THE WORKERS' COMPENSATION
RATING AND INSPECTION BUREAU

September 5, 2003

CIRCULAR LETTER NO. 1929

To All Members and Subscribers of the Bureau:

GENERAL REVISION OF RATES

EFFECTIVE SEPTEMBER 1, 2003
APPLICABLE TO NEW AND RENEWAL BUSINESS

The Commissioner of Insurance has ordered a general revision of workers' compensation rates, effective 12:01 A.M., September 1, 2003, applicable to new and renewal policies. This includes:

1. **RATE LEVEL DECREASE OF -4.0%**

The overall average decrease of -4.0% in the existing workers' compensation average rates shall vary by class. The new rates and minimum premiums are expected to be distributed in the next 10-14 days.

2. **EXPERIENCE RATING PLAN CHANGES**

The Experience Rating Plan Expected Loss Rates and D-Ratios will be revised and distributed. The Weighting Values and Ballast Values have been revised to be consistent with the NCCI's Graduated Experience Rating Table. The State Per Claim Accident Limitation and the State Multiple Claim Accident Limitation remain unchanged.

3. **EXPENSE CONSTANTS**

The Expense Constants have been revised as shown in Exhibit 1. The Expense Constant for most risks will increase from $244 to $264.

4. **RETROSPECTIVE RATE PLAN CHANGES**

There will be a new Table of Expected Loss Ranges and new State and Hazard Group Relativities. The Table of Expected Loss Ranges is updated to the NCCI 2001 Table (Item R-1371). The new State and Hazard Group Relativities are: Hazard Group 1: 1.70; Hazard Group 2: 1.58; Hazard Group 3: .98; Hazard Group 4: .62.

5. **NO CHANGES IN THE FOLLOWING:**

A. Loss Constants

B. Table of Specific Disease Elements

C. Manual rates for the "F" Class, Admiralty Law and Federal Employers' Liability Act classifications

D. All Risk Adjustment Program [ARAP] or Merit Rating Program

E. Premium Discount Tables A and B

F. Take-Out Credit

G. Qualified Loss Management Program [QLMP]

Also, there shall be no surcharge, or the equivalent thereof, on insureds in the Massachusetts Assigned Risk Pool.

Links to a copy of the Commissioner's Decision and Order and the Commissioner's Addendum to Decision and Order are provided.

Experience ratings and ARAP factors for policies effective September 1, 2003 and subsequent, will be issued in due course using the new Expected Loss Rates.

When the new rates, experience ratings, and ARAP factors are received, carriers should no longer attach Massachusetts Pending Premium Change Endorsement WC 20 04 01 to policies.

Revised MA Manual rate pages will be distributed and will be available on our web site at www.wcribma.org.

The new rates and rating values will also be available in electronic form (Microsoft Excel and text files) on the website. Diskettes and rate tapes of the new rates and rating values will only be distributed by special request through Chris Timbone (ctimbone@wcribma.org , ext. 585).

PAUL F. MEAGHER
President

PFM/cms
Attachment

MASSACHUSETTS WORKERS' COMPENSATION

EXPENSE CONSTANTS

PRIOR	
For Risks developing at least $200 in Standard Premium	$244
For Risks developing less than $200 in Standard Premium	$122
Per capita risks (per capita exposure, up to a maximum of $200)	$49

PROPOSED EFFECTIVE SEPTEMBER 1, 2003	
For Risks developing at least $200 in Standard Premium	$264
For Risks developing less than $200 in Standard Premium	$132
Per capita risks (per capita exposure, up to a maximum of $200)	$53

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COMMISSIONER OF INSURANCE

Rate Filing of the Worker's Compensation Rating and Inspection Bureau
Docket No. R2003-08

Decision and Order

I. Introduction and Procedural History

On February 28, 2003, the Worker's Compensation Rating and Inspection Bureau of Massachusetts ("WCRB"), on behalf of its members, submitted a filing for worker's compensation rates to be effective September 1, 2003. The Commissioner of Insurance ("Commissioner") designated Jean F. Farrington, Esq. and Richard A. Cody, Esq. to serve with her as hearing officers on this matter. A notice of hearing, issued on March 4, 2003, scheduled a public comment hearing and a prehearing conference for April 4. On March 6, the Attorney General ("AG") filed a notice of intent to participate. Counsel representing the parties throughout this proceeding are: for the WCRB, Scott Lewis, Esq. and Jordana Glasgow, Esq.; for the State Rating Bureau ("SRB") Norma Brettell, Esq. and Thomas McCall, Esq.; and for the AG, Peter Leight, Esq. and Gerald D'Avolio, Esq.

Speakers at the public comment hearing included a representative of each party and individuals appearing on behalf of the Commonwealth's Department of Economic Development, the Massachusetts Workers' Compensation Advisory Council ("MWCAC"), Associated Industries of Massachusetts, the PMC Insurance Group, and

three trade associations related to the construction industry.[1] At the prehearing conference that followed public comment, dates were set for cross-examination, submission of advisory filings, and post-hearing briefs. The schedule ordered the advisory filings to be bifurcated, setting earlier dates for submission of filings addressing topics other than the WCRB's profits recommendations.

Cross-examination of the witnesses for the WCRB took place on April 15, 16, 17, 18 and 29. The AG and the SRB submitted their advisory filings on all issues other than the profits component of the WCRB filing on April 29 and May 1, respectively. On May 8, those two parties filed a joint motion to postpone submission of their advisory filings on profits issues from May 7 and 8 to May 14 and 15. The motion was allowed, with the proviso that a hearing would take place on May 19 to address any requests for changes to the cross-examination schedule.

On May 28, MWCAC submitted an actuarial report on the WCRB rate filing prepared for it by Tillinghast-TowersPerrin, consulting actuaries. Cross-examination of witnesses for the AG and the SRB took place on May 29 and 30 and continued on June 4 and 10. On June 10 and June 19, respectively, the WCRB and the SRB filed additional memoranda relating to their proposed profits models, as requested by the presiding officers. On June 12, the WCRB submitted revisions to the profits model used in its initial filing.

The WCRB submitted a rebuttal filing on June 16; its witnesses were cross-examined on June 25 and 27. The SRB and the AG submitted surrebuttal filings on July 2. In addition, the AG moved to obtain testimony or discovery from three insurers; the WCRB filed an opposition to his request. On July 8, the WCRB moved to strike the testimony of Richard Cohn from the AG's surrebuttal filing; the AG filed an opposition. Orders issued denying both motions. Cross-examination of the witnesses for the AG and the SRB took place on July 10, 11 and 14. Briefs were filed on July 23. On that same date, the parties submitted a stipulation that addressed eight issues. On July 24, the Commissioner and the presiding officers issued an order approving the stipulation.

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[1] The three organizations are the Building Trades Employers Association of Eastern Massachusetts, the Massachusetts Council of Construction Employers and the Associated General Contractors of Massachusetts.

II. Statutory Framework

G.L. c. 152, §53A (§53A) sets out the statutory requirements for obtaining approval of rates for Massachusetts workers' compensation insurance. Subsection (1) requires any insurance company writing workers' compensation insurance in the Commonwealth to file its risk classifications and premiums with the Commissioner, either directly or through a rating organization authorized to act for it. The Commissioner thereafter conducts a hearing to determine whether the classifications and rates are not excessive, inadequate or unfairly discriminatory for the risks to which they effectively apply, and fall within a range of reasonableness. If she finds that they do not satisfy these criteria, she may disapprove them. In addition to these general requirements, §53A(12) specifically states that the Commissioner shall not approve classifications or rates that provide for any of the following: 1) dividends, unabsorbed premium deposits, savings or other payments allowed or returned by the insurer to policyholders, members, subscribers or stockholders; 2) expenses that exceed the filing insurer's expense needs; and 3) commission allowances that are not demonstrated to be reasonable and to reflect the actual cost to the agent or broker of services they provide.

The Commissioner, pursuant to §53A(13), must also make a finding, on the basis of information in the rate filing, that 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, any other unreasonable costs and expenses, and on the collection of appropriate premium charges owed to the insurer. If the Commissioner finds that the rates are excessive, and that the excess is the result of failure to employ adequate cost control programs, she may disapprove or limit any proposed increase in rates. Furthermore, if the Commissioner finds, after hearing, that any premiums currently in effect are excessive, she is to order a specific rate decrease, whether or not the insurer or rating organization has requested one.

Neither the statute nor the applicable procedural regulation, 211 CMR 110.00 *et seq.*, prescribes a particular methodology for developing rates or specifies the data that the insurer or rating bureau must include in its filing. However, §53A(3) requires that the filer provide the information that supports the filing, which may include information on the experience or judgment of the filer, the experience of other insurers, and any other

factors which the insurer deems relevant. The burden is on the filer to satisfy the decisionmaker that its proposed rates meet the statutory standard. *Workers' Compensation Rating and Inspection Bureau v. Commissioner of Insurance*, 391 Mass. 238, 245 (1984), citing *Liberty Mutual Insurance Co. v. Commissioner of Insurance*, 366 Mass. 38, 42 (1974). See also, *Blue Cross and Blue Shield of Massachusetts v. Commissioner of Insurance,* 420 Mass. 707, 709-710 (1995), concluding that the Commissioner may disapprove rates if the filer fails to submit sufficient evidence on which she may reasonably conclude that the proposed rates will not be inadequate, excessive or unfairly discriminatory.

III. The Parties' Recommendations

The WCRB, in its initial filing, sought an overall rate increase of 10.8 percent, a recommendation that was later, as a result of an error in a tax value, reduced to a recommended increase of 8.6 percent. The SRB, in its advisory filings, recommended an overall rate decrease of 9.9 percent, while the AG recommended a decrease of 21.4 percent. Over the course of this proceeding, the WCRB's recommendations on certain values changed as a result of agreements reached among the parties. In addition, the stipulation resolved eight disputed issues, as follows:

1. A premium adjustment factor for experience rating off-balance of 1.02 should be used in place of the factor in the WCRB's rate filing.
2. A loss adjustment expense ratio of 20.4 percent should be used in place of the factor in the WCRB's rate filing.
3. The expense trend factors in the WCRB's filing, as shown on revised page 6020 should be used.
4. The current rates for the F-classes should remain in place.
5. The state and hazard group relativities proposed in the WCRB's rate filing should be used.
6. The swing limits for classification pricing proposed in the WCRB's rate filing, at p. 10247R, should be used, except that 20 percent is to be substituted for 25 percent in lines (8) and (9).
7. The parties request the Commissioner to approve the WCRB's proposal to modify the experience rating plan so that the Weighting Values ("W table") and the Ballast Values ("B table") are consistent with the 1996 Graduated Experience Rating Table ("GERT") filed by the National Council on Compensation Insurance ("NCCI").
8. The WCRB, in anticipation of its next rate filing, will use reasonable efforts to collect from its members data showing (i) any revenues that its members received from installment fees, returned check fees, reinstatement fees or

> similar charges imposed on Massachusetts insureds; (ii) any otherwise unreported expenses associated with collecting such revenues; and (iii) any earned but uncollected premium association with their Massachusetts policies. The data is to be considered in the WCRB's next rate filing.

As with the agreements reached during the hearing, the stipulations will affect the parties' recommended rate levels. However, the record and the stipulation do not specify the individual or aggregate effects of these agreements on the parties' recommendations or estimate their effect on the overall state average rate level. At this time, four issues remain in controversy: loss development, loss trending, underwriting profits, and cost containment. Each of those will be addressed in turn.

A. Loss Development

Loss development refers to the process for estimating the ultimate value of workers' compensation claims, once they are paid or settled. The 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. Some workers' compensation claims are paid out over long time periods, so that losses may not reach their ultimate values for many years. The assumption underlying loss development is that historical payment and settlement patterns can be used to predict future patterns, if properly adjusted to take account of such matters as law changes, benefit changes, and changes in the proportion of medical and indemnity losses. Loss development proceeds from a review of loss reports made at sequential reporting intervals in order to determine the changes from one report to the next. Because claims may be paid out over many years, two separate calculations are made to estimate the ultimate value of workers' compensation claims. The first involves examination of reported losses, by policy year and by accident year, for a base period of 252 months (twenty-one years). The second requires calculation of a "tail factor" that estimates the ultimate value of losses on claims that remain open past the base period.

1. Basic loss development factors

The WCRB, in brief, develops the basic loss development factors utilizing a methodology that first develops medical and indemnity losses separately by policy year("PY") and by accident year ("AY"), using two sets of data, "paid" and "paid plus case." "Paid plus case" data reflect the reserves allocated to payment of losses. For each

of the two types of losses, the two most recent values generated by the paid and paid plus case method are then averaged, and those results are then combined to reach an industrywide development factor. Finally, the paid and paid plus case factors are averaged to reach the factors that the WCRB recommends for use in the rates. The WCRB notes that this is the methodology it has used, with the Commissioner's approval, for many years.

No party objects to the methodology that the WCRB used to calculate its basic loss development factors, and the AG does not oppose the WCRB's results. The SRB, however, argues that averaging the two factors this year produces an excessive estimate of ultimate losses because the "paid" and "paid plus case" approaches to development of medical losses generated markedly different results for such losses in the most recent years. Therefore, the SRB asserts, averaging these two values overestimates ultimate losses and, all else equal, will produce an excessive rate. The SRB argues that a better approach is to examine the loss data in an effort to reconcile the results of the "paid" and "paid plus case" estimates of medical losses. Adoption of its recommendations for adjusting the underlying "paid plus case" data this year would narrow the difference between those two results and reduce the average of the two values.

The SRB argues that the disparity in the estimates of medical losses produced by the two development methods gives little confidence that either method correctly estimates ultimate losses. It asserts that the WCRB should have explored the reasons for the differences between them. The SRB's witness on this issue is Dee Dee Mays, FCAS, MAAA, a principal of Perr & Knight, Inc., consulting actuaries. She concluded, from her examination of the data, that two elements might underlie the increased loss development for medical claims: 1) the inclusion of data from a company that, on average, had unusually large outstanding medical case reserves in PY 2000; and 2) recent strengthening by insurers of their medical loss reserves. The SRB questions whether any such strengthening would continue in the future. To remedy the effect of these elements, the SRB recommends excluding from the medical "paid plus case" loss development calculations data for the company with the high medical loss reserves, and using an average of the five most recent development factors, but excluding the highest and lowest

points, instead of a two-year average of the two most recent factors, to develop the medical "paid plus case" losses to ultimate.

The WCRB objects to the SRB's proposed adjustments, arguing that developing losses by the "paid" and the "paid plus case" methods is expected to yield different results and that, from year to year, one or the other will produce a higher estimate of ultimate losses. Because of differences in the results from year to year, rather than rely on one indication, the WCRB calculates loss development in two ways and averages the results. The WCRB disagrees with the theory that using two methods implies that either is likely to produce the correct estimate of ultimate losses. It describes its methodology as a way of giving equal weight to two kinds of information. Over time, the WCRB asserts, averaging produces mores stable results without upward or downward bias. The WCRB argues that the "paid" and "paid plus case" methods are expected to produce similar estimates of ultimate losses if, during the historical period reviewed, there have been no significant changes in payout patterns or loss reserves. However, if such changes have occurred, the two methods would be expected to produce different results. The WCRB concludes that the difference in the estimates produced by the "paid" and "paid plus case" methods this year is not evidence that either method is flawed, but reflects changes in the historical data. Averaging, it argues, appropriately addresses the effect of those changes.

The WCRB objects to excluding data for the company with large case reserves in PY 2000, arguing that the SRB based its recommendation on faulty assumptions about the average reserves for the company's claims. It points out that the reserves were actually distributed among a single large case and eighteen that were within a normal range, and notes that Ms. Mays admitted that, had she known the actual distribution, she would have recommended a different adjustment. The WCRB further criticizes the SRB for offering no standard for determining when a reserve should be considered unusually high, arguing that case reserves are expected to vary, and that truncating the upper end of the distribution, but not the lower end, would result in downward bias. It comments that large claims should not be removed from the data unless the rates allow for payments on occasional large claims resulting from catastrophic injuries.

The WCRB objects to what it calls the SRB's "five-year high/low averaging" methodology, arguing that over time the two-year methodology it uses is expected to produce unbiased estimates of ultimate losses, while the SRB's recommended methodology will result in biased outcomes. The WCRB argues that companies determine, individually, whether to strengthen or reduce their case reserves, and that such changes show no consistent pattern. It asserts that, in industrywide ratemaking, reserve increases by some companies will be offset by reserve decreases from others, so that removing only data that suggest strengthening will tend to underestimate ultimate losses. The WCRB also criticizes the SRB's methodology because it is not a recommendation for permanent change, but an initial step in a proposal to examine the data each year and determine what is appropriate.

We find that exclusion of data from a set used to calculate loss development is appropriate under certain circumstances. We note, for example, the testimony of Claudia Cunniff, FCAS, MAAA, a witness for the WCRB, on the exclusion of two companies that were unable to provide usable data to the WCRB, and the exclusion of data on losses resulting from the events of September 11. Review of company reports and investigation of perceived anomalies in reported information is essential in order to ensure that the data used to calculate rates is reasonable. We do not find, however, that the record supports the SRB's proposal to adjust the data underlying the paid plus case development of medical loss reserves. The SRB's recommendation for excluding data is based on a misconception of the distribution of the underlying losses, and we note Ms. Mays's testimony that her approach to adjusting data would vary depending on the actual claim distribution. Nevertheless, while we do not find an adjustment reasonable this year, we note that a modification to the loss development methodology that would define and separately analyze development of "catastrophic" claims might be appropriate for consideration in future rate proceedings.

We are persuaded that averaging "paid" and "paid plus case" data remains an appropriate approach to estimating ultimate losses, and that the WCRB's two-year averaging methodology for medical "paid plus case" loss development factors, without the SRB's proposed adjustments, will produce reasonable rates. Changes in reserves are not unexpected; no party argues that the reserves themselves fall outside a range of

reasonableness. Further, absent evidence that the established methodology produces unreasonable results, we are reluctant to substitute an approach that anticipates applying different methodologies in subsequent filings. The use of a predictable, consistent methodology promotes stability in ratemaking; adoption of an *ad hoc* approach to loss development would needlessly introduce an element of uncertainty into the rate approval process. We therefore approve the WCRB's basic loss development factors as filed.

2. Tail Factor Recommendations

Both the AG and the SRB objected to the tail factors in the WCRB's filing on the grounds that they did not develop their ratios from common evaluation intervals, in accordance with the methodology used in the *1999 Decision on Workers' Compensation Rates*. In the course of this proceeding, consistent with the AG's and SRB's recommendations, the WCRB revised its filing to place the development ratios at a common evaluation interval before calculating the 204th to ultimate tail factor. The WCRB points out that the factors it uses differ slightly from those displayed in the AG's filing, because he did not update the calculation of the proportion of medical losses. The AG does not object to the WCRB's revised tail factors.

