Or Shoe Mfg Noc

Calculation of Credibility and Balanced Formula Relativity:

- (1) MA Indicated Relativity
- (2) Countrywide Indicated Relativity
- (3) Relativity to Underlying Present Rate

Injury Type	
Indemnity	Medical
0.789	0.484
1.143	1.584
1.088	1.176

Calculation of MA Credibility:

The MA Credibilities are calculated using the formula $Z=(E / F)^{0.4}$ where E are expected losses for that injury type.

- (4) Adopted Relativity
- (5) Industry Group Pure Premium Underlying Present Rate Factor
- (6) Pure Premium Underlying Present Rate = (4) x (5)
- (7) Expected Losses = (6) x [(Total Exposure from Exhibit 1)]
- (8) Full Credibility Standards
- (9) MA Credibility = Minimum of {100%, [(7) / (8)]^{0.4}}

Injury Type	
Indemnity	Medical
1.089	1.175
0.816	0.421
0.889	0.495
208,198	115,900
28,050,000	6,400,000
14%	20%

Calculation of Countrywide Credibility

The Countrywide Credibilities are calculated using the formula $Z=(E / F)^{0.4}$ where E are the countrywide claim counts for that injury type. The countrywide credibility is limited to no more than half of the complement of the credibility assigned to the Massachusetts data.

- (10) Countrywide Lost-Time Claims
- (11) Countrywide Claim Count Standard
- (12) Countrywide Credibility = Minimum of {[(10) / (11)]^{0.4}, 0.5 x [100% - (9)]}
- (13) Credibility to Underlying Present Rate = 100% - (9) - (12)
- (14) Formula Relativity = [(1) x (9)] + [(2) x (12)] + [(3) x (13)]
- (15) Off Balance Factor

Injury Type	
Indemnity	Medical
297	297
1,150	1,000
43%	40%
43%	40%
1.070	1.201
1.004	1.007

- (16) Balanced Formula Relativity

Injury Type		
Indemnity	Medical	Total
1.066	1.192	1.109

Notes:

- (1): Exhibit 1, Page 2.
- (2): Exhibit 2, Page 2.
- (3): Relativity of (6) to Industry Group average, using 5 year Schedule Z exposure as weights.
- (4): Section IX-F, Exhibit 1.
- (5): Section IX-E, Exhibit 1.
- (8), (11): Section IX-D, Exhibit 1, Page 1.
- (10): Exhibit 2, Page 1.
- (15): Factor to balance Formula relativities across industry group to unity using 5 year Schedule Z exposure by injury type.
- (16) = (14) / (15), Total Balanced Formula Relativity is the weighted average of Partial Relativities using the MA Industry Group Pure Premium as weights.

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Section IX - Classification Pricing
Subsection L - Pricing Example
7/1/2022

Section IX - L
Exhibit 4

Pricing Example for Class 2660 Boot Or Shoe Mfg Noc

Calculation of Proposed Average Rate and Proposed Manual Rate:

(1) Total Balanced Formula Relativity	1.109
(2) Capped Rate Level Factor	1.781
(3) Proposed Average Capped Rate = (1) x (2)	1.98
(4) Offset for Merit Rating	0.997
(5) Offset for ARAP	1.054
(6) Offset for Construction Classification Premium Adjustment Program	1.000
(7) Provision for Insolvency Fund Assessment Recoupment	0.0052
(8) Proposed Manual Rate = $\{(3) / [(4) \times (5) \times (6)]\} \times \{1.000 / [1.000 - (7)]\}$	1.89
(9) Minimum Premium	225
(10) Loss Constant	0
(11) Expected Loss Rate	0.94
(12) D-Ratio	0.19

Notes:

(1): Exhibit 3.

(2): Section IX-H, Exhibit 1. Proposed average uncapped rates are capped by an iterative process using rate levels to determine if the required change is achieved. Class 2660 is in the Manufacturing Industry Group.

(4), (5), (6), (7): Section IX-K, Exhibit 1. Class 2660 is not eligible for the Construction Credit program.

(9) = $\{[(8) \times 35.0] + (10) + \text{Expense Constant}\}$ subject to a maximum of \$500

Where Expense Constant = 159 if $(8) \times 35 + (10) < 200$

= 250 if $(8) \times 35 + (10) \geq 200$ and < 1000 .

= 338 if $(8) \times 35 + (10) \geq 1000$.

(10): No loss constant for Manufacturing classes, \$50 for Construction classes, \$20 for all other classes.

(11) = (3) x Ratio of Experience Rating ELR to Average Rate, from Section X - A, Exhibit 1. Class 2660 is in Hazard Group B.

(12): See text of Section X for an explanation of the calculation of D-Ratios.

EXPERIENCE RATING

Experience rating is a procedure that uses past insurance experience for individual policyholders to predict their future losses. In this procedure, the manual rate for the risk is adjusted by an experience rating modification that serves to increase or decrease the rate for individual policyholders depending on whether that policyholder's past experience has been worse or better than expected.

The experience rating modification for an insured is determined by comparing actual past losses to expected losses. This section of the filing develops elements used in the derivation of Expected Loss Rates (ELRs) and D-Ratios, which are needed for the calculation of experience rating modifications.

Section X-A - Expected Loss Rates

Generally, an insured's experience rating modification is based on its exposure and loss experience for the last three completed policies for which the WCRIBMA has received data. For the purpose of experience rating, we must derive expected losses on a comparable basis for each of those three policy periods. These calculations are detailed in Section X-A and Section X-E.

Expected Losses for an insured are derived by multiplying the ELR for each applicable class by the reported exposure (typically payroll in hundreds) for each class. The proposed ELRs are displayed in Section X-E. The ELR for each class is the product of the proposed average capped rate for that class (as shown in Section IX-J) and the Ratio of

Experience Rating ELR to Average Rate (as calculated in Section X-A) for the hazard group containing the classification. We use the Ratio of Experience Rating ELR to Average Rate to remove the allowances for underwriting profit and expenses (including loss adjustment expenses) from the capped rate, and then adjust the remaining pure premiums to a level comparable to that of the losses entering the experience rating calculation itself. The Ratio of Experience Rating ELR to Average Rate is a composite factor that incorporates elements relating to expenses (Exhibit 1), trend (Exhibit 1), loss limitations (Exhibit 2 & 3), benefit level differences (Exhibit 1), loss development (Exhibits 4 & 5) and investment income (Exhibit 6).

Section X-B - Calculation of D-Ratios

The second task of Section X is to determine the portion of the expected loss that is considered primary. The experience rating formula splits losses into primary losses and excess losses (the loss amount above the primary loss subject to a maximum). Primary losses are given more weight than excess losses because primary losses are more predictive than excess losses for purposes of estimating an insured's prospective loss experience. For this rate filing, primary losses are defined as the first \$7,500 of loss per claim. The WCRIBMA increased the split point from \$5,000 to adjust for changes in claims severity.

The D-Ratio is defined as the portion of expected losses that is expected to be primary. In experience rating, multiplication of a risk's expected losses by the appropriate

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D-Ratio gives the expected primary losses to which the risk's actual primary losses are compared. The proposed D-Ratios are displayed in Section X-E.

The procedure used here for the calculation of D-Ratios is the same general methodology as used in all of the WCRIBMA's filings since 2001. The general methodology is as follows. First, the WCRIBMA calculates partial D-Ratios for indemnity and medical losses from detailed loss data (Section X-B). The loss data is taken from Unit Statistical Plan Data for three policy years (consistent with the data used elsewhere in this filing), and is adjusted for law amendment changes and severity trend to the level corresponding with the losses that will be used in experience rating. Indemnity and medical partial D-Ratios are calculated separately.

We calculate final D-Ratios by class as a weighted average of the partial D-Ratios using the formula:

$$"D" \text{ Ratio} = \frac{[(P_i)(D_i) + (P_m)(D_m)]}{[P_i + P_m]}$$

where P_i and P_m are the proposed partial pure premiums for indemnity and medical. D_i and D_m represent the associated partial D-Ratios. The resulting D-Ratios by classification are shown in Section X-E.

Section X-C – Expected Loss Rates for F-Class

The calculations for F-Class rates differ from the state classifications because F-Classes are subject to different benefit provisions than the state classifications. Changes in F-Class rates include a separate calculation for the Ratio of Experience Rating ELR to Average Rate, shown in Section X-C, by excluding the loss based assessment from the federal indemnity losses. Additionally, the law factors and loss development factors are weighted by losses to reflect that F-Class benefits can be paid either under state or federal laws. The remaining calculations mirror the calculations for the state classifications from Section X-A.

Section X-D – State Reference Point

The experience rating plan recognizes that the loss experience of large insureds is more predictive than the loss experience of small insureds for purposes of predicting future loss experience. Large insureds are expected to have a larger number of claims than small insureds, and a larger number of expected claims effectively provides a larger sample size from which to estimate future loss experience. Consistent with the law of large numbers, as the number of expected claims increases the predictive value of the loss experience increases. When calculating an experience modification in accordance with the rules in the experience rating plan, the predictive value assigned to actual loss experience is based on expected loss dollars instead of expected claim counts. Consequently, increases in claims severity result in higher predictive value being assigned to actual loss experience, all else being equal. In other words, despite no change in sample size (the expected number of claims), the predictive value is deemed

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to have increased if claims severity increases. To account for this, certain parameters used within the experience rating plan, including the G-Value used to derive the Weighting and Ballast tables, need periodic updates to adjust for changes in claims severity.

In this filing, the WCRIBMA continues with the estimation of the state average cost per claim (SACC) expected during the prospective effective period for the proposed new rates. The WCRIBMA used three years of Unit Statistical Plan data and the estimated severity trend factors found in Section V to estimate the SACC. The SACC is then used to derive the State Reference Point, which in turn is used to derive the G-Value needed for updating the Weighting and Ballast tables.¹ The State Reference Point is also used to calculate the State Accident Limitation. The SACC, the selected State Reference Point, and the resulting G-Value are all updated in Section X-D. The current G-Value of 12.0 would be replaced with a value of 14.0.

The B and W values are functions of G and expected losses, E, of a particular insured.

$$B = E [(0.1 E + 2,570 G) / (E + 700 G)], \text{ subject to a minimum}^2 \text{ of } 2,500 G.$$

B is rounded to the nearest 5,000. Next we define the intermediate value C.

$$C = E [(0.75 E + 203,825 G) / (E + 5,100 G)], \text{ subject to a minimum of } 60,000 G.$$

$$\text{Then } W = (E+B) / (E+C)$$

W is rounded to the nearest .01.

The proposed new Weighting and Ballast tables are shown in Section X-E.

¹ An explanation of the derivation of the various parameters used in experience rating can be found in a paper authored by Gillam, William R. "Workers Compensation Experience Rating: What Every Actuary Should Know" PCAS LXXIX, 1992, P.215-239.

² Minimum for B and C from NCCI Explanatory Memorandum on "Graduated Experience Rating Tables" included in WCRIBMA filing for 9/1/2003 rates, Section XI-E, P. 11078-11079.

Calculation of ELR Factors

Unit Report / Policy Effective Dates (1)	Hazard Group (2)	Permissible Loss Ratio (3)	Exp Rating LER by Hazard Group (4)	Law Factor (5)	Loss Trend / Payroll Trend (6)	Loss Development to 10th Report (7)	Loss Development from 10th Report to Ult (8)	Investment Income Offset (9)	Ratio of Exp Rating ELR to Average Rate (10)
1st Report 7/1/2020 to 6/30/2021	A	0.589	0.010	1.010	0.942	1.443	1.038	1.009	0.405
	B	0.589	0.022	1.010	0.942	1.462	1.046	1.007	0.393
	C	0.589	0.044	1.010	0.942	1.470	1.049	1.007	0.381
	D	0.589	0.071	1.010	0.942	1.468	1.051	1.005	0.371
	E	0.589	0.093	1.010	0.942	1.486	1.054	1.004	0.357
	F	0.589	0.119	1.010	0.942	1.478	1.055	1.001	0.349
	G	0.589	0.131	1.010	0.942	1.486	1.058	1.002	0.341
2nd Report 7/1/2019 to 6/30/2020	A	0.589	0.015	1.022	0.915	1.158	1.038	1.009	0.511
	B	0.589	0.034	1.022	0.915	1.173	1.046	1.007	0.492
	C	0.589	0.068	1.022	0.915	1.179	1.049	1.007	0.471
	D	0.589	0.111	1.022	0.915	1.178	1.051	1.005	0.450
	E	0.589	0.147	1.022	0.915	1.192	1.054	1.004	0.426
	F	0.589	0.188	1.022	0.915	1.186	1.055	1.001	0.408
	G	0.589	0.207	1.022	0.915	1.192	1.058	1.002	0.395
3rd Report 7/1/2018 to 6/30/2019	A	0.589	0.017	1.029	0.888	1.055	1.038	1.009	0.573
	B	0.589	0.039	1.029	0.888	1.069	1.046	1.007	0.550
	C	0.589	0.077	1.029	0.888	1.075	1.049	1.007	0.524
	D	0.589	0.126	1.029	0.888	1.074	1.051	1.005	0.496
	E	0.589	0.165	1.029	0.888	1.087	1.054	1.004	0.467
	F	0.589	0.212	1.029	0.888	1.081	1.055	1.001	0.445
	G	0.589	0.233	1.029	0.888	1.087	1.058	1.002	0.429
1st - 3rd Report Average	A								0.497
	B								0.478
	C								0.459
	D								0.439
	E								0.417
	F								0.401
	G								0.389

Notes:

- (1): Unit Stat Reports used to experience rate a policy taking effect during the prospective effective period.
- (3): Section VI-J, Exhibit 1, (10).
- (4): Exhibit 2, (10) - (12).
- (5): Section IV-A, Exhibit 1.
- (6): Section V-A, Exhibit 1, Page 1. Net Trend applied from USR policy effective period to prospective effective period.
- (7): Exhibit 4, Page 1, (6).
- (8): Exhibit 5, Page 1, (7).
- (9): Exhibit 6, (7).
- (10) = { (3) x [1.0 - (4)] } / [(5) x (6) x (7) x (8) x (9)]

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Loss Elimination Ratios for Losses in Excess of Experience Rating Caps
 By Hazard Group

Hazard Group	Adjusted Total Losses	Adjusted Excess Losses	Implied Loss Elimination Ratio = (3) / (2)	Expected Losses	Expected Losses Wgtd LER	Balanced LER Differential	Selected LER Differential
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A	67,984,773	970,222	0.014	83,052,299	0.014	0.13	0.13
B	243,330,772	7,977,694	0.033	274,916,926	0.033	0.29	0.29
C	465,730,533	30,451,642	0.065	549,653,911	0.065	0.58	0.58
D	225,405,005	25,784,945	0.114	260,162,131	0.114	1.02	0.95
E	314,064,645	29,933,372	0.095	407,601,539	0.095	0.85	1.25
F	450,096,579	94,840,896	0.211	544,762,271	0.211	1.88	1.60
G	71,520,983	14,115,343	0.197	94,443,899	0.197	1.76	1.76
Total	1,838,133,292	204,074,113	0.111	2,214,592,976	0.112	1.00	1.00

Loss Elimination Ratio by Hazard Group

Hazard Group	First Report	Second Report	Third Report
(9)	(10)	(11)	(12)
A	0.010	0.015	0.017
B	0.022	0.034	0.039
C	0.044	0.068	0.077
D	0.071	0.111	0.126
E	0.093	0.147	0.165
F	0.119	0.188	0.212
G	0.131	0.207	0.233
Total	0.075	0.117	0.132

Notes:

- (2): Unit Statistical Plan losses, PYs 2016 - 2018. Adjusted by factors from Section X - B, Exhibit 1, Page 2.
- (3): Adjusted losses above per claim limit of \$350,000
- (5): PYs 2016 - 2018, exposure times pure premium underlying present rates.
- (6): Total = (6) Weighted by (5)
- (7) = (6) / [Total for (6)]
- (10) - (12) = [Exhibit 3, (5)] x (8)

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Loss Elimination Ratio
 Factor to Reflect the State Accident Limitation of \$350,000

Report (1)	Injury Type (2)	Adjusted Total Losses (3)	Adjusted Excess Losses (4)	Loss Elimination Ratio = (4) / (3) (5)
1st	Fatal	7,534,656	3,492,742	0.464
1st	Permanent Total	12,988,442	9,193,844	0.708
1st	Permanent Partial	181,226,858	21,158,483	0.117
1st	Temporary Total	276,524,962	4,033,564	0.015
1st	Medical Only	29,231,846	0	0.000
1st	Total	507,506,763	37,878,634	0.075
2nd	Fatal	12,235,311	6,466,470	0.529
2nd	Permanent Total	55,640,870	34,607,875	0.622
2nd	Permanent Partial	294,203,840	28,170,321	0.096
2nd	Temporary Total	271,135,325	8,389,559	0.031
2nd	Medical Only	28,303,317	0	0.000
2nd	Total	661,518,665	77,634,225	0.117
3rd	Fatal	13,289,053	6,152,688	0.463
3rd	Permanent Total	70,358,503	34,850,593	0.495
3rd	Permanent Partial	311,762,388	38,246,729	0.123
3rd	Temporary Total	247,011,132	9,311,245	0.038
3rd	Medical Only	26,686,788	0	0.000
3rd	Total	669,107,864	88,561,255	0.132

Notes:

Unit Statistical Plan losses have been adjusted by multiplying by law amendment changes and severity trend factors from Section X - B, Exhibit 1, Page 2.

(4): Adjusted losses above per claim limit of \$350,000

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Section X - Experience Rating
 Subsection A - Expected Loss Rates
 7/1/2022

Section X - A
 Exhibit 4
 Page 1

Hazard Group Development Factors to Tenth Report

Development to 10th Report (1)	Hazard Group (2)	Losses at Latest Report (3)	Selected Relativity (4)	Balanced Relativity = (4) / TT(4) (5)	Selected Dev. Factor to 10th Report (6)
1st to 10th	A	18,229,625	0.980	0.980	1.443
1st to 10th	B	65,570,595	0.993	0.993	1.462
1st to 10th	C	129,017,522	0.998	0.998	1.470
1st to 10th	D	59,597,181	0.997	0.997	1.468
1st to 10th	E	76,838,983	1.009	1.009	1.486
1st to 10th	F	100,436,580	1.004	1.004	1.478
1st to 10th	G	23,852,218	1.009	1.009	1.486
1st to 10th	Total	473,542,704	1.000	1.000	1.472
2nd to 10th	A	23,108,335	0.980	0.980	1.158
2nd to 10th	B	78,900,210	0.993	0.992	1.173
2nd to 10th	C	147,761,979	0.998	0.998	1.179
2nd to 10th	D	72,990,276	0.997	0.997	1.178
2nd to 10th	E	105,736,588	1.009	1.009	1.192
2nd to 10th	F	160,063,082	1.004	1.003	1.186
2nd to 10th	G	20,216,735	1.009	1.009	1.192
2nd to 10th	Total	608,777,205	1.000	1.000	1.182
3rd to 10th	A	21,765,745	0.980	0.980	1.055
3rd to 10th	B	81,377,941	0.993	0.992	1.069
3rd to 10th	C	155,089,075	0.998	0.998	1.075
3rd to 10th	D	76,512,910	0.997	0.997	1.074
3rd to 10th	E	105,626,170	1.009	1.009	1.087
3rd to 10th	F	156,285,207	1.004	1.003	1.081
3rd to 10th	G	25,215,477	1.009	1.009	1.087
3rd to 10th	Total	621,872,525	1.000	1.000	1.077

Notes:

(3): See Exhibit 4 Pages 3-5.

(4): See Page 2 for State Classifications for selection. The entry in the "Total" row is the weighted average using incurred losses at latest report in column (3) as the weights.

