

New York

Workers Compensation



Ratemaking

-A Current Perspective-

NEW YORK WORKERS COMPENSATION RATEMAKING

A Current Perspective

Preface

Actuarial Ratemaking is a constantly changing science in which new applications of mathematical principles, refinements of existing formulas and the evaluation of alternative data sources continually take place in order to accurately determine insurance rates and rating values for all lines of business. Workers compensation ratemaking is no exception to this continuing evolution and many changes have occurred in the ratemaking methodologies for this line of business over the past several years. Consequently, this paper serves as an update to one previously written by the New York Compensation Insurance Rating Board in 1990. Acknowledgment is hereby made to the previous authors, as many of the basic principles remain valid today, as well as to the many members of the Casualty Actuarial Society who have contributed to the advancement of ratemaking techniques over the years and upon which much of the New York methodology is based.

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I. Introduction

The major objective of this paper is to provide the reader with a general understanding of the methodology used by the New York Compensation Insurance Rating Board for developing workers compensation rates.

Although much of the information relating to ratemaking is technical in nature, the explanations provided in this document are being presented, wherever possible, in a manner that will enable a larger audience to obtain a practical understanding of the overall ratemaking process.

At the conclusion of this paper, it is our intention that the reader will have gained substantial knowledge of the ratemaking system for workers compensation in New York and an appreciation of both the objectivity and soundness of the methods used.

II. History

At the beginning of the twentieth century, there was a growing concern in many states, including New York, with respect to the economic and social consequences resulting from an increasing rate of industrial workplace injuries, as well as the inequities of the laws at that time pertaining to both the liability of the employers and the rights of the injured workers. Injured workers had to initiate legal actions against their employers and prove that the employer was negligent in order to obtain any form of reimbursement for their medical costs or to obtain other monetary awards to replace lost wages. These actions took a long time to be settled and, in the interim, financial hardship and possibly the loss of one's job often confronted the injured workers. The employer, on the other hand, in addition to experiencing a loss of production by virtue of the injury to the worker and the expense of possibly having to hire and train a replacement employee, faced unknown, and potentially large, financial liabilities from these legal actions. Consequently, to protect both workers and employers, workers compensation laws were enacted which provided specified benefits to injured workers without regard to the fault of the employer and, in turn, protected the employers from costly litigation when workplace injuries did occur. These laws effectively established workers compensation as the exclusive remedy for workplace injuries or disease.

As a result of the passage of the New York Workers' Compensation Law in 1914, employers are required to provide complete medical care and a weekly indemnity, or loss of earnings, benefit for their

injured workers. However, to ensure that employers would be able to fulfill their obligations under the law, a mechanism of insurance was also established in which the liability of the employer would be transferred to an insurance company by virtue of the insurance company providing a workers compensation insurance policy. Although the employer must pay the insurance company for this coverage, the employer is substituting a known expense, i.e., an insurance premium, for the protection against a potentially larger and unbudgeted expense due to unforeseen workplace accidents and claims for benefits.

The amount of premium to be charged to each employer is dependent on many variables including the size of the employer, the nature of the employer's business and the relative safety of the workplace. In addition, the use of medical cost containment techniques such as managed care or preferred provider organizations, the implementation of drug-free workplace programs, the establishment of workplace safety programs, and the availability of specialty programs, such as dividend plans and deductibles for qualified employers, can also affect the premium paid by the employer. Although detailed descriptions and applications of these latter pricing considerations are beyond the scope of this paper, some additional information is provided in a later section.

In general, the insurance premium must be sufficient to fund the benefits required to be paid to injured workers as set forth in the applicable workers compensation law, to cover the expenses of the insurance company and to provide the insurance company with a reasonable profit. Specifically, the premium must be sufficient to cover any weekly benefits awarded to the injured worker, as well as to pay doctors, hospitals and others for medical and rehabilitative services that are incurred in treating the injured worker and returning him or her to work. In addition, an insurance company, like any other enterprise, incurs certain costs of doing business which are necessary to provide the prescribed insurance protection. These include such expenses as commissions to agents, the overhead or operating costs of an insurance company, premium taxes and the expenses incurred in administering and settling claims. In addition, a provision for profit is usually also contained in the premium which reflects both the elements of reward and risk associated with the business of insurance.

The task of determining the premium that will be appropriate for both the employer and insurance company is customarily assigned to actuaries. Actuaries are trained insurance professionals, with academic backgrounds usually in mathematics, statistics and/or economics, who interpret statistical data and apply mathematical formulas to that data in order to project future insurance costs, as well as to perform other statistical analyses. Actuaries are employed by insurance companies, rating organizations, such as the New York Compensation Insurance Rating Board (NYCIRB), government agencies and financial corporations.

The remainder of this paper will elaborate on the data and methodologies used by the actuaries at the NYCIRB to determine adequate and equitable workers compensation rates for the employers of New York.

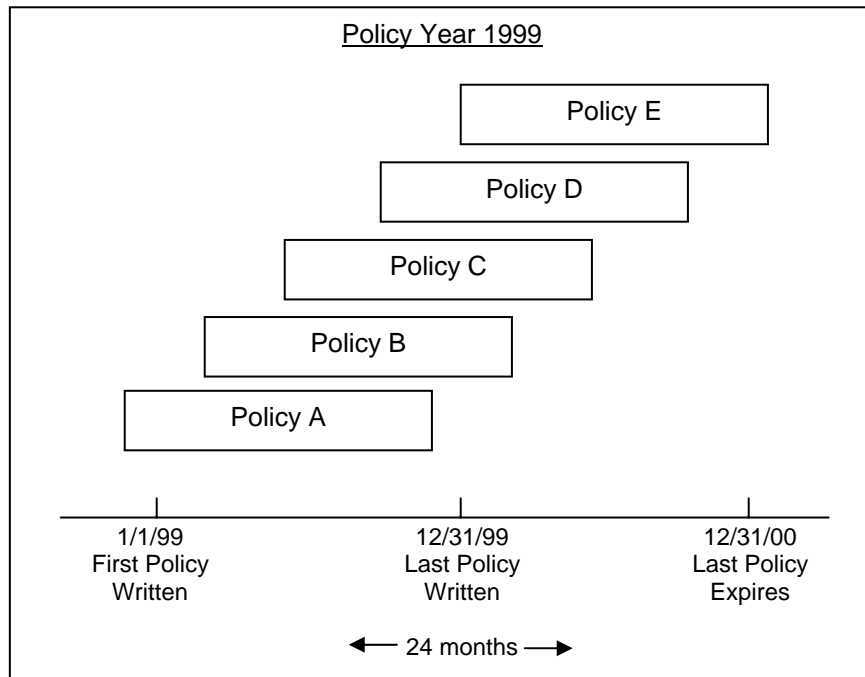
III. Data Used for Ratemaking

The entire ratemaking process begins with the collection by the NYCIRB of two major types of workers compensation data, namely Aggregate Financial Data and Unit Statistical Plan Data. Each of these data sources, specifically as they relate to the ratemaking process, will be explained in detail below. After both techniques are presented, an explanation of how these data are utilized to produce both an overall statewide average rate level change and specific rates for over 600 individual employer business classifications will be provided.