However, the SRB proposes a second adjustment to the tail factor calculation, arguing that the selected "paid" and "paid plus case" tail factors are not consistent with the underlying "paid" and "paid plus case" data. The SRB, to reconcile the two indications, uses the historical "paid plus case" loss development in the tail to impute a "paid" loss tail factor based on the relationship between the "paid plus case" and "paid" losses. The resulting tail factors are lower than those proposed by the WCRB.

The WCRB argues that this approach is inconsistent with past practice and with the rationale for the SRB's other two proposed adjustments. It asserts that Ms. Mays calculates factors based on "paid" losses in the tail, but disregards "paid" loss development patterns in selecting the tail factor, instead relying solely on reported historical "paid plus case" loss development. The WCRB argues that Ms. Mays selects "paid" AY and PY tail factors that are lower than the calculated factors, and then applies adjusted "paid" tail factors to "paid" losses that have not been adjusted. The result, the WCRB argues, artificially suppresses the tail factor and would significantly

underestimate losses. Further, the WCRB asserts, the SRB's recommended tail factors are well outside the range of any experienced in recent history.

We find that the WCRB's proposed tail factors will produce rates that fall within a range of reasonableness. We are not persuaded that it is appropriate to disregard "paid" loss development in calculating tail factors.

B. Loss and Premium Trend

The role of loss and premium trend in workers' compensation ratemaking is to adjust losses and premiums for changes from the historical experience period, in this proceeding, PY 2000 and AY 2001, to the mid-point of the policy period for which these rates are filed. Because workers' compensation policies are priced based on payroll within a classification, premiums can potentially increase because of wage increases. Losses, at the same time, may increase because of such factors as higher claim frequency and increased severity. The "net annual trend" reflects the relative relationship of increases or decreases in premiums and losses.

1. The Parties' Recommendations

The parties to this proceeding make three different net trend recommendations. The WCRB proposes a positive net annual trend of 0.9 percent, which reflects its expectation that losses will increase slightly faster than premiums during the projection period. It argues that medical cost inflation accounts for the entire positive net trend; that indemnity severity is rising only slightly faster than payroll; and that the increase in indemnity severity is offset by a continuing decline in claim frequencies. The SRB projects a net annual trend of zero percent. Its witness on net trend, Ms. Mays, testified that it is not possible to predict with any degree of certainty that loss ratios will either increase or decrease from 2001 to 2003, and therefore recommends assuming that loss ratios will not change because of trend. The AG has proposed an annual net trend of –2.5 percent. His witness, Allan I. Schwartz, FCAS, MAAA, president of AIS Risk Consultants, Inc., an actuarial consulting firm, testified that his selected recommendation is based on an analysis of historic trend in net costs, as measured by the loss ratio. The AG asserts that the data would support a more negative trend, and notes that his selected value is slightly more negative than the –2.2 percent figure adopted by the Commissioner in the *1999 Decision on Workers' Compensation Rates*.

2. The Parties' Methodologies

a. The WCRB

The WCRB proposes a methodology to trend workers compensation losses which, rather than using past loss ratios to project future loss ratios, independently projects the constituents of net trend: payroll, claim severity, and claim frequency. It separately calculates claim frequency, claim severity (independently for medical and indemnity trends) and premium trends using a least squares regression model for each calculation. It then weights medical and indemnity severity to arrive at a total severity trend. The WCRB's net trend is the product of the frequency and severity trends divided by the annual premium trend. The WCRB's witness on trend issues was Donald Bashline, FCAS, MAAA.

Each regression projects a rate of change for the four dependent variables in relation to independent variables. For claim frequency, the WCRB considers the impact of the 1986 and 1991 law changes, cost containment initiatives during the 1990s and the effect of the economic climate, asserting that claim frequency declines during recessions and increases during periods of economic recovery. It regresses payroll and indemnity claim severity against changes in wage levels, and medical claim severity against time.

The WCRB relies on data from economy.com, an independent provider of economic and financial data, to forecast three of its four dependent variables. Premium trend and indemnity severity are based on economy.com forecasts of Massachusetts employment and payroll through 2005. One of the WCRB's two models of claim frequency uses the unemployment rate as the independent variable; the other uses the Massachusetts Gross State Product ("GSP.") The WCRB argues that by using separate models for each component of loss ratio trend it is able to consider each trend individually in relation to the independent variable or variables most closely related to it. It asserts that the model it used to derive a net trend factor in its 2001 filing, a single regression of loss ratio against time, assumes that loss ratios change stably through time. The WCRB argues that that assumption ignores the cyclical effect of changes in the economy on claim frequency and severity and the "dislocating" impact of those changes in recent years. As examples, it argues that assuming that the state average weekly wage ("SAWW") will change by the amount of the most recent revision would probably

underestimate rates, and that extrapolating current frequency trends to the future equals an assumption that Massachusetts will continue to lose jobs.

The WCRB argues that the relationship between the economic climate and workers' compensation claim frequency has been studied extensively, and that research shows that, all else equal, claim frequencies tend to decline when the economy slows and to increase in periods of economic expansion. It cites to a British study that considered that layoffs in an economic downturn generally focused on more recent hires, thus increasing the average experience of the workforce and making it safer, while expansions create a less experienced, and therefore more accident-prone, workforce. The cited study also noted that changes in work hours and intensity associated with expansions and reductions in work forces can affect worker fatigue, and increase injury levels. The WCRB also reports a finding that expansion can result in the use of older, and often less safe, equipment. Another report concluded that workplace accident rates are inversely related to the level of unemployment, because workers are less likely to report an injury in a declining economy. Further, it refers to actuarial studies that support the correlation between claim frequency and the employment rate. In addition, the WCRB argues, the correlation between the GSP and claim frequency has a relatively strong level of explanatory significance and a high r-squared coefficient.

The WCRB adjusts its frequency regression equations to account for law changes and cost containment. It assumes an effect of the 1991 Workers' Compensation Reform law and cost containment that is constant from 1998 to date, noting that this methodology is similar to the cost containment adjustment in its 1999 and 2001 filings.

However, the WCRB asserts, there is evidence of a national long-term decline in workplace injury rates that it attributes, in part, to changing job conditions and increased safety awareness. It notes that although its model did not detect a long-term trend, it took this evidence into account in selecting a frequency trend which is -2.25 percent, rather than the -1.5 percent indicated by its model. For its indemnity severity trend, the WCRB bases its forecast of future changes in severity by looking at the relationship between wage levels and average indemnity costs. It constructs a regression equation using indemnity claim cost as the dependent variable and the SAWW, as derived from economy.com data, as the independent variable. It uses the forecasted wage levels, also

based on economy.com data, to calculate expected indemnity severity. The result of applying this methodology is an indemnity severity trend of +3.4 percent. However, the WCRB also argues that claim durations will be affected as the economy grows and frequency change begins to level off. It comments that the injuries that are unreported during an economic slowdown are more likely to be minor ones, of shorter than average duration. In a period of increased reporting of injuries, it notes, claim duration might also be shortened. Therefore, the WCRB judgmentally adjusted the indicated indemnity severity trend to +3.0 percent.

The WCRB states that average medical claim costs have increased by more than 50 percent over the last three complete policy years, and that health insurance costs overall are growing at double-digit annual rates. The WCRB's regression of medical claim costs against time indicates an annual change of +12.4 percent. However, because of duration declines, which would also reduce the average medical claim costs, the WCRB judgmentally reduces its annual medical severity trend to +0.5 percent. The WCRB calculates payroll trend by using actual Massachusetts wage and salary data, as provided by economy.com, through November 2002 and its forecast data through 2005. The payroll trend is the annualized change from the midpoint of each experience period to the midpoint of the rate period. The WCRB notes that the forecasted changes vary from year to year, so that the trends for AY 2001 and PY 2000 are slightly different. It therefore averaged the two trends as the payroll trend for each experience period; the resulting annual trend is +2.2 percent.

The WCRB argues that its trend methods are actuarially sound and produce trend factors that are reasonable. It asks the Commissioner to approve its methodology and the resulting trend factors.[2] Further, it asserts, the NCCI uses an econometric frequency model that uses variables that are related to those the WCRB has employed.

b. The SRB

The SRB does not recommend a particular methodology for deriving the net trend. Its witness, Ms. Mays, testified that it is appropriate to review historical changes in payroll, frequency and claim severity separately, rather than base a trend on the ratio of

[2] The WCRB asks the Commissioner, if she decides not to approve a positive net trend, to adopt the "null hypothesis" recommended by the SRB.

losses to premium, but criticizes the WCRB's reliance on its regression models. She notes as well that historical loss ratios have generally decreased since 1992 and that the WCRB's trend projection is about equal to the average of the loss ratios for PYs 1999 and 2000. However, the SRB points out, the preliminary results for PY 2001 indicate that the downward loss ratio trend has continued since 1999.

Ms. Mays comments that the close fit in the WCRB's regressions for the years 1981-1995 can equally be interpreted as the result of cost containment adjustments during that period, rather than reflections of economic variables. She compared historical claim frequencies to the multiple regressions lines produced by the WCRB models and also calculated regression models, one based solely on the WCRB's economic data and one excluding such data. Ms. Mays concluded that regression models excluding the economic data fit the historical data nearly as well as the regression models including such data, and that her regression based on economic data alone did not fit well at all. She notes as well that none of the regression models fit the historical changes from 1995 forward. Consequently, the SRB concludes that there is no reasonable confidence that the models accurately predict to the projected period.

In any event, the SRB points out, even if the results of the regressions were compelling, the model should not be used unless the WCRB can show that the regressions do demonstrate causation, not simply correlation. Further, it argues, even if there were a causal connection between claim frequency and the economy, the WCRB needs to provide compelling evidence of future economic variables.

The SRB asserts that the WCRB's model also depends on two controversial premises. It points out that workers' compensation literature over the past twenty-five years includes studies that reach conclusions on claim frequency and unemployment that are opposite to those cited by the WCRB. In support of the position that recessions might increase rather than reduce workers' compensation loss costs, these studies suggest that higher unemployment encourages employees to file claims in order to continue to receive earnings; that it makes employees more reluctant to file claims for minor injuries, thus producing higher average severities; and that less experienced workers, who file more claims than experienced workers, are likely to be laid off first.

The SRB argues that basing trend on predictions about the future of the Massachusetts economy is also open to doubt. Again, Ms. Mays describes economic forecasting as "notoriously difficult," commenting that contradictory studies "proliferate, especially during recessions." Pointing to recent newspaper articles reporting on such studies, she again notes that the WCRB's predictions are controversial.[3]

The SRB further notes that time is not a strong predictor of future results. Ms. Mays's graphs of historical payroll, claim severity, both for medical and indemnity claims, and claim frequency show that only payroll changes consistently over time, and that even that change has flattened in recent years. Although these trends have, in the aggregate, decreased loss ratios since 1992, the SRB concludes that continued decreases in loss ratios will require some combination of continued increases in payroll, continued significant decreases in frequency, and a slowdown in increases in severity. It asserts that the WCRB's regressions against time and economic variables do not allow predictions of any of these events. Finally, the SRB notes, the loss adjustment expense provision in the rates may affect future loss ratios.

The SRB concludes that no one can predict with any reasonable degree of confidence that loss ratios will increase from 2001 to 2003, or that they are highly likely to decrease. Ms. Mays notes that 2001 data is highly immature and is not reliable in developing a net trend. It therefore recommends assuming that loss ratios will not change because of trend, and that the Commissioner adopt a trend factor of 0.0 percent.

c. The AG

The AG derives his recommended net loss trend by analyzing the workers' compensation experience data in the WCRB filing to derive the historic trend in net costs as measured by the loss ratios. The loss ratio consists of the ratio of losses, adjusted to reflect historical benefit level changes and the impact of cost containment, and premiums, adjusted for historic premium level changes. The resulting adjusted loss ratio for the historical time periods is then examined for trends by using standard actuarial procedures for fitting a curve to the data. Those annual historic changes in the adjusted loss ratio are

[3] Ms. Mays notes that the "lagged" frequency trends produced by the WCRB, at the request of the hearing officers, raised the indicated frequency trends, a result that she would not have expected because the WCRB's anticipated recovery would not occur with the projected period. She comments that this result discredits the ability of the WCRB's models to predict claim frequency.

then used as the basis for a projected net annual trend. The AG asserts that this is the approved decision methodology that was affirmed in the *1999 Decision on Workers' Compensation Rates*.

The AG states that two key factors are required to apply this methodology, an estimate of the impact of cost containment and the historical period over which to perform the net trend analysis. The AG used the 35 percent value for the effect of cost containment that the Commissioner adopted in the *1999 Decision on Workers' Compensation Rates*, and used various time periods to perform his loss trend analysis. The time periods started with PYs 1991 to 1999, and ended with PY 2000 or 2001. He calculated loss ratios separately for medical and indemnity claims and, based on his results, selected a net annual loss trend of -2.5 percent for both indemnity and medical claims. He argues that his data analysis would support a more negative trend, as would evidence that cost containment would, as in the past, continue to reduce losses. The AG points out that the -2.5 percent trend is consistent with the -2.2 percent trend adopted by the Commissioner in the *1999 Decision on Workers' Compensation Rates*. He comments that the trend selected in that decision was based on experience through PY 1997, and that losses have continued to drop from that period to the present. Because of those continued downward net loss trends, the AG recommends adopting a more negative net loss trend this year. To determine his payroll trend, the AG analyzed change in the SAWW for the period from 1997 to 2001, concluding that an annual payroll trend of +4.5 percent is reasonable. Multiplying the net loss trend by the payroll trend, the AG arrives at an absolute loss trend of +1.9 percent, or a factor of 1.019. He states that his analysis is consistent with losses increasing at about 1.9 percent per year.

3. The Parties' Arguments

a. The WCRB

The WCRB argues that it has projected a small positive net trend based on its review of recent observed patterns and cost drivers that are reasonably expected to affect claim frequency, claim severity, and payroll trends. It argues that the AG, rather than analyze the causal factors that might affect those trends, chose an arbitrary value of -2.5 percent. The WCRB asserts that the AG did not base his selection on the method approved by the Commissioner in the *1999 Decision on Workers' Compensation Rates*.

The WCRB argues that focus, in the past, on the extrapolation of observed trends in loss ratios obscures analysis of the underlying forces affecting the components of net trend. It asserts that the methodology it has employed permits explicit examination of the economic drivers underlying each component, and incorporates the "well-documented and intuitively-appealing" relationship between claim frequency and the economic climate. The WCRB argues that different methods of estimating trend may be required because the causal factors affecting trend components may operate in distinct ways at varying times. It argues that multiple regressions or econometric models improve the projection of movements in claim frequency, and that its filing recognizes the interaction between changes in claim severity and claim frequency. The WCRB argues that the SRB's expert witness agreed with the central conceptual points of its methodology, even though she criticized some of its empirical methods and results. Further, it argues, even though she did not accept the WCRB's models, she did not rule out the use of econometric models.

In response to the AG, the WCRB argues that his characterization of the WCRB's recommendation as a "trend reversal" fails to recognize that the WCRB predicts changes in the rate, but not the direction, of change in its separate trend components. As a result of its examination of economic variables, the WCRB projects a combined effect of changes in claim frequency, severity and payroll that will produce a positive net trend, but not a trend reversal. The WCRB opposes the AG's recommendation, arguing that Mr. Schwartz offered no convincing reason for accepting a -2.5 percent net trend. It asserts that, instead of using the methodology employed by the Commissioner in 1999, he ran different regressions of historical loss ratios against time for various periods. Further, the WCRB notes, the AG did not use any of his witness's regression results, but simply selected a value based on the unfettered exercise of his judgment.[4] The WCRB points out that the result of regressing five years of loss ratios, as was done in the *1999 Decision on*

[4] The WCRB notes that in the AG's advisory filing, Mr. Schwartz made adjustments for the impact of cost containment on indemnity, but not medical, losses. That conceded error was corrected in the AG's surrebuttal filing, but the result did not cause a change in the AG's recommended –2.5 percent trend. The WCRB argues that failure to revise the net trend value demonstrates that the AG did not use the results of his regressions but simply selected an arbitrary figure.

Workers' Compensation Rates, would have resulted in a -6.6 percent annual net trend, a value that the AG would not endorse.[5]

The WCRB argues that the similarity of a -2.5 percent net annual trend to a -2.2 percent net trend, as approved in the *1999 Decision on Workers' Compensation Rates*, is not a reason to adopt it, and that reliance on trending loss ratios in that decision does not justify doing so this year. It contends that Ms. Mays's testimony shows that regressions of claim frequency, claim severity, and payroll against time are not good predictors, and questions the predictive value of regressions of loss ratios over time. If the Commissioner does not adopt its trend recommendation, the WCRB asks that she approve the 0.0 percent net trend recommended by the SRB.

b. The SRB

The SRB argues that the WCRB has proposed a new and untested procedure to predict net trend that depends heavily on independent forecasts that have not been shown to be reliable or dependable. It points out that these forecasts are more complicated that the prediction of the number of workers' compensation claim that will be filed in Massachusetts in a particular year. The SRB argues that the economic variables that the WCRB relies on to predict loss frequencies do not seem to be useful for that stated purpose. The SRB questions the WCRB's transformation of a long-lived downward trend to a positive annual net trend.

The SRB agrees with the AG's arguments that the WCRB's multiple regression model should not be adopted. It asserts that cost containment factors, not economic factors, account for the fit between the WCRB's model and workers compensation experience for the period between 1981 and 1995, and that none of the WCRB models fit the actual data since 1995. The SRB argues that the economy.com projections underlying the WCRB's models are untested. Consequently, the SRB argues, they cannot be depended upon to produce accurate projections. Further, the SRB argues, the WCRB has not shown that its correlations demonstrate causation. It comments, as well, that the econometric models produce highly unstable results. The SRB notes that Mr. Bashline's testimony this year on econometric models contradicts testimony he gave

[5] Mr. Schwartz agreed that application of the precise methodology used in 1999 would have resulted in an annual net of –6.6 percent.

in the 1999 workers' compensation rate proceeding. Finally, the SRB argues, the WCRB has not shown how loss frequencies and loss severities are related, noting Ms. Mays's testimony that econometric modelling, if used, should be performed for both frequency and severity trends.[6]

The SRB comments that the AG recommends use of the traditional method for projecting losses, fitting a trend line to past loss ratios, and that he insists that the data justify a -2.5 percent net loss trend. It criticizes the AG's objections to matters such as the separate analysis of the various components of trend. The SRB characterizes its recommendation as an intermediate position. Describing the traditional methodology as suspect, it notes its agreement with the WCRB that it may be time to take a fresh look at the methodology for predicting workers' compensation losses, and concurs with the suggestion of separate projections of component trend factors. In support of that approach, the SRB argues that loss ratio trends will not continue downward unless there is a confluence of different trends in separate loss components. It notes that Ms. Mays expressed concern over the differing course and speed of movement of the components of net trend, and her testimony that only payroll has moved in a consistent fashion. The SRB comments as well on Ms. Mays's concerns over the continued effect of cost containment measures, and the possibility that, as loss adjustment expense ("LAE") ratios decrease, the improvement in loss ratios may also level off.