(6) = (5) x (Total LDF from page (3) - (5))

Hazard Group Reported Loss Development Relativities to Tenth Report

Relativities for State Classification Rates

Hazard Group (1)	Development			Average Relativity (5)	Selected (6)
	3rd Report to 10th Report (2)	2nd Report to 10th Report (3)	1st Report to 10th Report (4)		
A	0.991	0.985	0.963	0.980	0.980
B	0.997	0.993	0.988	0.993	0.993
C	0.999	0.997	0.997	0.998	0.998
D	0.997	1.000	0.994	0.997	0.997
E	1.005	1.006	1.015	1.009	1.009
F	1.001	1.003	1.007	1.004	1.004
G	1.002	1.012	1.013	1.009	1.009

Relativities for F-Class Rates

Hazard Group (7)	Development			Average Relativity (11)	Selected (12)
	3rd Report to 10th Report (8)	2nd Report to 10th Report (9)	1st Report to 10th Report (10)		
C	0.998	0.995	0.992	0.995	0.995
E	1.004	1.004	1.010	1.006	1.006
F	1.000	1.001	1.001	1.001	1.001
G	1.001	1.010	1.007	1.006	1.006

Notes:

(2) - (4): Pages 3 through 5. = [(12) for Hazard Group] / [(12) for Hazard Groups A-G Total]

(5): Average of (2) - (4)

(8) - (10): Pages 3 through 5. = [(12) for Hazard Group] / [(12) for Hazard Groups C,E,F,G Total]

(11): Average of (8) - (10)

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Loss Development of Schedule Z to Tenth Report by Hazard Group

Policy Year 2018 at 18 Months
 First Report to Tenth Report

Hazard Group	Indemnity Losses Likely To Develop		Indemnity Losses Not Likely To Develop		Medical Losses Likely To Develop		Medical Losses Not Likely To Develop		Total Losses		
	Reported Losses	Losses Developed to 10th Report	Reported Losses	Losses Developed to 10th Report	Reported Losses	Losses Developed to 10th Report	Reported Losses	Losses Developed to 10th Report	Total Reported Losses =(2)+(4)+(6)+(8)	Total Developed Losses =(3)+(5)+(7)+(9)	Develop. Factor = (11) / (10)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
A	1,956,179	3,800,001	7,159,100	12,230,138	1,390,960	1,667,925	7,723,386	8,148,150	18,229,625	25,846,214	1.418
B	10,577,008	20,546,504	24,486,468	41,831,080	5,685,306	6,817,352	24,821,813	26,186,941	65,570,595	95,381,877	1.455
C	22,601,283	43,904,415	47,485,659	81,121,394	15,759,329	18,897,292	43,171,251	45,545,546	129,017,522	189,468,646	1.469
D	10,680,436	20,747,419	20,595,338	35,183,728	9,990,891	11,980,255	18,330,516	19,338,642	59,597,181	87,250,044	1.464
E	15,192,654	29,512,687	29,066,332	49,655,020	9,336,130	11,195,120	23,243,867	24,522,213	76,838,983	114,885,040	1.495
F	15,272,052	29,666,923	42,251,977	72,180,514	12,296,311	14,744,725	30,616,240	32,300,045	100,436,580	148,892,207	1.482
G	5,393,177	10,476,586	7,688,473	13,134,484	4,113,792	4,932,921	6,656,776	7,022,880	23,852,218	35,566,871	1.491
A, B, C, D, E, F, G	81,672,789	158,654,535	178,733,347	305,336,358	58,572,719	70,235,589	154,563,849	163,064,416	473,542,704	697,290,899	1.472
C, E, F, G	58,459,166	113,560,611	126,492,441	216,091,412	41,505,562	49,770,058	103,688,134	109,390,683	330,145,303	488,812,764	1.481

Notes:

(2), (4), (6), (8): Unit Statistical Plan Data.

(3), (5), (7), (9): Unit Statistical Plan Data x Loss Development Factors to 10th report from Exhibit 5, Page 5.

X 000011

Loss Development of Schedule Z to Tenth Report by Hazard Group

Policy Year 2017 at 30 Months
 Second Report to Tenth Report

Hazard Group	Indemnity Losses Likely To Develop		Indemnity Losses Not Likely To Develop		Medical Losses Likely To Develop		Medical Losses Not Likely To Develop		Total Losses		
	Reported Losses	Losses Developed to 10th Report	Reported Losses	Losses Developed to 10th Report	Reported Losses	Losses Developed to 10th Report	Reported Losses	Losses Developed to 10th Report	Total Reported Losses =(2)+(4)+(6)+(8)	Total Developed Losses =(3)+(5)+(7)+(9)	Develop. Factor = (11) / (10)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
A	3,445,433	4,439,075	9,761,169	12,239,503	1,342,895	1,455,676	8,558,838	8,759,135	23,108,335	26,893,390	1.164
B	15,290,032	19,699,584	32,320,906	40,527,096	6,255,980	6,781,381	25,033,292	25,619,130	78,900,210	92,627,191	1.174
C	33,077,353	42,616,659	57,723,704	72,379,596	14,431,872	15,643,915	42,529,050	43,524,330	147,761,979	174,164,500	1.179
D	14,897,784	19,194,214	30,501,818	38,246,147	9,002,963	9,759,066	18,587,711	19,022,707	72,990,276	86,222,134	1.181
E	26,565,112	34,226,328	41,786,232	52,395,643	13,578,618	14,719,002	23,806,626	24,363,757	105,736,588	125,704,729	1.189
F	38,516,765	49,624,764	58,859,820	73,804,169	34,426,786	37,318,077	28,259,711	28,921,055	160,063,082	189,668,065	1.185
G	4,577,963	5,898,220	9,065,399	11,367,079	3,038,541	3,293,729	3,534,832	3,617,555	20,216,735	24,176,583	1.196
A, B, C, D, E, F, G	136,370,442	175,698,843	240,019,048	300,959,234	82,077,655	88,970,846	150,310,060	153,827,670	608,777,205	719,456,592	1.182
C, E, F, G	102,737,193	132,365,971	167,435,155	209,946,487	65,475,817	70,974,723	98,130,219	100,426,698	433,778,384	513,713,878	1.184

Notes:

(2), (4), (6), (8): Unit Statistical Plan Data.

(3), (5), (7), (9): Unit Statistical Plan Data x Loss Development Factors to 10th report from Exhibit 5, Page 5.

X 000012

Loss Development of Schedule Z to Tenth Report by Hazard Group

Policy Year 2016 at 42 Months
 Third Report to Tenth Report

Hazard Group	Indemnity Losses Likely To Develop		Indemnity Losses Not Likely To Develop		Medical Losses Likely To Develop		Medical Losses Not Likely To Develop		Total Losses		
	Reported Losses	Losses Developed to 10th Report	Reported Losses	Losses Developed to 10th Report	Reported Losses	Losses Developed to 10th Report	Reported Losses	Losses Developed to 10th Report	Total Reported Losses =(2)+(4)+(6)+(8)	Total Developed Losses =(3)+(5)+(7)+(9)	Develop. Factor = (11) / (10)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
A	3,749,389	4,177,735	8,535,987	9,451,017	1,192,637	1,232,256	8,287,732	8,389,716	21,765,745	23,250,723	1.068
B	18,080,128	20,145,676	31,422,228	34,790,588	8,781,585	9,073,305	23,094,000	23,378,182	81,377,941	87,387,751	1.074
C	38,407,255	42,795,058	60,041,217	66,477,439	15,576,608	16,094,056	41,063,995	41,569,305	155,089,075	166,935,858	1.076
D	18,194,117	20,272,688	28,224,193	31,249,734	11,275,968	11,650,551	18,818,632	19,050,203	76,512,910	82,223,176	1.075
E	31,571,953	35,178,863	42,285,262	46,818,104	10,352,991	10,696,913	21,415,964	21,679,497	105,626,170	114,373,376	1.083
F	42,427,342	47,274,416	57,145,184	63,270,961	31,626,141	32,676,747	25,086,540	25,395,241	156,285,207	168,617,364	1.079
G	7,016,380	7,817,960	9,168,514	10,151,349	5,396,206	5,575,466	3,634,377	3,679,100	25,215,477	27,223,874	1.080
A, B, C, D, E, F, G	159,446,564	177,662,394	236,822,585	262,209,191	84,202,136	86,999,293	141,401,240	143,141,244	621,872,525	670,012,122	1.077
C, E, F, G	119,422,930	133,066,296	168,640,177	186,717,852	62,951,946	65,043,181	91,200,876	92,323,143	442,215,929	477,150,472	1.079

Notes:

(2), (4), (6), (8): Unit Statistical Plan Data.

(3), (5), (7), (9): Unit Statistical Plan Data x Loss Development Factors to 10th report from Exhibit 5, Page 5.

X 000013

Loss Development Factors From 10th to Ultimate

Hazard Group	Losses Developed to 10th Report				Indicated Development Factor to Ultimate	Balanced Selected Factor
	Indemnity		Medical			
	Likely to Develop	Not Likely to Develop	Likely to Develop	Not Likely to Develop		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
A	12,416,810	33,920,658	4,355,857	25,297,001	1.038	1.038
B	60,391,764	117,148,765	22,672,038	75,184,253	1.046	1.046
C	129,316,132	219,978,428	50,635,263	130,639,181	1.049	1.049
D	60,214,321	104,679,609	33,389,871	57,411,552	1.051	1.051
E	98,917,877	148,868,767	36,611,034	70,565,467	1.054	1.054
F	126,566,103	209,255,643	84,739,550	86,616,341	1.055	1.055
G	24,192,765	34,652,912	13,802,116	14,319,535	1.058	1.058
TOTAL	512,015,772	868,504,782	246,205,728	460,033,331	1.051	1.051

Notes:

(2) - (5): Exhibit 4, Pages 3-5.

(6): Weighted Average of Development Factors from Page 2.

(Likely to Dev. Ind. 1.127, Not Likely to Dev. Ind. 1.019, Likely to Dev. Med. 1.084, Not Likely to Dev. Med. 1.011)

(7): Factors are balanced to the total development factor from Page 2.

X 000014

X 000015

Section X - Experience Rating
 Subsection A - Expected Loss Rates
 7/1/2022

Section X - A
 Exhibit 5
 Page 2

Calculation of Development Category Development Factors from 10th to Ultimate

Policy Year (1)	Unit Stat Plan Losses Developed to 10th Rept. (2)	Aggregate Financial Develop. Factor 10th to Ult. (3)	Differential in Loss Development (4)	Unit Stat Plan Losses Adjusted to Financial Agg. Ult. Loss Level = (2) x (3) x (4) (5)	Development Factor 10th to Ult. = (5) / (2) (6)
Indemnity					
2018	463,990,893	1.036	1.022	491,246,797	1.059
2017	476,658,076	1.036	1.022	504,658,080	1.059
2016	439,871,585	1.036	1.022	465,710,665	1.059
Total	1,380,520,555			1,461,615,542	1.059
Medical					
2018	233,300,006	1.037	1.000	241,883,891	1.037
2017	242,798,516	1.037	1.000	251,731,883	1.037
2016	230,140,537	1.037	1.000	238,608,175	1.037
Total	706,239,059			732,223,950	1.037
Ind.+ Med.					
2018	697,290,899			733,130,688	1.051
2017	719,456,592			756,389,964	1.051
2016	670,012,122			704,318,840	1.051
Total	2,086,759,613			2,193,839,492	1.051

(7)	Unit Stat Plan Indem. Losses Developed to 10th Report (8)	Development Factor 10th to Ult. (9)	(10)	Unit Stat Plan Med. Losses Developed to 10th Report (11)	Development Factor 10th to Ult. (12)
a. Likely to Develop	512,015,772	1.127	a. Likely to Develop	246,205,728	1.084
b. Not Likely to Develop	868,504,782	1.019	b. Not Likely to Develop	460,033,331	1.011
c. Total	1,380,520,555	1.059	c. Total	706,239,059	1.037

Notes:

(2): Page 4.

(3): Page 3.

(4): Page 8.

(8),(11): Page 4.

(9), (12): Likely to Develop Factor = 1 + (Total Losses/Likely to Develop Losses) x ("Appropriate Column 6 Factor" - 1) x 0.8

(9), (12): Not Likely to Develop Factor = 1 + (Total Losses/Not Likely to Develop Losses) x ("Appropriate Column 6 Factor" - 1) x (1 - 0.8)

X 000016

Section X - Experience Rating
Subsection A - Expected Loss Rates
7/1/2022

Section X - A
Exhibit 5
Page 3

Calculation of Development Factor from USR at 10th report to Aggregate Financial Ultimate Level

	<u>Indemnity</u>	<u>Medical</u>
(1) Development Factor based on Paid + Case 132 Months to Ult.	1.028	1.011
(2) Est. Ultimate Losses (Prior to Escalation Adj.) based on Paid + Case Develop. Method		
(a) PY2017	470,808,643	233,314,817
(b) PY2018	458,033,395	229,554,165
(c) Average	464,421,019	231,434,491
(3) Est. Ultimate Losses (Prior to Escalation Adj.) based on Paid Develop. Method		
(a) PY2017	463,878,304	240,341,463
(b) PY2018	478,288,342	246,528,033
(c) Average	471,083,323	243,434,748
(4) Ratio of Est. Ultimate Losses based on average of Paid and Paid + Case indications to Est. Ultimate Losses based on Paid + Case = { [(2c) + (3c)] / 2.000 } / (2c)	1.007	1.026
(5) Development Factor to bring Unit Statistical Plan Data 10th report to Aggregate Financial Ultimate Level = (1) x (4)	1.036	1.037

Notes:

- (1): 132 Months to 252 Months LDF from Section II-B, Exhibit 1.
x 252 Months to Ult LDF from Section II-C, Exhibit 2, Page 1.
(2),(3): Section II-A, Exhibit 1.

Losses Developed to 10th Report

Policy Year (1)	Loss Development Category (2)	Paid + Case			
		Reported Schedule Z Losses		Losses Developed to 10th Report	
		Indemnity (3)	Medical (4)	Indemnity (5)	Medical (6)
2018	Likely	81,672,789	58,572,719	158,654,535	70,235,589
2018	Not Likely	178,733,347	154,563,849	305,336,358	163,064,416
2018	TOTALS	260,406,136	213,136,568	463,990,893	233,300,006
2017	Likely	136,370,442	82,077,655	175,698,843	88,970,846
2017	Not Likely	240,019,048	150,310,060	300,959,234	153,827,670
2017	TOTALS	376,389,490	232,387,715	476,658,076	242,798,516
2016	Likely	159,446,564	84,202,136	177,662,394	86,999,293
2016	Not Likely	236,822,585	141,401,240	262,209,191	143,141,244
2016	TOTALS	396,269,149	225,603,376	439,871,585	230,140,537

Notes:

(3),(4): Sum of Unit Statistical Plan Data.

(5),(6): Unit Statistical Plan Data x Loss Development Factors to 10th report from Exhibit 5,

Page 5.

X 000017

X 000018

Section X - Experience Rating
 Subsection A - Expected Loss Rates
 7/1/2022

Section X - A
 Exhibit 5
 Page 5

Summary of Development Factors Industry

		Likely to Develop								
		Development Factors From:								
		18-30	30-42	42-54	54-66	66-78	78-90	90-102	102-114	114-126
		(1) Indemnity Paid + Case Losses								
5yr Weighted Average		1.508	1.156	1.067	1.023	1.009	1.002	1.000	1.006	1.003
Cumulative		1.943	1.288	1.114	1.044	1.021	1.011	1.009	1.009	1.003
		(2) Medical Paid + Case Losses								
5yr Weighted Average		1.106	1.049	1.010	1.002	0.994	1.006	0.995	0.999	1.028
Cumulative		1.199	1.084	1.033	1.023	1.021	1.028	1.022	1.027	1.028
		Not-Likely to Develop								
		Development Factors From:								
		18-30	30-42	42-54	54-66	66-78	78-90	90-102	102-114	114-126
		(3) Indemnity Paid + Case Losses								
5yr Weighted Average		1.362	1.132	1.061	1.026	1.013	1.000	1.003	1.000	1.001
Cumulative		1.708	1.254	1.107	1.043	1.017	1.004	1.004	1.001	1.001
		(4) Medical Paid + Case Losses								
5yr Weighted Average		1.031	1.011	1.009	1.002	1.000	1.000	1.001	1.000	1.000
Cumulative		1.055	1.023	1.012	1.003	1.001	1.001	1.000	0.999	1.000

Notes:

(1),(2): Page 6.

(3),(4): Page 7.

X 000019

Section X - Experience Rating
 Subsection A - Expected Loss Rates
 7/1/2022

Section X - A
 Exhibit 5
 Page 6

Calculation of Likely to Develop Development Factors Industry

Likely to Develop						
Policy Year	Unlimited Indemnity Paid + Case Losses			Unlimited Medical Paid + Case Losses		
	Evaluated at month		Link Ratio	Evaluated at month		Link Ratio
	18	30		18	30	
2013	75,085,375	108,661,340	1.447	55,878,171	58,042,191	1.039
2014	90,023,062	132,399,487	1.471	86,197,739	87,485,628	1.015
2015	81,691,092	123,108,598	1.507	73,153,224	78,506,698	1.073
2016	79,129,954	120,807,014	1.527	57,536,352	64,905,850	1.128
2017	77,362,318	123,082,734	1.591	59,105,047	78,179,392	1.323
Weighted Average			1.508			1.106
	30	42		30	42	
2012	115,645,789	133,211,420	1.152	80,121,961	81,207,774	1.014
2013	116,427,911	132,126,317	1.135	60,551,723	62,880,097	1.038
2014	141,402,597	166,301,789	1.176	91,703,285	95,922,252	1.046
2015	129,759,902	150,385,056	1.159	80,486,836	85,256,821	1.059
2016	129,015,282	149,044,072	1.155	72,268,200	78,787,395	1.090
Weighted Average			1.156			1.049
	42	54		42	54	
2011	134,109,135	147,184,349	1.097	79,496,022	81,865,452	1.030
2012	140,879,961	150,341,403	1.067	84,244,178	87,633,830	1.040
2013	138,831,558	147,898,346	1.065	64,745,900	64,266,294	0.993
2014	173,878,981	183,230,453	1.054	98,540,661	98,382,261	0.998
2015	158,503,009	167,734,740	1.058	88,157,886	87,205,926	0.989
Weighted Average			1.067			1.010
	54	66		54	66	
2010	138,887,438	143,265,084	1.032	71,827,516	72,099,216	1.004
2011	153,883,029	157,014,689	1.020	84,851,989	84,313,856	0.994
2012	159,136,429	163,097,441	1.025	90,049,359	88,818,185	0.986
2013	155,975,467	158,724,906	1.018	66,369,694	67,681,042	1.020
2014	192,688,404	196,819,987	1.021	100,871,265	101,735,082	1.009
Weighted Average			1.023			1.002
	66	78		66	78	
2009	144,311,051	145,538,317	1.009	67,498,561	66,361,195	0.983
2010	146,293,312	145,897,684	0.997	73,305,701	74,902,254	1.022
2011	160,596,528	163,902,541	1.021	85,898,204	86,818,288	1.011
2012	170,435,890	173,236,811	1.016	90,838,418	86,706,351	0.955
2013	162,069,568	162,403,159	1.002	69,276,432	69,542,045	1.004
Weighted Average			1.009			0.994
	78	90		78	90	
2008	148,815,195	148,382,645	0.997	61,766,844	60,186,275	0.974
2009	146,821,809	146,570,917	0.998	66,718,336	66,921,102	1.003
2010	148,210,917	148,736,251	1.004	75,547,228	77,945,948	1.032
2011	165,489,820	165,754,772	1.002	87,105,586	86,203,911	0.990
2012	174,510,658	176,217,730	1.010	87,003,805	88,999,252	1.023
Weighted Average			1.002			1.006
	90	102		90	102	
2007	168,573,320	167,495,002	0.994	81,512,166	80,771,074	0.991
2008	149,073,543	149,080,438	1.000	60,583,065	59,919,449	0.989
2009	150,055,803	149,762,061	0.998	67,681,748	68,053,950	1.005
2010	148,495,064	149,873,824	1.009	77,545,953	77,608,539	1.001
2011	167,373,195	167,449,219	1.000	86,761,485	85,966,358	0.991
Weighted Average			1.000			0.995
	102	114		102	114	
2006	179,190,854	181,060,586	1.010	96,843,838	98,818,269	1.020
2007	167,832,664	168,286,340	1.003	80,791,981	80,638,159	0.998
2008	148,613,968	149,257,000	1.004	59,604,481	59,447,227	0.997
2009	149,665,102	150,357,176	1.005	67,940,750	67,213,895	0.989
2010	150,087,823	150,925,089	1.006	77,943,008	76,577,876	0.982
Weighted Average			1.006			0.999
	114	126		114	126	
2005	180,497,859	180,793,941	1.002	89,093,107	89,473,888	1.004
2006	180,330,402	180,524,178	1.001	98,586,453	97,044,058	0.984
2007	168,286,340	169,602,704	1.008	80,638,159	94,835,773	1.176
2008	149,517,000	150,491,753	1.007	59,472,227	59,217,046	0.996
2009	150,662,820	150,475,520	0.999	67,489,412	65,841,599	0.976
Weighted Average			1.003			1.028

Note:
 Unit Statistical Plan Data, Excluding Large Deductible Policies.