A. Aggregate Financial Data

Aggregate financial data from all insurance companies writing workers compensation business in New York is collected annually by the NYCIRB. The data is formally requested, in what is referred to as a “Call For Data”, in January of each year and requires the reporting of aggregate premium and loss data for up to twenty reporting periods. This financial data is submitted by the carriers to the NYCIRB in two formats, namely, Policy Year and Accident Year. A third format of data, Calendar Year, although not specifically requested, can be derived from the policy year information.

Policy Year data consists of premiums and losses arising from policies written in a specific time period such as January 1, 1999 through December 31, 1999. This configuration of data is the most accurate in terms of directly matching the premiums with the losses from the same block of policies which the other formats do not do. On the other hand, it takes twenty-four months for all premiums to be fully earned on a twelve month block of policies such that, while it is more accurate, this format is less timely than the others. A chart is provided below to illustrate the time necessary to accumulate a complete policy year.



Accident Year data represents premiums earned and losses incurred in a given, usually twelve month, time period. In this manner of reporting, premiums are those earned in a calendar year, irrespective of when policies were actually written. The losses represent payments and reserves only for accidents that occurred in the given time period. Consequently, although not exactly comparable to the policy premiums, the loss information is more timely than that of policy year and its use is especially important when observing economic or benefit change impacts on insurance experience.

Calendar Year data simply reflects all financial transactions during a twelve month period from January 1 through December 31. In this reporting format, both premium and loss transactions, irrespective of either their policy effective dates or accident dates, respectively, are aggregated for a specific calendar year time-period. This format is also more timely than policy year, but is the least accurate of the three forms of data in terms of the relationship between premiums and losses.

B. Expense Data

Each year, as part of its “Call For Data”, the NYCIRB also requests workers compensation expense information from the Insurance Expense Exhibit (IEE) of each of its member carriers. The IEE is a supplement to the carrier’s Annual Statement, which is a formal financial document that must be filed annually with the Insurance Department of each state in which the carrier writes business. The IEE expense data is used by the NYCIRB to determine the carrier’s overhead and administrative costs for inclusion in the manual rates. In addition, a copy of each carrier’s New

York Statutory Page 14 of the Annual Statement is also requested since this page contains the most recent New York information available regarding commission expenses and loss adjustment expense, as well as dividends paid to policyholders.

C. Unit Statistical Plan Data

Unit Statistical Plan (USP) data is detailed statistical information which is required to be reported by the insurance carriers to the NYCIRB on each and every insured employer in New York. Reporting instructions and definitions of the required data elements are contained in the New York Workers Compensation Statistical Plan which is published and maintained by the NYCIRB. At this level of detail, specific payroll, premium and loss information by type of injury is reported by classification code for each policy. The required data for each policy is initially valued eighteen months after the inception date of the policy and then at twelve month intervals, thereafter, up to a total of ten reports. The initial eighteen month valuation of the policy was established in order to allow sufficient time for most premium audits to be completed and for most claims to have been reported and initial reserves established. Similar to the aggregate policy year information, USP data is also compiled on a policy year basis, but it is somewhat less timely due to the initial eighteen month valuation date for each policy. Nevertheless, this information is ideal for use in determining appropriate classification manual rates and is also used in the calculation of each employer's experience modification.

IV. The Ratemaking Process

A. Basic Principles

The overall goal of the ratemaking process is to develop rates which, when applied to the applicable underlying exposure base, will provide sufficient funds to pay expected losses and insurance company expenses, as well as produce a reasonable level of profit commensurate with the insurance risk being assumed. In a given year, rates, and their resultant policy premiums, are intended to meet all claim costs associated with these policies regardless of when the claims occur and are ultimately settled. For example, if a loss occurs in 1999 on a policy written in 1999, but payments are still being made to the claimant in 2015, the premium collected in 1999 must be sufficient to cover the payments through 2015, as well as the expenses incurred in servicing both the policy and the claim.

In New York, workers compensation rates are subject to regulatory review and approval by the New York State Insurance Department prior to their use which ensures that, by statute, the rates shall not be inadequate, excessive or unfairly discriminatory.

The mathematics and formulas used in determining workers compensation rates in New York reflect standard actuarial ratemaking techniques that are used, in varying forms, in other states and by other rating organizations. In conjunction with its own ongoing research efforts, the NYCIRB actuarial staff constantly monitors developments in ratemaking techniques that are published by the Casualty Actuarial Society, as well as the methodologies used by other rating organizations, to ensure that the most current techniques are applied to New York data.

Ratemaking data, by its nature, is historical and only provides information regarding past experience. It is the job of the actuary to take that data, refine it and adjust it so that it not only reflects current conditions, but also projects future conditions as well. The next sections of this paper will describe the various steps in the New York ratemaking process that are necessary to produce adequate workers compensation rates.

B. Determination of Statewide Loss Ratio

Premiums and Losses

Aggregate financial data on both a policy year and accident year basis, accumulated from NYCIRB's annual "Call For Data", forms the basis of the ratemaking methodology. The use of both policy year and accident year data strikes a balance between stability (policy year) and responsiveness (accident year) in the overall rate level determination. Data from all insurance carriers, including the State Insurance Fund (SIF), is used in this step of the process. (Up until 2005, the SIF had been excluded from this experience as a result of a 1959 court decision in which it was determined that, since the SIF was required to write any business, regardless of the employer's loss record, its experience would generally be different (worse) than that of the private market and, therefore, should be excluded from the overall rate level. In 2005, the New York State Insurance Department determined that the SIF experience was not that much different from that of the private market and ordered the Rating Board to include the SIF experience in its annual rate revisions). Experience from large deductible programs had also been customarily excluded from the rate filings since the employers in these programs tend to be larger risks that the NYCIRB and its members believe are analogous to self-insureds in terms of their premiums being determined, for the most part, independent of the manual rates. The New York State Insurance Department, however, does not agree with this position and has insisted that the large deductible experience be included in the general rate revision.

In order for the data to be appropriate for use in ratemaking, however, adjustments must first be made to the reported premiums and losses for both the policy year and accident year statistics.

Adjustments to Premium

The first adjustment relates to the policy year premium. Although the premium for most of the policies in the policy year is fully reported, there are still certain amounts, particularly relating to policies written toward the end of the year, which are not yet known at the end of the policy year and do not get reported until the following or subsequent years. Auditing adjustments account for most of the premium that is reported subsequent to the end of the policy year. Since payroll is the underlying exposure base for workers compensation, carrier audits of employer payroll records are necessary to ensure that the premium for each employer accurately reflects the appropriate payroll for the policy period. Revised audits may also be made which can further delay the reporting of final policy premiums. In order to measure this “development” of policy premium, the NYCIRB analyzes the development of prior policy years using historical premium reporting patterns and then applies the results of this analysis to the reported premium for the policy year under review. This procedure ensures that all premium is included in the ratemaking formula. The current methodology utilizes the five most recent years available to measure the historical development of policy year premiums. The use of five years provides a great degree of stability to the ratemaking process by effectively tempering any year-to-year fluctuations in development that might occur.