In the face of concerns over the effect of apparently changing factors on losses, the SRB recommends admitting the limits of reliable knowledge and proposes a flat net trend. It argues that the AG mischaracterizes the SRB's recommendation as a trend reversal based on an underlying "null hypothesis." The SRB observes that PY 2001 data are too immature to permit their use in developing a net trend. Therefore, the SRB argues, conclusions about movement from 2001 levels are little more than speculation. Describing its recommendation as cautious, the SRB argues that it reflects the entire picture, including a stagnant economy, possible economic recovery, decreasing cost control expenditures, decreasing claim frequencies, SAWW levels, and increasing medical and indemnity severities.

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[6] Ms. Mays testified that the regression methodology for frequency and severity should be consistent, commenting that one should not be regressed against time and one against some explanatory variable, as the WCRB did this year.

c. The AG

The AG argues that because the Commissioner's methodology trends loss ratios, it does not need to trend claim frequency and claim severity separately. Using a regression of loss ratio data over time to estimate loss ratio trend, he states, incorporates the functional impact of the many factors that, over time, may cause loss ratios to change. He points out that a time-based regression does not mean that time causes loss ratios to change, but empirically reflects the effects of the universe of causes. The AG points out that the loss ratio methodology avoids problems associated with trends in frequency and severity, because it does not try to isolate and identify particular factors that influence workers' compensation costs, but instead observes all factors that may affect costs and projects that forward.

The AG asserts that his net loss trend recommendation is reasonable, supported by historical data, and consistent with the *1999 Decision on Workers' Compensation Rates*. He points out that loss ratios have continued to decline since that decision, thus justifying approval of a more negative net loss trend. The AG argues that the historical data support a continued net loss trend, pointing out that the WCRB calculated a series of net loss trends that showed flat or positive trends only for medical claim costs. The AG points out that the positive values calculated by the WCRB, if averaged with the negative trends, would produce negative net trends. He argues that the only way to obtain a trend that is not negative is to ignore the historical data. In support of his payroll trend, the AG comments that Mr. Schwartz ran four regressions that include the most recent 2001 data point, which produced an average trend of 4.8 percent. He asserts that his selected payroll trend, 4.5 percent, is reasonable and consistent with the WCRB's procedures.

The AG argues that the loss ratio methodology avoids a number of problems with the WCRB's econometric model. As an example, he comments that the WCRB treats its trend components inconsistently, relying on data from 1981 to 2001 to calculate claim frequency, but only five years of data, from 1996-2000 for severity trends. The AG points out that the loss ratio methodology avoids any problem of mismatched years, because it automatically uses the same number of years for each trend calculation.

As additional support for the reasonability of his recommendation, the AG offers a comparison between pure premium trend and trends in claim severity, claim frequency

and an exposure measure (payroll divided by workers). He asserts in his filing that the results of calculating the WCRB's individual trend components on a reasonable and consistent basis should be comparable to the result from calculating pure premium trend directly. The AG states that the results of performing those calculations support his recommendations.

Responding to the WCRB's argument that the CDM is biased low, because of changes in loss development, the AG points out that Mr. Bashline incorrectly identified the net annual trend for the years 1993-1997. In any event, he argues, the WCRB's bias argument does not reflect that any bias resulting from changes in loss development over time would also bias frequency and severity calculations. The AG also comments that Mr. Bashline's position on bias is based on data for a single year, an insufficient observation period to demonstrate bias, and that it is not related to trend, but to loss development. He points out that in this proceeding the AG uses the WCRB's own basic loss development factors in its loss trend calculations. The AG observes that the CDM trend, using 1993-1997 data was –4.6 percent, a value that he describes as "uncannily accurate" in light of the actual net loss trend, -4.6 percent, for the period 1997-2000. Therefore, he notes, the trend selected in the *1999 Decision on Workers' Compensation Rates* was too low.

The AG argues that the projection of a turning point in trend is unreasonable, commenting that the rate of downward trend has accelerated, not moderated in the most recent data. He asserts that the Commissioner should consider that the net loss trend for PY 2000 to AY 2001 is minus five percent to minus six percent, an annualized net loss trend of ten to twelve percent. In contrast, he argues, the WCRB projects a positive net loss trend. The SRB's recommended net loss trend of zero percent, the AG argues, also projects a turning point, or reversal, in net loss trend, even though the trend has been consistently negative in the historical period. The AG argues that the WCRB has, incorrectly, projected turning points in filings for 1994, 1996, 1998 and 1999 rates. Citing to the *1999 Decision on Workers' Compensation Rates,* he argues that before predicting a change in trend, there must be evidence of such a shift. The AG argues that in this record there is no evidence of a turning point, and that the loss ratio data do not

suggest an upturn. He characterizes the WCRB's attempt to predict a turning point as speculative.

The AG argues that, unlike the loss ratio methodology, projecting claim frequency and severity separately, as the WCRB and the SRB have done, requires an estimation of claim counts. He asserts that if claim counts are inaccurate or unreliable, frequency and severity will be inaccurate. The AG argues that because claim counts are problematic, they are not used in the procedure to fix-and-establish private passenger automobile insurance rates. In this case, the AG points out, the WCRB maintains two sources of claim counts: the unit statistical plan (or Schedule Z data) and financial aggregate data. These two data sets provided different claim counts and thus produced undisputedly different frequency and severity trend estimates.[7] The AG argues that the WCRB's use of financial aggregate data in its filing this year is a departure from prior years, when it used statistical plan data. The AG comments that in the actuarial literature, unit statistical plan data is used to validate claim counts. He notes that the unit statistical plan data produce frequency and severity trends that are similar to unbiased external indices, while the financial aggregate data produce very different results. The AG argues that the WCRB made no attempt to reconcile the claim count data from the two sources, and that the SRB did not check the data. In response to the WCRB's assertion that the unit statistical plan data are unreliable because they depend on SAWW data, the AG points out that financial aggregate data calculation also includes the SAWW data and are therefore equally affected by its alleged unreliability.

The AG argues that to obtain its positive net trend, the WCRB ignores the historical data and instead, as it has twice in the past, relies on an econometric model.[8] Characterizing the WCRB's method as speculative, the AG argues that, when used in the past, it also produced positive net loss trends at a time when the historical data showed that loss ratios were trending down. The AG notes that the *1998 Decision on Workers Compensation Rates* and the *1999 Decision on Workers' Compensation Rates* both found the trends predicted by the econometric model to the unreasonable.

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[7] The AG notes that the Unit Statistical Plan data produce significantly lower severity trends for both indemnity and medical claims. He points out in his filing that, to project D-ratios, the WCRB uses lower indemnity and medical trends. He questions the reasons for the WCRB's use of different factors in separate sections of its filing.

[8] The AG points out that the WCRB does not use that term to describe its model.

Citing to those prior decisions, the AG comments that they rejected the WCRB's assumption that claim frequency can be explained by a single economic variable, instead noting the many social and economic factors that may affect the ratio of workers' compensation losses to premium. The AG argues that the WCRB has failed to establish that the precise model it proposed demonstrates a causal relationship between employment and trends in workers' compensation loss ratios. He notes Mr. Bashline's testimony that the variables chosen by the WCRB in this proceeding are the not the sole variable affecting workers' compensation claim frequencies in Massachusetts.

The AG argues that the historical data do not support the WCRB's position that claim frequencies are inversely related to the unemployment rate and that, all else equal, claim frequencies tend to decline when the economy slows and to increase during periods of expansion. He points out that in the 1996-2000 experience period, which the WCRB uses in the regressions for its severity model, the unemployment rate decreased, the economy expanded and the detrended GSP increased. The AG argues that under the WCRB's theory, claim frequency should have increased in those years, while it actually decreased. The AG also argues that the data do not support the WCRB's argument that in the period from 1996 to 1998 the effect of cost containment overwhelmed economic factors to keep frequencies down. In addition, the AG asserts, the WCRB's econometric model does not reflect older historical data for periods from 1987 to 1992 and 1992 to 1995.

The AG argues that Ms. Mays's regressions of the economic variables in the WCRB's model, which were included in the SRB filing, show that those variables explain nothing. Similarly, he states, regressions performed by Mr. Schwartz for time periods beginning in 1988 and ending in 2001 showed that the WCRB's variable had no statistical significance or any ability to explain changes in claim frequency over the past 15 years. He argues that any explanatory ability of the WCRB's variables relates only to experience in the early to mid 1980s, and not to experience in the period from the late 1980s to the present. The AG argues that the Commissioner, in the *1998 Decision on Workers' Compensation Rates* looked at the explanatory ability of the econometric model for various time periods, as a way of evaluating whether it could reflect changes in the loss ratio generally. He comments that the WCRB does not dispute that the model has no

explanatory ability beginning around 1988, but instead argues that including data from 1981 through 1987 in the regression improves its ability to explain change. The AG observes that a model that explains something that occurred 16 to 20 years ago, but nothing since then, is not a reasonable model for predicting a trend from 2003 to 2004.

The AG argues that the WCRB did not test its econometric model by examining its predictions during the most recent historical period. He notes that the Commissioner, in 1998, approved such testing to assess the reasonableness of an econometric model. The AG asserts that the WCRB's model predicts frequency values that are nearly 30 percent higher than the 2001 frequency value in the WCRB's filing. Further, he contends, for the 1996-2000 period, the model significantly underpredicts frequencies at the beginning of the period and significantly overpredicts them at the end. The AG also states that the model produces inaccurate trends during the historical period from 1996 through 2001. Even though the WCRB argues that the 2001data are immature, the AG points out that the 2001 data do not affect the comparison between the historical data and the model results for 1996-2000. Similarly, the AG argues, the econometric model did not accurately predict increases and decreases for time periods similar in length to the WCRB's 3.417 year trend period.[9]

Further criticizing the WCRB's model, the AG argues that it unreasonably treats cost containment.[10] As in 1998 and 1999, the AG asserts, the WCRB uses a dummy variable in its model to adjust for improvements in cost containment from 1989 to 1998, backfitting the model when changes that cannot be explained by employment levels occur. The AG notes that Mr. Bashline has, in the past, criticized this procedure. He argues that the dummy variable captures, among other things, the impact of long-term reductions in claim frequency that the WCRB acknowledges have occurred, but does not detect in the model. If the dummy variable is influenced by factors other than cost containment, it may incorporate factors, in addition to cost containment, that would further reduce frequency during the policy period. Thus, linking a dummy variable only

[9] The AG applied the WCRB's unemployment and GSP models to two four-year (1997-2000 and 1998-2001) time periods and two three-year time periods (1998-2000 and 1999-2001).

[10] The AG notes that the cost containment factor in the trend calculation removes the effect of past cost containment efforts, on the assumption that these effects are non-recurring and will not be repeated in the rate period. This process raises the otherwise determined net trend value. The AG distinguishes this procedure from the adjustment to the rates that the SRB proposes, based on insurers' alleged failure to employ certain cost containment techniques.

to cost containment may not accurately consider all the factors that it represents. The AG further notes that the econometric model produces an aggregate cost containment impact of 36.3, using the unemployment variable, and 42.1 percent using the GSP variable. He argues that in the *1999 Decision on Workers' Compensation Rates*, the Commissioner found a total 35 percent impact on cost containment from frequency and severity combined. The AG notes that the WCRB has performed no studies of cost containment that supports its higher estimates. He argues that its cost containment method and aggregate impact are inconsistent with the CDM, as set out in the *1999 Decision.*

The AG argues that the WCRB's payroll trend is unreasonable. He comments that the historical data show that between 1996 and 2000 employee wages in Massachusetts increased at an annual rate of 6.6 percent. In contrast, the WCRB relies on economic forecasts to predict a 2.2 percent payroll trend. The AG questions, as well, the WCRB's use of data from economy.com, noting that its filing does not explain the methods underlying economy.com forecasts or offer any evidence of the reliability of its past forecasts. He notes Ms. Mays's testimony on the difficulty of economic forecasting, and points to studies she submitted that are inconsistent with the economy.com data.

Further, the AG argues, the WCRB's predicted payroll trend is inconsistent with its projected severity (medical cost) and expense trends. He points out that the WCRB judgmentally reduces some of its trend values, but not others. Further, the AG argues, the WCRB makes inconsistent assumptions about the impact of economic factors on each separate trend. Pointing out that payroll is a measure of wages, he argues that the WCRB unreasonably assumes that economic factors reduce the wages of workers in Massachusetts, but not of insurance company workers. The AG also notes Ms. Cunniff's testimony that she expected Massachusetts wages to trend from 2001 to 2004 as they did from 1997-2000. The AG argues that the moderation in the Massachusetts wage trend in 2001 is not a reason to ignore the 1996-2000 historical data, contending that if historical experience is used to predict costs and insurance wages, it should be used to predict payroll. In addition, the AG states that the WCRB's severity trends do not consider the interaction between claim frequency and claim severity trends.

The AG opposes the SRB's recommendation of a zero percent net loss trend, arguing that it is based on judgment, rather than calculations, and that it ignores the

historical data. He comments that the graphic displays of historical loss ratios prepared by Ms. Mays show a continued steady decline, and states that she agreed that, using a loss ratio methodology, the trend for 2003 would be negative. The AG argues that the SRB's approach to making a recommendation is unreasonable, because it is based on speculation, rather than data, and relies on the possibility that the decline shown by the historical data will slow or not continue. Noting that trend looks both at the direction of change and the rate of change, the AG points out that the latter cannot be determined from graphs. The AG further criticizes the SRB's recommendation because it represents an increase in net trend, when its witness had no confidence that such an increase will occur.

The AG argues, as well, that Ms. Mays prepared graphs from inaccurate data and than, when corrected, they show a decline in medical costs from 2000 to 2001 and a lower rate of increase for indemnity costs. He asserts that the decline in the wage component of trend from 2000 to 2001, and the decline in medical costs offset each other. Because of a substantial decrease in claim frequency, the AG concludes, the net trend must therefore be negative. He argues that Ms. Mays's stated reasons for ignoring the negative trend are speculative and inconsistent with the data. In response to her suggestion that a decrease in LAE may increase or level the loss ratio, the AG challenges both assumptions underlying that rationale: that LAE ratios are actually declining and that changes in LAE correlate with and cause a change in loss ratios. He asserts that the data do not support either proposition. Similarly, the AG asserts that the data do not show any strong relationship between wage changes and loss ratio changes.

The AG argues that the SRB's recommendation inaccurately reflects loss trends because its witness did not take into account the correlation between frequency and severity. If frequency is reduced because, in a time of high unemployment, workers elect not to report low-cost claims, average claim severity will increase. Conversely, an upward change in frequency would reduce average severity. The AG argues that Ms. Mays agrees that when trend components are correlated, projecting frequency and severity separately is a questionable methodology. When that correlation is negative, the AG points out, separate projections will overstate the expected values of losses. Further, the AG notes, Ms. Mays agrees that severity and frequency should be modeled in the

same way; regressions against time should not be combined with regressions against some explanatory variable. The AG asserts that Ms. Mays's method is questionable because she separately projected frequency and severity, without calculating and adjusting for the correlation between them.

4. Discussion and Analysis

The *1987 Decision on Workers' Compensation Rates* observes that net trend has been used for workers' compensation ratemaking since 1982. Most recently, in the *1999 Workers' Compensation Rate Decision*, the Commissioner approved a methodology that analyzes changes in net costs, as measured by loss ratios, over time, and projects future values from that appropriately adjusted historical experience.[11] The AG therefore refers to that loss ratio methodology as the CDM for trend. The WCRB, this year, offers a methodology that separately trends claim frequency, claim severity, and payroll, applying to each component factors that, it argues, will affect future losses and payroll levels. As the proponent of a new methodology, the WCRB has the burden of demonstrating that it is superior to the approved methodology, and will result in reasonable rates.

We note that the WCRB has twice, in the past five years, proposed a trending model based on economic factors, notably employment levels. The *1998 Decision on Workers' Compensation Rates* did not reject so-called econometric models outright, but concluded that the positive net trend that the WCRB recommended, based on such a model, was unreasonable. The decision rejected the WCRB's use of employment level as the sole indicator of future workers' compensation loss ratios, noting the SRB's position that many social and economic factors affect the ratio of workers' compensation losses to premium. The *1999 Decision on Workers' Compensation Rates*, similarly, found that a WCRB model that again used employment level as the primary indicator of future loss ratios failed to demonstrate a reasonable causal relationship between employment and trends in loss ratios. The Commissioner therefore again rejected the trend value produced by that model, describing it as "unreasonable, excessive and unsupported by the weight of the evidence."

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[11] Adjustments recognize such factors as historic benefit level changes, law changes, and the effect of cost containment.

We are not persuaded that the WCRB's proposed methodology this year produces a reasonable trend value. The WCRB projects claim frequency from a series of multiple regressions that separately incorporate two variables: the unemployment rate and the GSP. It supports its choices with citations to studies that, it argues, support the principle that claim frequency declines during recessions and increases during periods of economic recovery. However, one principal source on which it relies, a study by Davies and Elias, is based on experience in Great Britain; the WCRB did not demonstrate that the workers' compensation system in that country and prevailing conditions there are similar to those in Massachusetts. Both the SRB and the AG point out that other studies reach directly opposite conclusions. We note Mr. Schwartz's testimony that he knew of no comprehensive accepted theory of how the economy, and changes to the economy, relate to workers' compensation losses. Therefore, we find that the WCRB has not demonstrated that the premise underlying its approach is correct. Even if the regressions that the WCRB performs show a correlation in the 1980s between unemployment rates and claim frequency, regressions performed on more recent data do not produce a similar result. In any event, the WCRB has not proved that unemployment causes changes in loss ratios.

The WCRB's second set of claim frequency regressions, which look at changes in the GSP, are similarly defective. The intervenors have shown that for recent data the use of an economic variable produces no different results. Again, the WCRB has not demonstrated a causal relationship between the GSP and frequency trend.