X 000020

Section X - Experience Rating
 Subsection A - Expected Loss Rates
 7/1/2022

Section X - A
 Exhibit 5
 Page 7

Calculation of Not-Likely to Develop Development Factors Industry

Not-Likely to Develop						
Policy Year	Unlimited Indemnity Paid + Case Losses			Unlimited Medical Paid + Case Losses		
	Evaluated at month		Link Ratio	Evaluated at month		Link Ratio
	18	30		18	30	
2013	151,893,831	197,119,159	1.298	135,797,902	138,584,820	1.021
2014	156,117,962	211,413,562	1.354	140,235,236	144,067,755	1.027
2015	167,781,433	223,719,198	1.333	140,468,808	144,197,592	1.027
2016	161,538,066	224,542,821	1.390	142,881,583	150,521,185	1.053
2017	177,470,018	253,306,756	1.427	150,286,998	154,208,323	1.026
Weighted Average			1.362			1.031
	30	42		30	42	
2012	180,539,073	204,885,106	1.135	130,876,561	133,226,468	1.018
2013	189,352,588	213,569,478	1.128	136,075,288	136,329,252	1.002
2014	202,410,452	230,143,679	1.137	139,850,098	140,993,317	1.008
2015	217,067,894	243,134,347	1.120	142,217,454	142,400,897	1.001
2016	216,334,553	247,225,077	1.143	143,158,835	146,815,981	1.026
Weighted Average			1.132			1.011
	42	54		42	54	
2011	202,730,203	213,513,934	1.053	131,551,649	132,811,796	1.010
2012	197,216,565	209,394,773	1.062	130,190,064	130,815,533	1.005
2013	206,864,237	219,732,459	1.062	134,463,449	136,103,188	1.012
2014	222,566,487	235,418,420	1.058	138,374,908	139,749,314	1.010
2015	235,016,394	251,407,709	1.070	139,499,832	140,768,178	1.009
Weighted Average			1.061			1.009
	54	66		54	66	
2010	194,625,626	200,250,656	1.029	126,048,121	126,999,564	1.008
2011	206,815,254	212,291,911	1.026	129,825,259	129,717,029	0.999
2012	200,599,747	206,270,421	1.028	128,400,004	126,672,711	0.987
2013	211,655,338	218,218,291	1.031	133,999,788	135,305,033	1.010
2014	225,960,469	229,471,658	1.016	137,260,310	138,335,920	1.008
Weighted Average			1.026			1.002
	66	78		66	78	
2009	180,040,985	183,626,325	1.020	120,158,627	120,719,906	1.005
2010	197,176,378	199,815,831	1.013	125,734,546	125,541,421	0.998
2011	208,710,072	209,731,799	1.005	128,132,681	127,593,282	0.996
2012	198,931,972	202,376,015	1.017	124,652,478	124,623,582	1.000
2013	214,873,629	216,968,566	1.010	133,709,643	134,089,868	1.003
Weighted Average			1.013			1.000
	78	90		78	90	
2008	186,985,748	186,856,470	0.999	116,549,359	116,820,041	1.002
2009	182,342,833	183,211,379	1.005	120,362,765	120,017,965	0.997
2010	197,502,598	196,982,144	0.997	124,896,447	125,339,594	1.004
2011	208,144,520	208,739,206	1.003	127,305,984	127,338,863	1.000
2012	201,102,168	200,310,015	0.996	124,326,128	124,180,074	0.999
Weighted Average			1.000			1.000
	90	102		90	102	
2007	179,281,974	179,969,621	1.004	123,480,783	123,564,406	1.001
2008	186,165,572	186,474,061	1.002	116,423,251	115,988,622	0.996
2009	179,726,493	179,929,108	1.001	119,257,319	119,432,521	1.001
2010	197,223,331	198,160,537	1.005	125,739,589	125,670,248	0.999
2011	207,120,783	207,744,834	1.003	126,781,289	127,492,778	1.006
Weighted Average			1.003			1.001
	102	114		102	114	
2006	167,236,771	167,322,886	1.001	111,899,825	112,370,808	1.004
2007	179,631,959	179,728,191	1.001	123,543,499	123,029,750	0.996
2008	186,940,531	187,245,197	1.002	116,303,590	116,528,878	1.002
2009	180,026,067	179,809,922	0.999	119,545,721	119,514,576	1.000
2010	197,946,538	197,621,320	0.998	125,335,779	124,999,152	0.997
Weighted Average			1.000			1.000
	114	126		114	126	
2005	176,662,285	176,795,303	1.001	114,588,846	114,565,630	1.000
2006	168,053,070	168,914,320	1.005	112,602,624	112,666,572	1.001
2007	179,728,191	180,208,721	1.003	123,029,750	122,785,675	0.998
2008	186,985,197	187,091,798	1.001	116,503,878	116,471,507	1.000
2009	179,504,278	179,191,973	0.998	119,239,059	119,291,728	1.000
Weighted Average			1.001			1.000

Note:
 Unit Statistical Plan Data, Excluding Large Deductible Policies.

Escalation Adjustment for Indemnity Losses Only

Loss Development Method (1)	Policy Year (2)	Differential in Loss Development (3)
Paid Plus Case	2018	1.007
	2017	1.007
	2016	1.007
Paid	2018	1.037
	2017	1.037
	2016	1.037
Average of Paid and Paid Plus Case	2018	1.022
	2017	1.022
	2016	1.022

Notes:

(3): Section II-D, Exhibit 1, Page 1 and Exhibit 2, Page 1.

X 000021

X 000022

Section X - Experience Rating
 Subsection A - Expected Loss Rates
 7/1/2022

Section X - A
 Exhibit 6

Investment Income Offset

Hazard Code (1)	Injury Type (2)	Indemnity		Medical		Total Investment Income Offset (7)
		Developed Losses at Ultimate (3)	Investment Income Offset (4)	Developed Losses at Ultimate (5)	Investment Income Offset (6)	
A	Fatal	50,821	0.955	0	1.000	
A	Permanent Total	1,148,381	0.942	167,120	0.944	
A	Permanent Partial	21,924,977	1.010	8,972,414	1.011	
A	Temporary Total	25,434,717	1.012	14,480,422	1.013	
A	Medical Only	0		6,677,061	1.000	
A	TOTAL	48,558,896	1.009	30,297,017	1.009	1.009
B	Fatal	5,408,597	0.955	584,130	1.000	
B	Permanent Total	6,242,046	0.942	3,944,681	0.944	
B	Permanent Partial	77,893,310	1.010	24,437,072	1.011	
B	Temporary Total	97,892,156	1.012	52,954,483	1.013	
B	Medical Only	0		18,667,403	1.000	
B	TOTAL	187,436,109	1.007	100,587,769	1.008	1.007
C	Fatal	4,093,587	0.955	307,019	1.000	
C	Permanent Total	18,342,266	0.942	9,902,369	0.944	
C	Permanent Partial	179,937,951	1.010	61,164,769	1.011	
C	Temporary Total	167,523,495	1.012	87,226,106	1.013	
C	Medical Only	0		28,364,574	1.000	
C	TOTAL	369,897,299	1.007	186,964,837	1.007	1.007
D	Fatal	5,153,269	0.955	615,278	1.000	
D	Permanent Total	9,148,643	0.942	9,892,730	0.944	
D	Permanent Partial	78,758,963	1.010	32,744,765	1.011	
D	Temporary Total	81,469,187	1.012	42,410,876	1.013	
D	Medical Only	0		8,574,052	1.000	
D	TOTAL	174,530,061	1.006	94,237,700	1.004	1.005
E	Fatal	5,179,327	0.955	302,496	1.000	
E	Permanent Total	22,855,948	0.942	8,639,835	0.944	
E	Permanent Partial	103,699,116	1.010	34,557,612	1.011	
E	Temporary Total	131,443,330	1.012	56,382,091	1.013	
E	Medical Only	0		11,146,014	1.000	
E	TOTAL	263,177,721	1.004	111,028,048	1.006	1.004
F	Fatal	14,134,719	0.955	972,853	1.000	
F	Permanent Total	31,560,267	0.942	33,805,611	0.944	
F	Permanent Partial	184,275,921	1.010	79,228,868	1.011	
F	Temporary Total	125,900,590	1.012	57,504,574	1.013	
F	Medical Only	0		7,914,886	1.000	
F	TOTAL	355,871,498	1.002	179,426,793	0.999	1.001
G	Fatal	2,882,795	0.955	121,917	1.000	
G	Permanent Total	5,273,298	0.942	4,956,980	0.944	
G	Permanent Partial	35,583,370	1.010	14,359,013	1.011	
G	Temporary Total	18,837,102	1.012	9,149,750	1.013	
G	Medical Only	0		850,883	1.000	
G	TOTAL	62,576,564	1.002	29,438,543	1.000	1.002

Notes:

(3),(5): From Exhibit 4, Pages 3-5, Developed to Ultimate.

(4),(6): Section IX-B, Exhibit 4.

(7) = Average of (4) and (6) weighted by (3) and (5).

Calculation of Statewide Partial "D" Ratios by Benefit Type

Benefit Type (1)	Adjusted Primary Losses (2)	Adjusted Total Losses (3)	Partial D-Ratio = (2) / (3) (4)
Indemnity	133,120,322	1,026,820,558	0.130
Medical	175,088,820	607,238,621	0.288

Notes:

Data at the individual claim level for PYs 2016 - 2018 have been adjusted by the factors shown on Page 2. The Adjusted Primary Losses are capped at \$5,000 per claim. The Adjusted Total Losses are capped at \$350,000 per claim. If losses are capped, the proportions for capped indemnity and capped medical losses are consistent with the proportions for unlimited indemnity and unlimited medical.

X 000023

Severity Trend and State Benefit Level Adjustment Factors

Policy Year	Indemnity By Injury Type				Medical by Injury Type				
	Fatal	Permanent Total	Permanent Partial	Temporary Total	Fatal	Permanent Total	Permanent Partial	Temporary Total	Medical Only

(1) Severity Trend Factors

2016	1.055	1.055	1.055	1.055	1.069	1.069	1.069	1.069	1.068
2017	1.068	1.068	1.068	1.068	1.078	1.078	1.078	1.078	1.065
2018	1.051	1.051	1.051	1.051	1.059	1.059	1.059	1.059	1.071

(2) State Benefit Level Adjustment Factors

2016	1.017	1.020	1.031	1.014	1.000	1.000	1.000	1.000	1.000
2017	1.018	1.021	1.032	1.014	1.000	1.000	1.000	1.000	1.000
2018	1.023	1.028	1.044	1.019	1.000	1.000	1.000	1.000	1.000

(3) Combined Severity Trend and State Benefit Level Adjustment Factors

2016	1.073	1.077	1.088	1.070	1.069	1.069	1.069	1.069	1.068
2017	1.086	1.090	1.102	1.083	1.078	1.078	1.078	1.078	1.065
2018	1.075	1.080	1.097	1.071	1.059	1.059	1.059	1.059	1.071

Notes:

(1): Exhibit 2.

(2): Section IV-A, Exhibit 1. PY 2016 to CPY 2018_07. PY 2017 to CPY 2019_07. PY 2018 to CPY 2020_07.

(3) = (1) x (2)

X 000024

Severity Trend Factors

(1)			(2) Historical Values		
Schedule Z Policy Year			Indemnity Severity	Lost Time Medical Severity	Medical Only Severity
01/01/2016	-	12/31/2016	30,384	11,575	902
01/01/2017	-	12/31/2017	30,639	11,745	929
01/01/2018	-	12/31/2018	31,748	12,237	950
(3) Selected Annual Trend			2.0%	2.3%	2.8%
(4) Trend Period Length [Years between (1) and (5)]				2.497	

(5)			(6) Trend Factors from Sched Z PYs to Pol Eff Periods		
Policy Effective Period			Indemnity Severity	Lost Time Medical Severity	Medical Only Severity
07/01/2018	-	06/30/2019	1.055	1.069	1.068
07/01/2019	-	06/30/2020	1.068	1.078	1.065
07/01/2020	-	06/30/2021	1.051	1.059	1.071

Notes:

(2): Section V-A Exhibit 2, Pages 1, 2, and 3.

(3): Section V-A Exhibit 1, Page 1.

(6): For 7/1/2018 effective period, 1/1/2018 divided by 1/1/2016, then (3) for .5 years.

For 7/1/2019 effective period, 1/1/2018 divided by 1/1/2017, then (3) for 1.5 years.

For 7/1/2020 effective period, (3) for (4).

X 000025

Calculation of ELR Factors

Unit Report / Policy Effective Dates (1)	Hazard Group (2)	Permissible Loss and LBA Ratio (3)	Weighted LBA (4)	Exp Rating LER by Hazard Group (5)	Law Factor (6)	Loss Trend / Payroll Trend (7)	Loss Development to Ultimate Report (8)	Investment Income Offset (9)	Ratio of Exp Rating ELR to Average Rate (10)
1st Report 7/1/2020 to 6/30/2021	C	0.589	0.063	0.044	1.004	0.942	1.680	1.007	0.331
	E	0.589	0.063	0.093	1.004	0.942	1.688	1.004	0.313
	F	0.589	0.063	0.119	1.004	0.942	1.684	1.001	0.306
	G	0.589	0.063	0.131	1.004	0.942	1.688	1.002	0.301
2nd Report 7/1/2019 to 6/30/2020	C	0.589	0.063	0.068	1.006	0.915	1.274	1.007	0.437
	E	0.589	0.063	0.147	1.006	0.915	1.277	1.004	0.400
	F	0.589	0.063	0.188	1.006	0.915	1.275	1.001	0.383
	G	0.589	0.063	0.207	1.006	0.915	1.277	1.002	0.373
3rd Report 7/1/2018 to 6/30/2019	C	0.589	0.063	0.077	1.008	0.888	1.153	1.007	0.491
	E	0.589	0.063	0.165	1.008	0.888	1.155	1.004	0.445
	F	0.589	0.063	0.212	1.008	0.888	1.154	1.001	0.422
	G	0.589	0.063	0.233	1.008	0.888	1.155	1.002	0.410
1st - 3rd Report Average	C								0.420
	E								0.386
	F								0.370
	G								0.361

Notes:

(1): Unit Stat Reports used to experience rate a policy taking effect during the prospective effective period.

(3), (5), (7), (9): Section X-A, Exhibit 1.

(4): Loss Based Assessment weighted by federal indemnity losses as a % of losses.

(6): State Factors from Section IV-A, Exhibit 1 and Federal Factors from Section IV-F, Exhibit 1 weighted by Adjusted Reported Losses from Section VIII-C, Exhibit 1, Pages 2 and 4. Federal losses are 100% of total reported indemnity losses and 100% of total reported medical losses.

(8): Exhibit 2.

(10) = $[(3) / \{ 1.0 + (4) \}] \times [1.0 - (5)] / [(6) \times (7) \times (8) \times (9)]$

X 000026

X 000027

Section X - Experience Rating
 Subsection C - Expected Loss Rates for F-Class
 7/1/2022

Section X - C
 Exhibit 2

Hazard Group Development Factors to Ultimate

Development to Ultimate (1)	Hazard Group (2)	Losses at Latest Report (3)	Selected Relativity (4)	Balanced Relativity = (4) / TT(4) (5)	Selected Dev. Factor to Ultimate (6)
1st	C	129,017,522	0.995	0.995	1.680
1st	E	76,838,983	1.006	1.006	1.688
1st	F	100,436,580	1.001	1.001	1.684
1st	G	23,852,218	1.006	1.006	1.688
1st	Total	330,145,303	1.000	1.000	1.684
2nd	C	147,761,979	0.995	0.995	1.274
2nd	E	105,736,588	1.006	1.006	1.277
2nd	F	160,063,082	1.001	1.000	1.275
2nd	G	20,216,735	1.006	1.006	1.277
2nd	Total	433,778,384	1.000	1.000	1.275
3rd	C	155,089,075	0.995	0.995	1.153
3rd	E	105,626,170	1.006	1.006	1.155
3rd	F	156,285,207	1.001	1.000	1.154
3rd	G	25,215,477	1.006	1.006	1.155
3rd	Total	442,215,929	1.000	1.000	1.154

Notes:

(3): See Section X-A, Exhibit 4, Page 1.

(4): See Section X-A, Exhibit 4, Page 2 for F-Classes for selection. The entry in the "Total" row is the weighted average using incurred losses at latest report in column (3) as the weights.

(6) = 1.00 + (5) x (Total LDF from Exhibit 3 - 1.00)

Loss Development Factors For Use in Calculation of Reciprocals

Report (1)	Benefit Type (2)	Injury Type (3)	State Loss Development Factor to Ultimate (4)	Federal Loss Development Factor to Ultimate (5)	Average Loss Development Factor to Ultimate (6)	Distribution of Ultimate Losses (7)	Adjusted Distribution = (7) / (6) (8)	LDF to Ultimate to Derive ELR = TT(7) / TT(8) (9)
1st	Indemnity	Likely to Develop	2.189	2.325	2.325	30.9%	13.3%	
1st	Indemnity	Not Likely to Develop	1.740	1.810	1.810	36.2%	20.0%	
1st	Medical	Likely to Develop	1.300	1.527	1.527	12.8%	8.4%	
1st	Medical	Not Likely to Develop	1.067	1.135	1.135	20.1%	17.7%	
1st	Total					100.0%	59.4%	1.684
2nd	Indemnity	Likely to Develop	1.452	1.481	1.481	30.9%	20.8%	
2nd	Indemnity	Not Likely to Develop	1.277	1.254	1.254	36.2%	28.9%	
2nd	Medical	Likely to Develop	1.176	1.316	1.316	12.8%	9.7%	
2nd	Medical	Not Likely to Develop	1.035	1.060	1.060	20.1%	19.0%	
2nd	Total					100.0%	78.4%	1.275
3rd	Indemnity	Likely to Develop	1.255	1.281	1.281	30.9%	24.1%	
3rd	Indemnity	Not Likely to Develop	1.128	1.109	1.109	36.2%	32.6%	
3rd	Medical	Likely to Develop	1.120	1.250	1.250	12.8%	10.3%	
3rd	Medical	Not Likely to Develop	1.024	1.024	1.024	20.1%	19.6%	
3rd	Total					100.0%	86.6%	1.154

Notes:

(4): Section X-A, Exhibit 5, Page 5 and Section X-A, Exhibit 5, Page 2.

(5): Section VIII-E, Exhibit 1, Page 1.

(6): Average of (4) and (5) weighted by % of Total Reported Losses from Section VIII-C, Exhibit 1 Page 2 and Page 4.

Federal losses are 100.0% of total reported indemnity losses and 100.0% of total reported medical losses.

(7): Section IV-E, Exhibit 2, Page 2.

X 000028

X 000029

Section X - Experience Rating
Subsection D - State Reference Point
7/1/2022

Section X - D
Exhibit 1

State Reference Point

Report (1)	Policy Year (2)	Reported Claims (3)	Reported Losses (4)	Average Claim Cost = (4) / (3) (5)
1st	2018	42,577	473,542,704	11,122
2nd	2017	43,867	608,777,205	13,878
3rd	2016	42,354	621,872,525	14,683
Total		128,798	1,704,192,434	13,232
(6)	Indicated State Reference Point = [Total (5)] x 250			3,307,878
(7)	Average Annual Severity Trend			2.12%
(8)	Length of Trending Period in Years			2.497
(9)	Trend Factor = [1.000 + (7)] ^ (8)			1.054
(10)	Trended State Reference Point = (6) x (9)			3,486,126
(11)	Selected State Reference Point			3,500,000
(12)	G = (11) / 250,000			14.00
(13)	State Per Claim Accident Limitation = (11) x 0.1			350,000
(14)	Multiple State Claim Accident Limitation = (13) x 2			700,000

Notes:

(3), (4): Unit Statistical Plan Data, Excluding Large Deductible Policies.

(7): Credibility Weighted Severity Trends from Section V-A, Exhibit 1, Page 1 weighted by Injury Type Weights at Ultimate from Section IV-E, Exhibit 2, Pages 1 and 2.

(8): Section X-B, Exhibit 2.

(11): Current State Reference Point is 3,000,000.