Since, in general, policy year premiums may mature over several years, for example, due to a revised experience modification or audit, development factors are computed for 1st to 2nd, 2nd to 3rd, 3rd to 4th, 4th to 5th and 5th to 6th report dates. Studies have shown that any premium changes reported beyond a sixth report are negligible, as well as questionable, so that policy year premiums are considered to be fully mature at the 6th report. By combining all of the development factors from each report valuation, a total premium development factor is computed and is applied to the policy year premium to produce the fully developed premium. A typical premium development calculation can be found in the Appendix on Page A-1.

Premium development factors are not necessary for the accident year premiums since accident years utilize calendar year premiums which reflect all premium transactions specifically for that year.

A second adjustment is made to both the developed policy year and reported accident year premiums. This adjustment takes into account any rate changes that have taken place during, or subsequent to, the particular policy year and accident year that is being used in the rate level analysis. The purpose for the adjustment is to estimate what the premiums would have been if all policies had been written at the latest approved NYCIRB rates which are the ones under review and the ones which most likely will be revised. This is commonly referred to as “adjusting

premium to current rate level". Accordingly, if the current Rating Board rates are effective as of October 1, 2000, premiums for all review years are adjusted to the level of the rates effective on October 1, 2000.

Once the adjustments for policy year premium development and current rate level are made, the policy year and accident year premiums are ready to be related to the losses incurred in the respective years.

At this juncture, it is important to point out that the premium used in workers compensation ratemaking, and which is being adjusted as described above, is what is called "standard premium". Standard premium is commonly used in workers compensation to denote premium prior to the application of such elements as premium discounts and retrospective rating adjustments. Since it is the manual rate level that is being evaluated, it is appropriate to exclude these elements from the rate level analysis. In New York, standard premium for ratemaking purposes includes premium resulting from standard rating procedures including premium credits or debits from experience and merit rating, premium credits resulting from the use of the New York Construction Classification Premium Adjustment Program and Territory Differential Premiums for construction classes. Explanations of these standard premium components, as well as other pricing mechanisms, are described later in this paper in Section V.

Adjustments to Losses

Once the premiums have been adjusted, comparable adjustments are also made to the policy year and accident year losses. The first adjustment is made to account for any statutory benefit changes, as well as medical fee schedule and hospital cost changes, which have occurred subsequent to the start of the policy year and accident year being analyzed. This is called "adjusting losses to current law, or benefit, level". This calculation is necessary so that the current rate level can be evaluated relative to the current level of New York benefits that is in effect.

The second adjustment to losses takes into consideration the anticipated maturing of the policy year and accident year as more and more information becomes known on the claims which have been incurred. Changes in both claim value estimates, as well as new claims that may arise at a later date, are reflected in the adjustment of losses to an "ultimate settlement basis" by the utilization of an actuarial technique known as "loss development".

The methodology used for loss development is similar to that previously explained and illustrated for premium development, but includes development for individual periods well beyond a sixth

report. Loss amounts can change significantly over time due to many factors. The Workers' Compensation Board may award benefits to a claimant that are often greater, though sometimes less, than the insurance company's estimate; medical conditions of claimants change which can affect both medical and indemnity values; unexpected cases reopen and benefits are awarded; latent disease claims can be reported years after the policy that provides coverage has expired; subrogation and fraud recoveries; and, third-party liability cases that qualify for workers compensation policy coverage under New York statutes, may emerge several years after a policy has expired and may take several more years to finally settle. Consequently, historical patterns of the development of losses from earlier years, separately for indemnity and medical, are analyzed to determine an estimate of the ultimate value of all claims for the policy year and accident year under review. In the most recent rate revisions, individual year development is included to a nineteenth report for policy year and to a twentieth report for accident year, which is the maximum number of reports required in the data Calls. Since there still can be additional changes in the loss amounts for some claims beyond the twentieth stage, an aggregate development factor is also included to ensure that the policy year and accident year losses are truly at their "ultimate" value when used in the ratemaking process. The analysis of loss development patterns consists of a review of five years of data which ensures stability of the development factors by minimizing the effects of any aberrations in either an individual year or valuation. Separate analyses are undertaken for indemnity and medical losses in recognition of their significantly different development patterns. An illustration of a loss development calculation can be found in the Appendix on Page A-2.

The final adjustment to the policy year and accident year losses is the inclusion of those expenses that are related to the adjustment and settlement of claims. Lawyers' fees, adjusters' fees, the cost of court testimony and other expenses which are related to the settlement of claims are included in this amount. An extensive analysis of this loss adjustment expense component is undertaken annually and uses both Insurance Expense Exhibit and Statutory Page 14 data, as previously described, as well as data from the data Calls. The present methodology includes a review of from three to five years of data to ensure that a single year does not unduly influence the magnitude of the final factor. A factor of 18.8%, as a percent of total incurred losses, was calculated for the 2001 rate revision based on a review of these expenses.

Loss Ratio Determination

As a result of the adjustments described above, the policy year and accident year losses are now at the current benefit level, developed to an ultimate settlement basis and are inclusive of claim adjustment expenses. Likewise, the policy year and accident year premiums are also on a developed and current level basis. A ratio of the adjusted losses to the adjusted premium is then

calculated which is referred to as the “adjusted loss ratio”. This loss ratio represents the portion of the current level premium which is attributable to loss and loss expense and is a standard insurance industry measurement of loss experience in rate filings. Illustrations of adjusted loss ratio calculations from the 2001 rate revision are shown below.

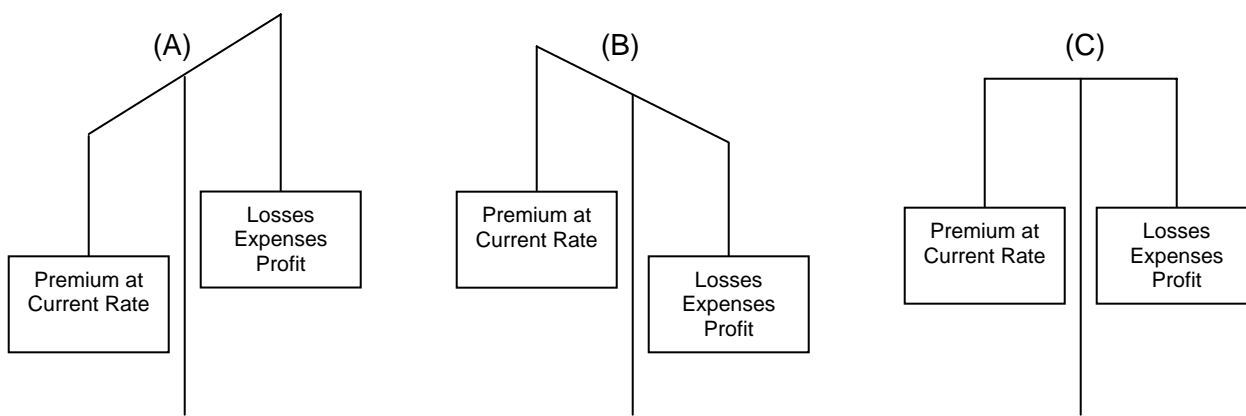
- a. Adjusted Policy Year 1999 Incurred Losses = \$1,318,115,231
- b. Adjusted Policy Year 1999 Standard Earned Premium = \$1,785,048,102
- c. Policy Year 1999 Adjusted Loss Ratio = (a) ÷ (b) = .738

- a. Adjusted Accident Year 2000 Incurred Losses = \$1,303,243,652
- b. Adjusted Calendar Year 2000 Standard Earned Premium = \$1,837,932,305
- c. Accident Year 2000 Adjusted Loss Ratio = (a) ÷ (b) = .709

C. Analysis of Current Rate Adequacy

Once the policy year and accident year adjusted loss ratios have been calculated, the next step is to determine the overall adequacy of the current rates using these adjusted loss ratios.