We also find that the WCRB relies on data sources that it has not shown to be reliable for workers' compensation ratemaking. For example, its develops its severity trend for indemnity claims by regressing claims against projections of the SAWW derived from economy.com data. We agree with the AG's and the SRB's objections to the use of data from a source whose methodologies have not been identified and whose product has not been tested for reliability. In addition to questions about the external data, we note that the WCRB's methodology also requires accurate data on claim counts. This year, it chose to use financial aggregate, rather than unit statistical plan data. The AG points out that because of differences in the data sources, the WCRB's results change significantly if its methods are applied to statistical plan data. If a methodology that relies

on claim counts is to be adopted for use in workers' compensation ratemaking, the proponent must demonstrate that its source materials are appropriate and accurate for their intended purpose. The WCRB has failed to do so.

The WCRB argues that its methodology is better because it allows an analysis of factors affecting each component of trend. Mr Schwartz does not disagree that various drivers affect those components, or that significant large scale changes in the economy could make it invalid simply to trend past loss ratios into the future. Ms. Mays considers separate trending to be reasonable and recognizes the potential effect of economic factors on workers' compensation trends. She submitted, as part of her testimony, publications addressing the possible paths for the Massachusetts economy. Consensus that economic changes could affect trend components, however, does not change a party's burden to demonstrate that a causal connection exists between its chosen variables and that its calculations properly quantify its effect. We do not find that the WCRB has met that burden. For the reasons stated above, as well as the reasons set out in earlier decisions rejecting an econometric model, we find that the WCRB's methodology is not reasonable and, if approved, would result in rates that do not meet the statutory standards.

Arguments that the Commissioner should reject net trend recommendations because they were judgmentally selected are not persuasive. It is apparent, from this proceeding and a review of prior decisions, that parties' net trend recommendations are commonly the result of judgment, generally applied to the results of quantitative analysis. All of the parties this year based their recommendations, to varying degrees, on judgment. The WCRB judgmentally reduced the indicated values produced by its regressions; Ms. Mays bases her recommendation on judgment, looking at the uncertainty of the direction of losses and payroll. The AG's recommendation this year is based on judgment; he states that his calculations would support a significantly more negative trend. Thus, we are persuaded that a net trend may be selected based on reasoned judgment. The advantages of a loss ratio methodology, as set forth by the AG, are that it does not require accurate claim counts or an analysis of individual factors that may impact payroll, claim severity or claim frequency, and avoids issues of mismatched data. By looking at loss ratios, it incorporates the historical effect over time of all factors that may affect trend components. We need not address the WCRB's argument that a loss

ratio methodology is inherently biased low; we note that the AG has selected a net trend factor which, he states, is less than what would be supported by the historical data.

Regressions against time, however, are not necessarily, by themselves, reliable for prospective ratemaking. We note both Ms. Mays's testimony questioning the significance of regressions against time as a predictor of the future, and Mr. Schwartz's testimony that time regressions might not be appropriate predictors if there is reason to believe that trends are not going to continue as they have in the past.[12] As with other quantitative approaches, loss ratio trends will vary depending on the selected time period on which the regression is performed. The value of historical loss ratio trends, calculated over any period, as predictors of the future depends on the similarity of conditions in the historical period and the rate period. Net trends in a period of strong economic growth, particularly in payroll, may not reflect conditions in a period of economic stagnation or decline.

The AG's recommendation is based on actuarial analysis that concludes that all the historical data support a continued downward net trend. Although Ms. Mays agrees that the data, if analyzed solely based on a loss ratio methodology, would support a negative trend, she also stated the essence of the SRB's position: that movements in payroll, claim frequency and claim severity have worked together to decrease loss ratios since 1992, but that continued decreases in loss ratios will require increases in payroll, continued significant decreases in frequency, a slowdown in the increase in severity, or some combination of all three. We find persuasive her assessment of the conditions that would need to prevail in the future to support a downward net trend.

It would be imprudent to limit our review of net trend to the evaluation of opposing actuarial analyses of the historical data, without giving attention to the factors that are reasonably expected to affect the future. We are not persuaded that the conditions that prevailed in the historical period of the mid- to late 1990s will be reproduced during the rate period. The precise relationship between the overall

[12] Ms. Mays testified on the approaches that the NCCI has taken to projecting loss trends, opining that it used a loss ratio methodology, at least in part, because the data were readily available. She notes, as well, that in the 1980's the results from using such a methodology matched what was happening in the marketplace. However, loss ratio projections did not work when conditions began to turn in the 1990s. At that time, the NCCI began to look at econometric modeling to explain what was going on, because time did not seem to be a good predictor.

Massachusetts economy and the workers' compensation system is not easily understood. Furthermore, even if there were agreement on the nature of that relationship, projections would still require an analysis of future economic movement, a task that this record shows to be difficult and controversial.

On this record, we are not persuaded that historical loss ratios, in a time of economic uncertainty, will accurately predict loss ratios for the rate period. No party disputes that medical costs, according to the Boston Medical Consumer Price Index, are rising. We are not persuaded that the exercise of judgment should focus on whether the data would support a finding that trend has reached a turning point.[13] We do not find it speculative to acknowledge that the period of steady growth has, at least, faltered, and that at least one sector of the economy, medical costs, has risen significantly.

We find credible Ms. Mays's testimony that no one "can say, with any reasonable degree of confidence that loss ratios will increase from 2001 to 2003. Neither do I believe that any of us can say that these ratios are highly likely to decrease." We therefore conclude, in the circumstances of this year, that the approach recommended by the SRB, a zero percent net trend, is the best option presented to produce reasonable rates. We disapprove the trend recommendations in the WCRB's filing, but would approve a filing that incorporated the SRB's trend recommendation.

C. Underwriting Profits

The underwriting profit component of rates is intended to compensate investors in the insurance business for risks associated with that investment, by provisions that are expected to ensure a fair rate of return to them. As described in the *1987 Decision on Workers' Compensation Rates*, an underwriting profit model

> "implicitly or explicitly calculates the return on investment required by an investor in an insurance company and determines the income which will be generated from invested funds. When combined with other rate elements, a profit provision should produce a premium which provides a

[13] Past workers' compensation rate decisions have referred to a directional shift from a negative to a positive net loss trend as a turning point. The WCRB characterizes its recommendation this year as reflecting a difference in the rate, but not the direction, of change. The magnitude of the positive net trend resulting from the WCRB's econometric method this year is far smaller than the trend proposed in prior rate filings. In 1999, the WCRB projected a net trend of +3.9 percent, while the SRB recommended a net trend projection of –3.6 percent. In 1998, they made similar recommendations.

> competitive return to investors but does not include in premium any costs which policyholders should not pay."

The underwriting profits provision in the rates is developed from the application of a mathematical model to data that reflects the experience of the industry as a whole.[14] This year, the WCRB recommends using an internal rate of return ("IRR") model to develop the underwriting profits provision, instead of the Myers Cohn ("M-C") model that it has utilized for some twenty years. The SRB also recommends use of an IRR model, but one that differs from the model proposed by the WCRB. The AG urges retention of the M-C model, but also offers an alternative IRR model to that recommended by the WCRB. The disputes over the underwriting profits provision relate to the choice of a profits model, the structure of an appropriate IRR model, and the particular inputs that should be used in an IRR model. As noted in the introduction to this decision, some of those disputes were resolved over the course of this proceeding.

1. The Underwriting Profits Model

a. The Parties' Arguments

i. The WCRB

The WCRB identifies insurers' cost of capital as one of the expected costs associated with the transfer of risk. To develop its underwriting profits provision, it recommends use of an IRR model developed for it by Dr. David Appel, a principal of Milliman USA, Inc., an actuarial and financial consulting firm. It argues that an IRR model is preferable because it is widely used, observing that Massachusetts is the only state that relies on the M-C model for insurance ratemaking. The WCRB points out that the National Council on Compensation Insurance ("NCCI") uses an IRR model in many states where it files rates that include an underwriting profits provision. It argues that businesses, including insurers and other regulated industries, use IRR models as a basis for internal financial decisionmaking, and that such models are widely used to determine rates of return for regulated utilities.

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[14] The "whole," for purposes of these proceedings, has no single definition. Estimates of the beta of equity, for example, rely on countrywide data for publicly traded property and casualty insurance companies; cash flow models, however, may look only at the experience of companies offering workers' compensation in Massachusetts.

the investment, while the M-C model depends on an estimate of the beta of liabilities, a process which has generated contentious debate in rate proceedings.[15] The WCRB asserts, in addition, that the results of an IRR model are easier to interpret because the output is a profit provision associated with a specific cost of capital. In contrast, it alleges, the results of the M-C model do not readily translate into allowable returns on investment, making it difficult to compare the rate of return on Massachusetts workers' compensation insurance to returns on other investments and to evaluate whether the overall rate level is reasonable. Absent an ability to make such comparisons, insurers may find it difficult to decide whether to invest their capital in Massachusetts, rather than elsewhere.

The WCRB argues that the Commissioner should approve use of an IRR model, noting that no party argues that IRR models are inherently unreasonable or that the M-C model is the only model that satisfies regulatory requirements. It asserts that the AG could not identify any aspect of Massachusetts insurance regulation that demonstrates that the M-C model is uniquely appropriate to setting an underwriting profits provision. In support of its position, it notes that the AG's witness, Professor Cohn, testified that there is noting inherently wrong in using an IRR model. The WCRB argues that the Commissioner cannot lawfully forbid use of such a model, even if she would prefer continued use of the M-C model. It specifically urges approval of the IRR model developed by Dr. Appel (the "Appel IRR").[16] The WCRB, in response to an anticipated argument from the SRB and the AG that that the proprietary nature of the model should bar such approval, points out that it shared the Appel IRR with the other parties to this proceeding subject to a confidentiality agreement.

ii. The SRB

The SRB recommends an IRR model presented by Dr. Michael Ileo, president and chief economist of Technical Associates, Inc. ("TAI"), an economic and financial

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[15] The beta of liabilities was defined, in the *Decision on 1999 Private Passenger Automobile Insurance Rates,* as the measurement of the "relationship between returns on the industry's insurance underwriting operation and returns on the market, that is, it measures how the rate of return to policyholders, measured in terms of loss, expense and tax payments made by insurers on their behalf, co-varies in relation to the rate of return on the 'market portfolio' of risky assets."

[16] In the course of this proceeding, each party has made different recommendations for an IRR model and opposed aspects of the model or inputs proposed by the other parties. To reduce confusion, the WCRB model will be designated as the Appel IRR model.

ii. The SRB

The SRB recommends an IRR model presented by Dr. Michael Ileo, president and chief economist of Technical Associates, Inc. ("TAI"), an economic and financial consulting firm. Dr. Ileo testified that the TAI model is comparable to IRR models that have been used by the NCCI. The SRB describes IRR models as a cornerstone of modern financial theory, notes that they are widely used in the insurance industry, and considers that they are particularly suited to long-tail lines such as workers' compensation which involve flows of funds over different time periods. The SRB generally shares the WCRB's opinions on the merits of an IRR model, particularly the extent to which it is relied on by regulators in other states, and the argument that IRR modeling can be meaningfully related to comparable applications in other states. Although the SRB agrees that the theory underlying IRR models is comparatively simple, it notes that the actual applications are, of necessity, intricate and complex because the cash flows associated with a real insurance transaction are complicated.

The SRB argues that although the M-C model has been used in Massachusetts for many years, historically other approaches have been taken as well. It points out that retaining a model simply because it has been in place for a long time would have prevented past changes in the underwriting profits model. It supports adoption of an IRR model to determine underwriting profits not only in this case but also, as a matter of regulatory policy, on a going-forward basis. The SRB notes the testimony of its witness, Dr. Ileo, that the IRR model appropriately balances the interests of consumers and insurers. Although the SRB points out that the overall structure of its IRR model is essentially identical to that recommended by the WCRB, it disputes some of the Appel IRR model treatments and input values, arguing that such treatments and values should neither stem from findings reached in the era of M-C, nor be selectively chosen based on past M-C applications. In its advisory filings, it recommends a number of modifications to the Appel IRR.

iii. The AG

The AG, in support of his position that the M-C model should be used to set the underwriting profits provision, offered the testimony of Professor Richard Cohn, co-developer of that model and a professor of finance at the University of Hartford. The

AG's recommendations for an IRR model were presented by Mr. Schwartz. The AG argues that the goal of insurance rate regulation should be fairness to policyholders and insurance company shareholders. He describes the M-C model as one designed for use in a regulatory setting to produce a fair premium for both policyholders and shareholders, and to reflect the standpoint of both those constituencies and the regulator. The AG asserts that it is therefore superior to the Appel IRR, which views profit and return from the shareholder's perspective, virtually ignoring policyholders. The AG argues that, in states that do not regulate insurance rates, insurers may view profit only from the shareholder's point of view, but that it is inappropriate for state regulators to ignore the policyholders' perspective. Opposing the argument that an IRR model is superior to the M-C model because it employs a cost of capital, the AG points out that the IRR model itself does not calculate the cost of capital but, like the M-C model, relies for that value on the capital asset pricing model ("CAPM"). Characterizing the M-C model as the commissioner's decision model ("CDM"), the AG argues that it has been used continuously since 1981 to determine underwriting profits, despite the availability of IRR models during that period. He asserts that virtually all issues that have arisen with respect the M-C model have been resolved in a series of decisions by the Commissioner, commenting that it is advantageous to both policyholders and insurers to have a model that the regulator has employed consistently and thoroughly reviewed over time. As further evidence of the value of consistency, he AG points to the testimony of Claudia Cunniff, an actuarial witness for the WCRB. The AG argues that consistency does not mean that methods never change, but that change should not be made unless data show that a previously used method produces an inappropriate result. He notes that the CDM has not been shown to do so.

The AG argues that the M-C model is superior to the Appel IRR because it is in the public domain. He asserts that any policyholder or insurer can therefore determine how underwriting profits are calculated. In contrast, he notes, the WCRB has agreed to keep the Appel IRR model confidential and not to disclose it to the general public. The AG asserts that the use of an undisclosed model in a public proceeding might be acceptable if no other model were either available or considered workable, conditions

that do not exist in this proceeding. Further, he argues, nothing on the records shows that an IRR model is superior in accuracy or reliability to the M-C model.

The AG argues that the burden of proof is on the WCRB to show by a preponderance of the evidence that each element of its filing is reasonable. He asserts that neither the WCRB nor the SRB have offered expert testimony to show that the Appel IRR model is superior to the M-C model, and have therefore not met the burden of showing that the CDM should be changed.

The AG recommends that the M-C model be used to determine the underwriting profit provision for workers' compensation rates. However, if the Commissioner approves use of an IRR model to establish the underwriting profits provision, the AG recommends an IRR model that differs from the Appel IRR and alternative values for inputs to the IRR and to the WCRB's methods for estimating the cost of capital.

b. Discussion and Analysis

Under c. 152, §53A, the Commissioner must determine whether the classifications and rates in the WCRB's filing are "not excessive, inadequate or unfairly discriminatory for the risks to which they respectively apply and that they fall within a range of reasonableness." Neither the statute nor regulations promulgated thereunder prescribe a particular methodology for developing rates that will satisfy the statutory standards. Prior decisions indicate that, over time, various methodologies have been utilized to set the underwriting profits provision and that proposals for change have been both approved and rejected.[17] Although the WCRB has used the M-C model to develop the underwriting profits provision in its rate filings for some twenty years, no party argues that it is therefore bound to utilize that model in perpetuity.[18] At the same time, a change to an established methodology should not be made lightly; the burden is on the proponents of change to demonstrate that the proposed methodology is superior to that in place.

We have carefully considered the parties' arguments on the choice of an underwriting profits model. We do not find the arguments put forth in support of the

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[17] See, *e.g., August 20, 1987 Decision on Workers' Compensation Rates*, at 84 *et seq., November 1979 Decision on Workers' Compensation Rates, October 1982 Decision on Workers' Compensation Rates.*

[18] The AG argues that for the past ten years the profits from Massachusetts workers' compensation insurance have proven to be consistently higher than the countrywide profits, and points out that those profits were earned with rates using the M-C model.

theoretical superiority of an IRR, by themselves, persuasive.[19] Both the M-C and IRR models have underpinnings in economic and financial theory. The use of IRR models to make business decisions is not persuasive evidence that they are therefore appropriate for use in ratemaking. The issues in financial decisionmaking for companies are not necessarily identical to the regulator's interests in ensuring that rates are fair, adequate, nondiscriminatory and fall within a range of reasonableness. However, in the context of regulatory review, IRR models developed for purposes of internal financial planning may offer useful perspectives, particularly with respect to determining recommended returns to equity owners. In addition, we note that IRR models are used in all other states in connection with workers' compensation insurance ratemaking proceedings.

For over twenty-five years now, in proceedings to approve workers' compensation rates and to fix-and-establish private passenger automobile insurance rates, determination of the underwriting profits provision has required application of a series of theoretical models. Some, like the CAPM, produce results that are then applied within the framework of the chosen profits model. We are persuaded that the IRR model is conceptually simpler than the M-C model, permits a more direct, and understanding of the relationship between insurers' financial structures and underwriting profit provisions in rates and therefore, from that point of view, is superior. At the same time, on this record, we are unpersuaded that adoption of an IRR model to determine underwriting profits will simplify the ratemaking process. The hard-fought disputes over the structure and inputs to an IRR model for use in this proceeding demonstrate that an IRR model engenders no less controversy than the M-C model. At the same time, we are aware that, initially at least, proposals to adopt any new model are unlikely to proceed without extensive debate. Therefore, the argument that, in contrast to issues related to the IRR, the inputs to the M-C model on record in this case are undisputed is not, in itself, a reasonable basis for adopting it again this year.