EXPERIENCE RATING PLAN MANUAL

MASSACHUSETTS

Proposed Effective July 1, 2022

TABLE OF EXPECTED LOSS RATES AND DISCOUNT RATIOS

CLASS CODE	EXP LOSS RATE	DISC RATIO	CLASS CODE	EXP LOSS RATE	DISC RATIO	CLASS CODE	EXP LOSS RATE	DISC RATIO	CLASS CODE	EXP LOSS RATE	DISC RATIO	CLASS CODE	EXP LOSS RATE	DISC RATIO
0005	1.08	.18	2115	2.45	.18	3041	1.17	.18	3634	0.66	.18	4439	1.99	.20
0008	1.01	.19	2121	0.63	.19	3042	1.61	.19	3635	1.12	.20	4452	1.15	.18
0016	1.38	.19	2130	0.64	.19	3066	1.02	.18	3638	0.74	.18	4459	1.26	.18
0034	1.31	.19	2131	1.31	.19	3076	0.99	.18	3642	0.44	.18	4470	0.87	.18
0035	0.75	.19	2143	1.18	.17	3081D	1.89	.19	3643	0.67	.18	4484	0.90	.19
0036	1.31	.19	2150	1.62	.19	3082D	1.89	.19	3647	0.96	.18	4493	0.83	.18
0042	1.40	.19	2156	1.60	.19	3085D	1.84	.19	3648	0.53	.19	4511	0.14	.18
0046	1.11	.20	2157	1.82	.18	3110	3.79	.18	3681	0.28	.18	4512	0.04	.19
0050	1.88	.18	2172	0.73	.17	3111	0.90	.18	3685	0.26	.18	4557	0.82	.17
0059D	.	.	2211	2.25	.18	3113	0.74	.19	3724	1.73	.18	4558	0.68	.19
0065D	.	.	2220	1.11	.19	3114	1.24	.18	3726	2.06	.17	4583	0.96	.19
0066D	.	.	2260	2.04	.18	3118	0.72	.18	3807	1.18	.20	4611	0.38	.18
0067D	.	.	2288	1.71	.18	3119	0.43	.19	3808	1.36	.19	4635	1.83	.20
0079	0.92	.20	2305	1.15	.18	3120	0.58	.18	3821	2.07	.19	4653	0.89	.18
0083	1.57	.19	2362	0.82	.19	3122	1.02	.19	3826	1.90	.20	4665	4.13	.17
0106	3.73	.19	2380	0.75	.19	3127	0.63	.18	3830	0.68	.18	4692	0.24	.18
0113	1.31	.19	2402	0.88	.19	3131	0.55	.19	3841	0.73	.18	4693	0.35	.19
0170	1.31	.19	2413	1.48	.19	3132	1.02	.19	4000	2.20	.18	4720	0.70	.19
0771	.	.	2416	0.99	.19	3145	0.70	.19	4021	1.26	.19	4740	0.31	.18
0908	37.12	.18	2417	0.81	.17	3146	0.92	.19	4024	1.54	.18	4741	1.11	.18
0909	86.22	.21	2501	0.95	.18	3169	1.13	.20	4034	2.36	.19	4771	1.65	.17
0912	172.44	.21	2503	0.49	.17	3179	0.50	.18	4036	0.74	.19	4777	0.93	.19
0913	74.23	.18	2570	1.72	.18	3180	1.11	.18	4038	1.22	.17	4825	0.17	.18
0917	1.07	.18	2576	0.97	.19	3188	1.08	.18	4053	1.05	.19	4828	0.37	.18
0918	0.19	.17	2585	1.25	.19	3200	0.93	.19	4062	0.84	.18	4829	0.34	.18
1430	1.78	.18	2586	0.92	.19	3220	1.26	.19	4112	0.16	.19	4902	0.74	.19
1438	1.27	.18	2587	1.03	.18	3223	(a)	(a)	4113	1.05	.19	4923	0.26	.18
1463	4.98	.20	2623	1.98	.19	3255	0.89	.18	4114	1.19	.18	5020	1.71	.17
1624D	1.49	.19	2651	0.70	.19	3257	1.05	.19	4130	1.54	.19	5022	3.91	.18
1655	0.94	.18	2660	0.94	.19	3270	0.95	.19	4133	0.71	.18	5037	5.86	.18
1701	0.89	.18	2683	1.00	.19	3300	1.37	.20	4150	0.42	.17	5040	7.87	.18
1710D	1.55	.19	2688	0.81	.19	3305	(a)	(a)	4239	0.99	.18	5057	6.99	.20
1747	1.02	.19	2702	4.91	.19	3315	1.33	.18	4243	1.17	.18	5059	8.88	.19
1748	1.28	.20	2710	2.38	.19	3336	1.06	.18	4244	1.29	.18	5102	2.44	.17
1853	0.53	.17	2731	1.14	.19	3365	1.86	.19	4250	0.91	.18	5146	2.72	.18
1924	1.01	.18	2747	2.57	.18	3372	0.87	.18	4251	0.95	.17	5160	1.13	.18
1925	2.96	.25	2790	0.91	.18	3373	1.58	.18	4273	1.34	.18	5183	1.26	.18
2003	1.59	.18	2802	1.53	.18	3381	0.81	.18	4279	0.98	.18	5188	1.57	.17
2014	1.56	.18	2835	0.84	.18	3383	0.69	.19	4283	0.64	.18	5190	0.96	.18
2021	1.11	.19	2836	1.17	.18	3385	0.36	.18	4299	0.80	.18	5191	0.34	.19
2039	1.69	.18	2841	1.68	.19	3400	1.08	.20	4304	1.88	.19	5192	1.22	.19
2041	1.05	.18	2883	1.42	.18	3507	1.19	.18	4307	0.76	.19	5213	4.40	.18
2070	1.45	.18	2923	0.65	.18	3515	1.16	.18	4308	0.89	.15	5215	1.79	.18
2081	1.16	.20	2942	0.77	.19	3558	0.33	.20	4351	0.38	.18	5221	2.66	.17
2089	1.15	.18	3018	0.96	.18	3571	0.29	.18	4352	0.53	.18	5222	3.55	.17
2095	1.17	.18	3022	1.54	.19	3574	0.74	.18	4360	0.27	.18	5223	1.65	.18
2101	1.20	.18	3027	1.38	.19	3612	0.54	.19	4361	0.27	.20	5348	1.95	.17
2105	(a)	(a)	3028	1.16	.19	3620	1.42	.18	4362	0.21	.18	5402	3.03	.18
2111	0.99	.19	3030	1.95	.19	3629	0.74	.18	4410	1.36	.20	5403	3.49	.18
2114	1.20	.18	3040	2.14	.17	3632	0.68	.18	4432	0.32	.19	5437	1.49	.18

(a) Expected Loss Rates and Discount Ratios for each individual risk must be obtained by Home Office from the WCRIBMA
 D Supplement Disease Loading

Proposed Effective July 1, 2022

TABLE OF EXPECTED LOSS RATES AND DISCOUNT RATIOS

CLASS CODE	EXP LOSS RATE	DISC RATIO	CLASS CODE	EXP LOSS RATE	DISC RATIO	CLASS CODE	EXP LOSS RATE	DISC RATIO	CLASS CODE	EXP LOSS RATE	DISC RATIO	CLASS CODE	EXP LOSS RATE	DISC RATIO
5443	1.58	.18	7016M	1.12	.79	7704	1.37	.19	8719	1.00	.18	9179	19.19	.22
5445	2.48	.17	7024M	1.40	.79	7720	0.60	.19	8720	0.34	.18	9180	1.84	.21
5462	2.24	.17	7038M	2.12	.76	7855	1.30	.17	8721	0.09	.19	9182	1.31	.21
5472	2.91	.17	7046M	3.02	.58	8001	0.77	.20	8726F	1.68	.20	9186	1.77	.21
5473	3.39	.18	7047M	1.76	.69	8002	0.88	.21	8734M	0.21	.54	9220	1.58	.19
5474	1.58	.18	7050M	3.32	.67	8006	0.53	.20	8737M	0.17	.54	9402	1.59	.18
5478	1.41	.17	7090M	2.65	.76	8008	0.36	.19	8738M	0.26	.53	9403	3.84	.18
5479	2.33	.18	7098M	3.55	.58	8010	0.76	.19	8742	0.04	.19	9410	1.69	.19
5480	1.80	.17	7099M	4.45	.51	8013	0.16	.20	8745	2.63	.20	9501	0.86	.18
5506	2.12	.18	7133	(a)	(a)	8017	0.45	.19	8747	0.33	.17	9505	0.86	.18
5507	2.13	.17	7151M	3.96	.52	8018	1.67	.18	8748	0.29	.18	9519	1.01	.18
5508D	1.70	.18	7152M	6.22	.52	8021	1.51	.18	8800	0.48	.18	9521	1.20	.18
5509	2.10	.19	7153M	4.96	.52	8031	0.74	.19	8803	0.02	.19	9522	0.71	.18
5538	1.67	.18	7219	2.97	.18	8032	0.60	.19	8805M	0.09	.60	9533	6.35	.17
5545	18.48	.19	7230	3.72	.18	8033	0.63	.18	8810	0.03	.19	9534	2.08	.17
5547	4.17	.19	7231	4.97	.18	8034	1.32	.17	8814M	0.07	.60	9549	1.62	.17
5606	0.50	.19	7309F	4.10	.19	8039	0.62	.20	8815M	0.11	.59	9552	2.82	.19
5610	2.04	.17	7313F	5.67	.15	8044	1.16	.19	8820	0.03	.19	9586	0.16	.18
5645	2.60	.19	7317F	6.91	.19	8046	0.99	.20	8824	0.96	.19	9620	0.31	.19
5701	7.67	.19	7327F	8.99	.19	8048	1.12	.19	8826	0.71	.19			
5703	4.52	.18	7333M	4.51	.70	8058	1.01	.20	8829	1.04	.18			
5705	3.79	.18	7335M	5.30	.70	8103	1.13	.19	8831	0.46	.22			
6003	3.09	.17	7337M	6.65	.61	8105	3.72	.17	8832	0.12	.18			
6005	1.70	.18	7350F	6.98	.17	8106	2.08	.19	8833	0.48	.18			
6204	2.05	.18	7360	1.72	.18	8107	1.22	.19	8835	0.78	.18			
6217	1.70	.17	7370	1.71	.19	8111	1.20	.19	8837	(a)	(a)			
6229	1.51	.18	7380	2.56	.18	8203	2.71	.18	8868	0.34	.19			
6233	0.82	.17	7382	1.69	.18	8204	2.65	.19	8901	0.03	.19			
6251D	1.68	.17	7394M	5.80	.84	8215	1.29	.19	9014	0.91	.19			
6252D	2.03	.17	7395M	7.41	.84	8227	1.99	.19	9015	1.32	.18			
6306	3.39	.17	7398M	9.29	.74	8232	2.21	.19	9016	0.77	.20			
6319	1.07	.18	7403	1.38	.19	8233	2.22	.19	9019	1.10	.18			
6325	1.00	.18	7405	0.48	.18	8235	1.79	.19	9033	1.06	.18			
6400	2.04	.19	7420	3.49	.20	8263	2.21	.19	9040	1.43	.19			
6504	1.20	.18	7421	0.42	.17	8264	2.00	.19	9044	0.61	.18			
6702M	(a)	(a)	7422	0.41	.17	8265	2.13	.19	9052	0.68	.18			
6703M	(a)	(a)	7425	1.00	.18	8279	1.45	.20	9058	0.70	.19			
6704M	(a)	(a)	7431	0.41	.17	8291	1.45	.19	9060	0.47	.20			
6801F	2.56	.18	7445	.	.	8292	1.49	.18	9061	0.49	.19			
6811	2.25	.18	7453	.	.	8293	3.08	.19	9062	0.49	.19			
6824F	3.39	.20	7502	0.68	.18	8350	2.62	.18	9063	0.28	.20			
6826F	2.12	.18	7515	1.25	.23	8380	1.09	.18	9077F	2.82	.23			
6834	0.94	.19	7520	1.31	.19	8381	0.71	.19	9079	0.47	.19			
6836	1.20	.20	7538	2.07	.18	8385	1.49	.18	9089	0.32	.19			
6843F	4.47	.18	7539	0.56	.19	8392	0.76	.20	9093	0.51	.20			
6854	3.93	.18	7580	1.37	.18	8393	0.55	.18	9101	1.72	.19			
6872F	6.24	.19	7590	2.16	.19	8500	2.22	.19	9102	0.92	.19			
6874F	6.81	.18	7600	1.51	.17	8601	0.08	.19	9154	0.69	.20			
6882	5.49	.19	7601	2.02	.18	8709F	2.14	.19	9156	0.85	.20			
6884	5.99	.18	7610	0.15	.17	8710	1.07	.18	9178	6.48	.24			

(a) Expected Loss Rates and Discount Ratios for each individual risk must be obtained by Home Office from the WCRIBMA
 D Supplement Disease Loading
 F Expected Loss Rates and Discount Ratios for risks covered under the United States Longshore and Harbor Workers' Compensation Act.
 M Expected Loss Rates and Discount Ratios for risks subject to Admiralty Law or Federal Employers Liability Act (FELA).

EXPERIENCE RATING PLAN MANUAL

Proposed Effective July 1, 2022

TABLE OF WEIGHTING VALUES

Expected Losses	Weighting Values	Expected Losses	Weighting Values	Expected Losses	Weighting Values
0 - 2,931	0.04	829,408 - 894,882	0.24	3,418,995 - 3,696,438	0.44
2,932 - 11,851	0.05	894,883 - 963,836	0.25	3,696,439 - 4,005,844	0.45
11,852 - 20,962	0.06	963,837 - 1,036,559	0.26	4,005,845 - 4,353,074	0.46
20,963 - 86,018	0.07	1,036,560 - 1,113,376	0.27	4,353,075 - 4,745,517	0.47
86,019 - 125,216	0.08	1,113,377 - 1,194,646	0.28	4,745,518 - 5,192,622	0.48
125,217 - 162,596	0.09	1,194,646 - 1,280,770	0.29	5,192,623 - 5,706,665	0.49
162,597 - 200,061	0.10	1,280,771 - 1,372,202	0.30	5,706,666 - 6,303,899	0.50
200,062 - 238,261	0.11	1,372,203 - 1,469,451	0.31	6,303,900 - 7,006,299	0.51
238,262 - 277,532	0.12	1,469,452 - 1,573,094	0.32	7,006,300 - 7,844,326	0.52
277,533 - 318,093	0.13	1,573,095 - 1,683,786	0.33	7,844,327 - 8,861,466	0.53
318,094 - 360,117	0.14	1,683,787 - 1,802,272	0.34	8,861,467 - 10,122,016	0.54
360,118 - 403,757	0.15	1,802,273 - 1,929,410	0.35	10,122,017 - 11,725,231	0.55
403,758 - 449,157	0.16	1,929,411 - 2,066,185	0.36	11,725,232 - 13,832,817	0.56
449,158 - 496,463	0.17	2,066,186 - 2,213,738	0.37	13,832,818 - 16,727,225	0.57
496,464 - 545,823	0.18	2,213,739 - 2,373,398	0.38	16,727,226 - 20,950,201	0.58
545,824 - 597,396	0.19	2,373,399 - 2,546,720	0.39	20,950,202 - 27,688,977	0.59
597,397 - 651,350	0.20	2,546,721 - 2,735,538	0.40	27,688,978 - 40,145,480	0.60
651,351 - 707,868	0.21	2,735,539 - 2,942,030	0.41	40,145,481 - 70,958,999	0.61
707,869 - 767,148	0.22	2,942,031 - 3,168,801	0.42	70,958,999 - 274,327,342	0.62
767,149 - 829,407	0.23	3,168,802 - 3,418,994	0.43		0.63

- | | |
|---|-----------|
| (a) State Per Claim Accident Limitation | \$350,000 |
| (b) State Multiple Claim Accident Limitation | \$700,000 |
| (c) U.S. Longshore and Harbor Workers' Act Per Claim Accident Limitation | \$130,000 |
| (d) U.S. Longshore and Harbor Workers' Act Multiple Claim Accident Limitation | \$260,000 |
| (e) Employers Liability Accident Limitation | \$55,000 |
| (f) USL&HW Act-Expected Loss Factor-Non-F Classes | 13.6% |
| (g) Cap on Modifications = $1 + (0.00005) [(Expected Losses) + (2) (Expected Losses) / (14)]$ | |

X 000033

MASSACHUSETTS EXPERIENCE RATING PLAN MANUAL

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Proposed Effective July 1, 2022

TABLE OF BALLAST VALUES

Expected Losses	Ballast Values	Expected Losses	Ballast Values	Expected Losses	Ballast Values
0 - 68,696	35,000	1,726,975 - 1,776,919	210,000	3,475,984 - 3,525,970	385,000
68,697 - 104,903	40,000	1,776,920 - 1,826,867	215,000	3,525,971 - 3,575,956	390,000
104,904 - 146,890	45,000	1,826,868 - 1,876,818	220,000	3,575,957 - 3,625,943	395,000
146,891 - 191,997	50,000	1,876,819 - 1,926,771	225,000	3,625,944 - 3,675,930	400,000
191,998 - 238,797	55,000	1,926,772 - 1,976,726	230,000	3,675,931 - 3,725,918	405,000
238,798 - 286,573	60,000	1,976,727 - 2,026,684	235,000	3,725,919 - 3,775,906	410,000
286,574 - 334,949	65,000	2,026,685 - 2,076,643	240,000	3,775,907 - 3,825,894	415,000
334,950 - 383,716	70,000	2,076,644 - 2,126,605	245,000	3,825,895 - 3,875,882	420,000
383,717 - 432,750	75,000	2,126,606 - 2,176,568	250,000	3,875,883 - 3,925,871	425,000
432,751 - 481,974	80,000	2,176,569 - 2,226,533	255,000	3,925,872 - 3,975,860	430,000
481,975 - 531,338	85,000	2,226,534 - 2,276,500	260,000	3,975,861 - 4,025,849	435,000
531,339 - 580,807	90,000	2,276,501 - 2,326,468	265,000	4,025,850 - 4,075,839	440,000
580,808 - 630,358	95,000	2,326,469 - 2,376,437	270,000	4,075,840 - 4,125,829	445,000
630,359 - 679,972	100,000	2,376,438 - 2,426,407	275,000	4,125,830 - 4,175,819	450,000
679,973 - 729,638	105,000	2,426,408 - 2,476,379	280,000	4,175,820 - 4,225,809	455,000
729,639 - 779,346	110,000	2,476,380 - 2,526,352	285,000	4,225,810 - 4,275,800	460,000
779,347 - 829,088	115,000	2,526,353 - 2,576,326	290,000	4,275,801 - 4,325,791	465,000
829,089 - 878,859	120,000	2,576,327 - 2,626,301	295,000	4,325,792 - 4,375,782	470,000
878,860 - 928,654	125,000	2,626,302 - 2,676,276	300,000	4,375,783 - 4,425,773	475,000
928,655 - 978,470	130,000	2,676,277 - 2,726,253	305,000	4,425,774 - 4,475,764	480,000
978,471 - 1,028,304	135,000	2,726,254 - 2,776,231	310,000	4,475,765 - 4,525,756	485,000
1,028,305 - 1,078,152	140,000	2,776,232 - 2,826,209	315,000	4,525,757 - 4,575,748	490,000
1,078,153 - 1,128,014	145,000	2,826,210 - 2,876,188	320,000	4,575,749 - 4,625,739	495,000
1,128,015 - 1,177,887	150,000	2,876,189 - 2,926,168	325,000	4,625,740 - 4,675,732	500,000
1,177,888 - 1,227,771	155,000	2,926,169 - 2,976,148	330,000	4,675,733 - 4,725,724	505,000
1,227,772 - 1,277,664	160,000	2,976,149 - 3,026,129	335,000	4,725,725 - 4,775,716	510,000
1,277,665 - 1,327,564	165,000	3,026,130 - 3,076,111	340,000	4,775,717 - 4,825,709	515,000
1,327,565 - 1,377,472	170,000	3,076,112 - 3,126,093	345,000	4,825,710 - 4,875,702	520,000
1,377,473 - 1,427,386	175,000	3,126,094 - 3,176,076	350,000	4,875,703 - 4,925,694	525,000
1,427,387 - 1,477,306	180,000	3,176,077 - 3,226,059	355,000	4,925,695 - 4,975,687	530,000
1,477,307 - 1,527,231	185,000	3,226,060 - 3,276,043	360,000		
1,527,232 - 1,577,161	190,000	3,276,044 - 3,326,028	365,000		
1,577,162 - 1,627,095	195,000	3,326,029 - 3,376,013	370,000		
1,627,096 - 1,677,033	200,000	3,376,014 - 3,425,998	375,000		
1,677,034 - 1,726,974	205,000	3,425,999 - 3,475,983	380,000		

For Expected Losses (E) greater than \$4,975,687, the Ballast Value is calculated using the following formula (rounded to the nearest 1):

$$\text{Ballast} = (0.1E + 2,500GE / (E + 700G))$$

G = 14

XI 000001

Miscellaneous Rating Values

In this section, we discuss recommended modifications to various miscellaneous rating values, including the following:

- Massachusetts Benefits Deductible Program Credits
- Massachusetts Benefits Claim and Aggregate Deductible Program Credits

Section XI-B – Massachusetts Benefits Deductible Program Credits

The Massachusetts Benefits Deductible Program allows insureds to elect a per claim deductible applicable to the sum of medical and indemnity losses. Deductible levels of \$500, \$1,000, \$2,000, \$2,500 and \$5,000 are offered to every employer. Insureds that elect a deductible obtain a premium reduction reflective of the percentage of losses expected to be retained by the insured as a consequence of the deductible. Higher deductibles should be associated with larger premium credits because an insured's expected retained losses increase as the deductible level increases.