Pictorially, rate level adequacy can be reviewed in one of three ways as illustrated below.



In Example (A), the premium at the current rate level is greater than the costs expected to be incurred at the current benefit level. Therefore, since more funds than necessary are being generated, the current price (rate) is too high and a rate decrease is warranted.

In Example (B), the premium at its current level is insufficient to fund the benefit system and, therefore, a rate increase is warranted.

Finally, Example (C) is an illustration of a balanced system in which the premiums being generated are equal to the costs being incurred; in other words, when rate adequacy has been achieved.

To determine what percentage change, if any, is necessary to bring the system to its equilibrium point, several steps must be taken.

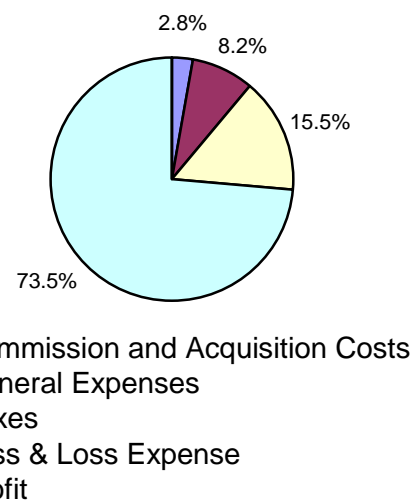
Expected (Target) Loss Ratio

In order to measure the significance of the policy year and accident year adjusted loss ratios, a benchmark or target, better known as an “expected loss ratio”, must be determined. This ratio represents the portion of each premium dollar which is actually available for paying losses, together with loss adjustment expense, and which underlies the current rates.

To arrive at the expected loss ratio, we begin with 100% of premium and subtract from it the relative portion of premium which is attributable to the operating expenses of the carriers. The remainder is the portion that is available to pay benefits and their related expenses.

The carrier expense components used in this step of the ratemaking process include commissions to agents and brokers, other acquisition costs such as marketing expenses, general overhead expense, New York premium taxes and profit. It is important to note that the expenses related to the handling of claims are not one of the expense items here since they are already included in the loss portion of the adjusted loss ratios.

Premium Dollar Components



In the 2000 rates, which is the basis upon which the premiums are being evaluated, 26.5% of the premium dollar was needed for the aforementioned carrier expenses. Consequently, 73.5% of the premium dollar (100% - 26.5%) remains for the paying of claims at the current benefit level which translates into an expected loss ratio of .735.

Experience Indication

The next step in the ratemaking process is to compare the policy year and accident year adjusted loss ratios with the expected loss ratio. If the adjusted loss ratio is greater than the expected loss ratio, an overall increase in rate level is indicated based on this experience. Consequently, if the adjusted loss ratio is less than the expected loss ratio, a decrease is indicated based on this experience. The indicated rate level changes based on the adjusted policy year and accident year data, as previously determined, are derived below:

- a. 1999 Policy Year Indicated Rate Level Change
 $.738 \div .735 = 1.004$, or + 0.4 %
- b. 2000 Accident Year Indicated Rate Level Change
 $.709 \div .735 = .965$, or - 3.5 %

Average Experience Indication

Two indications of how the current level loss ratio compares to the loss ratio that is expected have now been produced; one based upon 1999 policy year experience, and the other upon 2000 accident year experience. Since the ratemaking process gives equal consideration to both the policy year (stability) and accident year (responsiveness) experience, the two indicated rate level changes must be combined into an overall indicated experience change. This is accomplished through an arithmetic average of the policy year and accident year indications.

- a. Policy Year Indication = 1.004 (+0.4%)
- b. Accident Year Indication = .965 (-3.5%)
- c. Average Experience Indication = $\{(a)+(b)\} \div 2 = .985$, or -1.5%

At this point, it is important to keep in mind that this calculation of the indicated change to current rates is based upon the current rate level and the current statutory benefit provisions and is based upon historical data from policy year 1999 and accident year 2000. Since an adequate rate level at some future date is the ultimate goal of the ratemaking process, a means of projecting future conditions must enter the methodology and become an integral part of each filing. The next three sections address how this is accomplished.

D. Trend Factors

In the early years of workers compensation, and up until the mid-1970s, changes in wage levels (and consequently payrolls and premium) were sufficient to offset changes in claim frequency and claim costs so that additional ratemaking components were not necessary in order to establish adequate rates. However, in the mid-1970s, increases in the number and costs of claims began

to outstrip wage increases so that an additional element was introduced into the ratemaking process to address this issue.

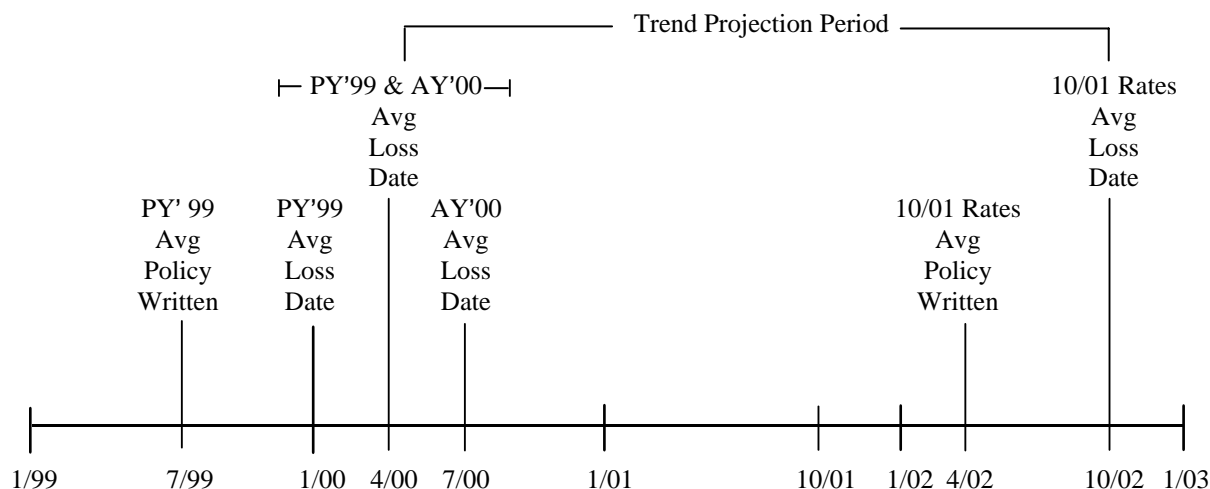
The recognition of changing costs by projecting historical results into a prospective time period is accomplished by what is referred to as “trend”. Future costs can be influenced by many things. For example, the implementation of safety programs can be expected to affect both the number of accidents and their severity; changes in administrative procedures by the Workers’ Compensation Board can affect the size of awards for benefits; inflation can severely impact medical costs; statutory reforms can impact both claim frequency and claim costs for years to come; wage inflation can impact the collected premiums since employee payroll is the underlying base for most classifications of business in workers compensation; statutory benefit changes can impact the average cost of claims and, sometimes, even the number of claims; and, changes in the state’s economy can affect claim frequency, claim severity and payrolls. The actuaries at the NYCIRB take into account all of these considerations when estimating future costs.