The AG argues that the M-C model also presents two other advantages: that it is in the public domain, and that it has been thoroughly discussed in a series of earlier rate

[19] Although the WCRB argues repeatedly that its witness, Dr. Appel, is the best qualified witness of those who testified on underwriting profits, we are not persuaded that his testimony should receive greater weight than those of the other four expert witnesses. No party challenged the qualifications of those experts. With the exception of Dr. Ileo, all have testified in prior ratemaking proceedings in Massachusetts.

decisions. Industrywide ratemaking is a public proceeding that affects all insurers offering workers' compensation insurance in Massachusetts as well as every employer in Massachusetts. It is important to utilize models that are accessible to anyone who wishes to participate in these hearings and can be understood by those who must evaluate them. Furthermore, the parties should be able to replicate the results produced from any proposed model. We would be reluctant to approve the use of any underwriting profits model that is protected from scrutiny on the grounds that it is proprietary. Nevertheless, we are not persuaded that IRR models must, of necessity, be considered proprietary. The IRR model in the WCRB's filing was, according to Dr. Appel's testimony, specifically developed for that purpose and is unique to Massachusetts workers' compensation. However, Dr. Ileo testified that IRR theory is widely used for investment decision making by both public entities and private industry, and Professor Cohn stated that IRR models, as a criterion for making financial decisions are discussed, and criticized, in finance textbooks and by finance professors. We decline to reject use of an IRR model out of hand on the ground that a particular incarnation is proprietary. Nevertheless, in a public proceeding, any person proposing a model must be prepared to disclose it fully to all parties for review and evaluation. *See, 1987 Decision on Workers' Compensation Rates*, 10-13. We note, as well, that pursuant to 211 CMR 110.04 (2), which sets out the requirements for workers' compensation rate filings, the filing party must include "all material, including all data, statistics, schedules and exhibits, which [it] wishes to be considered at the hearing and all information upon which its recommendations are based."

In support of his argument that the M-C model is superior to an IRR because it has been extensively discussed in earlier years, the AG cites to a number of prior rate decisions addressing aspects of the M-C model. He refers to the conclusions in those decisions as the CDM. However, we note that many of those decisions relate to the fixing-and-establishing of private passenger automobile insurance rates. The *1999 Decision on Workers' Compensation Rates* cautioned against automatically adopting findings made in the private passenger rate decisions in proceedings to approve workers' compensation rates. We are not persuaded that past approval of a particular methodology for use in private passenger automobile insurance rate decisions is evidence that it should

be adopted in this proceeding. Our review of past decisions on workers' compensation rate filings shows them to be of limited value in addressing the choice of an underwriting profits model. The principle that a profits model should examine cash flows and should recognize insurers' investment yields, enunciated by then Commissioner James Stone in the *May 1975 Decision on Workers' Compensation Rates,* has remained, in the relatively few decisions that discuss underwriting profits, the cornerstone for profits models. Both IRR and M-C models satisfy those criteria.

The oft-cited decision in *Federal Power Commission v. Hope Natural Gas Co.*, 320 U.S. 591 (1944) establishes two important points: 1) that the fixing of just and reasonable rates involves a balancing of investor and consumer interests; and 2) that the return to the equity owner should be commensurate with returns on investments in other enterprises having corresponding risks and sufficient to assure confidence in the financial integrity of the enterprise, so that it maintains its credit and attracts capital. We are guided by the principle enunciated in the *1987 Decision on Workers' Compensation Rates,* that "a profit provision should produce a premium which provides a competitive return to investors but does not include in premium any costs which policyholders should not pay." We conclude, therefore, that any underwriting profits model must be evaluated to ensure that it reflects fairness to policyholders. While the AG argues that the M-C model was specifically developed to consider the interests of policyholders, insurers and investors, he does not assert that no other model could satisfy those interests. Professor Cohn testified that an IRR model that properly takes into account the time value of money and appropriately allocates the risk of the insurance transaction to the various parties to it could produce an underwriting profits result that is similar to the result developed from the M-C model. On this record, we are not persuaded that an IRR model is inherently incapable of producing a reasonable underwriting profits provision or that the use of it by a rate filer would render proposed rates unreasonable. We find its use in other states compelling evidence that an IRR model is appropriate for workers' compensation ratemaking; no party argues that it has consistently, in other states, produced rates that would not comply with Massachusetts statutory standards.

As a model for determining underwriting profits, we are presented in this proceeding with a choice between the M-C model and some formulation of an IRR

model.[20] Each party sponsors an IRR model that incorporates different structural components and recommends different input values. The AG argues that the burden on the WCRB is to demonstrate that each element of its filing is reasonable, and that it must demonstrate the superiority of any proposed methodological change. We concur that any party proffering an underwriting profits model must persuade the decisionmaker that the model, if adopted, represents a reasonable approach to estimating underwriting profits and will result in rates that meet the statutory standards. Demonstrating superiority of a new methodology to a current methodology, when either is capable of producing a reasonable result, presents more subtle and elusive issues.

Massachusetts has, for the past two decades, approved rates that use a unique model to develop the underwriting profits provision in those rates. According to the AG, over the past ten years those rates have resulted in operating profits for Massachusetts workers' compensation insurers that are higher than the countrywide average operating profits. The WCRB does not argue that change is necessary because the underwriting profits provision produced by the M-C model results in inadequate rates. No person has presented any historical data that would permit a comparison among the M-C model and various IRR model formulations as accurate predictors of actual underwriting profits. In any event, the choice of an underwriting profits model should not be based on its anticipated effect, upward or downward, on the underwriting profits provision.

Nevertheless, absent evidence that no other model could balance the interests of the participants in the workers' compensation insurance transaction, we are not persuaded that retention of the unique M-C model is necessary to protect Massachusetts consumers. We find that a properly implemented IRR model has the capacity to produce an underwriting profits provision for workers' compensation rates that will result in rates that fall within a range of reasonableness. Our view of what constitutes rates which fall within a range of reasonableness has not changed, but remains consistent with that enunciated in past decisions on workers' compensation insurance rates.

For the following reasons, we conclude that use of an IRR model for the underwriting profits provision will be superior to the M-C model. Each of the United

[20] Although the IRR and M-C models are both classified as discounted cash flow, or DCF, models, they treat cash flows differently. As described by Dr. Appel, the IRR calculates a rate of return that is embodied in the cash flows, while the M-C model is a net present value method for evaluating cash flows.

States retains jurisdiction and oversight of its workers' compensation insurance. The NCCI, which files rates on behalf of insurers in many states other than Massachusetts, uses an IRR model to develop underwriting profit provisions in those states where profits are part of the rate filing. We are not persuaded that the issues relating to evaluating a profits provision are so different in Massachusetts that it must keep a unique system in place. Even though the WCRB is independent of the NCCI, some aspects of the NCCI's rating systems, such as the experience modification rating plan, are incorporated into the Massachusetts system.

We are persuaded that it is beneficial, particularly for a line of insurance which routinely operates in multiple jurisdictions, to have in place ratemaking procedures that are, to the extent possible, similar from state to state.[21] Viewing the IRR in the context of ratemaking for a line of coverage where insurers and a significant percentage of policyholders operate on multi-state bases, we are persuaded that its use in Massachusetts will facilitate overall understanding of the ratemaking process and simplify process of developing rate recommendations. Use of an IRR model in Massachusetts may permit insurers more easily to make comparisons between the profitability provisions in Massachusetts rates and those in place in other states; it may therefore help encourage entry into the market. For all these reasons, we find that use of an IRR model in Massachusetts is superior to continued use of the M-C model.

However, a finding that an IRR model is superior to the M-C model and can produce a reasonable underwriting profits provision is not equivalent to a finding that the Appel IRR proposed by the WCRB would result in rates that fall within a range of reasonableness. History informs us that in rate proceedings, disputes often focus as much on the structure of the model and the values to be inserted into a particular model as on the model itself. That is certainly the case this year. For the reasons set forth below, we find that rates incorporating an underwriting profit provision developed from the Appel IRR model, as proposed by the WCRB, would not fall within a range of reasonableness. We therefore disapprove the underwriting profits provisions of its filing. The disputed individual components of the filing and the IRR model will be addressed below.

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[21] However, because of differences in state laws relating to workers' compensation and the regulation of insurance rates, ratemaking procedures are unlikely to be identical. We note, as well, Dr. Appel's testimony that IRR models may be developed for specific purposes.

2. Inputs to the Underwriting Profits Model

An underwriting profits provision developed through an IRR is based on the premise that insurers should receive a fair rate of return for entering into the insurance transaction. One of the expenses associated with that transaction is the cost of capital committed to the insurance business. However, in addition to incurring costs related to capital, insurers receive investment income. Implementation of an IRR model is a two-step process that begins with an estimate of the fair and reasonable rate of return, or cost of capital, to insurers, and then establishes a profit provision that will produce that fair return. Once the target cost of capital is estimated, the IRR model analyses discounted cash flows to determine what profit factor is necessary to achieve that already determined fair rate of return.

In the course of this proceeding, the WCRB modified its initially filed Appel IRR to reflect criticisms made by the intervenors. On June 12, it filed revisions that incorporated three changes: 1) commission payout cash flows are matched to premium cash flows; 2) loss and expense flows used in the profit model are matched to the provisions for losses and expenses in the rates; and 3) use of the most recently published Internal Revenue Service discount factors that insurers must use to discount loss and loss adjustment expense reserves for federal income tax purposes to compute the underwriting profit provision. Among the aspects of the Appel IRR that remain contested are: 1) the cost of capital and investment yields; 2) the appropriate method for allocating surplus; and 3) the treatment of policyholder dividends. These will be addressed in turn.

3. The Cost of Capital and Investment Yields

a. The Cost of Capital

i. The Parties' Recommendations

The Appel IRR estimates the fair rate of return, or cost of capital, at 10.32 percent. It reaches this result by averaging the results of applying two methods, a DCF model and the Capital Asset Pricing Model ("CAPM") to market data for a sample of 26 insurance companies included in the Value Line Investment Survey Property/Casualty insurance group. Dr. Appel interpreted his results as an estimate of the fair rate of return for the average risk activity in which property/casualty insurers engage. Although his testimony identified a number of factors that he considered might demonstrate that

workers' compensation line of insurance is of above-average risk, he stated that he did not adjust his estimate to reflect any higher risk.

The DCF method that Dr. Appel employs estimated the cost of capital as the sum of the estimated dividend yields for the Value Line sample in the next twelve months and the dividend growth rate for that sample in the past decade. He bases his results on the Value Line Investment Survey dated December 27, 2002, estimating a dividend yield of 1.37 percent and a dividend growth rate of 8.73 percent, for an overall cost of capital of 10.10 percent. The dividend per share growth rate component of this estimate averages three data points: the Value Line Survey values for 10-year and 5-year rates of change, and its forecast for 2000 through 2006. The AG criticizes the use of a DCF method to estimate the cost of capital estimate, noting that it assumes that the growth rate will continue in perpetuity, a prospect which Professor Cohn finds unlikely. Using a similar approach and, with one exception, the same Value Line sample, but relying on the survey publication dated March 28, 2003, the AG averages the historical 10-year growth rate and the Value Line forecast growth rate and estimates a dividend growth rate at 6.23 percent. Adding the estimated dividend yield of 2.0 percent to that value results in a cost of capital of 8.23 percent. However, the AG considers that value to be somewhat low and does not does not rely on it in estimating his cost of capital.

The CAPM estimates the cost of capital as the sum of the risk-free rate plus the value derived from multiplying the average equity beta coefficient of the Value Line sample by the difference between the market risk premium and the risk-free rate. Dr. Appel separately calculated the cost of capital for three different risk-free yields, short-term, intermediate term and long-term United States Treasury bills. His 10.53 percent CAPM cost of capital is the average of those three calculations. Dr. Appel's estimate of the beta coefficient is the average published by Value Line in December 2002. His value for the market risk premium is the average of the full series of market risk premia for the years 1926 through 2002, as published by Ibbotson Associates.

The AG asserts that there is no general agreement in the finance profession on implementation of the CAPM approach to estimating the cost of capital. He comments that Dr. Appel's use of three different methods, equally weighted, reflects uncertainty as to what risk-free rate should be employed, and considers that uncertainty a reason to

reject an IRR model that requires estimation of the target cost of capital. Following Dr. Appel's methodology, but calculating risk-free yields based on data for the first quarter of 2003, rather than the fourth quarter of 2002, and using a value for the beta of equity that averages estimates from three different financial sources, and a calculated value for the market risk premium that places greater weights on more recent years in the Ibbotson series, the AG derives an estimated CAPM cost of capital of 8.18 percent. Again, he does not rely on that result in estimating the cost of capital, but judgmentally selects 8.5 percent as a reasonable value.

The SRB witness, Dr. Ileo, did not conduct an independent study of the cost of equity, but opined that, in current financial markets, Dr. Appel's 10.32 percent cost of capital appeared to be within a zone of reasonableness. Acknowledging that TAI had estimated a higher cost of capital in a 2002 Virginia rate proceeding, Dr. Ileo testified that, given current economic conditions, he did not find it unusual for the cost of capital to be less at this time.

Both the AG and the SRB argued that the cost of capital, however calculated, should not be used as the target rate of return in an IRR model, because it does not reflect that workers' compensation insurers employ debt as well as equity in financing. Consequently, they assert, the target rate of return must be adjusted to account for the effect of debt financing. Professor Cohn estimates that insurance holding companies use 15 percent debt financing, and then uses a weighted average methodology to revise the otherwise calculated cost of capital to reflect the capital structure of insurance holding companies. That adjustment revises his 8.5 percent value for the cost of capital downward to 7.8 percent; as applied to Dr. Appel's 10.3 value, it lowers his cost of capital estimate to 9.3 percent. Dr. Ileo, using the same debt financing ratio of 15 percent, and a cost of debt based on the long-term debt of the 26 Value Line Insurers, derives an adjusted cost of capital of 9.86 percent. He testified that using the average capital structure of the Value Line sample as a basis for the debt financing calculation would reduce that cost of capital.

b. Investment Yields

The WCRB's underwriting profits provision incorporates an investment yield, net of investment expenses, of 5.10 percent. Dr. Appel testified that he utilized a value

provided by the WCRB that is based on a long-standing methodology, developed for use in Massachusetts, that estimates the expected investment yield by averaging observed yields for a variety of investments over the past year. He commented that this differs from his preferred methodology, which would average yields over the past three months, on the premise that current yields are the best predictor of future yields. The SRB, in its initial advisory filing, adopted the WCRB's 5.10 percent estimate of investment yield. The AG recommends a prospective investment rate of return on assets, net of investment expense, of 4.6 percent; the difference between his estimate and the WCRB's results from Professor Cohn's lower estimate of the pre-tax return on stocks and miscellaneous assets.

c. Updated Recommendations

Subsequent to their initial filings, the SRB and the WCRB were requested to provide updated information on the cost of capital and investment yields. On June 10, the WCRB filed a memorandum from Dr. Appel which he described as an attempt to replicate and update cost of capital calculations that Dr. Ileo's partner in TAI, David Parcell, had performed in connection with an October 2002 hearing on workers' compensation rates in Virginia. Dr. Appel testified that the WCRB did not provide him with an updated asset return calculated on the same basis as the asset returns in its initial filing, and that he did not update the WCRB's work. He stated that calculations he had performed independently resulted in a yield rate that was similar to the result of his update of TAI's Virginia filing. Based on his application of that methodology, Dr. Appel concluded that the weighted average cost of capital was currently 10.77 percent and the investment yield rate was 4.62 percent.

On June 19, the SRB filed a report from TAI that criticized Dr. Appel's June 10 report as "inappropriate," because it transferred an approach to ratemaking developed specifically for Virginia to a proceeding in Massachusetts, with no showing that the characteristics of the regulated market were similar or that the regulatory framework and objectives are the same in both jurisdictions. TAI also calculated capital costs and investment yields based on an update of information in the underwriting profits provision of the WCRB filing, determined the variances to those updated results that would account for methodologies that TAI would have employed had it been initially requested to

provide a cost of capital analysis, and computed the resulting underwriting profits provision. TAI concludes in its report that retaining Dr. Appel's averaging of DCF and CAPM estimates of the cost of capital, using data from the March 2003 Value Line Investment Survey and March-May 2003 data for risk-free rates, would produce an unweighted cost of capital of 10.18 percent. Applying the 85/15 percent split between equity and debt financing, TAI revises its estimated weighted average cost of capital to 9.74 percent. TAI also submitted a revised calculation of the WCRB's portfolio rate of return, using more recent data, that resulted in an investment yield value of 4.73 percent. Dr. Ileo testified that he followed the WCRB's methodology, but was unable to replicate its methodology for determining asset yields on bonds. The TAI report accepted the appropriateness of the Value Line sample used in this proceeding by Dr. Appel and Professor Cohn, but questioned the applicability of the Value Line sample to workers' compensation insurance in Massachusetts. Dr. Ileo testified that TAI typically examines, by companies and insurer groups, the levels and trends in market shares in a state, and uses the results of those studies to guide it on the set of insurers to be utilized on a consistent basis as a representative sample for capital cost, investment yield, and other IRR model inputs. Its report refers to a relationship between regulatory objectives in any given jurisdiction and the choice of a framework for determining the cost of capital and investment yields. However, TAI did not recommend use of an alternative sample of insurers to estimate the cost of capital or investment yield in this proceeding. Based on the values in the TAI report, the SRB, in its surrebuttal filing, recommends an investment yield of 4.73 percent and a weighted average cost of capital of 9.74 percent.

ii. The Parties' Arguments

The WCRB argues that its original 10.32 percent estimate of the cost of capital was reasonable, and was considered by the SRB's witness to be "likely to be within a zone of reasonableness." It further noted that the SRB had adopted its 5.10 percent estimate of investment yield. The WCRB objects to the AG's 7.8 percent estimate of the cost of capital, stating that he presented no evidence that any regulator had ever set so low a target rate of return in comparable circumstances, and noting that the 7.8 percent value is lower than the cost of equity allowed to public utilities, which are perceived as less risky than property/casualty insurance. The WCRB further argues that the SRB's

witness, estimating the CAPM cost of capital from Professor Cohn's chosen values for the beta of equity and the market risk premium, found the result to be too low.

Arguing that the parties agree that the cost of capital and the investment yield should be updated on a consistent basis to a common point in time, the WCRB considers that the appropriate cost of capital is the 10.77 percent that Dr. Appel derived by updating values in the underwriting profits model that TAI used in Virginia in the fall of 2002. The WCRB argues that the cost of capital does not vary from state to state, and that TAI's methodologies for estimating the cost of capital are not so state-specific that the results of applying those methodologies in one jurisdiction cannot be used in another state. It asserts that the adjustments to the composition of the Value Line survey samples that TAI has made exclude companies from the survey for reasons that are not state-specific.

Further, the WCRB argues that the investment yield calculated by Dr. Appel following TAI's Virginia filing, 4.62 percent, is close to that calculated by Professor Cohn. It asserts, as well, that its estimates of bond yields correctly reflect the mix of bonds in insurers' portfolios and that the use of bond yields that are based solely on long-term maturities would overstate asset returns.

The SRB argues that the updates that TAI performed of the WCRB's cost of capital analyses produce an appropriate estimate of the unweighted and weighted cost of capital. It objects to the use of the estimates produced by Dr. Appel in his June 10 memorandum, arguing that his attempt to replicate TAI's work in Virginia was not appropriate for use in Massachusetts. The SRB argues that the regulatory frameworks in Massachusetts and Virginia are fundamentally different. It notes that even if the cost of capital is not, by nature, a state-specific value, the methods of estimating it may vary. The SRB characterizes the Virginia method as "quite unique," arguing that, given the specific methodology that Virginia has adopted, it would be inappropriate to adopt it in Massachusetts.