Section XI-B, Exhibit 1 displays Loss Elimination Ratios and Premium Credits for the available deductible levels. The premium credits have been calculated with the following considerations:

- The deductible will apply to the sum of indemnity and medical losses.
- The database used is Unit Statistical Report data from policy years 2014, 2013, 2012, 2011, and 2010 at fifth report. Each loss is multiplied by appropriate trend, law amendment and development factors. Claim costs are trended to 7/1/2023, the average accident date (assuming the proposed small and medium deductible credits will be in effect for one year starting 7/1/2022). These factors are shown in Section XI-D, Exhibit 1 and they are taken directly from other sections of the filing.
- Each claim is then layered by size of loss to calculate loss elimination ratios (LER).
- The WCRIBMA used the same formula as in the last Massachusetts Benefits Deductible Program filing to calculate the premium credit. This is formula (8) in

XI 000003

“Fundamentals of Individual Risk Rating”, 1992, Part III by William R. Gillam and Richard H. Snader:

$$\frac{\text{Premium Credit}}{1.0 - \text{VEL}} = \frac{\text{LER} \times \text{SF} \times \text{ELR}}{1.0 - \text{VEL}}$$

LER - Loss Elimination Ratio (Section XI-B, Exhibit 1)

ELR - Expected Loss Ratio (Section VI-A, Exhibit 1)

VEL - Variable Expense Load (sum of the variable expense ratio from Section VI-A, Exhibit 1 and the IRR Profit Provision from Section VII-A, Exhibit 1)

SF - Safety Factor (based on the 2007 Stipulation)

The safety factor is warranted for a number of reasons. First, insureds that elect a small or medium deductible are more likely to benefit from having the deductible than an insured chosen at random. This is referred to as adverse selection and is exacerbated by the requirement in Massachusetts (211 CMR 115.04) mandating that all risks be offered a policy with a deductible. Second, unlike personal auto or health insurance where the insurance company pays claims net of any applicable deductible, workers' compensation insurers must pay the entire amount of the claim and then seek reimbursement of the deductible from the insured. This creates credit risk and some insureds default on their obligation to reimburse their insurance carrier. Additionally, the exposure insured by the insurance carrier is more risky if the policyholder has opted for a deductible because the policyholder retains the less risky portion of the total losses.

XI 000004

Section XI - Miscellaneous Rating Values
Subsection B - Massachusetts Benefits Deductible Program Credits
7/1/2022

Section XI-B
Exhibit 1

Massachusetts Benefits Deductible Program Premium Credits

Deductible Level (1)	Loss Elimination Ratio (2)	Expected Loss Ratio (3)	Safety Factor (4)	Variable Expense Ratio (5)	Underwriting Profit Provision (6)	Premium Credit (7)
500	2.9%	0.589	0.90	0.203	0.041	2.0%
1,000	5.1%	0.589	0.90	0.203	0.041	3.6%
2,000	8.4%	0.589	0.90	0.203	0.041	5.9%
2,500	9.8%	0.589	0.90	0.203	0.041	6.9%
5,000	16.0%	0.589	0.90	0.203	0.041	11.2%

Notes:

(2): Based on Unit Statistical Data

(3): Section VI-J, Exhibit 1.

(4) = 0.9 from 9/1/2007 Stipulation.

(5): Section VI-A, Exhibit 1.

(6): Section VII-A, Exhibit 1.

(7) = $[(2) \times (3) \times (4)] / [1.0 - (5) - (6)]$

XI 000005

Section XI-C – Massachusetts Benefits Claim and Aggregate Deductible Program

Credits

The Massachusetts Benefits Claim and Aggregate Deductible Program allows insureds to elect a per claim deductible applicable to the sum of medical and indemnity losses. However, unlike the Massachusetts Benefits Deductible Program, the losses retained by the insured are subject to a maximum, the aggregate limit. Only one deductible option is available with the Massachusetts Benefits Claim and Aggregate Deductible Program. Insureds may elect a \$2,500 deductible with an aggregate limit equal to the greater of \$10,000 or 5% of the “Basis for the Aggregate Limit at Policy Inception” which is defined in the Massachusetts Workers Compensation and Employers Liability Insurance Manual (“Massachusetts Manual”) as manual premium subject to any applicable merit or experience rating.

Section XI-C, Exhibit 1 shows the pricing of the \$2,500 per claim deductible subject to an aggregate limit. In the exhibit, the WCRIBMA estimates how much less of a credit is appropriate given the limitation on the insured’s retained losses. For the Massachusetts Benefits Deductible Program, a credit of 6.9% is estimated for a \$2,500 per claim deductible (not subject to an aggregate limit). The 6.9% will serve as the basis for the calculation of the credit factors applicable to the Massachusetts Benefits Claim and Aggregate Deductible Program.

The impact of the aggregate limit on retained losses will vary with the premium size for an insured. Consistent with the law of large numbers, the loss experience for smaller policies is more volatile than for larger policies. Hence, proportionately “smaller insureds”

XI 000006

have either very low or very high loss ratios when compared to “larger insureds.” Consequently, smaller insureds are less apt to benefit from an aggregate limit. In this section, factors are derived to modify the credit proposed for a \$2,500 deductible without an applicable aggregate limit. These vary by premium size to reflect the differential benefits of the aggregate limit for different size insureds. As in the prior Massachusetts Benefits Claim and Aggregate Deductible Program filing, the selection of the adjustment factor is based on the results of a simulation model shown in Section XI-C, Exhibit 2.

The simulation model does the following for each simulated insured:

- Assumes the insured has an expected claim frequency of N.
- Simulates the number of claims for the insured by generating a random number from a Poisson distribution with mean N.
- For each simulated claim, selects at random an actual loss amount from those reported in policy years 2014, 2013, 2012, 2011, and 2010 at 5th report. Loss amounts are adjusted for trend, development and law changes.
- Applies the per claim deductible to each claim to estimate the retained losses prior to application of the aggregate limit.
- Summarizes the simulated retained losses.
- Applies the aggregate limit to the sum of the simulated retained losses.

XI 000007

Section XI - Miscellaneous Rating Values
Subsection C - Massachusetts Benefits Claim and Aggregate Deductible Program Credits
7/1/2022

Section XI-C
Exhibit 1

Massachusetts Benefits Claim and Aggregate Deductible Program Premium Credit for \$2,500 Per Claim Deductible with Aggregate Limit

Estimated Annual Standard Premium (1)	Expected Number of Claims Per Year = Midpoint of (1) / \$24,279 (2)	Aggregate Limit (3)	Selected Adjustment Factor for Aggregate Limit (4)	Premium Credit = (4) x 6.9% (5)
0 - 75,000	1.5	\$10,000	0.99	6.8%
75,000 - 100,000	3.6	\$10,000	0.93	6.4%
100,000 - 125,000	4.6	\$10,000	0.87	6.0%
125,000 - 150,000	5.7	\$10,000	0.80	5.5%
150,000 - 200,000	7.2	\$10,000	0.71	4.9%
Over 200,000	8 or more	5% of the 'Basis for the Aggregate Limit at Policy Inception'	0.65	4.5%

Notes:

(2): Based on \$24,279 in standard premium (no ARAP) per expected claim.

(4): Selected based on the simulation results shown in Exhibit 2.

(5): The 6.9% is based on the \$2,500 per claim deductible without any aggregate limit, from Section XI-B, Exhibit 1.

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Section XI - Miscellaneous Rating Values
 Subsection C - Massachusetts Benefits Claim and Aggregate Deductible Program Credits
 7/1/2022

Section XI-C
 Exhibit 2

Results of Simulation Model

Expected Number of Claims Per Year (1)	Number of Simulated Risks (2)	LER with No Aggregate Limit (3)	LER with \$10,000 Aggregate Limit (4)	LER with 5% of the Basis for Aggregate Limit (5)	Ratio of LERs (\$10,000 limit) = (4) / (3) (6)	Ratio of LERs (5% limit) = (5) / (3) (7)
1	1,000,000	9.78%	9.77%	4.18%	1.00	0.43
2	1,000,000	9.79%	9.73%	5.68%	0.99	0.58
3	1,000,000	9.80%	9.59%	6.21%	0.98	0.63
4	1,000,000	9.81%	9.31%	6.55%	0.95	0.67
5	1,000,000	9.71%	8.82%	6.71%	0.91	0.69
6	1,000,000	9.79%	8.41%	6.93%	0.86	0.71
7	1,000,000	9.81%	7.89%	7.07%	0.80	0.72
8	1,000,000	9.78%	7.32%	7.15%	0.75	0.73
9	1,000,000	9.83%	6.82%	7.27%	0.69	0.74
10	1,000,000	9.81%	6.30%	7.32%	0.64	0.75
12	1,000,000	9.80%	5.41%	7.42%	0.55	0.76
14	1,000,000	9.82%	4.72%	7.53%	0.48	0.77
16	1,000,000	9.82%	4.14%	7.58%	0.42	0.77
18	1,000,000	9.82%	3.69%	7.64%	0.38	0.78
20	1,000,000	9.80%	3.32%	7.67%	0.34	0.78
25	1,000,000	9.80%	2.65%	7.74%	0.27	0.79
30	1,000,000	9.83%	2.22%	7.82%	0.23	0.80
40	1,000,000	9.79%	1.66%	7.87%	0.17	0.80
50	1,000,000	9.80%	1.33%	7.92%	0.14	0.81
75	1,000,000	9.81%	0.89%	7.98%	0.09	0.81
100	1,000,000	9.80%	0.66%	8.00%	0.07	0.82
150	1,000,000	9.80%	0.44%	8.02%	0.04	0.82
200	1,000,000	9.80%	0.33%	8.03%	0.03	0.82
300	1,000,000	9.80%	0.22%	8.03%	0.02	0.82
400	1,000,000	9.80%	0.17%	8.03%	0.02	0.82
500	1,000,000	9.81%	0.13%	8.03%	0.01	0.82

Notes:

(5): The Aggregate Limit is based on the average claim severity of the simulated losses, \$15,059 and the permissible loss ratio of 0.589. One claim is assumed to be expected for each \$24,279 of standard premium.

XI 000009

Section XI - Miscellaneous Rating Values
 Subsection C - Massachusetts Benefits Claim and Aggregate Deductible Program Credits
 7/1/2022

Section XI-C
 Exhibit 3

Law Amendments, Loss Development Factors, and Severity Trend

(1) Law Amendment Factors to Prospective Effective Period

Policy Year	Indemnity Losses				Medical Losses
	Death	Permanent Total	Permanent Partial	Temporary Total	All Injury Types
PY 2010	1.080	1.088	1.146	1.055	1.000
PY 2011	1.076	1.083	1.136	1.053	1.000
PY 2012	1.071	1.076	1.124	1.049	1.000
PY 2013	1.069	1.073	1.118	1.047	1.000
PY 2014	1.063	1.069	1.111	1.045	1.000

(2) Loss Development Factors - Fifth Report to Ultimate

Loss Development Category	Indemnity	Medical
Likely to Develop	1.078	0.977
Not Likely to Develop	1.016	0.996

(3) Severity Trend Factors

We apply three distinct trend factors.

Trend to PY 2014 is based on empirical USR data at 5th report.

Trend from PY 2014 to PY 2018 is based on severities from Section V-A, Exhibit 2.

Trend from PY 2018 to the Prospective Effective Period is based on the projected severity trends from Section V-A, Exhibit 1.

Trend Period		Indemnity	Lost Time Medical	Medical Only
From	To			
PY 2010	PY 2014	1.177	1.209	1.099
PY 2011	PY 2014	1.109	1.115	1.079
PY 2012	PY 2014	1.098	1.086	1.032
PY 2013	PY 2014	1.100	1.175	1.004
PY 2014	PY 2018	1.046	1.040	1.120
PY 2018	Prosp. Eff. Period	1.093	1.108	1.131

Notes:

(1): Section IV-A, Exhibit 1.

(2): Section IV-E, Exhibit 1, Pages 1 and 2.

(3): Section V-A, Exhibits 1 and 2.

XI 000010

MASSACHUSETTS WORKERS COMPENSATION AND EMPLOYERS LIABILITY INSURANCE MANUAL	RATES
<i>Proposed Effective July 1, 2022</i>	Page RA-5

MISCELLANEOUS VALUES

Basis of Premium applicable in accordance with the footnote instructions for Code 7370 - "Taxicab Co.":
 Employee operated vehicles..... \$132,200.00
 Leased or rented vehicles..... \$88,100.00

Basis of Premium for Sole Proprietors, Partners of Legal Partnerships, Members of Limited Liability Companies or Partners of Limited Liability Partnerships in accordance with Rule IX-B-3-a..... \$61,700.00

Payroll Limitations:

For Executive Officers - in accordance with Rule IX-A-3-a and b
 Minimum individual payroll for an executive officer per week..... \$270.00
 Maximum individual payroll for an executive officer per week..... \$1,350.00

For Spouses of Individuals, Co-Partners or Corporate Officers - in accordance with Rule IX-A-4
 Minimum individual payroll for a spouse per week..... \$270.00

For Elected or Appointed Officers of a City or Town - in accordance with Rule IX-A-5
 Minimum individual payroll for an elected or appointed officer per week..... \$270.00
 Maximum individual payroll for an elected or appointed officer per week..... \$1,350.00

Applicable with footnote instructions detailing the maximum average weekly wage per employee for the following three classification codes:
 Code 9186 - Amusement Device Operator, Carnival or Circus Traveling - All Employees & Drivers..... \$400.00
 Code 9179 - Athletic Sports Or Park: Contact Sports..... \$400.00
 Code 9178 - Athletic Sports Or Park: Non-Contact Sports..... \$400.00

Terrorism Insurance Program - Certified Loss:..... 0.03

BENEFITS DEDUCTIBLE COVERAGE PROGRAM

Medical and Indemnity Deductible Amount	Premium Reduction Percentage
\$500	2.0%
\$1,000	3.6%
\$2,000	5.9%
\$2,500	6.9%
\$5,000	11.2%

BENEFITS CLAIM AND AGGREGATE DEDUCTIBLE PROGRAM

Basis for the Aggregate Limit	Claim Deductible Amount	Aggregate Deductible Amount	Premium Reduction Percentage
\$ 0 to \$75,000	\$2,500	\$10,000	6.8%
\$75,001 to \$100,000	\$2,500	\$10,000	6.4%
\$100,001 to \$125,000	\$2,500	\$10,000	6.0%
\$125,001 to \$150,000	\$2,500	\$10,000	5.5%
\$150,001 to \$200,000	\$2,500	\$10,000	4.9%
over \$200,000	\$2,500	5% of Basis for the Aggregate Limit	4.5%

Expense Constant applicable in accordance with Basic Manual Rule VI-E-2:
 Policies which develop earned Standard Premium of less than \$200..... \$159.00
 Policies which develop earned Standard Premium of at least \$200
 and less than \$1,000..... \$250.00
 Policies which develop earned Standard Premium of \$1,000 or more..... \$338.00

The expense constant for private residence per capita classifications is \$64, up to a maximum of 4.

Notes:

- Benefit Deductible Coverage Program - Section XI-B, Exhibit 1.
- Benefit Claim and Aggregate Deductible Program - Section XI-C, Exhibit 1.
- Expense Constant - Section VI-D, Exhibit 1.
- Expense Constant for private residences - Section I-A, Exhibit 1.

XI 000011

RATES		MASSACHUSETTS WORKERS COMPENSATION AND EMPLOYERS LIABILITY INSURANCE MANUAL	
Page RA-6		Proposed Effective July 1, 2022	
Premium Discount Percentages —(See Basic Manual Rule VII). The following premium discounts are applicable to Standard Premiums. Note: Premium Discount is not applicable to Assigned Risk policies.			
		Type A Discount	Type B Discount
First	\$ 10,000.....	0.0%	0.0%
Next	190,000.....	9.1%	5.1%
Next	1,550,000.....	11.3%	6.5%
Over	1,750,000.....	12.3%	7.5%
United States Longshore and Harbor Workers' Compensation Coverage Percentage applicable only in connection with Rule XII-D-3-b "U.S. Longshore and Harbor Workers' Compensation Act" of the MA Manual.....			19.5%
(Multiply an eligible Non-F classification rate by a factor of 1.195)			
EXPERIENCE RATING ELIGIBILITY			
A risk is eligible for intrastate experience rating when the payrolls or other exposures developed in the last year or last two years of the experience period produced a subject premium of at least \$11,000. If more than two years, an average annual premium of at least \$5,500 is required. The Experience Rating Plan Manual should be referenced for the latest eligibility amounts by state.			

Notes:

USL&H factor - Section VIII-J, Exhibit 1.

XII 000001

RETROSPECTIVE RATING PLANS

The NCCI's Retrospective Rating Plan has been adopted for use in Massachusetts since 1936. Retrospective rating plans adjust the premium of a policy to reflect an insured's loss experience during the effective period of the policy. At the simplest level, an insured's retrospective premium is determined by the formula

$R = [B + (c \times L)] \times t$, where:

R = Retrospective Premium, subject to minimum and maximum amounts

B = Basic Premium

c = Loss Conversion Factor, generally reflecting loss adjustment expense

L = Actual Incurred Loss during the effective policy period

t = Tax Multiplier

The basic premium provides for the expenses of carriers. It also includes a net insurance charge, which is intended to compensate for the possibility that the otherwise-indicated retrospective premium will exceed the maximum permissible premium amount. Similarly, there is a savings resulting from the possibility that the otherwise-indicated retrospective premium will be less than the permissible minimum premium amount. The net insurance charge is the difference between the charge for the maximum and the savings from the minimum.

XII 000002

The calculations in this section appear in Sections XII-A, XII-B and XII-C and are similar to those used by the Commissioner in the 2003 Rate Decision. This year, consistent with the previous filings, the WCRIBMA includes miscellaneous taxes in the Tax Multiplier.

Section XII-A displays the calculation of the parameters needed for retrospective rating. Insureds electing to purchase a retrospectively rated policy may choose one of two options that differ as to their treatment of allocated loss adjustment expenses (“ALAE”). Option one, the traditional approach, is designed so that expected ALAE is primarily recovered through the application of the loss conversion factor to losses (Exhibit 3). Option two uses the sum of losses and ALAE, as opposed to only losses, in its calculation of retrospective premium and therefore, the loss conversion factor is smaller (Exhibit 4).

Section XII-B calculates the revised provision for the residual market subsidy.

Section XII-C displays the tables of expense ratios corresponding to the parameters calculated in Section XII-A.

Section XII-D and E presents the calculation of hazard group differentials.

Section XII-F presents an update of the Excess Loss Factors.

XII 000003

**RETROSPECTIVE RATING PLAN MANUAL
 STATE SPECIAL RATING VALUES**

**MASSACHUSETTS
 RR1**

Proposed Effective July 1, 2022

1. Hazard Group Differentials

A	B	C	D	E	F	G
1.87	1.54	1.32	1.11	0.93	0.72	0.59

2. Tax Multipliers

- a. State (non-F Classes) 1.033*
 - b. Federal Classes, or non-F classes 1.075*
 where rate is increased by the
 USL&HW Act Percentage
- * Includes 0.08% residual market subsidy provision
 and 0.52% insolvency fund assessment provision

3. Expected Loss Ratio

0.582

Expected Loss and Allocated Loss Adjustment Expense Ratio (ALAE Option)

0.632

4. Loss Conversion Factor

1.187

Loss Conversion Factor for Allocated Loss Adjustment Expense Option (ALAE Option)

1.094

5. Table of Expense Ratios Excluding Taxes and Including Profit

Type A Company

Massachusetts
 Effective July 1, 2022

Type B Company

Massachusetts
 Effective July 1, 2022

Table of Expense Ratios Excluding Allocated Loss Adjustment Expense and Taxes and Including Profit (ALAE Option)

Type A Company

Massachusetts
 Effective July 1, 2022

Type B Company

Massachusetts
 Effective July 1, 2022

6. 2013—Table of Expected Loss Ranges

April 1, 2014

7a.