Traditional New York Methodology

In order to measure and evaluate the various components that can affect future cost levels, the traditional New York trend methodology consists of separate analyses of claim frequency, claim costs and wage growth. Unit Statistical Plan data for the latest eight available policy years is used to calculate historical average claim frequency and average claim costs by type of injury (death, permanent total, major permanent partial, minor permanent partial, temporary and medical). Claim frequencies are measured in terms of the number of claims per million dollars of premium at current rates with the claims being developed to a fifth report. Average claim costs are expressed as losses divided by the number of claims with both the claims and losses developed to a fifth report and the losses adjusted to the current benefit level. The adjusted data by injury type is then summarized into total indemnity and medical claim frequencies and average claim costs for the eight year analysis period. A statistical method known as “regression analysis” is then applied to the data which produces indicated trends in the frequencies and claim costs. Both linear and exponential lines of best fit are used in this analysis and are applied to the full eight years of data, as well as to the latest five years. These multiple applications help identify the impact on trend of sudden changes in frequency and claim cost and also provide alternative solutions in cases of data aberrations. Studies have shown, however, that the exponential application applied to the latest five years of data yields the most accurate trend and this application has been the one used in most of the rate revisions in New York over the past several years. An example of a trend calculation can be found in the Appendix on Page A-3.

Since workers compensation premiums are a function of payroll, it follows that increases in wage levels will likewise result in increases in premium. Average weekly wage data, obtained from the New York Department of Labor, is used as the basis for the wage trend. To recognize the effect of increasing wages on premium, a regression analysis, similar to that used for frequency and claim cost, is used to project the change in wage levels.

The results of the above regression analyses of claim frequency, claim costs and wages are expressed in terms of average annual changes. These annual changes must then be projected into the prospective policy period under which the new rates will be in effect. To accomplish this, the average date of loss is first determined for the policy year and accident year aggregate experience, as well as for the prospective policy period. Using the assumption that individual policies are written uniformly throughout the year, for policy year 1999, the average policy is written on 7/1/99 and, assuming that losses are also incurred uniformly throughout the year, the average date of loss for a 7/1/99 policy is 1/1/00. For accident year 2000, since this format is keyed to claims incurred in the 2000 year, the mid-point or average date of loss is 7/1/00. Since the policy year and accident year experience has been averaged previously, the respective dates of loss must likewise be averaged. This produces an average date of loss for the experience period of 4/1/00 (midpoint of 1/1/00 and 7/1/00). For the prospective policy period, the rates contemplated in the 2001 rate revision were to become effective 10/1/01. Using the same assumptions regarding policies and incurred losses, the average policy will be written on 4/1/02 which results in an average date of loss of 10/1/02. Therefore, the annual changes in claim frequency, claim costs and wages will be projected 2¹/₂ years (from 4/1/00 to 10/1/02). A graphical presentation of this trend projection period may be helpful.



Econometric Models

Although the above described trend methodology has worked well in the past as a predictor of future costs, the underlying data cannot include the most recent, or current, changes in frequency, claim cost and/or wages simply by virtue of its policy year and valuation nature. For example, in the 2001 rate revision, policy year 1998, as seen on Page A-3, was the latest time period available with which to calculate loss trend. On the other hand, published economic data are often very current (sometimes no more than a month or a quarter earlier than the present time) and recent national studies have shown that there are correlations between economic variables

and workers compensation insurance costs. In an effort to close the gap between the data used for trend and the economic information that reflects current conditions, “econometric trend models” have been developed. These models use sophisticated mathematical techniques to identify and quantify effects of recent economic activities which relate to insurance costs. Economic factors such as unemployment, gross state product (GSP), new businesses, business failures, CPI indices, wage levels and others are statistically analyzed and related to their effects on workers compensation insurance costs. The end results of this type of analysis produce a trend in insurance costs that can also be applied to the experience indications in a rate filing. Although an example of an econometric model can be seen in the Appendix on Page A-4, one must realize that these models are dynamic in nature. This means that the economic variables used and the formulas developed for them will change from filing to filing as the statistical measurements of correlation are reapplied to new, and later, data.

In the 2001 Rating Board filing, a combination of the traditional trend methodology and the econometric models was used to determine a trend factor of 1.016 which represents a projected 1.6% increase in costs from the historical experience period to the policy period in which the new rates are to be in effect.

E. Expenses

Even though expenses have already entered the ratemaking process in the previously described derivation of the expected loss ratio, those expenses are the ones underlying the current rates, not the expenses that will be needed for the prospective policy period. To derive the prospective expenses, the three most recent years of commission, other acquisition and general expenses are reviewed as a function of standard premium and are averaged to determine the respective expense components for the rate revision. New York data is used for the commission component and countrywide figures underlie the other acquisition and general expense components. Although, ideally, New York data should be used for all expenses, most private carriers have countrywide operations with many functions often being provided at central locations in support of individual state activities. Consequently, it is very difficult to accurately determine an individual state’s, or line of business’s, share of these overhead expenses, so that countrywide data is used.

The current New York premium tax rate, plus a small provision for miscellaneous taxes and fees, is also one of the expense components. Although a profit provision is an integral part of every rate filing, a 0% provision has been included in all New York workers compensation filings since 1991. Previously, profit had been included in rate filings at a fixed rate of 2.5% of premium in virtually all jurisdictions, including New York. However, in the mid-to-late 1980s, due to a significant growth of income from investments, especially earnings on loss reserves, the 2.5% was considered by many state regulators to no longer be appropriate for inclusion in workers

compensation rate filings. Many states developed specific formulas for determining the profit provision in order to reflect investment returns. Specifically, in New York, an Insurance Department analysis in 1991 concluded that the combination of investment income and a 0% profit provision in the rates was sufficient for the carriers to earn a fair rate of return on their workers compensation business. Consequently, beginning in 1991, a profit provision of 0% has been included by the NYCIRB in all of its workers compensation rate filings which has resulted in average rate levels below what would have been indicated using the traditional 2.5% factor.

With the profit provision and all other expenses having now been determined, a new expected loss ratio is then calculated in the same manner as described earlier. Arithmetically, a ratio of the new expected loss ratio to the current one produces a factor representing the change in expenses for inclusion in the current rate revision.

F. Statutory Benefit and Medical Fee Schedule Changes

Although the historical data in a rate filing is adjusted to the current benefit level, there can be legislative changes to the benefit structure, as well as changes to the state's Medical Fee Schedule, which may impact future policy periods and which must be reflected in the prospective rates.