The SRB points out that Dr. Appel subsequently testified that he would accept in this proceeding the original 10.32 percent cost of capital proposed in the WCRB filing, and further stated that the SRB's updated cost of capital was not meaningfully different from his own updates.

The AG argues that Dr. Ileo's investment yield calculations in his June 19 memorandum are speculative and unsupported, and understate asset returns. He points out that Dr. Ileo could not replicate the WCRB's methodology because he did not know the sources of the numbers in the WCRB filing. The AG states that the asset yields for bonds in the WCRB filing are lower than those in the Mergent Bond Survey, and questions why Dr. Ileo did not simply use the most recent values from the standard sources in his updating of the WCRB filing.

iii. Discussion and Analysis

In an era of economic uncertainty, determining whether a cost of capital falls within a range of reasonableness is particularly challenging. We are mindful of the limitations of both the DCF and CAPM methodologies, as well as the problems associated with the choice of inputs for any model. In addition, the problems associated with any methodology are compounded by the convoluted recent history of the financial markets. We have considered the evidence on this record and reached the following conclusions.

First, we approve, as a starting point for estimating the cost of capital, a method that averages the results of a DCF and a CAPM methodology. We further approve the methodology utilized by the WCRB that averages CAPM cost of capital from three different risk-free yields. We are not persuaded that the parameters for the equity beta and the market risk premium utilized by the WCRB this year produce a CAPM estimate of the cost of capital that falls outside a range of reasonableness, and will therefore approve use of those values.

At the same time, we are not persuaded that the WCRB's chosen methodologies for estimating the equity beta and the market risk premium represent the preferred approaches to determining those values. For the equity beta, the AG urges the use of a methodology that averages estimates from three different financial reporting services, Value Line, Yahoo! and Standard and Poors. That methodology was approved for use in private passenger automobile insurance ratesetting in the *Decision on 1999 Automobile Insurance Rates.* The AG also supports adoption of the formula used in that decision to estimate the market risk premium.

The CAPM is a financial model that is independent of both the M-C and IRR models. Therefore, it is reasonable to conclude that principles enunciated for developing inputs to the CAPM may be equally applicable whatever the line of insurance or the chosen underwriting profits provision model. We do not equate a CDM developed for private passenger automobile ratesetting to a CDM for workers' compensation ratemaking. It may be, however, that the reasoning on a matter that is common to both proceedings, such as the CAPM, could ordinarily apply equally to both. This year, however, the AG does not recommend adoption of the results of applying the multi-source averaging methodology for the equity beta and the weighted market risk premium in the CAPM formula. His witness selected a value that was higher than that result, commenting that under current economic policy relating to interest rates it produced an unduly low measure of the prospective cost of equity capital for property casualty insurers.[22] We note, as well, Dr. Ileo's testimony that TAI, in its work, sometimes uses betas from published sources other than Value Line. We conclude that the procedure for selecting these values is subject to reevaluation in future rate filings. Furthermore, Dr. Ileo testified that TAI, while it relies on the Value Line sample of insurers, adjusts that sample depending on the jurisdiction. No party suggests making any significant changes to the composition of the sample this year, and the record does not offer information on the extent to which the NCCI, in implementing IRR models, relies on the Value Line sample.[23]

Similarly, we find that Professor Cohn's comment on the problem inherent in the DCF of estimating a perpetual growth for future dividends is well-taken. However, his estimate again results in a cost of capital that he considers to underestimate the prospective cost of equity capital. The difference between his methodology and that of

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[22] We take note of Professor Cohn's comment that the Value Line survey evaluates betas for companies on the New York Stock Exchange Composite Index, while Standard & Poors and Yahoo! base their estimates on the Standard & Poors 500. That is also the database that Ibbotson Associates uses to calculate market risk premia. The use of an averaging methodology to offset potential upward bias in a single data source has been discussed in the context of private passenger automobile ratesetting. The reasons for differences in the values to be averaged have also been considered. We note that the spread between the Value Line beta and the Yahoo! and Standard and Poors betas, shown on Exhibit 3, page 2 to Professor Cohn's testimony in the AG's initial advisory filing, is far greater than the spread in those values as reported in the *Decision on 2001 Automobile Insurance Rates*, 99 and in the *Decision on 1999 Automobile Insurance Rates*, 93. The precise reasons for the increased differences were not explained on the record.

[23] Professor Cohn eliminated one company that he describes as a mortgage company, not an insurer.

the WCRB appears to be, in part, that the latter averages three values, separate rates of change in earnings growth rates for the past ten years and for the past five years, with a forecast for years 2000 through 2006. Professor Cohn averages a single historical ten-year dividend growth rate with the forecasted dividend growth rates. The parties do not address the theoretical reasons underlying either approach.

We conclude, as well, that the WCRB's methodology for estimating investment yields will produce rates that fall within a range of reasonableness, and therefore approve its use. Neither the SRB nor the AG objects to the WCRB's overall approach; differences between the parties' recommended values result from changes in input values, which we address below.

Both the WCRB and the SRB submitted responses to the Commissioner's May 30 request to provide a current estimate of the cost of capital. TAI's June 19 report, filed by the SRB, in general, followed the WCRB's methodology for determining the cost of capital, but inserted more recent Value Line data and more current values for United States treasury bill rates. The insertion of those updated values reduced both the DCF and the CAPM estimates which, when averaged, produced an unweighted cost of capital of 10.18 percent. The WCRB did not revise its own filing to incorporate more recent data, but instead submitted a memorandum that purported to replicate and update a cost of capital and investment yield methodology that TAI had employed in an October 2002 Virginia workers' compensation rate hearing. Its analysis resulted in an unweighted cost of capital of 11.05 percent.

We find that it is not unreasonable, in a rate hearing, to update inputs to a cost of capital model to reflect current conditions in financial markets. Market conditions, however, are a moving target and as a practical matter, for ratemaking purposes the cost of capital and other values will always be determined as of a particular point. On this record, we approve updating the inputs to the WCRB's DCF and CAPM cost of capital models to reflect data from the Value Line survey dated March 28, 2003 and the returns on treasury bills for the period ending in May 2003, producing an unweighted cost of capital of 10.18 percent. We approve, as well, the 4.73 percent updated value for investment yields that TAI submitted in its June 19 memorandum. Even though TAI was unable to replicate the WCRB's formula for bond yields, we are not persuaded that its

results are unreasonable. Substituting increased yields for long-term bonds would improve investment yields, but would not fairly represent the distribution of bonds in insurer asset portfolios.

Because we are disapproving some components of the WCRB's filing, we recognize that, at the time of a revised filing, even more recent data may be available. On balance, in the interest of certainty, if a revised filing is received within a reasonable time period, we would not find it appropriate to update those values again. However, in the future, the parties should consider whether alternative approaches to estimating the cost of capital might produce results that reasonably reflect anticipated fluctuations over time.

We are not persuaded that it is reasonable to substitute, for the cost of capital estimated using the DCF and CAPM methodologies in the WCRB's initial filing, the WCRB's proposed update based on its interpretation of methodologies used by TAI in Virginia. First, TAI vigorously denies the accuracy of Dr. Appel's description of his undertaking as an attempt to replicate TAI's work in Virginia. Assuming, *arguendo,* that TAI's Virginia methodology might present an alternative model for an underwriting profits provision, the WCRB has not met the burden of demonstrating that the methodology is superior to what it has already recommended in this proceeding.

Even though the cost of capital for insurers is not, in concept, inherently state-specific, we are not persuaded that Virginia's system for workers' compensation ratemaking is comparable to that in place in Massachusetts. We note Dr. Ileo's testimony on the differences between the two states including, but not limited to, limitation of the ratemaking proceeding to the involuntary market, the number of servicing carriers in that market, and the set of agreed upon parameters developed with the Commonwealth of Virginia. As the AG argues, profit provisions in states will vary because loss payment and loss development patterns vary from state to state. We note, as well, testimony that TAI, rather than use the entire Value Line sample, in Virginia and in other states, has made adjustments to the data based on a series of criteria. No party to this proceeding has presented a principled basis for adjusting the Value Line sample for use in Massachusetts, and we will not approve doing so this year. Although TAI's June 19 report also offered a range of estimates of the cost of capital that utilized some methodologies that it might have applied if it had been asked, in the preparation of the

SRB's initial filing, to perform a cost of capital analysis, Dr. Ileo did not recommend adoption of any of those methodologies in Massachusetts.[24] Dr. Appel's testimony acknowledging the variety of IRR models that Milliman has developed, and that others have developed, further supports our conclusion that any proposal to adopt a model used in another state must be approached cautiously, and that the proponent must demonstrate a match between the underlying goals, principles and theories in the two jurisdictions.

4. ***Weighting the Cost of Capital to Reflect Debt Structure***

Both the AG and the SRB argue that the WCRB's cost of capital estimate should not be used in the IRR because it does not consider the effect of the division between debt and equity financing in the capital structure of insurance holding companies. The WCRB took the position, in its initial filing, that the target rate of return used in the IRR model should not consider that division because, according to Dr. Appel, insurers typically do not issue debt at the operating company level, and therefore, unlike public utilities, do not consider debt in determining the overall cost of capital. The AG disputes that statement; Professor Cohn testified that in his experience insurers do use weighted averages to calculate the cost of capital. The AG argues that a weighted average methodology should be used because the cost of capital is calculated from data on publicly traded stock companies, entities that operate at a holding company level.[25] He points out that equity betas, dividend yields and growth rates, all used in estimating the cost of capital, are calculated from holding company data. The AG argues, as well, that the decisions on private passenger automobile insurance rates have adopted this approach.

We agree that estimates of the cost of capital should reflect debt/equity financing at the holding company level. The reasoning underlying adoption of that approach in decisions on private passenger automobile insurance rates is equally applicable here. The parties, however, do not agree on the inputs to the weighting formula. Both Professor Cohn and Dr. Ileo employ a formula that estimates debt at 15 percent and equity as 85 percent of holding company debt. However, Dr. Ileo notes that this formula relates only to long-term debt, and that using the average capital structure, which shows a higher

[24] One such methodology consisted of excluding data on some companies in the Value Line sample.
[25] The AG notes, and Dr. Ileo concurs, that insurance companies are generally not publicly traded.

percentage of debt, would reduce the fair rate of return. Professor Cohn estimates the pre-tax cost of debt at 6.00 percent, which he then adjusts for taxes. Dr. Ileo estimates the pre-tax cost of debt at 7.25 percent, again using long-term debt only, and noting that incorporating short-term debt costs and preferred equity costs into the analysis would change the result. At the request of the WCRB, Dr. Appel calculated a weighted average cost of capital using the methodology followed by TAI in the SRB's initial advisory filing.

To the extent that the cost of capital estimates in the WCRB's filing fail to recognize the capital structure of insurance holding companies, we disapprove that filing. We would approve a cost of capital estimate that adopts a weighted average methodology. We are persuaded that the appropriate inputs to that formula should reflect a weighted average of debt returns, rather than be limited to the cost of long-term debt. We find that weighting the cost of capital by a ratio of 15 percent debt and 85 percent equity, as agreed upon by Professor Cohn and Dr. Ileo, and at an average cost of long-term of 7.25 percent annually, will produce reasonable rates.[26] Although there is agreement on this formula this year, in light of evidence in the record that it may understate the extent of debt in insurers' capital structures, it is subject to reassessment in the future.

5. Surplus Allocation Methodology

The underwriting profits model incorporates a procedure for allocating surplus to the workers' compensation insurance transaction. Surplus represents funds that insurers may need, in addition to loss reserves, to protect policyholders against unforeseen contingencies; surplus funds are therefore available for investment. For ratemaking purposes, surplus is allocated as a ratio of either premium or reserves. The parties to this proceeding disagree on the methodology and the inputs that should be used to allocate surplus in the underwriting profits provision.

a. The Parties' Arguments

The WCRB, relying on Dr. Appel's testimony that there is no generally agreed upon approach to allocating surplus to line of business or state, argues that either a

[26] We note that in the WCRB rebuttal filing Dr. Appel, at the request of the WCRB, weighted the cost of capital utilizing Dr. Ileo's methodology.

premium to surplus or a reserve to surplus method is acceptable, and that neither is inherently unreasonable. It asserts that the Commissioner must approve the method chosen by the WCRB, if that method is reasonable. In its filing, the WCRB displays three alternative methods for calculating surplus, but recommends a premium to surplus methodology, at a 2 to 1 ratio. Dr. Appel's methodology adjusts the premium to surplus ratio for expenses and applies a factor to accelerate surplus takedown. In support of its selection, the WCRB argues that Dr. Appel was the most knowledgeable witness on profits issues, and that no other witness showed that the allocation method or amount of surplus allocated to workers' compensation was unreasonable. Further, the WCRB argues, the premium to surplus methodology has always been used in the M-C model, and that the choice of a different model does not require a different assumption about surplus allocation. As additional support for its position, the WCRB asserts that the National Association of Insurance Commissioners ("NAIC") allocates surplus across lines based on the sum of total reserves and earned premium, a method that implies a premium to surplus ratio that is close to the assumption in the Appel IRR. It notes that this is the method used in financial reporting on insurance expense exhibits and the NAIC report of profitability by state by line.

The SRB establishes surplus requirements as the ratio of loss and LAE reserves to surplus. Its recommended surplus ratio, 2.01, is a five-year average of data reported in A.M. Best's *Aggregates and Averages* on the average countrywide experience of commercial casualty predominating insurers over the most recently available past five years. Its witness, Dr. Ileo testified that the reported countrywide experience is representative of workers' compensation insurers in Massachusetts.

The SRB opposes Dr. Appel's proposal for measuring surplus in relationship to premium, commenting that he uses a reserve to surplus ratio in IRR modeling in other states, and that the NCCI, throughout the country, uses reserve to surplus ratios in its IRR models. It notes, as well, that reserve to surplus ratios are far more frequently used in solvency studies than premium to surplus ratios. Responding to the WCRB's position that the premium to surplus measure is a traditional approach, the SRB points out that it has been utilized only in connection with the M-C model, and that it is therefore not necessarily consistent with an IRR model. The SRB criticizes the WCRB's inclusion in

its filing of a factor to accelerate surplus takedown, commenting that such a provision is incorrect, absent evidence that unforeseen events are more likely to occur during the early states of an insurer's claims obligations. It points out that the WCRB offered no evidence showing that to be the case.

The SRB argues that, in the context of an IRR model, the WCRB's proposed premium to surplus ratio is incorrect for two reasons. First, it claims that the Appel IRR model generates a pattern of policyholder protections beyond loss and LAE reserves that poses ever increasing risks that the funds needed to meet future claims may not be available. The SRB argues that the ratio of loss and LAE reserves to surplus in the Appel IRR approach shows widely varying degrees of solvency protection above reserves over time, ranging from very high levels in the early periods to exceptionally low in later years. It notes that the dwindling amount of policyholder protection over time means that at the later stages of the insurance transaction, when claims for occupational diseases might arise, there is little surplus available to meet unforeseen contingencies. In contrast, the SRB argues, its method provides a constant level of policyholder protection against insolvency over time that equate to a nearly 50 percent contingency beyond reserves at all time intervals.

Second, the SRB argues, the surplus contributions produced by the Appel IRR defy economic and financial logic, unless viewed as an opportunity to earn extraordinary profits on those contributions. It questions why an insurer would commit so much cash to surplus during the early stages of the insurance transaction, the time when underwriting cash flow is at its largest. Dr. Ileo posits that this would occur only if insurers expected that earnings from workers' compensation insurance would be greater than earnings from alternative investments in comparable risks. The SRB asserts that the surplus provision in the Appel IRR fulfills this expectation.

The AG establishes surplus requirements as a ratio of loss and unearned premium reserves to surplus, characterizing this approach as the standard NCCI method, and noting that Dr. Appel has used this method in other jurisdictions. The AG argues that, in the M-C model, the method of allocating surplus has little or no effect but that, in the Appel IRR, it significantly affects the profit provision. Asserting that rates should be set on the presumption that tapping the surplus will not be required, the AG takes the

position that the allocation of surplus should have no material effect on the rate, because that rate is premised on losses incurred at the anticipated level and investment income earned at the expected level.

The AG argues that, even though the WCRB characterizes a two to one premium to surplus allocation method as a continuation of prior Massachusetts practice, surplus in the Appel IRR is not used in the same way as it is in the M-C model. He states that the M-C model begins with a normative premium to surplus ratio because it assumes that investors will supply no further surplus. In contrast, the Appel IRR selects that value but also requires investors to supply additional surplus at later points. The AG points out that in the real world investors do not supply additional funds, and that there is no need for them to do so.

Further criticizing the Appel IRR model, the AG asserts that it makes an accounting assumption that allocates the total losses paid over 65 years and to the first two years of the policy. He states that it is not a "cash in cash out" model that reflects real world cash flows, and that it posits a need for surplus that is based on that accounting assumption, not on the need for surplus to cover loss payments. The AG argues that, if additional surplus is assumed to be supplied each quarter, the two to one premium to surplus ratio in the Appel IRR provides too much surplus and is therefore unreasonable. The AG argues that a "normative" value is not reasonable in an IRR model that is intended to accurately estimate the final return to investors by modeling cash flows. He points out that his recommendation for a reserve to premium ratio is based on actual data.

The AG asserts that, in any event, on a calendar year basis, the Appel IRR model assumes a premium to surplus ration of one-half to one, not the "normative" regulatory rate of two to one. That ratio would require a dollar in surplus for every $0.50 of premium, and thus assumes four times more surplus to support the premium as the normative value. The AG argues that the excessive provision for surplus in the IRR creates a substantial increase in the profit provision, because it is assumed that the surplus is obtained from shareholders, who then receive the cost of capital for making that investment.[27]

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[27] Further, the AG comments, the reward which stockholder would be receive, at a 10.3 percent cost of capital, is high when the short term borrowing costs are around 1 percent.

In response to the WCRB's argument that a two to one premium to surplus ratio is similar to the NAIC value adopted for regulatory purposes, the AG argues that the rules for regulatory accounting are different. He comments that the NAIC, when it considers the premium to surplus ratio, only assigns a surplus need to the premium for the current year, not for premium from prior years. In contrast, the AG argues, the Appel IRR assumes that surplus is needed for premiums written not just in the current year but for premiums written long ago. Consequently, the numerical value of the premium to surplus ratio in the Appel IRR cannot be directly compared to the value used for regulatory purposes.