Excess Loss Factors

(Applicable to New and Renewal Policies)

Per Accident Limitation	Hazard Groups						
	A	B	C	D	E	F	G
\$25,000	0.375	0.398	0.420	0.439	0.457	0.483	0.511
30,000	0.359	0.383	0.405	0.426	0.444	0.472	0.503
35,000	0.344	0.369	0.392	0.414	0.433	0.462	0.495
40,000	0.331	0.356	0.380	0.403	0.423	0.452	0.488
50,000	0.308	0.334	0.359	0.384	0.404	0.434	0.475
75,000	0.263	0.289	0.316	0.346	0.366	0.398	0.447
100,000	0.229	0.255	0.283	0.314	0.336	0.367	0.422
125,000	0.202	0.226	0.255	0.288	0.309	0.340	0.400
150,000	0.181	0.203	0.231	0.265	0.286	0.316	0.380
175,000	0.162	0.183	0.210	0.245	0.265	0.294	0.361
200,000	0.147	0.166	0.193	0.227	0.246	0.274	0.344
250,000	0.122	0.139	0.163	0.197	0.214	0.241	0.313
300,000	0.103	0.118	0.141	0.173	0.188	0.213	0.286
500,000	0.062	0.071	0.087	0.112	0.123	0.142	0.209
1,000,000	0.029	0.033	0.042	0.056	0.062	0.073	0.118
2,000,000	0.013	0.015	0.019	0.026	0.029	0.034	0.060
3,000,000	0.008	0.009	0.012	0.016	0.018	0.022	0.039
4,000,000	0.005	0.006	0.008	0.011	0.013	0.015	0.028
5,000,000	0.004	0.005	0.006	0.009	0.010	0.012	0.021

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**MASSACHUSETTS
 RR2**

**RETROSPECTIVE RATING PLAN MANUAL
 STATE SPECIAL RATING VALUES**

Proposed Effective July 1, 2022

**7b. ALAE Option Excess Loss and Allocated Loss Adjustment Expense Factors
 (Applicable to New and Renewal Policies)**

<u>Per Accident Limitation</u>	<u>Hazard Groups</u>						
	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>F</u>	<u>G</u>
\$25,000	0.415	0.439	0.462	0.482	0.501	0.530	0.559
30,000	0.397	0.423	0.447	0.468	0.488	0.518	0.550
35,000	0.382	0.408	0.433	0.456	0.477	0.507	0.542
40,000	0.368	0.395	0.421	0.445	0.466	0.497	0.535
50,000	0.344	0.371	0.398	0.425	0.446	0.479	0.521
75,000	0.295	0.324	0.353	0.384	0.406	0.440	0.492
100,000	0.259	0.287	0.317	0.351	0.374	0.408	0.466
125,000	0.230	0.257	0.288	0.323	0.347	0.380	0.443
150,000	0.206	0.232	0.262	0.299	0.322	0.355	0.422
175,000	0.187	0.210	0.240	0.277	0.300	0.332	0.403
200,000	0.170	0.191	0.221	0.258	0.280	0.311	0.385
250,000	0.142	0.161	0.189	0.226	0.245	0.275	0.352
300,000	0.121	0.138	0.163	0.199	0.217	0.245	0.324
500,000	0.073	0.084	0.102	0.131	0.144	0.165	0.241
1,000,000	0.034	0.040	0.050	0.066	0.073	0.086	0.138
2,000,000	0.015	0.018	0.023	0.031	0.035	0.041	0.071
3,000,000	0.009	0.011	0.014	0.019	0.022	0.026	0.046
4,000,000	0.007	0.008	0.010	0.014	0.015	0.018	0.033
5,000,000	0.005	0.006	0.007	0.010	0.012	0.014	0.026

8. Retrospective Development Factors

<u>With Loss Limit</u>				<u>Without Loss Limit</u>			
1st	2nd	3rd	4th & Subsequent	1st	2nd	3rd	4th & Subsequent
<u>Adj.</u>	<u>Adj.</u>	<u>Adj.</u>	<u>Adj.</u>	<u>Adj.</u>	<u>Adj.</u>	<u>Adj.</u>	<u>Adj.</u>
0.11	0.07	0.05	0.00	0.14	0.09	0.06	0.00

9. State Special Classifications by Hazard Group

All Massachusetts Hazard Group assignments can be found in Appendix G of the 2008 Edition of the Massachusetts Workers' Compensation & Employers Liability Insurance Manual.

XII 000005

Section XII - Retrospective Rating
Subsection A - Expenses
7/1/2022

Section XII - A
Exhibit 3

Expense Provisions Underlying the Proposed Retrospective Rating Plans

Total Expenses:

(1) Commission and Other Acquisition Expenses	12.7%
(2) Fixed Expenses	5.4%
(3) Premium Discount	5.5%
(4) Underwriting Profit Provision	4.1%
(5) Total Expenses Excluding Taxes and Assessments (= (1) + (2) + (3) + (4))	<u>27.7%</u>
(6) Current Premium Tax Rate	2.28%
(7) Miscellaneous Taxes	0.32%
(8) Retro Provision for the Residual Market Subsidy	0.08%
(9) Insolvency Fund Assessment	<u>0.52%</u>
(10) Tax Multiplier (= $1.0 / \{ 1.0 - [(6) + (7) + (8) + (9)] \}$)	1.033
(11) Expected Loss and LAE Ratio (adjusted for Residual Market Subsidy) (= $[1.0 / (10)] - (5)$)	69.1%
(12) Loss Adjustment Expense (as percentage of losses)	18.7%
(13) Loss Conversion Factor (= $1.0 + (12)$)	1.187
(14) Expected Loss without LAE (= $(11) / (13)$)	58.2%
(15) Expenses excluding Premium Taxes but including LAE (= $(5) + [(12) \times (14)]$)	38.6%

Notes:

- (1): Section VI-J, Exhibit 1, line (1).
- (2): Section VI-J, Exhibit 1, line (7), less the provision for miscellaneous taxes, see line (7) below.
- (3): Section VI-A, Exhibit 1, line (2).
- (4): Section VII-A, Exhibit 1, line (14).
- (6): Section VI-B, Exhibit 3, line (2).
- (7): Section VI-B, Exhibit 1, the average of the results of columns (13) x (15) / (17).
- (8): Section XII-B, Exhibit 1, line (3).
- (9): Section IX-K, Exhibit 5, page 1, line (9).
- (12): Section VI-J, Exhibit 1, line (9).

XII 000006

Section XII - Retrospective Rating
Subsection A - Expenses
7/1/2022

Section XII - A
Exhibit 4

Expense Provisions Underlying the ALAE Option of the Recommended Retrospective Rating Plans

(1) Expected Loss without Defense and Cost Containment Expense (as percentage of Standard Premium plus ARAP)	58.2%
(2) Selected Three Year Average Defense and Cost Containment Expense Ratio (as percentage of losses)	8.5%
(3) Expected Loss plus ALAE Ratio (= (1) x [1.0 + (2)])	63.2%
(4) Loss Adjustment Expense (as percentage of losses)	18.7%
(5) Loss Conversion Factor (= [1.0 + (4)] / [1.0 + (2)])	1.094
(6) Tax Multiplier	1.033
(7) Expenses excluding Premium Taxes but including LAE (as percentage of Standard Premium plus ARAP)	38.6%
(8) Expenses including all AO Expenses but excluding ALAE Expenses and Premium Taxes (= (7) - [(1) x (2)])	33.6%

Notes:

(1): Exhibit 3, line (14)

(2): Section VI-H, Exhibit 1, Page 1, line (3), DCC assumed a proxy for ALAE.

(4), (6), (7): Exhibit 3, lines (12), (10) and (15) respectively.

XII 000007

Section XII - Retrospective Rating
Subsection B - Residual Market Subsidy
7/1/2022

Section XII - B
Exhibit 1

Calculation of the Provision for the Residual Market Subsidy

(1) Voluntary Market Implied Rate Factor Equivalent	0.999
(2) Factor to Take into Account Basic Premium	0.800
(3) Retro Provision for the Residual Market Subsidy	0.08%

Notes:

(1): Section I-E, Exhibit 1, page 1.

(2): From the filing for the provision for the Residual Market Subsidy effective 1/1/89.

(3) = $[1.0 - (1)] \times (2)$

RETROSPECTIVE RATING PLAN MANUAL **MASSACHUSETTS**
STATE SPECIAL RATING VALUES **RR5**
Proposed Effective July 1, 2022

TABLE OF EXPENSE RATIOS—EXCLUDING TAXES AND INCLUDING PROFIT
TYPE A COMPANY—MASSACHUSETTS

Standard Premium		Expense Ratio	Standard Premium		Expense Ratio	Standard Premium		Expense Ratio
From	To		From	To		From	To	
0	10,057	0.386	18,130	18,510	0.346	102,519	116,020	0.306
10,058	10,173	0.385	18,511	18,907	0.345	116,021	133,617	0.305
10,174	10,292	0.384	18,908	19,322	0.344	133,618	157,508	0.304
10,293	10,414	0.383	19,323	19,755	0.343	157,509	191,801	0.303
10,415	10,538	0.382	19,756	20,208	0.342	191,802	206,522	0.302
10,539	10,666	0.381	20,209	20,683	0.341	206,523	215,167	0.301
10,667	10,797	0.380	20,684	21,180	0.340	215,168	224,567	0.300
10,798	10,931	0.379	21,181	21,702	0.339	224,568	234,826	0.299
10,932	11,068	0.378	21,703	22,250	0.338	234,827	246,067	0.298
11,069	11,209	0.377	22,251	22,826	0.337	246,068	258,438	0.297
11,210	11,353	0.376	22,827	23,433	0.336	258,439	272,119	0.296
11,354	11,501	0.375	23,434	24,074	0.335	272,120	287,330	0.295
11,502	11,654	0.374	24,075	24,750	0.334	287,331	304,342	0.294
11,655	11,810	0.373	24,751	25,466	0.333	304,343	323,494	0.293
11,811	11,970	0.372	25,467	26,224	0.332	323,495	345,220	0.292
11,971	12,135	0.371	26,225	27,028	0.331	345,221	370,074	0.291
12,136	12,305	0.370	27,029	27,884	0.330	370,075	398,783	0.290
12,306	12,479	0.369	27,885	28,795	0.329	398,784	432,322	0.289
12,480	12,658	0.368	28,796	29,768	0.328	432,323	472,021	0.288
12,659	12,843	0.367	29,769	30,809	0.327	472,022	519,747	0.287
12,844	13,033	0.366	30,810	31,926	0.326	519,748	578,211	0.286
13,034	13,229	0.365	31,927	33,126	0.325	578,212	651,494	0.285
13,230	13,430	0.364	33,127	34,421	0.324	651,495	746,048	0.284
13,431	13,638	0.363	34,422	35,820	0.323	746,049	872,709	0.283
13,639	13,853	0.362	35,821	37,339	0.322	872,710	1,051,173	0.282
13,854	14,074	0.361	37,340	38,991	0.321	1,051,174	1,321,389	0.281
14,075	14,302	0.360	38,992	40,797	0.320	1,321,390	1,756,575	0.280
14,303	14,538	0.359	40,798	42,778	0.319	1,756,576	1,908,387	0.279
14,539	14,782	0.358	42,779	44,962	0.318	1,908,388	2,088,923	0.278
14,783	15,035	0.357	44,963	47,380	0.317	2,088,924	2,307,187	0.277
15,036	15,296	0.356	47,381	50,073	0.316	2,307,188	2,576,382	0.276
15,297	15,566	0.355	50,074	53,091	0.315	2,576,383	2,916,693	0.275
15,567	15,846	0.354	53,092	56,495	0.314	2,916,694	3,360,589	0.274
15,847	16,136	0.353	56,496	60,367	0.313	3,360,590	3,963,854	0.273
16,137	16,437	0.352	60,368	64,808	0.312	3,963,855	4,831,092	0.272
16,438	16,750	0.351	64,809	69,954	0.311	4,831,093	6,184,086	0.271
16,751	17,075	0.350	69,955	75,988	0.310	6,184,087	8,589,719	0.270
17,076	17,412	0.349	75,989	83,162	0.309	8,589,720	14,058,552	0.269
17,413	17,763	0.348	83,163	91,831	0.308	14,058,553	38,693,808	0.268
17,764	18,129	0.347	91,832	102,518	0.307	38,693,809	OVER	0.267

Table based on the following discounts:

Standard Premium	Discount	
First	10,000	0.0%
Next	190,000	9.1%
Next	1,550,000	11.3%
Over	1,750,000	12.3%

Expected Loss Ratio

0.582

Tax Multiplier

1.033

MASSACHUSETTS **RETROSPECTIVE RATING PLAN MANUAL**
RR6 **STATE SPECIAL RATING VALUES**
Proposed Effective July 1, 2022

TABLE OF EXPENSE RATIOS—EXCLUDING TAXES AND INCLUDING PROFIT

TYPE B COMPANY—MASSACHUSETTS

Standard Premium		Expense Ratio	Standard Premium		Expense Ratio	Standard Premium		Expense Ratio
From	To		From	To		From	To	
0	- 10,102	0.386	19,852	- 20,683	0.361	238,706	- 257,919	0.336
10,103	- 10,313	0.385	20,684	- 21,587	0.360	257,920	- 280,497	0.335
10,314	- 10,533	0.384	21,588	- 22,574	0.359	280,498	- 307,407	0.334
10,534	- 10,763	0.383	22,575	- 23,655	0.358	307,408	- 340,028	0.333
10,764	- 11,003	0.382	23,656	- 24,846	0.357	340,029	- 380,394	0.332
11,004	- 11,254	0.381	24,847	- 26,163	0.356	380,395	- 431,636	0.331
11,255	- 11,516	0.380	26,164	- 27,627	0.355	431,637	- 496,832	0.330
11,517	- 11,791	0.379	27,628	- 29,264	0.354	498,833	- 590,808	0.329
11,792	- 12,080	0.378	29,265	- 31,108	0.353	590,809	- 724,368	0.328
12,081	- 12,383	0.377	31,109	- 33,200	0.352	724,369	- 935,954	0.327
12,384	- 12,701	0.376	33,201	- 35,593	0.351	935,955	- 1,322,149	0.326
12,702	- 13,037	0.375	35,594	- 38,359	0.350	1,322,150	- 1,814,219	0.325
13,038	- 13,390	0.374	38,360	- 41,590	0.349	1,814,220	- 1,993,772	0.324
13,391	- 13,764	0.373	41,591	- 45,416	0.348	1,993,773	- 2,212,770	0.323
13,765	- 14,158	0.372	45,417	- 50,017	0.347	2,212,771	- 2,485,815	0.322
14,159	- 14,576	0.371	50,018	- 55,656	0.346	2,485,816	- 2,835,729	0.321
14,577	- 15,020	0.370	55,657	- 62,727	0.345	2,835,730	- 3,300,293	0.320
15,021	- 15,491	0.369	62,728	- 71,856	0.344	3,300,294	- 3,946,894	0.319
15,492	- 15,993	0.368	71,857	- 84,096	0.343	3,946,895	- 4,908,598	0.318
15,994	- 16,528	0.367	84,097	- 101,361	0.342	4,908,599	- 6,489,942	0.317
16,529	- 17,101	0.366	101,362	- 127,548	0.341	6,489,943	- 9,574,419	0.316
17,102	- 17,714	0.365	127,549	- 171,978	0.340	9,574,420	- 18,246,383	0.315
17,715	- 18,373	0.364	171,979	- 207,751	0.339	18,246,384	- OVER	0.314
18,374	- 19,084	0.363	207,752	- 222,155	0.338			
19,085	- 19,851	0.362	222,156	- 238,705	0.337			

Table based on the following discounts:

Standard Premium	Discount
First	10,000 0.0%
Next	190,000 5.1%
Next	1,550,000 6.5%
Over	1,750,000 7.5%

Expected Loss Ratio

0.582

Tax Multiplier

1.033

RETROSPECTIVE RATING PLAN MANUAL **MASSACHUSETTS**
STATE SPECIAL RATING VALUES **RR7**
Proposed Effective July 1, 2022

**TABLE OF EXPENSE RATIOS—EXCLUDING ALLOCATED LOSS ADJUSTMENT EXPENSE
 AND TAXES AND INCLUDING PROFIT**

TYPE A COMPANY—MASSACHUSETTS

Standard Premium		Expense Ratio	Standard Premium		Expense Ratio	Standard Premium		Expense Ratio
From	To		From	To		From	To	
0	- 10,057	0.336	18,130	- 18,510	0.296	102,519	- 116,020	0.256
10,058	- 10,173	0.335	18,511	- 18,907	0.295	116,021	- 133,617	0.255
10,174	- 10,292	0.334	18,908	- 19,322	0.294	133,618	- 157,508	0.254
10,293	- 10,414	0.333	19,323	- 19,755	0.293	157,509	- 191,801	0.253
10,415	- 10,538	0.332	19,756	- 20,208	0.292	191,802	- 206,522	0.252
10,539	- 10,666	0.331	20,209	- 20,683	0.291	206,523	- 215,167	0.251
10,667	- 10,797	0.330	20,684	- 21,180	0.290	215,168	- 224,567	0.250
10,798	- 10,931	0.329	21,181	- 21,702	0.289	224,568	- 234,826	0.249
10,932	- 11,068	0.328	21,703	- 22,250	0.288	234,827	- 246,067	0.248
11,069	- 11,209	0.327	22,251	- 22,826	0.287	246,068	- 258,438	0.247
11,210	- 11,353	0.326	22,827	- 23,433	0.286	258,439	- 272,119	0.246
11,354	- 11,501	0.325	23,434	- 24,074	0.285	272,120	- 287,330	0.245
11,502	- 11,654	0.324	24,075	- 24,750	0.284	287,331	- 304,342	0.244
11,655	- 11,810	0.323	24,751	- 25,466	0.283	304,343	- 323,494	0.243
11,811	- 11,970	0.322	25,467	- 26,224	0.282	323,495	- 345,220	0.242
11,971	- 12,135	0.321	26,225	- 27,028	0.281	345,221	- 370,074	0.241
12,136	- 12,305	0.320	27,029	- 27,884	0.280	370,075	- 398,783	0.240
12,306	- 12,479	0.319	27,885	- 28,795	0.279	398,784	- 432,322	0.239
12,480	- 12,658	0.318	28,796	- 29,768	0.278	432,323	- 472,021	0.238
12,659	- 12,843	0.317	29,769	- 30,809	0.277	472,022	- 519,747	0.237
12,844	- 13,033	0.316	30,810	- 31,926	0.276	519,748	- 578,211	0.236
13,034	- 13,229	0.315	31,927	- 33,126	0.275	578,212	- 651,494	0.235
13,230	- 13,430	0.314	33,127	- 34,421	0.274	651,495	- 746,048	0.234
13,431	- 13,638	0.313	34,422	- 35,820	0.273	746,049	- 872,709	0.233
13,639	- 13,853	0.312	35,821	- 37,339	0.272	872,710	- 1,051,173	0.232
13,854	- 14,074	0.311	37,340	- 38,991	0.271	1,051,174	- 1,321,389	0.231
14,075	- 14,302	0.310	38,992	- 40,797	0.270	1,321,390	- 1,756,575	0.230
14,303	- 14,538	0.309	40,798	- 42,778	0.269	1,756,576	- 1,908,387	0.229
14,539	- 14,782	0.308	42,779	- 44,962	0.268	1,908,388	- 2,088,923	0.228
14,783	- 15,035	0.307	44,963	- 47,380	0.267	2,088,924	- 2,307,187	0.227
15,036	- 15,296	0.306	47,381	- 50,073	0.266	2,307,188	- 2,576,382	0.226
15,297	- 15,566	0.305	50,074	- 53,091	0.265	2,576,383	- 2,916,693	0.225
15,567	- 15,846	0.304	53,092	- 56,495	0.264	2,916,694	- 3,360,589	0.224
15,847	- 16,136	0.303	56,496	- 60,367	0.263	3,360,590	- 3,963,854	0.223
16,137	- 16,437	0.302	60,368	- 64,808	0.262	3,963,855	- 4,831,092	0.222
16,438	- 16,750	0.301	64,809	- 69,954	0.261	4,831,093	- 6,184,086	0.221
16,751	- 17,075	0.300	69,955	- 75,988	0.260	6,184,087	- 8,589,719	0.220
17,076	- 17,412	0.299	75,989	- 83,162	0.259	8,589,720	- 14,058,552	0.219
17,413	- 17,763	0.298	83,163	- 91,831	0.258	14,058,553	- 38,693,808	0.218
17,764	- 18,129	0.297	91,832	- 102,518	0.257	38,693,809	- OVER	0.217