When the statutory benefits change, for example, the maximum weekly benefit is increased, the NYCIRB analyzes the new benefit structure relative to that currently in effect. Standard actuarial methodologies are used in these analyses and certain statistics relating to the distribution and size of wages, the loss of earnings potential and the distribution of claims by injury type are usually necessary to perform these evaluations.

In addition to statutory benefit changes, the Workers' Compensation Board (WCB) may also adjust the state Medical Fee Schedule and hospital charges, and these changes must also be reflected in the prospective rates. The NYCIRB uses detailed information from the WCB and the New York Department of Health to calculate the effect of these changes on the rate level and incorporates this into its rate filing.

G. Statewide Rate Level Change

Once the above steps are completed, a final indicated statewide rate level change is then computed. The experience indication, multiplied by the trend factor, the change in expenses and the change in benefits and medical fee schedules produce the level of rates needed for the prospective policy period. This calculation is shown below for the 10/1/01 rate revision in which

no change (1.000) in overall rate level was produced. The previous sections of this paper in which the details of each item have been explained are also shown.

a. Average Experience Indication (Section C)	.985
b. New York Trend Factor (Section D)	1.016
c. Change in Expense Provisions (Section E)	.999
d. Change in Benefits & Medical Fees (Section F)	1.000
e. Final Indicated Change in Rate Level	1.000
(a) x (b) x (c) x (d)	

The determination of the statewide rate level change is only the first step of the ratemaking process. The overall rate level change now needs to be distributed to the more than 600 individual classifications so that each class rate is equitable relative to all others.

H. Determination of Classification Rates

There are approximately 600 employment classifications in New York for workers compensation. The purpose of this classification system is to group employers in the same type of business so that a manual rate can be produced that reflects the exposure to loss that is common to all of the employers in the class. For classification purposes, it is the business of the employer that determines the classification and not individual employees, occupations or operations within the business. Since a classification rate represents the average experience of all employers in that class, it is a fair and equitable means of distributing the cost of workers compensation insurance. The procedure for establishing classification rates is a two part process.

Industry Group Differentials

The first step is to distribute the previously calculated statewide rate level change into what is referred to as "Industry Groups". Industry Groups are broad business categories that are comprised of individual classes that intuitively and statistically fit into one of these general descriptions and are used to more precisely distribute the rate level change. For many years in virtually all states, there were three Industry Groups, namely, manufacturing, contracting and all other. However, in the mid-1990's, a national study indicated that five groups were more appropriate than three for ratemaking, and the groups of manufacturing, contracting, office and clerical, goods and services, and miscellaneous (the remaining classes) were established. New York continued to utilize the original three groups until 2001, when a NYCIRB actuarial study determined that nine Industry Groups were statistically better suited for calculating class rates in New York. These groups are:

Food and Beverage Manufacturing	Professional and Office
Chemical Manufacturing	Services
All Other Manufacturing	Maritime, Admiralty, Federal
Contracting	Miscellaneous
Stores and Dealers	

To begin the rate level distribution process in New York, the latest three years of Unit Statistical Plan classification data are compiled into the nine Industry Groups and loss ratios are used as the basis for calculating the relationship of each group's experience to the statewide average. The underlying premium base is standard premium on current rate level and includes payroll development. Incurred losses are developed to an ultimate settlement basis and are at the current benefit level. However, in this calculation, since the Statistical Plan loss data is reported on an injury type basis, the losses are first segregated into serious (death, permanent total and major permanent partial), non-serious (minor permanent partial and temporary) and medical components, and then loss development factors, unique to each of these components, are applied. The methodology also includes separate indemnity and medical trend, as previously determined and described earlier.

At this stage of the process, recognition is given to the fact that data, when segregated into relatively small segments, can become unstable and subject to fluctuations and aberrations. To address this concern, the concept of "credibility" is introduced into the ratemaking process. Credibility is determined by mathematical formulas which recognize the variability of a body of data and compute an arithmetic value for the data being analyzed. Credibility values range from 1.00, which represents fully believable and stable data, to 0.00, which represents data that is considered unuseable by itself for the purpose at hand. The base used to determine credibility can vary depending on the type of information being analyzed. Common bases of credibility include, but are not limited to, the number of claims, dollars of loss and dollars of premium. Industry Group credibility in New York is based on the three year total number of compensable cases. In general, once the credibility value is calculated for a body of data, the difference between 1.00 and that data's credibility, known as the "complement of credibility", is assigned to another larger and more stable body of data, and a weighted value is calculated which takes the place of the original data. In the Industry Group analysis, the complement of each of the individual group credibilities is assigned to the total for all groups combined. For example, if Industry Group 2's loss ratio is .866 with a calculated credibility of .325, and the total loss ratio is 1.128, then the credibility for the total loss ratio would be assigned a factor of $(1.00 - .325)$, or .675. The "credibility weighted" loss ratio for Industry Group 2 would then be $\{(.866 \times .325) +$

($1.128 \times .675$), or 1.043. The resultant credibility weighted Industry Group loss ratios are then weighted together to produce a new total loss ratio. The credibility weighted Industry Group loss ratios, divided by the new loss ratio for all groups combined, produces an indicated rate level differential. Using the above example, dividing Industry Group 2's credibility weighted loss ratio of 1.043 by the new total loss ratio, which is 1.132, produces an indicated rate level differential for Industry Group 2 of .92. Once the indicated differentials are calculated, an additional refinement is then included which recognizes different wage trends by Industry Group.

Page A-5 in the Appendix provides an example of the calculation of Industry Group differentials in New York. If a Group's final differential is greater than 1.00, its experience is worse than average and a rate level greater than the statewide rate change will be applied to the classes within the group. Conversely, if the differential is less than 1.00, its experience is better than the statewide average and a rate level change less than the statewide rate change will be applied to the classes in the group.

As a last step in the process, the differentials are applied to the statewide average rate level change in order to determine the appropriate rate level change for each Industry Group. For example, if the differential for Industry Group 1 is .95 and the overall rate level change is 1.05, or +5.0%, then the average rate level change for that Industry Group would be ($.95 \times 1.05$), or .998 which is -0.2%. The rate level change of -0.2% for this Industry Group is less than the overall +5.0% since its Industry Group differential of .95 indicates that the total experience of classes in this Group is better than average.

Classification Rates

Once the differentials are determined for each Industry Group, the next step is to distribute the Industry Group rate change to each classification within the Group. This is accomplished by calculating "pure premiums" for each of the individual classes within each Group. Pure premiums are losses related to an exposure base which, for workers compensation, is usually \$100 of payroll. Five years of Unit Statistical Plan experience for each class is used in this process with both the losses (separately for serious, non-serious and medical) and payrolls developed to a fifth report and losses adjusted to the current benefit level. These adjustments are similar to those previously described above in the calculation of the Industry Groups differentials. One difference is that, in this step, with the data segregated into even smaller segments (i.e. class), five years of experience is used in order to provide the most stable and credible experience, while still maintaining responsiveness, at the class level. Another way in which the class data is made more stable is to exclude loss amounts above a certain threshold. In the 2001 rate revision, individual claims were limited to \$1,300,000 and the maximum for any single accident was

\$2,600,000 in order to prevent any large claim from having too great of an impact on the rate developed for the class. There are also credibility values determined for each class which, unlike the claim count criteria used in the Industry Group calculation, are based on dollars of expected losses, separately for serious, non-serious and medical. A classification which is considered to be fully credible (value of 1.00) uses only the current payrolls and losses for use in determining the indicated rate. If the class data is less than fully credible, the complement of credibility is assigned to the past experience in order to retain stability in the rate structure.