Although the SRB and the AG both recommend a reserve to surplus methodology, they measure reserves differently and take different approaches to reach their recommended values. The AG defines reserves as loss and LAE reserves, as well as reserves for unearned premium. His selected value, 2.74, is the most recent (2001) data point for commercial casualty predominating property/casualty insurance companies published in Best's *Aggregates and Averages*. The SRB's witness, Dr. Ileo, allocates surplus as a ratio of loss and LAE reserves only. Although he acknowledges that the NCCI incorporates unearned premium reserve as well as loss and loss adjustment reserves in its calculations, he testified that he does not consider that unearned premium reserves pose a significant risk, and therefore does not consider that surplus needs to be committed to cover them. The SRB recommends a reserve to surplus ratio of 2.01, the five-year historical average of loss and loss adjustment reserves for countrywide commercial casualty predominating insurers, as reported by A.M. Best. Dr. Ileo notes that the ratio has remained very stable over time, ranging between 2 and 2.5 to one in the last fifteen years.

b. Discussion and Analysis

Surplus allocations are intended to ensure that funds will be available should reserves prove to be inadequate. The WCRB takes the position in this proceeding that surplus should be calculated as a ratio of premium, while the SRB and the AG argue that in an IRR model the applicable relationship is reserves to surplus. The WCRB's argument that, because its witness testified that either ratio may be used to allocate surplus the Commissioner must approve the WCRB's choice, is not persuasive. Even if

both methods are, in theory, reasonable, in this proceeding the decisionmaker must consider whether a particular method will produce rates that meet the statutory standards. We have considered the parties arguments and have determined that it is appropriate to use a reserve to surplus ratio to allocate surplus.

The approaches to the measurement of surplus in the Appel IRR model and in the AG/SRB IRR models reflect different perceptions about the need for surplus over time and the identity of the ultimate contributors to surplus. The Appel IRR model measures surplus in relation to premium, for the period in which premium is being written and collected.[28] We find persuasive the intervenors' arguments that this process is based on accounting assumptions that incorrectly reflect cash flows in the real world, and on the unreasonable premise that shareholder would, in the future, contribute to surplus. We find that the Appel IRR model, by positing the need for additional future investment to maintain surplus, would result in rates that are excessive.

The SRB and the AG both argue that surplus is needed to ensure that claims are paid, and therefore should be measured against reserves. The SRB notes that this methodology reflects that workers' compensation losses present a constant risk over time, rather than the assumption that risk is concentrated in the first two years of the policy. Because workers' compensation is a long-tail line of insurance, it is appropriate to allocate surplus in a manner that recognizes that claims may be paid over many years. We find that allocating surplus as a ratio of reserves in the underwriting profits model reflects the reasonable principle that rates should cover future losses, and that shareholders should not be expected to make future contributions to ensure that adequate surplus is available. We note, as well, that our conclusion is consistent with the NCCI methodology in states where it uses an IRR model for underwriting profit provisions.

For the reasons stated above, we agree that the surplus should be allocated as a ratio of reserves and disapprove that aspect of the WCRB's IRR model that allocates surplus as a ratio of premium. We further disapprove the surplus takedown factor included in the WCRB's IRR model. We would approve a model that measured surplus as a ratio of reserves. For measuring the reserves to surplus ratio, we will approve

[28] The Appel model also includes a factor to accelerate surplus takedown, described by Dr. Ileo as a factor that establishes ongoing policyholder protection beyond reserves.

limiting reserves to those for losses and loss adjustment expenses. We are not, however, persuaded that selection of a single data point is a reasonable approach to determining the reserve to surplus ratio. The most recent data point, recommended by the AG, is higher than any other in the series, and the AG does not explain the reasoning behind his selection of a single point. We are persuaded that using a five-year averaging methodology will smooth out year-to-year differences in the reported values and will improve rate stability. We therefore would approve a filing that incorporates into an IRR model a reserve to surplus ratio that averages the past five year's data points, as shown on page 86 of Exhibit 17.

5. Policyholder Dividends

a. The Parties' Arguments

The Appel IRR model includes, among other cash flows, a calculation of the cash that insurers will have available for investment over time that reflects a reduction in those funds because of anticipated dividend payments to policyholders. The tables in the WCRB filing assume that policyholders begin to receive dividends in the seventh quarter following policy inception, and that, beginning with the tenth quarter, the dividend payment remains constant. The WCRB argues that if dividend flows are not recognized, imaginary investment income will be imputed to insurers on funds that they do not actually hold. It asserts that it has taken this approach in the past, and that it has never before been questioned.[29] The WCRB estimates the level of dividends from the experience of all insurers, calculating the most recently available 13-year average ratio of dividends to net earned premiums for Massachusetts workers' compensation insurance. The value incorporated in its initial and revised table of assumptions relating to its IRR analysis is 2.90 percent.

The WCRB disputes the position taken by the SRB and the AG that G.L. c. 152, §53A (12) ("§53A (12)") prohibits taking account of dividends in this fashion. It asserts that the statute is intended to ensure that insurers do not recoup, through expense provisions in the rates, amounts previously paid in dividends, pointing out that the statute also prevents insurers from passing on unreasonable commissions or excess expenses.

[29] The WCRB states, in its filing, that its treatment of policyholder dividends as cash flows was done the way the Commissioner did when she set rates effective September 1, 1999.

The WCRB points out that it does not include an allowance for dividend payments in the company expense component of the rates, an approach that might not be permitted under the statute. It argues that inclusion of dividend payments in the cash flows underlying the underwriting profits provisions recognizes that insurers are expected to continue to pay policyholder dividends, and that, as a result of making such payments, they will have less money to invest. The SRB takes the position that §53A (12) categorically prohibits consideration of policyholder dividends in workers' compensation rates. It points to Dr. Appel's testimony that his IRR model is based on his understanding of past Massachusetts practice and does, in fact, give partial consideration to the effect of such dividends. The SRB notes that Dr. Appel considers that dividends are appropriately treated as a company expense but has, in this proceeding, looked only at the amount by which dividends reduce the funds available for investment. The SRB objects to the use of phrases such as the "traditional Massachusetts assumption" and "traditional method utilized in Massachusetts" to justify the WCRB's treatment of policyholder dividends, arguing that any past practice in Massachusetts was based on the application of the M-C model. It notes Professor Cohn's testimony that dividends do not affect the underwriting profits provision in the M-C model at anywhere near the magnitude that they affect the Appel IRR model results. The SRB, relying on Dr. Ileo's testimony, asserts that it is inappropriate summarily to transfer input treatments or parameter values used in that model to an IRR model, commenting that the WCRB has selectively chosen to transfer some aspects of its former application of the M-C model, such as the treatment of policyholder dividends, to an IRR model, but to disregard others. In any event, the SRB argues, the treatment of policyholder dividends in an IRR model for ratemaking, rather then in an IRR proposed only as a reasonability check, has not been previously litigated. For that reason, it asserts, no question of issue preclusion is presented. Further, the SRB argues, the issue raised in this proceeding is novel, because it addresses not just the treatment of policyholder dividends in workers' compensation generally, but how they are to be treated in a particular IRR model.

The SRB, characterizing §53A (12) as "refreshingly clear," asserts that none of the expert witnesses in this matter can speak authoritatively on the meaning of the statute

because none of them is an attorney. It argues that no weight should therefore be given to Dr. Appel's commentary on the statute.

In addition to its position that the statute prohibits any inclusion of dividends in workers' compensation rates, the SRB provides several reasons why sound ratemaking practice supports their exclusion. It notes that the payment of dividends is purely discretionary and that, because they typically apply to employers viewed as preferred risks, dividends are not a cost of doing business associated with typical or standard risks. It argues that standard premium rates should not be inflated to include discretionary discounts. The SRB also references the testimony of Allan Schwartz on the actuarial reasons that support its position.

The AG argues that Dr. Appel's dividend provisions are both unlawful and unreasonable. Contrary to Dr. Appel's testimony that the effect of his treatment of dividends was very modest, the AG asserts that incorporates the full amount of estimated dividends and increases the profit provision by two to three percent.[30] He points out that the Appel IRR fully reimburses insurers for policyholder dividends by increasing profit in the rates by the amount of those dividends.

The AG argues that policyholder dividends should be excluded as a matter of law from the Appel IRR model. He argues that c. 152, §53A allows the Commissioner to give "due consideration" to a number of factors but that subsection (12) explicitly states that she shall not approve any classifications or rates that contain provisions for any dividends. Describing the legislative intent as clear, the AG takes the position that the provision means that rates cannot include the payment of dividends anywhere in the rate, or any other payments to policyholders whether considered dividends or not. He argues that the statute forecloses the WCRB's position that, because dividends are paid, they must be included in the model so that "all cash flows may be considered." Describing the WCRB's proposal as a "back-door" approach, the AG argues that treating dividends as an expense or as a reduction in investable funds does not change their effect on increasing underwriting profits. The AG argues that Dr. Appel's comparison of Massachusetts to North Carolina misstated Massachusetts law. He points out that Florida and North

[30] The AG asserts that the large impact of dividends in the Appel IRR model is a significant disadvantage in a regulatory rate proceeding, and points out that dividends have little or no effect in the M-C model.

Carolina have not allowed rates that include policyholder dividends, even though their statutes require them to consider or give due consideration to dividends.[31]

The AG also argues that, as an actuarial matter, policyholder dividends should be excluded from the Appel IRR model. He asserts that increasing underwriting profits through the inclusion of policyholder dividends would result in unfairly discriminatory rates, because policyholders who obtain coverage from companies that do not pay dividends, or pay less than the average dividend, will pay more for insurance so that some insurers may pay dividends or higher than average dividends to their policyholders. He notes that the WCRB does not address the issue of unfairly discriminatory rates.

Further, the AG argues, policyholder dividends by definition are not guaranteed and represent a discretionary distribution of profit by insurers. He takes the position that, if companies choose to make such distributions, that choice should not be used to increase future profits in the rates. Further, the AG argues, a rate increase as a result of distributing profit is especially unreasonable for policyholders of mutual companies because, as company owners, they already receive distributions of profit. owners. He describes dividends to mutual company owners as a distribution of profit that is the equivalent of shareholder dividends for stock companies, noting that the latter are not included in the rates. The AG argues that the explicit underwriting profit provision built into the rates allows for all companies, stock and mutual, to make a profit and to distribute part of that profit to owners in the form of dividends.

In addition, the AG asserts that policyholder dividends are a marketing tool, designed to ensure that the preferred policyholder stays with the dividend paying company, and reflect competition among insurers for that are perceived as "preferred." He states that competitive measures should not be used to increase the rates.

Relying on the testimony of his actuarial witness, Mr. Schwartz, the AG argues that Actuarial Standard of Practice No. 29 outlines factors that an actuary, in reviewing policyholder dividends, should consider. Those factors include the company's history, the relationship between dividends and loss experience, and whether the dividends related to risk transfer. The AG asserts that that the record contains no evidence on these issues,

[31] The AG observes that Dr. Appel thinks that North Carolina is just wrong about "due consideration" to dividends.

commenting that Dr. Appel's statement that dividends are clearly related to risk transfer is unsupported.

Responding to Dr. Appel's statement that, because rates reflect reduced losses resulting from dividend programs they must also reflect the cost of those dividends, the AG argues that reduced losses benefit insurers, who pay out less in loss costs, but do not benefit policyholders until rates are reduced.[32] He points out that if the payment of dividends is used to increase rates, insurers benefit twice, through reduced losses and increased profits. The AG characterizes such double payments as unreasonable. Further, he notes, increasing rates to recognize payment of dividends would remove any incentive to reduce losses, because policyholders will understand that dividends are offset by rate increases.

b. Discussion and Analysis

G. L. c. 152, §53A (12), in pertinent part, instructs the Commissioner not to approve workers' compensation classifications or rates that "contain provisions for any dividends, unabsorbed premium deposits, savings, or other payments allowed or returned by insurers to their policyholders, members, subscribers or stockholders." This provision, enacted as part of the 1991 Workers' Compensation Reform Act, superceded a provision, contained in the former §52C, that allowed rates to give "due consideration" to "dividends, savings or unabsorbed premium deposits allowed or returned by insurers to their policyholders, members or subscribers." No party has pointed to a post-1991 decision on workers' compensation rates that either addressed the effect of the law change on underwriting profits filings, or requested the Commissioner to consider any issue relating it. The Commissioner has been asked, this year, to consider whether the WCRB's filing, which concededly "recognizes" the effect of paying policyholder dividends by subtracting the cash value of policyholder dividends from its estimate of cash that insurers have available to invest.

Both the SRB and the AG argue that, as a matter of law, the statute prohibits including policyholder dividends, like stock dividends, from workers' compensation rates. The WCRB, on the other hand, argues that the statute is intended to ensure that

[32] Dr. Appel states that dividends provide "significant incentives" for employers to improve loss experience, and that the improved experience is included in historical data on loss experience.

insurers do not recoup, through expense provisions in the rates, amounts previously paid in dividends, and therefore does not prevent recognition in the rates of the cost of future dividends. As expected, the opinions offered by the parties' experts support their respective positions. However, because none of the experts is qualified as an attorney, their opinions can be given little, if any weight.[33]

No party has identified any past rate filings or decisions that might provide guidance on this issue. The record contains no evidence that the question of policyholder dividends in the M-C model has came up for review in any past decision. The WCRB's treatment of policyholder dividends thus appears to present a novel issue for review. The WCRB argues that it treats dividends as it did in previous rate filings. However, it did not identify any earlier filings that, as part of an underwriting profits model, estimated the value of cash available to insurers for investment. The tables of net underwriting cash flows in its current filing, as well as those in the SRB and AG filings, show a value of zero in the column headed dividends.

Further, even if the WCRB has treated dividends this year as it did in prior rate filings using the M-C model, that alone would not be persuasive precedent for approving that approach in an IRR model. The AG points out that the effect of the WCRB's treatment of policyholder dividends in the Appel IRR is far greater than the effect of policyholder dividends in the M–C model. We are persuaded that it is not appropriate to transfer inputs or assumptions developed for use in the M-C model into an IRR model, without evidence that they are appropriate for use in an IRR. The WCRB presented no evidence that in the past it included in the M-C model an estimate of the value of cash that is available for investment. It does not argue that such a provision is standard in an IRR model. Dr. Appel testified that he has not, in states where he excluded dividends as a company expense, removed the impact of dividend cash flows on investment income. We note Mr. Schwartz's testimony that the NCCI does not make an adjustment to reflect loss of investable funds in states where its IRR model does not provide for dividends. We find, therefore, that no past practice serves as precedent for the WCRB's proposed treatment of policyholder dividends in its proposed rates.

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[33] We note, however, that Dr. Appel incorrectly refers to Massachusetts as a state in which "due consideration" should be given to dividends.

No party disputes that some insurers have, historically, paid dividends to policyholders or the expectation that some insurers will continue to pay dividends in the future. However, the WCRB's argument that §53A (12) does not prohibit inclusion in the rates of an allowance for dividends that insurers will distribute to policyholders during the rating period is not persuasive. On its face, the statute prohibits provisions in workers' compensation rates for any dividends, unabsorbed premium deposits, savings, or other payments "allowed or returned" by insurers to their policyholders, members, subscribers or stockholders. We do not find that the use of the past tense to describe such payments should be interpreted as limiting this proscription to payments made in the past, while allowing those contemplated in the future. Workers' compensation rates are made prospectively. The WCRB's proposal relating to policyholder dividends represents an "allowance" for such future payments. The WCRB's argument that the statute does not prohibit such recognition would effectively eviscerate a provision that, even it argues, is intended to prevent excessive rates. We note, further, that the WCRB does not distinguish policyholder dividends from other types of payments or explain why it takes the position that rates should recognize the effect of paying policyholder, but not stockholder, dividends.

Even if we were persuaded that §53A (12) permitted some consideration of policyholder dividends, on this record we would not approve the WCRB's approach. The *1987 Decision on Workers' Compensation Rates,* issued before the 1991 Reform Act, explicitly stated that underwriting profits provisions should not include in premiums any costs that policyholders should not pay. The WCRB's perspective on recognizing policyholder dividends in the rates does not consider the question of whether policyholders should pay those costs, but examines them from the purported point of view of an investor. Dr. Appel's testimony expresses his position that, as an economic matter, workers' compensation rates should reflect insurers' total costs of doing business, one of which is the payment of dividends. His stated preference is to treat dividends as an insurer expense but, as an alternative, he looks at them as a factor that should be

considered in determining the investor's expected rate of return.[34] In contrast, both the SRB and the AG have provided extensive, and persuasive, analysis of the reasons why policyholders should not be required to pay, through rates, for dividends that insurers may choose to offer to some, but not all, customers. Dr. Appel agrees that dividend plans are loss sensitive. Therefore, it is reasonable to assume that insurers pay dividends to policyholders with better than anticipated loss experience. The WCRB's treatment of policyholder dividends is based on the premise that the payment of dividends diminishes revenue from funds that are expected to be available for investment. However, dividends are more accurately represented as sharing with policyholders the benefit of reducing loss costs below their expected value. Insurers have the option of returning some of the money saved to policyholders or adding it to the pool of invested funds. The WCRB's treatment of dividends is based on the incorrect assumption that they are paid from funds that insurers would expect to invest and that investors would therefore consider in determining an expected rate of return. We disapprove that portion of the WCRB's underwriting profits model that represents the effect of policyholder dividends in the form of reductions to investable cash.

6. Other issues

The AG and the SRB have voiced a number of other criticisms of the Appel IRR, suggesting alternative approaches to estimating input values and additional matters that the model might address. The WCRB objects to incorporating into the model any proposals other than those it has consented to in the course of this proceeding. We have considered the disputed issues and reached the following conclusions.

a. *Distribution of policy sales in Massachusetts.*

The premium cash flows in the Appel IRR model are based on the assumption that policies are sold uniformly throughout the year. The premium collection pattern for a single policy, provided by the WCRB, was then converted into a full policy year cash flow. The AG pointed out that this assumption is inaccurate, because the WCRB filing shows that 16.7 percent of annual premium is written in January. He states that the

[34] At various times in his testimony, Dr. Appel describes dividends as a "refund of premium paid at the end of the policy period (and are frequently tied to the loss experience of the insured)" and a "discount or rebate on the price of insurance." We note that premium discounts are addressed at G. L. c. 152, §53A (9). G. L. c. 175, Section 182 prohibits rebates of premium.

income recognition rules for statutory accounting and federal taxes cause after-tax statutory income to be realized faster for policies written at the beginning of the year. He argues that the WCRB, by assuming that policies are written later in the year than is actually the case, slows the recognition of after-tax statutory income, and inflates the value of its underwriting profits provision. The AG, although he identified policy sales distribution as an issue, did not make any adjustment in his filings to address the Massachusetts data.