Table based on the following discounts:

Standard Premium	Discount	
First	10,000	0.0%
Next	190,000	9.1%
Next	1,550,000	11.3%
Over	1,750,000	12.3%

Expected Loss and Allocated Loss Adjustment
Expense Ratio (ALAE Option)

0.632

Tax Multiplier

1.033

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MASSACHUSETTS	RETROSPECTIVE RATING PLAN MANUAL
RR8	STATE SPECIAL RATING VALUES
<i>Proposed Effective July 1, 2022</i>	

**TABLE OF EXPENSE RATIOS—EXCLUDING ALLOCATED LOSS ADJUSTMENT EXPENSE
 AND TAXES AND INCLUDING PROFIT**

TYPE B COMPANY—MASSACHUSETTS

Standard Premium		Expense Ratio	Standard Premium		Expense Ratio	Standard Premium		Expense Ratio
From	To		From	To		From	To	
0	- 10,102	0.336	19,852	- 20,683	0.314	238,706	- 257,919	0.286
10,103	- 10,313	0.335	20,684	- 21,587	0.310	257,920	- 280,497	0.285
10,314	- 10,533	0.334	21,588	- 22,574	0.309	280,498	- 307,407	0.284
10,534	- 10,763	0.333	22,575	- 23,655	0.308	307,408	- 340,028	0.283
10,764	- 11,003	0.332	23,656	- 24,846	0.307	340,029	- 380,394	0.282
11,004	- 11,254	0.331	24,847	- 26,163	0.306	380,395	- 431,636	0.281
11,255	- 11,516	0.330	26,164	- 27,627	0.305	431,637	- 498,832	0.280
11,517	- 11,791	0.329	27,628	- 29,264	0.304	498,833	- 590,808	0.279
11,792	- 12,080	0.328	29,265	- 31,108	0.303	590,809	- 724,368	0.278
12,081	- 12,383	0.327	31,109	- 33,200	0.302	724,369	- 935,954	0.277
12,384	- 12,701	0.326	33,201	- 35,593	0.301	935,955	- 1,322,149	0.276
12,702	- 13,037	0.325	35,594	- 38,359	0.300	1,322,150	- 1,814,219	0.275
13,038	- 13,390	0.324	38,360	- 41,590	0.299	1,814,220	- 1,993,772	0.274
13,391	- 13,764	0.323	41,591	- 45,416	0.298	1,993,773	- 2,212,770	0.273
13,765	- 14,158	0.322	45,417	- 50,017	0.297	2,212,771	- 2,485,815	0.272
14,159	- 14,576	0.321	50,018	- 55,656	0.296	2,485,816	- 2,835,729	0.271
14,577	- 15,020	0.320	55,657	- 62,727	0.295	2,835,730	- 3,300,293	0.270
15,021	- 15,491	0.319	62,728	- 71,856	0.294	3,300,294	- 3,946,894	0.269
15,492	- 15,993	0.318	71,857	- 84,096	0.293	3,946,895	- 4,908,598	0.268
15,994	- 16,528	0.317	84,097	- 101,361	0.292	4,908,599	- 6,489,942	0.267
16,529	- 17,101	0.316	101,362	- 127,548	0.291	6,489,943	- 9,574,419	0.266
17,102	- 17,714	0.315	127,549	- 171,978	0.290	9,574,420	- 18,246,383	0.265
17,715	- 18,373	0.314	171,979	- 207,751	0.289	18,246,384	- OVER	0.264
18,374	- 19,084	0.313	207,752	- 222,155	0.288			
19,085	- 19,851	0.312	222,156	- 238,705	0.287			

Table based on the following discounts:

Standard Premium	Discount
First 10,000	0.0%
Next 190,000	5.1%
Next 1,550,000	6.5%
Over 1,750,000	7.5%

Expected Loss and Allocated Loss Adjustment
 Expense Ratio (ALAE Option)

0.632

Tax Multiplier

1.033

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Section XII - Retrospective Rating
 Subsection D - NCCI's Item R-1413
 7/1/2022

Section XII - D
 Exhibit 1

NATIONAL COUNCIL ON COMPENSATION INSURANCE, INC.

R-1413
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ITEM R-1413—2017 UPDATE TO THE RETROSPECTIVE RATING PLAN PARAMETERS—HAZARD GROUP DIFFERENTIALS, EXCESS LOSS PURE PREMIUM FACTORS AND EXCESS LOSS AND ALLOCATED EXPENSE PURE PREMIUM FACTORS

**EXHIBIT 2-HG
 DEVELOPMENT OF MICHIGAN HAZARD GROUP DIFFERENTIALS
 FOR HAZARD GROUPS A TO G**

- Step 1.** Five years of historical experience is trended, on-leveled, and developed to estimate the severities for each hazard group. For a given hazard group, state severities are calculated by weighting the severities by claim group together using claim counts. The severities and claim counts have been adjusted using countrywide relativities from NCCI's excess loss factor methodology.
- Step 2.** The severities are weighted with the countrywide severities by hazard group using a credibility that is based on the number of claims in the state's experience period. For this purpose, 155,000 claims are regarded as fully credible and the square root rule is used to compute partial credibilities.
- Step 3.** Credibility weighted severities for each hazard group are produced. A countrywide average severity is calculated by taking the weighted average of the state severities using claim counts as weights.
- Step 4.** The differentials are calculated by dividing the countrywide severity by the individual state hazard group severities.

<u>Step 1</u>	<u>Hazard Group</u>	<u>Michigan</u>	<u>Countrywide</u>
Severities	A	27,381	37,282
	B	33,796	45,889
	C	36,053	51,116
	D	42,308	60,165
	E	49,253	71,093
	F	58,989	87,212
	G	65,830	100,004
 <u>Step 2</u>	Claim Count	=	78,533
	Credibility	=	$(78,533 / 155,000)^{0.5} = 0.712$
 <u>Step 3</u>	<u>Hazard Group</u>	<u>Michigan</u>	
Credibility Weighted Severities	A	30,223	= $(0.712)(27,381) + (0.288)(37,282)$
	B	37,223	
	C	40,394	
	D	47,453	
	E	55,547	
	F	67,122	
	G	75,679	
	Countrywide Overall:	59,736	
 <u>Step 4</u>	<u>Hazard Group</u>	<u>Differentials</u>	
Differentials	A	1.98	= $59,736 / 30,223$
	B	1.60	
	C	1.48	
	D	1.26	
	E	1.08	
	F	0.89	
	G	0.79	

Note: The underlying data source for the above calculations is NCCI's Unit Statistical data, excluding medical-only claims. The Unit Statistical data for each state is adjusted accordingly, as reflected in the data underlying the Excess Loss Factor (ELF) calculation.

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Section XII - Retrospective Rating
 Subsection E - State Hazard Group Relativities
 7/1/2022

Section XII - E
 Exhibit 1

Development of State Hazard Group Differentials

Step 1, Severities:

Hazard Group (1)	Massachusetts Severities (2)	Countrywide Severities (3)	Massachusetts Overall Severity Split Using CW Severity Relativities = Overall (2) x (3) / Overall (3) (4)
A	26,508	37,292	32,287
B	31,380	45,689	39,557
C	41,749	51,116	44,256
D	52,510	60,165	52,090
E	62,730	71,093	61,551
F	96,752	87,212	75,507
G	139,898	100,004	86,582
Overall	51,719	59,736	51,719

Step 2, Credibility:

(5) Massachusetts Claim Count =	45,419
(6) Requirement for Full Credibility =	155,000
(7) Massachusetts Credibility = = [(5) / (6)] ^{0.5}	0.54

Step 3, Credibility Weighted Severities:

Hazard Group (8)	Massachusetts Credibility Weighted Severities (9)
A	31,454
B	37,943
C	46,045
D	56,021
E	66,566
F	92,376
G	121,599

Step 4, Relativities:

Hazard Group (10)	Indicated Relativities = Overall (3) / (9) (11)	Indicated Relativities Based on MA Severity Split Using CW Relativities = Overall (3) / (4) (12)	Average of the Two Indicated Relativities = [(11) + (12)] / 2.0 (13)	Selected Hazard Group Differential (14)
A	1.90	1.85	1.87	1.87
B	1.57	1.51	1.54	1.54
C	1.30	1.35	1.32	1.32
D	1.07	1.15	1.11	1.11
E	0.90	0.97	0.93	0.93
F	0.65	0.79	0.72	0.72
G	0.49	0.69	0.59	0.59

Notes:

- (2), (5): Lost Time Claim Data for Policy Years 2018 at 1st report, 2017 at 2nd report, 2016 at 3rd report, adjusted for trend, law amendments and development factors.
- (3), (6): Section XII - D, Exhibit 1 (NCCI's Item R-1413, Page 26.)
- (9) = [(2) x (7)] + { (3) x [1.0 - (7)] }

EXCESS LOSS FACTORS

This Section proposes new Excess Loss Factors (ELFs) to be effective July 1, 2022. The proposed ELFs for the seven hazard groups¹ are shown in Exhibit 1, page 1. Exhibit 1, page 2 shows the Excess Loss and ALAE Expense Factors for the seven hazard groups.

The proposed ELFs in Exhibit 1, page 1 are the selected Excess Ratios in Exhibit 3, page 1 times 58.2%, the proposed Expected Loss Ratio (without LAE) underlying the Retrospective Rating Plans from Section XII-A, Exhibit 3. Generally, the excess loss factor for a limit is the product of an excess ratio and a permissible loss ratio.

Exhibit 3, page 3 shows the Excess Ratios based on the data used in the September 1, 2008 filing adjusted for trend. Exhibit 3, page 2 shows the Excess Ratios for higher limits estimated by curve fitting. Exhibit 4 displays the parameters of the mixed Pareto-Exponential distribution and a calculation of excess factors for different entry ratios.

Analysis from September 1, 2008 Filing

The Excess Ratios calculated in this filing use the same data set and fitted curves used since the September 1, 2008 filing, with an adjustment for trend. On-level adjusted Schedule Z data for composite policy years 00/01, 99/00, 98/97, 96/97, and 95/96 at fifth report are used, and the Pareto-Exponential parameters from the September 1, 2008 filing are also used. An adjustment factor for trend and benefit changes from September 1, 2008 to the July 1, 2022 proposed effective date is shown on Exhibit 5. Rather than applying the factor to the data itself, the trend and benefit adjustment is made by dividing

¹ The seven hazard groups are denoted using the letters A, B, C, D, E, F, and G. Hazard group A has the lowest expected claim severity while hazard group G has the highest expected claim severity.

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the limits, including the truncation point, by the trend and adjustment factor. Using the adjusted limits and truncation point and the on-level adjusted data from September 1, 2008, the excess ratios are estimated using the same methodology underlying the 2010, 2014, 2016, 2018 and 2020 filings.

Estimation of Excess Ratios

For each hazard group this fitted curve, scaled to the observed mean, is used in Exhibit 3 to estimate the excess ratios for the data truncated and shifted at \$150,000.

The excess ratios for accident limits less than or equal to \$150,000 are determined directly from the data, as has been done in past filings. For accident limits L above \$150,000, the excess ratio is estimated from the product of (Empirical Excess Ratio at \$150,000, $R(150,000)$) x (Excess Ratio estimated from mixed Pareto-Exponential curve for $L - \$150,000$). (See the Appendix). The former is shown in Exhibit 3, page 3, the latter in Exhibit 3, page 2, while the product is in Exhibit 3, page 1. For accident limits of \$150,000 or less, the estimated excess ratio is equal to the observed excess ratio.

This method provides a smooth transition from relying on data for lower accident limits to relying on a fitted curve to provide some of the information at higher accident limits. It is important to note that even at higher accident limits, an important contribution to the excess ratio is $R(150,000)$, which is calculated directly from the data.

Calculation of Excess Loss Factors with ALAE Expenses

The calculation of the Excess Loss Factors including ALAE expenses follows the same general methodology outlined above. The assumption is made that ALAE expenses are proportional to the underlying losses. Let x be the factor to load losses for

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Section XII – Retrospective Rating Plans
Subsection F – Excess Loss Factors
7/1/2022

Section XII-F
Page 3

ALAE expenses. For an accident limit of L, the excess ratio is computed at a limit of L / x. The Excess Loss Factors are derived by multiplying this excess ratio by 63.2%, the expected loss and defense and cost containment ratio (from Section XII-A, Exhibit 4), which is a proxy for the expected loss and ALAE ratio.

APPENDIX – EXCESS LOSS FACTORS

Excess Ratios, Truncated and Shifted Data

Let $f(x)$ be the size of loss probability density function. Then the excess ratio for limit L is given by:

$$\begin{aligned}
 R(x) &= \frac{\int_L^{\infty} (x - L) f(x) dx}{\int_0^{\infty} x f(x) dx} \\
 &= \frac{\text{average dollars of loss excess of } L}{\text{average size of loss}} \\
 &= \frac{\text{total dollars of loss excess of } L}{\text{total dollars of loss}}
 \end{aligned}$$

Assume we have a truncation point of T. Assume we look at the size of loss distribution for the data truncated and shifted at T. So for a loss $x > T$, we instead look at $x - T$. Then the excess ratio for the truncated and shifted data for ground up limit $L > T$ can be written as

$$\hat{R}(L - T)$$

Assume we were computing the (observed) excess ratio for a \$500,000 accident limit, for hazard group 3 data

$$R(\$500,000) = \frac{\text{HG3 Losses Excess of } \$500,000}{\text{Total HG3 Losses}}$$

We can also express this in terms of the data truncated and shifted at \$150,000 as follows:

$$R(\$500,000) = \frac{\text{HG3 Losses Excess of } \$500,000}{\text{HG3 Losses Excess of } \$150,000} \times \frac{\text{HG3 Losses Excess of } \$150,000}{\text{Total HG3 Losses}}$$

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The second term is the excess ratio at \$150,000, $R(\$150,000)$, while the first term is $\hat{R}(\$350,000)$ = excess ratio at \$350,000 for the data truncated and shifted at \$150,000.

Thus

$$R(\$500,000) = \hat{R}(\$350,000) \times R(\$150,000).$$

In general, for limits $L > \$150,000$

$$R(L) = \hat{R}(L - \$150,000) \times R(\$150,000).$$

In the methodology we used, $\hat{R}(L - \$150,000)$ is estimated via a curve fit to the data truncated and shifted at \$150,000, while $R(\$150,000)$ is estimated from the data.

Excess Ratios, Mixed Distributions

Let a (mixed) distribution be a weighted average of two other distributions:

$$f(x) = pg(x) + (1-p)h(x).$$

Then the mean is a weighted average of the two means:

$$\begin{aligned} m_f &= \int_0^{\infty} x f(x) dx = \int_0^{\infty} x \{pg(x) + (1-p)h(x)\} dx \\ &= p \int_0^{\infty} xg(x) dx + (1-p) \int_0^{\infty} xh(x) dx \\ &= pm_g + (1-p)m_h. \end{aligned}$$

The excess ratio for limit L is given by:

$$\begin{aligned} R(L) &= \frac{\int_L^{\infty} (x-L)f(x) dx}{\int_0^{\infty} x f(x) dx} \\ &= \frac{p \int_L^{\infty} (x-L)g(x) dx + (1-p) \int_L^{\infty} (x-L)h(x) dx}{pm_g + (1-p)m_h} \end{aligned}$$

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$$= \frac{pm_g R_g(L) + (1-p)m_h R_h(L)}{pm_g + (1-p)m_h}$$

So the excess ratio for a mixed distribution is a weighted average of the excess ratios for the individual distributions, with weights equal to the product of the mean of each distribution times the weight in the mixture of each distribution.

For example, for the mixed Pareto-Exponential distribution with parameters:

$p = 0.7344$, $s = 2.3285$, $b = 1.4950$, $\theta = 0.6270$ (weight to Pareto, Pareto Shape, Pareto Scale, Exponential scale), at an entry ratio of 2, the excess ratio is computed as follows:

$$\text{Excess Ratio for Pareto} = \left(1 + \frac{x}{b}\right)^{1-s} = \left(1 + \frac{2}{1.4950}\right)^{1-2.3285} = 0.3236$$

$$\text{Excess Ratio for Exponential} = e^{-x/\theta} = e^{-2/0.6270} = 0.0412$$

$$\text{Mean for Pareto} = \frac{b}{s-1} = \frac{1.4950}{2.3285-1} = 1.1253$$

$$\text{Mean for Exponential} = \theta = 0.6270$$

Excess Ratio for Pareto-Exponential distribution at entry ratio 2

$$= \frac{(0.7344)(1.1253)(0.3236) + (1-0.7344)(0.6270)(0.0412)}{(0.7344)(1.1253) + (1-0.7344)(0.6270)} = 0.2763$$

This matches the value shown on Exhibit 4.

PARETO DISTRIBUTION

$$F(x;s,b) = 1 - \left(1 + \frac{x}{b}\right)^{-s}$$

$$f(x;s,b) = \frac{s}{b} \left(1 + \frac{x}{b}\right)^{-(s+1)}$$

$$E(X^y) = \frac{b^y \Gamma(y+1) \Gamma(s-y)}{\Gamma(s)}, \quad -1 < y < s$$

If y is an integer N ,

$$E(X^N) = \frac{b^N N!}{\prod_{i=1}^N (s-i)}, \quad N < s$$

$$\text{Mean} = \frac{b}{s-1}$$

$$\text{Variance} = \frac{b^2 s}{(s-1)^2 (s-2)}$$

$$\text{Coefficient of Variation} = \sqrt{\frac{s}{s-2}}, \quad s > 2$$

$$\text{Skewness} = \frac{2(s+1)}{s-3} \sqrt{\frac{s-2}{s}}, \quad s > 3$$

$$\text{Excess Ratio} = R(x) = \left(1 + \frac{x}{b}\right)^{1-s}$$

$$\text{Mean Residual Life} = e(x) = \frac{b+x}{s-1}$$

Note: s is the shape parameter, b is the scale parameter.

EXPONENTIAL DISTRIBUTION

$$F(x; \theta) = 1 - e^{-x/\theta}$$

$$f(x; \theta) = \frac{1}{\theta} e^{-x/\theta}$$

$$E(X^y) = \theta^y \Gamma(1 + y), \quad y > -1$$

If y is an integer N ,

$$E(X^N) = \theta^N N!, \quad N > -1$$

$$\text{Mean} = \theta$$

$$\text{Variance} = \theta^2$$

$$\text{Coefficient of Variation} = 1$$

$$\text{Skewness} = 2$$

$$\text{Excess ratio} = R(x) = e^{-x/\theta}$$

$$\text{Mean Residual Life} = e(x) = \theta$$

Note: θ is the scale parameter.

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Section XII - Retrospective Rating
Subsection F - Excess Loss Factors
7/1/2022

Section XII - F
Exhibit 1
Page 1

Excess Loss Factors Proposed to be Effective 07/01/2022

Accident Limit	Hazard Group						
	A	B	C	D	E	F	G
\$25,000	0.375	0.398	0.420	0.439	0.457	0.483	0.511
\$30,000	0.359	0.383	0.405	0.426	0.444	0.472	0.503
\$35,000	0.344	0.369	0.392	0.414	0.433	0.462	0.495
\$40,000	0.331	0.356	0.380	0.403	0.423	0.452	0.488
\$50,000	0.308	0.334	0.359	0.384	0.404	0.434	0.475
\$75,000	0.263	0.289	0.316	0.346	0.366	0.398	0.447
\$100,000	0.229	0.255	0.283	0.314	0.336	0.367	0.422
\$125,000	0.202	0.226	0.255	0.288	0.309	0.340	0.400
\$150,000	0.181	0.203	0.231	0.265	0.286	0.316	0.380
\$175,000	0.162	0.183	0.210	0.245	0.265	0.294	0.361
\$200,000	0.147	0.166	0.193	0.227	0.246	0.274	0.344
\$250,000	0.122	0.139	0.163	0.197	0.214	0.241	0.313
\$300,000	0.103	0.118	0.141	0.173	0.188	0.213	0.286
\$500,000	0.062	0.071	0.087	0.112	0.123	0.142	0.209
\$1,000,000	0.029	0.033	0.042	0.056	0.062	0.073	0.118
\$2,000,000	0.013	0.015	0.019	0.026	0.029	0.034	0.060
\$3,000,000	0.008	0.009	0.012	0.016	0.018	0.022	0.039
\$4,000,000	0.005	0.006	0.008	0.011	0.013	0.015	0.028
\$5,000,000	0.004	0.005	0.006	0.009	0.010	0.012	0.021

Notes:

Exhibit 3, page 1 times the Expected Loss Ratio without LAE of 58.2% from Section XII-A, Exhibit 3.