To ensure an even greater measure of stability in the determination of classification rates, three individual pure premiums for each class are computed and compared in order to determine the final pure premium that will be used to calculate the rate. The three pure premiums are referred to as the:

- Indicated Pure Premium, which is based on the current class experience;
- Formula Pure Premium, which is a credibility weighted value of the current and past class experience; and,
- Underlying Pure Premium, which is based on past class experience.

The methodology utilizes the middle value of the three pure premiums as the appropriate one for use in the development of the class rate. One final procedure for stabilizing the rate change for each class is to limit the change in pure premium to no more than twenty percent greater or less than the pure premium used as the basis for the prior year's rate calculation. A sample page of classification experience and pure premiums can be found in the Appendix on Page A-6.

To arrive at the final rate for each class, the indicated rate change for the appropriate Industry Group is applied to each class pure premium through an actuarial formula. Once this is done, a test, called the "test of rates", compares the premium derived using the old rate structure with the premium derived under the new rate structure for each Industry Group, to ensure that the correct amount of premium will be generated in the coming year. Within this process, it must be recognized that, due to the experience of individual classes as compared to others, rates for some classes will increase more than the Industry Group average and rates for other classes will change less than the average. However, once again, to ensure that very large swings in an individual class's rate do not occur from year to year, a limitation equal to the Industry Group change plus or minus 25% is imposed on the change for any single class rate.

Although the above described procedure is applicable to virtually every class, there are several classes for which either an additional step is necessary or an alternate methodology is used to determine their manual rates. The first of these are classes that are eligible for the Construction Classification Premium Adjustment Program (PAP). Briefly, the PAP is a unique program for the construction industry, which provides premium credits based on the hourly wages that are paid by the employer. (A detailed explanation of the program can be found in Section V.) Since the premium credits for individual employers reduce the total amount of premium that would be otherwise available to pay claims, an adjustment, or off-balance, is built into the manual rates of the affected classes which increases the rates by an amount equivalent to the premium credits. This off-balance is determined by analyzing the most recent PAP data with respect to the PAP credits, the policy premiums to which the credits were applied and the total premium for all construction classes. For example, if the average PAP premium credit is 17.9% and the policy premium to which the credits were applied represents 32.3% of the total construction class premium, the off-balance would be 5.8%, or an adjustment factor of 1.058 which is calculated as $[1.0 + (.179 \times .323)]$. This off-balance is applied to the rate for each construction class that is eligible for PAP as an additional calculation prior to the test of rates procedure that was previously described.

The classifications relating to volunteer firefighters, volunteer ambulance workers and building/wrecking are unique classes that are not conducive to the traditional pure premium calculation process. For these classes, a loss ratio methodology is used which is similar in application to the calculation of the overall indicated rate level change. However, since the methodology is applied at the class level, five years of experience are used and a credibility component is also included.

Upon approval by the New York State Insurance Department of the results from the above described processes, the final manual rates for all classes are published by the NYCIRB in the New York Workers Compensation & Employers Liability Manual.

V. Beyond the Manual Rate

As mentioned earlier in the beginning of the paper, the manual rate is only a starting point in the determination of workers compensation premiums for individual employers. Various pricing programs are available through the Rating Board's manuals or individual carrier programs that can adjust premiums both upward and downward. In addition, the state levies assessments on the carriers to fund various functions of the workers compensation system. These charges are, in turn, passed on to

policyholders and affect their final workers compensation costs. An overview of a few of these pricing programs, as well as the assessment process, is presented below.

A. Experience Rating

No two employers, although they may be in the same business, will have identical loss experience. Within each classification, for example, employers perform their operations differently and address safety issues to a greater or lesser degree than their peers. Consequently, within each classification, there are employers with more favorable or less favorable loss experience than the average experience that underlies the manual rate. To recognize these differences, and as an incentive to eliminate or reduce workplace accidents, the Experience Rating Plan was developed. Experience rating in workers compensation is a mandatory program applied to those employers whose policy premium is considered to be large enough for the employer’s own past experience to be an indicator of future costs. At the present time, \$5,000 of annual premium is used as the eligibility requirement in New York for experience rating. For New York employers with less than \$5,000 in annual premium, but greater than the minimum premium, a special rule in the Plan, known as “Merit Rating” applies and will be explained later. Experience rating compares, in an actuarial formula, an employer’s own loss experience to the expected or average loss experience generated by businesses of a similar type and size. Three years of payroll and loss data are traditionally used in this calculation. The resultant calculation produces what is known as an “experience modification” or “mod”, which is a factor that is applied to an employer’s premium produced by the manual rate. If the employer’s experience is better than average, a credit (factor less than 1.00) is given which lowers the premium. A modification greater than 1.00 indicates worse experience than average and a debit is given which results in a higher premium.

As previously mentioned, employers with less than \$5,000 in annual premium, but with a premium greater than the minimum premium, do not qualify for traditional experience rating as described above. For these employers, a Merit Rating Plan applies which is simply a table of premium credits and debits that is based on the total number of claims reported by the employer. Similar to experience rating, a three year time period is also used in this determination. The following schedule is currently utilized in New York to determine an employer’s merit rating factor:

<u>Number of Claims</u>	<u>Merit Rating Factor</u>
0	-8 %
1	0
2	+4
3 or more	+8

B. Premium Discount

Another pricing program that affects workers compensation policy premium is a program of premium discounts. Premium discounts are afforded in recognition that certain insurance carrier expenses decrease (as a percentage of premium) as the premium size of the employer increases.

The premium discount program is mandatory and requires that a discount be applied to any annual premium in excess of \$5,000. Tables of percentage discounts are published for several premium size intervals and the discount increases as the size of the premium interval increases.

In New York, there are separate premium discount tables that are published for stock and non-stock carriers. The discounts of non-stock carriers are less than the discounts of stock carriers because it is anticipated that the non-stock carriers will pay dividends to their policyholders. Stock carriers may use non-stock discounts and vice-versa upon the submission to the NYCIRB of a written notice of election. These elections must remain in effect for a minimum of one year. The following table illustrates the premium discount tables currently in effect in New York:

<u>Standard Premium</u>	<u>Stock Carriers</u>	<u>Non-Stock Carriers</u>
First \$5,000	0.0 %	0.0 %
Next \$95,000	10.9	3.5
Next \$400,000	12.6	5.0
Over \$500,000	14.4	7.0

C. Retrospective Rating

Unlike experience rating, the Retrospective Rating Plan is an optional program which only applies upon a mutual agreement between the employer and insurance carrier with respect to the rating elements which comprise the Plan. It is a program where, in essence, the employer agrees, prior to the start of the policy, to pay for its own loss costs plus a basic charge which covers the expenses and the costs of services provided by the carrier, and also includes a charge for the insurance risk borne by the carrier as part of the Plan.