Subsequently, Dr. Appel, in response to a request to do so, revised his IRR model to reflect the actual distribution of policy sales in Massachusetts. He then testified that the effect was *de minimis*, resulting in a change of only nine basis points (from –2.65 percent to –2.74 percent) in the WCRB's estimated underwriting profits provision. Dr. Appel commented, further, that the adjustment required substantial modifications to the software used to support the IRR model, and questioned whether the complexity introduced by this refinement to the cash flows is justified by the modest benefit it provides.

The SRB points out that, although the WCRB filed a revised model incorporating state specific data on the distribution of policy sales, Dr. Appel considered that the effort required to develop that approach had such a minimal effect of the rates that it was not justified. The SRB concludes that it does not recommend altering the Appel IRR to reflect the Massachusetts distribution of policy sales. The SRB, however, does not offer a recommendation on this issue.

Although adjusting the underwriting profits provision this year to reflect Massachusetts policy sales has a very small effect on the overall result, that alone would not persuade us to reject the adjustment. We are mindful of the principle that even small adjustments may result in rates that fall outside the range of reasonableness. However, we note that workers' compensation rates in Massachusetts, unlike private passenger automobile insurance rates, are not filed for use on a single calendar year basis. The statute provides only that the rates must remain in effect for at least one year. Depending on the effective date for a particular set of rates, policy sales may not, in relation to the calendar year, follow a consistent pattern from one rating period to another.

Consequently, we find that the assumption in the IRR model that policies are sold uniformly throughout the year is reasonable.

b. Inclusion of Deferred Tax Assets in the IRR.

The AG argues that insurers recognize federal income tax in accordance with statutory accounting principles ("SAPs"), which allow them to establish deferred tax assets. Statement of Statutory Accounting Principles No. 10 ("SSAP 10"), issued by the NAIC, addresses treatment of current and deferred federal and foreign income taxes. The AG notes that Dr. Appel agrees that insurers may establish deferred tax assets on their books and deferred tax credits as an asset on the statutory balance sheet, and that deferred tax assets affect the underwriting profits provision. He disputes Dr. Appel's position that the impact of deferred tax assets on the underwriting profits provision is small, amounting to only 0.3 percent of the total impact of discounting loss and LAE reserves for tax accounting. He asserts that Dr. Appel did not calculate his 0.3 percent estimate and that failure to recognize the benefits of deferred tax assets, even in that amount, would increase rates by about $3 million. The AG observes that Mr. Schwartz's calculation, showing a 0.8 percent impact, is in the record, and would affect rates by some $8 million. He argues that because there is agreement that SAPs allow companies to include deferred tax assets on their balance sheets, and that such assets do affect the IRR profits provision, the deferred tax assets should be included in the IRR model. He argues that if cash flows are determined based on accounting constraints, all aspects of the model should be consistent with statutory accounting.

The WCRB argues that the Commissioner should reject any adjustment for deferred tax assets because such an adjustment assumes that the codification of SSAP 10 would affect the federal income tax flows that are used in the IRR. Pointing to Mr. Schwartz's testimony that the codification changes how assets are booked on a company's annual statements but does not change tax payments, the WCRB asserts that the codification does not affect the amount of tax paid or the timing of the payment of federal income taxes, and provides no basis for adjusting the federal income tax flows in the IRR model. Dr. Appel testified that SSAP 10 addresses the impact of deferred tax assets on surplus requirements, not on the flow of tax payments. The WCRB also argues

that the IRR should not include an adjustment for deferred tax assets without considering the other effects of SAPs, such as deferred tax liabilities.

As with policy sale distributions, discussed above, the WCRB's argument that the potential dollar value of the adjustment does not justify the change is not persuasive. However, on this record, we are not persuaded that the provision for deferred tax assets in statutory accounting translates into a different cash flow for taxes under the IRR model. Furthermore, SAPs recognize deferred liabilities as well as assets. Consequently, any model that incorporates one must incorporate the other, as well as any other relevant effects of tax deferred assets. We conclude that the IRR model, at least this year, should not reflect deferred tax assets.

c. Discounting of loss reserves

The WCRB IRR model shows loss reserves on a nominal basis, rather than discounted for investment income. The AG notes that SAPs allow insurers to discount loss reserves for both income and liability purposes. He argues that, on the basis of SAPs, the WCRB's procedure overstates the needed level of liabilities and understates corresponding income. The AG considers that correcting for this approach would likely have a material impact on the indicated underwriting profit, by lowering the level of liabilities and speeding the recognition of income under SAPs. The AG argues that if accounting constraints are to be used to determine cash flows, they should be consistent with statutory accounting. However, he did not recommend a value for this adjustment. The SRB took no position on this issue.

The WCRB opposes any adjustment for loss reserve discounting. It argues that the AG assumes that, because the WCRB's filing does not reflect the application of the requirements of G. L. c. 152, §58 to loss reserves, as a matter of statutory accounting, it overstates the needed level of liabilities and understates corresponding income. It points to Dr. Appel's testimony that, first, this statute has nothing to do with establishing reserves as a liability on a statutory financial statement, and second, that it is rare for insurers, except for the use of tabular discounts in life pension cases, to be given permission to discount reserves for statutory accounting purposes. Further, Dr. Appel testified that to his knowledge, no expert has ever claimed that loss reserves in a

discounted cash flow model should be set on a discounted basis, even if indemnity payments beyond ten years in IRR cash flows would be subject to discounting.

On this record, we are not persuaded that an adjustment for loss reserve discounting is appropriate in the IRR model. Consequently, we will not order that the WCRB to incorporate such a provision in its model.

We have approved use of an IRR model to set an underwriting profits provision in this proceeding and have decided several disputed issues relating to the structure of and inputs to that model. Looking at the record as a whole, it is apparent that the parties have raised a number of additional issues, without necessarily recommending adjustments to the IRR model to reflect those matters. Concerns have been raised, for example, about the use of the Value Line sample of insurers in a proceeding on Massachusetts workers' compensation insurance rates, and comments made on the relationship between cash flows in an IRR model and principles of statutory accounting. We conclude that the IRR model, is appropriately viewed as a work in progress and anticipate that recommendations for use in future workers' compensation rate proceedings will be accompanied by proposals to refine its application.

D. Cost Containment

The WCRB's cost containment filing consists of a brief introductory statement, a copy of the cost containment survey and instructions sent to ten insurers writing workers' compensation insurance in Massachusetts, and copies of the companies' responses to the survey.[35] It also includes copies of three pages from the Annual Report on the State of the Massachusetts Workers' Compensation System for Fiscal Year 2002 which provide statistical information on the case load of the Department of Industrial Accidents ("DIA"), the DIA conference queue, and the investigations conducted by and stop work orders issued by its Office of Investigations. The WCRB also submitted a copy of the 2001 Annual Report of the Insurance Fraud Bureau, and copies of its newsletter, "focusFraud", with issue dates from May 2001 through September 2002. In

[35] The ten companies are: Associated Industries of Massachusetts Mutual Insurance Company, Arbella Indemnity Insurance Company, Atlantic Charter Insurance Company, CNA-Continental Casualty Company, Hanover Insurance Company, the Hartford Insurance Company, Kemper Insurance Company, Liberty Mutual Insurance Company, OneBeacon Insurance Company, and Travelers Insurance Company.

addition, the WCRB provided data on the estimated credits that policyholder have received, since 1990, as a result of the Qualified Loss Management Program. The cost containment survey addresses nine general areas: claims operations; medical bill audits; utilization review; preferred provider organizations (PPO) programs; capitated medical arrangements; other medical cost containment arrangements not included in the PPO arrangement and the capitated medical arrangements; control of fraudulent claims; loss prevention and engineering programs; and premium collection, audit and fraud control. In addition, the survey offers respondents an opportunity to comment on the requested information.

1. The Parties Arguments

The SRB argues that the industry, because it has shown an unforeseen lack of activity in setting up Preferred Provider Arrangements ("PPAs") for the use of its Massachusetts employers, as G. L. c. 152, §30 permits insurers to do, has failed to utilize adequate programs to control costs. The SRB recommends, therefore, that the Commissioner either disapprove the WCRB's filing or reduce the otherwise determined rate by 0.05 percent. The SRB bases its argument on studies by the Workers' Compensation Research Institute ("WCRI") which, it asserts, confirm that medical claim costs are significantly reduced when claimants receive health care services through a provider network, and that indemnity costs may also be reduced. Furthermore, the SRB states, studies show that the percentage of total medical payments made to in-network providers increases if the initial visit is with a network physician.

Pursuant to G. L. c. 152, §30, insurers can require workers' compensation claimants to receive their first scheduled (i.e., non-emergency) treatment from a PPA network provider, if the insurer has received approval for a PPA and the claimant's employer has consented to the requirement. The SRB asserts that the 1991 Workers' Compensation Reform Act included this provision in the belief that it would help reduce loss costs. It points out that only three insurers providing traditional workers' compensation insurance in Massachusetts have set up PPAs. Relying on the testimony of Donald Barber, executive vice president and general manager of the A.I.M. Mutual Insurance Company, it concludes that employers are receptive to signing up for insurer provided networks. The SRB concludes that, contrary to the WCRB's position that it has

no control over increases in the severity of medical claims, it has failed to utilize a tool available to it that has been shown to contain such costs.

The SRB asserts that the WCRI studies showed that handling medical claims exclusively in a provider network produced cost reductions ranging up to 46 percent for medical and 20 percent for indemnity claim costs. It points out that, despite these values, the SRB has predicted that acceptable use of PPAs would reduce such costs, respectively, by approximately six percent and three percent. Further, after adjusting these estimated to account for study limitations and the Massachusetts rating structure, the SRB recommended only a 0.5 percent rate reduction from the otherwise determined rate. It argues that it thus acknowledges that in Massachusetts employers have available to them a variety of loss prevention tools that are not available in other states.[36]

The SRB argues that the WCRB's efforts to discredit the applicability in Massachusetts of the WCRI studies on claim savings, on the ground that those studies did not distinguish Preferred Provider Organizations ("PPOs") from PPAs, fail to acknowledge that unapproved PPOs, unlike PPAs, do not allow for initial referrals of a claimant to a network provider. Further, the SRB states, the WCRI reports show that Massachusetts has the lowest penetration rate for PPOs of any state it studied. The SRB argues that the WCRB's position, that the company billing programs reported in the cost containment filing are evidence that the industry's efforts to save on medical claims are sufficient, is simply erroneous. It asserts that, regardless of the use of billing networks in the form of PPOs, a survey showed that PPAs result in claim cost savings because insurers who participated in PPAs were significantly more active in the areas of "return to work" and "modified duty" programs than were other insurers. The SRB concludes that adjusting the rates to reflect the industry's minimal use of an available cost containment tool will result in fairness to consumers and in greater efforts to reduce losses in the future.

The AG supports the SRB's request for an adjustment to reflect savings that could be realized by greater use of PPAs to treat workers' compensation claimants. He asserts that the SRB's position is well documented through the WCRI studies, and that its

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[36] The SRB predicts that, in a state that does not have the non-PPA options available to Massachusetts employers, the use of PPAs would reduce rate needs by about 1.6 percent.

recommendation is conservative in light of the WCRI findings. The AG argues that expanding the use of network providers would be a "win" for employees, employers, and insurers alike.

The WCRB urges the Commissioner to approve its cost containment filing and to reject the SRB's proposed adjustment. It argues that the Commissioner approved a similar cost containment filing in the *1999 Decision on Workers' Compensation Rates*, that insurers' responses this year indicate that their cost containment activities have a significant effect on reducing costs, and that, since 1999, the participating insurers have maintained and sometimes expanded such activities.

The WCRB argues that the SRB has not demonstrated that its cost containment filing does not satisfy the requirements of G. L. c. 152, §53A (13) ("§53A (13)"). It asserts that the statute requires cost containment programs to have a substantial impact on costs and expenses, and to be acceptable to the Commissioner, but does not require insurers to employ every conceivable program to reduce costs. The WCRB takes the position that rejection of the WCRB's cost containment filing would be tantamount to ordering all insurers to participate in PPAs, and asserts that there is no legal basis for such a result.

The WCRB argues, as well, that the SRB has not demonstrated that PPAs provide more significant cost savings than PPOs. It points out that the WCRI study on which Dr. Horn relied reviewed "network" claims, a category that included both PPAs and PPOs, and did not analyze whether the effect on claim costs varied depending on the classification of the network as a PPA or PPO. The WCRB notes that Mr. Barber testified that PPAs and PPOs are essentially the same. The WCRB argues, further, that the WCRI studies relied on 1997 data, and do not accurately reflect current insurer programs. It asserts that the study limitations render it unsuitable for use in ratemaking.

The WCRB makes three other arguments in support of rejection of the SRB's proposed adjustment. It asserts that the "vast" improvement in loss experience over the past several years suggests that there may be little, if any, opportunity for incremental cost containment. It argues that there is no evidence that the industry's loss and expense payments are excessive, and that such excess results from failure to exercise adequate cost controls. Finally, the WCRB contends, the Commissioner has never promulgated

cost control standards, as contemplated by §53A (13). Absent notice of the standards by which cost control efforts will be judged, it argues, she may not exercise the normative ratemaking power otherwise available to her under the statute.

ii. Discussion and Analysis

G.L. c. 152, §53A (13), requires the Commissioner to:

> ". . . make a finding on the basis of information submitted in any filing made pursuant to this section that the insurer or insurers employ cost control programs and techniques acceptable to the commissioner 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 on the collection of the appropriate premium charges owed to the insurer or insurers."

If the Commissioner does not make such a finding, she may disapprove the filing or, after a hearing, find that the proposed rates are excessive because of insurers' failure to utilize adequate programs to control costs or collect premiums. She may then either disapprove the filing or limit, in any way she deems appropriate, "the amount of any adjustment in premium charges based upon changes in costs, expenses and premium collections."

No party objects to the WCRB's cost containment filing on the ground that the cost containment programs described in Section 12 of its filing are inadequate, and we find that those programs are acceptable. We are not persuaded, however, that evaluation of cost containment programs should be limited to a review of current industry activities. The SRB's recommendation, supported by the AG, is based on the premise that the industry has generally failed to utilize PPAs approved by the Commissioner as a means of reducing workers' compensation claim costs. No party contests the proposition that insurers benefit if medical services to injured claimants are delivered through provider networks. Mr. Barber testified that, from an insurer's viewpoint, preferred provider networks give the insurer more information about and greater control over the course of medical treatment given to the injured worker, further commenting that the PPO or PPA doctor is involved with both the insurer and the patient. He agreed with the workers' compensation literature that directing workers into preferred provider networks chosen by carriers can reduce workers' compensation costs.

Similarly, the findings in the studies underlying the SRB's argument are not themselves challenged. The issue in dispute is the extent to which those studies support

an argument that Massachusetts insurers have failed to pursue an avenue available to them that has been shown to save on medical claim costs.

The format chosen for the WCRB's cost containment filing relies heavily on information provided in past surveys.[37] That format means that it is not possible to make an overall assessment of industry practices relating to medical claim costs from information directly included in this year's filing. The limited information in the WCRB filing supports its argument that billing review programs do reduce medical claim costs. Such programs, however, do not necessarily address all issues relating to potential claim cost savings. The underlying issue is not simply insurer use of approved PPAs or PPOs, but the extent to which claimants receive medical treatment in settings that maximize insurers' ability to control costs. The advantages of approved PPAs over other provider networks, the SRB argues, lie in increased opportunities to implement return to work and modified duty programs. The WCRB filing provides some information on insurers' procedures relating to such programs, but does not link those to the use of either PPOs or PPAs. No study has been conducted as to whether a claimant is more likely to have a first visit with a network provider if the employer is enrolled in its insurer's sponsored PPA than if the insurer or the employer participates in a PPO. No party has addressed the potentially complex subject of the relationships between employment based managed care health coverage and the scope of medical care provided to workers' compensation claimants, and the effects of those relationships on workers' compensation losses.

Based on this record, we are not persuaded that the paucity of workers' compensation PPAs demonstrates, by itself, that the industry has failed to utilize a cost control program that would achieve substantial savings in loss costs. At the same time, we do not reject the hypothesis that an increase in the number of insurer-sponsored networks could ultimately produce savings in loss costs that would outweigh any costs associated with establishment of such networks. We do not approve the SRB's proposed adjustment to the otherwise calculated rates this year, but invite the parties to develop a more precise analysis of the extent to which claim cost savings can be linked to enhanced

[37] In 2001, the WCRB surveyed six out of eight companies that had responded to a 1999 survey, plus four new companies. For 2003, it surveyed those same ten companies. Many of the company responses to questions in the 2003 survey omit any factual information and simply refer to the 2001 survey which, in turn, referred back to earlier surveys.

PPA participation. We note that the cost containment survey, as currently drafted, makes no reference to PPAs and consequently does not collect information that would permit a meaningful comparison of claim costs associated with particular provider arrangements in Massachusetts. We further advise the WCRB to revise the format of its cost containment filing to ensure that the filing, rather than reference previously submitted documents that are not in the record, provides information both on current company practices and changes over time in a manner that that will enable the Commissioner to assess its cost containment activities from a single document.

IV. Conclusion

We find that, on the record of this proceeding, the WCRB rate filing, as revised, contains proposed classifications or premiums that cannot be approved as "not excessive, inadequate, or unfairly discriminatory for the risks to which they respectively apply, and as within a range of reasonableness." We therefore disapprove the WCRB's filing, as revised during the course of this proceeding. The WCRB may, pursuant to G.L. c. 152, §53A (7) submit for approval a new filing that conforms to the findings in this decision on disputed issues.

So Ordered this 29th day of August 2003.

Richard A. Cody
Hearing Officer

Jean F. Farrington
Hearing Officer

Julianne M. Bowler
Commissioner of Insurance

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JULIANNE M. BOWLER
COMMISSIONER OF INSURANCE

Rate Filing of the Worker's Compensation Rating and Inspection Bureau
Docket No. R2003-08

Addendum to Decision and Order

The Decision and Order issued this day in this matter is hereby amended by adding the following language to our conclusion. Pursuant to G.L. c. 152, §53(8), we find that the workers' compensation premiums now in effect are excessive, and order a specific average decrease of four percent in workers' compensation premiums for policies taking effect on or after September 1, 2003.

So Ordered this 29th day of August 2003.

Richard A. Cody
Hearing Officer

Jean F. Farrington
Hearing Officer

Julianne M. Bowler
Commissioner of Insurance