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Section XII - Retrospective Rating
Subsection F - Excess Loss Factors
7/1/2022

Section XII - F
Exhibit 1
Page 2

Excess Loss and ALAE Factors Proposed to be Effective 07/01/2022

Accident Limit	Hazard Group						
	A	B	C	D	E	F	G
\$25,000	0.415	0.439	0.462	0.482	0.501	0.530	0.559
\$30,000	0.397	0.423	0.447	0.468	0.488	0.518	0.550
\$35,000	0.382	0.408	0.433	0.456	0.477	0.507	0.542
\$40,000	0.368	0.395	0.421	0.445	0.466	0.497	0.535
\$50,000	0.344	0.371	0.398	0.425	0.446	0.479	0.521
\$75,000	0.295	0.324	0.353	0.384	0.406	0.440	0.492
\$100,000	0.259	0.287	0.317	0.351	0.374	0.408	0.466
\$125,000	0.230	0.257	0.288	0.323	0.347	0.380	0.443
\$150,000	0.206	0.232	0.262	0.299	0.322	0.355	0.422
\$175,000	0.187	0.210	0.240	0.277	0.300	0.332	0.403
\$200,000	0.170	0.191	0.221	0.258	0.280	0.311	0.385
\$250,000	0.142	0.161	0.189	0.226	0.245	0.275	0.352
\$300,000	0.121	0.138	0.163	0.199	0.217	0.245	0.324
\$500,000	0.073	0.084	0.102	0.131	0.144	0.165	0.241
\$1,000,000	0.034	0.040	0.050	0.066	0.073	0.086	0.138
\$2,000,000	0.015	0.018	0.023	0.031	0.035	0.041	0.071
\$3,000,000	0.009	0.011	0.014	0.019	0.022	0.026	0.046
\$4,000,000	0.007	0.008	0.010	0.014	0.015	0.018	0.033
\$5,000,000	0.005	0.006	0.007	0.010	0.012	0.014	0.026

Excess Loss Factors Effective 9/1/2008

Accident Limit	Hazard Group						
	A	B	C	D	E	F	G
\$25,000	0.382	0.409	0.436	0.460	0.482	0.514	0.552
\$30,000	0.362	0.390	0.417	0.444	0.466	0.499	0.541
\$35,000	0.344	0.373	0.401	0.429	0.451	0.485	0.531
\$40,000	0.328	0.357	0.386	0.415	0.438	0.472	0.521
\$50,000	0.299	0.329	0.359	0.391	0.414	0.449	0.503
\$75,000	0.246	0.275	0.306	0.342	0.366	0.401	0.464
\$100,000	0.208	0.233	0.265	0.303	0.326	0.360	0.430
\$125,000	0.179	0.201	0.232	0.271	0.292	0.325	0.400
\$150,000	0.156	0.176	0.205	0.244	0.264	0.294	0.374
\$175,000	0.137	0.155	0.183	0.221	0.239	0.266	0.350
\$200,000	0.122	0.138	0.164	0.201	0.217	0.243	0.329
\$250,000	0.098	0.112	0.135	0.169	0.183	0.205	0.291
\$300,000	0.081	0.092	0.113	0.144	0.156	0.176	0.260
\$500,000	0.046	0.053	0.066	0.088	0.095	0.108	0.177
\$1,000,000	0.020	0.024	0.030	0.042	0.045	0.051	0.093
\$2,000,000	0.009	0.010	0.013	0.019	0.020	0.023	0.045
\$3,000,000	0.005	0.006	0.008	0.011	0.012	0.014	0.028
\$4,000,000	0.004	0.004	0.006	0.008	0.009	0.010	0.020
\$5,000,000	0.003	0.003	0.004	0.006	0.006	0.007	0.015

Note:
 9/1/2008 Stipulation. Section XII-F, Exhibit 1, Page 1.

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Section XII - Retrospective Rating
 Subsection F - Excess Loss Factors
 7/1/2022

Section XII - F
 Exhibit 3
 Page 1

Estimated Excess Ratios Based on Adjusted Data and Curves Fit to Data Truncated and Shifted at \$150,000

Accident Limit	Hazard Group						
	A	B	C	D	E	F	G
\$25,000	0.644	0.683	0.721	0.753	0.784	0.830	0.878
\$30,000	0.616	0.657	0.696	0.731	0.763	0.810	0.864
\$35,000	0.591	0.633	0.673	0.711	0.743	0.792	0.851
\$40,000	0.569	0.611	0.653	0.692	0.726	0.776	0.838
\$50,000	0.529	0.573	0.616	0.660	0.694	0.746	0.816
\$75,000	0.451	0.496	0.543	0.593	0.629	0.683	0.767
\$100,000	0.393	0.437	0.485	0.540	0.577	0.630	0.725
\$125,000	0.347	0.389	0.437	0.495	0.531	0.584	0.687
\$150,000	0.310	0.348	0.397	0.455	0.491	0.542	0.652
\$175,000	0.279	0.314	0.361	0.420	0.454	0.505	0.620
\$200,000	0.252	0.285	0.330	0.390	0.422	0.471	0.590
\$250,000	0.209	0.238	0.280	0.338	0.368	0.413	0.537
\$300,000	0.178	0.203	0.241	0.296	0.323	0.366	0.492
\$500,000	0.106	0.122	0.149	0.192	0.212	0.244	0.359
\$1,000,000	0.049	0.057	0.072	0.096	0.107	0.125	0.203
\$2,000,000	0.022	0.026	0.033	0.045	0.050	0.059	0.103
\$3,000,000	0.013	0.016	0.020	0.028	0.031	0.037	0.066
\$4,000,000	0.009	0.011	0.014	0.020	0.022	0.026	0.048
\$5,000,000	0.007	0.008	0.011	0.015	0.017	0.020	0.037

Note:

For Accident Limit $L \leq \$150,000$ excess ratios are from Page 3. For Accident Limit $L > \$150,000$ excess ratios are from Page 2 times the estimated excess ratio at $L = \$150,000$ (See Appendix).

Fitted Excess Ratios Based on Losses Truncated and Shifted to \$150,000

Accident Limit	Hazard Group													
	A		B		C		D		E		F		G	
	Entry Ratio	Excess Ratio	Entry Ratio	Excess Ratio	Entry Ratio	Excess Ratio	Entry Ratio	Excess Ratio	Entry Ratio	Excess Ratio	Entry Ratio	Excess Ratio	Entry Ratio	Excess Ratio
\$175,000	0.109	0.899	0.106	0.902	0.095	0.911	0.081	0.924	0.078	0.926	0.073	0.931	0.051	0.951
\$200,000	0.218	0.813	0.211	0.818	0.190	0.834	0.161	0.856	0.156	0.860	0.146	0.868	0.101	0.906
\$250,000	0.436	0.676	0.422	0.684	0.381	0.707	0.322	0.742	0.312	0.749	0.292	0.762	0.203	0.825
\$300,000	0.654	0.573	0.633	0.582	0.571	0.609	0.484	0.651	0.468	0.659	0.438	0.675	0.304	0.754
\$500,000	1.526	0.342	1.478	0.350	1.333	0.377	1.128	0.422	1.092	0.431	1.022	0.449	0.709	0.551
\$1,000,000	3.707	0.159	3.590	0.164	3.237	0.181	2.740	0.211	2.652	0.217	2.482	0.230	1.721	0.312
\$2,000,000	8.068	0.071	7.812	0.073	7.044	0.082	5.965	0.098	5.771	0.102	5.401	0.109	3.745	0.158
\$3,000,000	12.430	0.043	12.035	0.045	10.852	0.050	9.189	0.061	8.891	0.063	8.321	0.068	5.770	0.102
\$4,000,000	16.791	0.030	16.258	0.031	14.659	0.035	12.413	0.043	12.011	0.045	11.241	0.048	7.795	0.074
\$5,000,000	21.152	0.023	20.481	0.023	18.467	0.027	15.637	0.033	15.130	0.034	14.160	0.037	9.819	0.057

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Notes:

Entry Ratio = ([Limit] - [\$150,000 Truncation Point]) / [Average Size of Data Truncated and Shifted to \$150,000]

For the seven Hazard Groups, the detrended average sizes are \$160,493 for HGA, \$165,751 for HGB, \$183,830 for HGC, \$217,104 for HGD, \$224,369 for HGE, \$239,740 for HGF and \$345,729 for HGG.

Excess Ratio is computed for a Mixed Pareto - Exponential distribution with parameters: 0.7344, 2.3285, 1.4950, 0.6270 (weight to Pareto, Pareto Shape, Pareto Scale, Exponential Scale).

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Section XII - Retrospective Rating
 Subsection F - Excess Loss Factors
 7/1/2022

Section XII - F
 Exhibit 3
 Page 3

Excess Ratios Based on Adjusted Data

Accident Limit	Hazard Group						
	A	B	C	D	E	F	G
\$25,000	0.644	0.683	0.721	0.753	0.784	0.830	0.878
\$30,000	0.616	0.657	0.696	0.731	0.763	0.810	0.864
\$35,000	0.591	0.633	0.673	0.711	0.743	0.792	0.851
\$40,000	0.569	0.611	0.653	0.692	0.726	0.776	0.838
\$50,000	0.529	0.573	0.616	0.660	0.694	0.746	0.816
\$75,000	0.451	0.496	0.543	0.593	0.629	0.683	0.767
\$100,000	0.393	0.437	0.485	0.540	0.577	0.630	0.725
\$125,000	0.347	0.389	0.437	0.495	0.531	0.584	0.687
\$150,000	0.310	0.348	0.397	0.455	0.491	0.542	0.652
\$175,000	0.279	0.314	0.361	0.421	0.455	0.505	0.620
\$200,000	0.253	0.285	0.331	0.391	0.422	0.470	0.591
\$250,000	0.211	0.239	0.282	0.341	0.367	0.410	0.540
\$300,000	0.179	0.205	0.244	0.302	0.321	0.360	0.496
\$500,000	0.108	0.125	0.155	0.205	0.204	0.228	0.373
\$1,000,000	0.051	0.053	0.082	0.128	0.100	0.110	0.240
\$2,000,000	0.019	0.022	0.045	0.089	0.045	0.052	0.138
\$3,000,000	0.007	0.015	0.034	0.078	0.030	0.031	0.085
\$4,000,000	0.002	0.013	0.028	0.074	0.024	0.021	0.060
\$5,000,000	0.000	0.012	0.025	0.069	0.021	0.015	0.041

Notes:

Unit Statistical Plan Data for Composite Policy Years 00/01, 99/00, 98/99, 97/98, 96/97, 95/96 at fifth report, adjusted for trend, law amendments and development factors using factors from Exhibit 5.

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Section XII - Retrospective Rating
 Subsection F - Excess Loss Factors
 7/1/2022

Section XII - F
 Exhibit 4

Mixed Pareto-Exponential Distribution

Parameters:

Pareto shape = s	2.3285
Pareto scale = b	1.4950
Exponential scale = θ	0.6270
Weight to Pareto = p	0.7344
Mean =	1.0000
Variance =	5.5243
Coefficient of Variation =	2.3504
Skewness =	18.0452
Pareto Mean = $b / (s - 1.0)$	1.1253
Exponential Mean = θ	0.6270

Entry Ratio	Excess Ratio	Entry Ratio	Excess Ratio
0.1	0.9067	11	0.0496
0.2	0.8263	12	0.0448
0.3	0.7567	13	0.0407
0.4	0.6960	14	0.0372
0.5	0.6428	15	0.0343
0.6	0.5960	20	0.0241
0.7	0.5546	25	0.0183
0.8	0.5178	30	0.0145
0.9	0.4849	35	0.0119
1.0	0.4555	40	0.0101
1.25	0.3941	45	0.0087
1.5	0.3460	50	0.0076
1.75	0.3075	55	0.0067
2.0	0.2763	60	0.0060
2.50	0.2286	65	0.0054
3.0	0.1942	70	0.0049
3.5	0.1682	75	0.0045
4.0	0.1479	80	0.0041
4.5	0.1316	85	0.0038
5.0	0.1183	90	0.0035
6.0	0.0978	95	0.0033
7.0	0.0828	100	0.0031
8.0	0.0714		
9.0	0.0625		
10.0	0.0554		

Notes:
 See the Appendix for a sample calculation of an excess ratio.

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Section XII - Retrospective Rating
Subsection F - Excess Loss Factors
7/1/2022

Section XII - F
Exhibit 5

Total Severity Trend & Benefit Change Adjustment

	Indemnity	Lost Time Medical	Medical Only	Total
(1) PY 9/1/2008 Average Severity	26,182	10,183	794	
(2) PY 2018 Average Severity	31,748	12,237	950	
(3) Annual Severity Trend - From PY 2018 to Prospective Effective Period	2.0%	2.3%	2.8%	
(4) Trend Factor from PY 9/1/2008 to Prospective Effective Period = $[(2)/(1)] \times [1.000 + (3)]^{4.5}$	1.326	1.332	1.353	
(5) Injury Type Weight at Ultimate	67.06%	28.99%	3.95%	
(6) Total Severity Trend Factor from PY 9/1/2008 to Prospective Effective Period = (4) Weighted by (5)				1.329
(7) Total Benefit Level Change Factor from PY 9/1/2008 to Prospective Effective Period				1.075
(8) Combined Trend and Benefit Factor from PY 9/1/2008 to Prospective Effective Period = (6) x (7)				1.429

Notes:

(1),(2) : From Section V-A, Exhibit 2, Pages 1, 3, and 5. PY9/1/2008 is a weighted average of PY2008 and PY2009. = $(1/3) \times \text{PY2008} + (2/3) \times \text{PY2009}$

(3): From Section V-A, Exhibit 1.

(5): From Section IV-E, Exhibit 2, Pages 1 and 2.

(7): From Section IV-A, Exhibit 1.

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Data

The WCRIBMA systematically reviews the Aggregate Financial and Unit Statistical Report (“USR”) data submitted to the WCRIBMA by its members. Aggregate Financial data, the basis for the overall rate indication, is collected electronically. The application used to collect Aggregate Financial data, Massachusetts Financial Data Reporting Application (MAFDRA), contains both data validations and data edits. The data validations check individual fields against valid codes and values.

Aggregate Financial data is also subject to rigorous review and editing that compares the data reported for a given field to other data elements reported to the WCRIBMA. Edits are characterized as either basic or actuarial. Basic edits identify circumstances where something is obviously wrong. For example, if losses are reported for a policy year, a basic edit failure would occur if no premiums were reported for that same policy year. Actuarial edits identify circumstances where data appear to be anomalous but may in fact be correct. Data flagged by actuarial edits require either an explanation or a correction from the reporting entity.

Aggregate Financial data used in ratemaking are carefully reviewed by the WCRIBMA’s actuarial staff for purposes of ratemaking. Actuarial staff review by individual data reporter loss development factors, premium development factors, and expense ratios to identify anomalies that would have a material impact on the overall rate indication. Data reporters that have provided data deemed to be outliers are asked to explain the anomaly or provide a correction if needed. Actuarial staff also provides

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diagnostic reports to larger writers of workers' compensation in Massachusetts. Carriers are asked to review these reports and explain to the WCRIBMA whether or not the diagnostic reports align with their expectations.

USR data, the basis for the WCRIBMA's trend estimates and class rates, are collected electronically using a software system called Spectrum. Like Aggregate Financial data, USR data are subject to a multitude of validations and edits. Additionally, the WCRIBMA's actuarial staff extracts the USR data from Spectrum and maps the data into data marts used by the actuarial staff. As part of the process to load the data into the actuarial data marts, the data are again subject to a number of validations. Records that fail validation are flagged for explanation or correction by the carrier who submitted the data.

In 2005 the Commissioner ordered the WCRIBMA to develop a number of reconciliations that compare Aggregate Financial data to USR data. In 2006 the Commissioner approved changes to the Massachusetts Workers' Compensation Statistical Plan that call for the WCRIBMA to annually conduct a series of mandated reconciliations and compare the results of the reconciliation process to tolerances defined within the Massachusetts Workers' Compensation Statistical Plan. Carriers whose data fell outside of tolerance are required to provide an explanation for why the data are correct as reported or they are required to submit corrections. Carriers who do not comply are subject to potential further review by an independent audit firm if the Commissioner deems it to be necessary.

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In preparation for this rate filing, WCRIBMA actuarial staff assessed the available data to determine what it deemed suitable for ratemaking. For example, if a carrier has anomalous data or negative expenses due to accounting or other allocation processes, there will be a consideration of that data's suitability for ratemaking for the Industry as a whole. As a consequence, the Aggregate Financial data for several carriers were excluded from certain sections of the filing or excluded from use in the rate filing entirely as explained below.

As has been done since the 2003 filing, this filing excludes Aggregate Financial losses associated with the catastrophic events of September 11, 2001. Additionally, in this filing, loss data from Travelers Group for a single large loss with a Calendar Year change in excess of \$10 million, has been excluded from the Aggregate Financial Data. Had the WCRIBMA not excluded this one claim of the Travelers Group from Aggregate Financial Data, the rate indication would have been slightly lower.

Aggregate Financial data from Praetorian Insurance Company were excluded from the estimation of loss development factors and premium development factors. For purposes of Aggregate Financial data reporting, Redland Insurance Company and Praetorian Insurance Company began submitting consolidated data beginning with the 2010 year end valuation. Prior to that, Redland Insurance Company had been exempt from filing Aggregate Financial data (consistent with the terms outlined in the Massachusetts Worker's Compensation Statistical Plan) for one of the valuation dates contained in the development triangles. Therefore, the consolidated data for one of the valuation dates used in the development triangle are necessarily understated and the use

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of the data from these companies in the loss development calculations would be inappropriate. The exclusion of data from Praetorian Insurance Company from the estimation of loss development factors and premium development factors has no material impact on the rate indication.

Aggregate Financial data from Travelers Group was excluded from the estimation of expenses. Adjusting and other expenses reported by Travelers are considered outliers. For calendar year 2018, Travelers Group reported negative values for adjusting and other expenses on their Massachusetts Calendar Year Expense Data Call, Call #6 (Expense Call). Had the WCRIBMA not excluded the data of the Travelers Group from expenses, the rate indication would have been lower.

Aggregate Financial data reported by AIG was not used in the expense section of this filing. For calendar year 2017, AIG reported negative adjusting and other expenses on their Expense Call. Had the WCRIBMA not excluded the data of AIG Group from expenses, the rate indication would have been slightly lower.

Aggregate Financial data from Zurich Insurance Group was excluded from the estimation of premium development factors because the data for certain valuation points appeared anomalous. The exclusion of data from Zurich Insurance Group from the estimation of premium development factors has no material impact on the rate indication.

Aggregate Financial data from Zurich Insurance Group was not used in the expense section of this filing. For calendar years 2017, 2018, and 2019, Zurich Insurance Group's reported negative values for general expenses on their Expense Call. Had the

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WCRIBMA not excluded the data of Zurich Insurance Group from expenses, the rate indication would have been lower.

Aggregate Financial data from Chubb Limited Group was not used in the expense section of this filing. For calendar year 2019, Chubb Limited Group's reported adjusting and other expenses were an outlier compared to the balance of the industry. Had the WCRIBMA not excluded the data of Chubb Limited Group from expenses, the rate indication would have been higher.

Aggregate Financial data from Atlantic Charter Insurance Group was not used in the expense section of this filing. For calendar year 2018, Atlantic Charter Insurance Group's reported adjusting and other expenses were an outlier compared to the balance of the industry. Had the WCRIBMA not excluded the data of Atlantic Charter Insurance Group from expenses, the rate indication would have been higher.