An employer may choose such a “cost plus” arrangement with certain limitations. For example, there is often a maximum and/or minimum premium stipulated in the Plan regardless of how high or how low the actual loss costs turn out to be. The specific minimum and maximum amounts for a particular employer are agreed to prior to the inception of the policy. A limitation on the size of the losses that enter the Plan may also be selected for an appropriate charge.

Once the insurance policy has expired, the employer’s losses and other provisions of the Plan that have been previously agreed to, are entered into a formula that produces a revised premium.

If the revised premium is less than the original premium that was charged at the inception of the policy, the premium difference is returned to the employer. If the revised premium is greater than the original premium, then the employer must pay additional premium. This process is repeated at annual intervals until such time as the employer and carrier agree that no more adjustments to the premium will be made.

D. Expense Constant

In workers compensation, an expense constant is charged on every policy. This charge is a flat dollar amount (currently, \$200 in New York) that provides premium to cover some of the fixed costs of the insurance carriers for processing and issuing insurance policies. The expense provisions underlying the manual rates anticipate the collection of the expense constant dollars and, consequently, the manual rates are lower than they would be if no expense constant was charged.

E. Rate Deviations

Insurance carriers are permitted by statute to deviate from the manual rates published by the NYCIRB. Rate deviations are up-front percentage reductions applied to all employers written in a particular insurance company who meet specific (usually, better than average) eligibility criteria. The carrier must demonstrate to the Insurance Department, prior to use, that its loss and expense experience, and sometimes its underwriting philosophy, justifies the reduction in rates.

F. Dividend Plans

Dividend plans are also carrier initiated programs that are independent of the NYCIRB and which require approval by the Insurance Department prior to their use. These programs customarily use the loss experience of the employer at the end of the policy period as the basis for a dividend payment. Some programs combine loss experience with premium size and these plans are often referred to as “sliding scale”. Unlike rate deviations which are up-front premium reductions, dividend plan payouts are made after a policy has expired and are not guaranteed.

G. Deductibles

Deductibles are dollar amounts that an employer agrees to pay on every claim or occurrence in return for a reduction in premium. The NYCIRB develops and publishes premium credits for small deductibles ranging in size from \$100 to \$5,000. However, the most extensive use of deductibles in New York is by carriers that have independently filed “large deductible” programs with the Insurance Department. The deductibles on these programs are usually \$100,000 or greater and are tailored for large premium employers. Significant premium reductions accompany the

agreement to participate in a large deductible program since the employer will pay a large portion of the loss costs that are incurred.

H. Medical Related Programs

Since the early 1990's, there has been a continuing emphasis throughout the country on containing the costs of medical care which have been helping to drive up the premiums of both health and workers compensation insurance. To help stem the tide of rising medical costs, Managed Care Organizations and Preferred Provider Organizations are allowed in New York. Insurance carriers, in conjunction with the New York State Department of Health, have implemented these types of programs and, with the approval of the Insurance Department, offer premium reductions to employers who utilize these organizations for the treatment of their injured workers.

Drug-Free Workplace Programs have also been developed by some carriers and provide premium reductions, upon approval of the Insurance Department, to employers who implement a drug-free program for their employees.

I. Safety Programs

The implementation of a safety program has long been recognized as a means by which an employer can reduce or eliminate the number of workplace accidents and consequently, lower its workers compensation insurance premium. In New York, there is a statutorily mandated Compulsory Workplace Safety and Loss Prevention Program (Code Rule 59) that requires all employers, who have an annual payroll of more than \$800,000 and an experience modification over 1.20, to undergo a safety consultation by a certified safety consultant. The NYCIRB has the obligation to notify employers who meet the eligibility criteria and the New York Department of Labor has oversight authority over the entire program. Premium surcharges can be imposed by the carrier on an employer who fails to obtain a consultation or does not comply with the recommendations of the safety consultant.

Other safety programs, directed by statute, relate to the investment in safety related equipment and the voluntary implementation of a formal safety program. Although, as of this time, administrative procedures for these programs have not yet been established, some carriers, with Insurance Department approval, may offer premium credits to employers who have voluntarily initiated their own safety programs.

J. Construction Classification Premium Adjustment Program

The Construction Classification Premium Adjustment Program (PAP) was introduced by the NYCIRB in 1993 to address perceived premium inequities between high wage and low wage paying employers in the construction industry. In this program, all experience rated employers are eligible to receive premium credits of up to 30% based on the hourly wage being paid and the distribution of classifications on the policy. The NYCIRB calculates the credit annually from wage information by classification that the employer submits on a PAP application. Over 3,500 employers in the construction industry participate in the program each year and earn credits that average more than 15% of their policy premiums. As previously explained in the section of the paper relating to the calculation of classification rates, the manual rate for each of the construction classes is adjusted upward as an off-balance to these premium reductions.

K. Construction Employment Payroll Limitation

In addition to the Premium Adjustment Program described above, the Construction Employment Payroll Limitation Law was enacted in 1998. This law established a series of limitations on the amount of weekly payroll that can be used to determine workers compensation premiums for employers who perform commercial construction. The initial limitation, effective October 1, 1999, capped individual employee payrolls at \$900 per week plus half the difference between \$900 and the actual wages. The law also established additional caps in subsequent years, i.e., \$900 per week effective October 1, 2000; \$800 per week effective October 1, 2001; and, the greater of \$750 per week or the average weekly wage underlying the maximum workers compensation benefit effective October 1, 2002.

The authors of the legislation also recognized that, despite the cap on payrolls, the overall level of premium still needed to be maintained to ensure sufficient dollars for the payment of claims. They further recognized that this need should vary by geographic region since the level of wages being paid in the construction industry varies considerably within the state. Consequently, to maintain the overall premium level and to recognize these different wage levels, three geographic territories were defined in the law for the purpose of adjusting premiums to an adequate level. These territories are comprised of the five New York City boroughs, the counties surrounding New York City and the remainder of the state. The NYCIRB was designated as the organization responsible for determining the proper adjustments which are in the form of surcharges referred to as "territory differentials". The differentials are calculated using construction industry wage data by county from the New York Department of Labor, together with standard wage distribution tables and are applied to the premiums generated by employee payrolls attributable to commercial construction. These differentials must be filed and approved by the Insurance Department. A calculation of the territory differentials effective October 1, 2001, on the basis of the \$800 cap, is shown in the Appendix on Page A-7.

L. Assessments

In New York, as in many other states, insurance carriers are assessed for the costs of administering the workers compensation system, as well as for the costs of certain special funds that provide specific benefits to injured workers. Each year, the New York Workers' Compensation Board (WCB) assesses the carriers for the expenses of the WCB, payments made by the Special Disability Fund (known as the Second Injury Fund in other states), payments made by the Reopened Case Fund, the expenses of the Special Funds Conservation Committee which administers the Special Funds and Interdepartmental Expenses in conjunction with federal labor laws.

Since assessments are costs to the carriers in addition to their customary expenses and incurred losses, state statutes often permit a recoupment or funding of these costs through higher manual rates or a policyholder surcharge. Prior to April 1, 1994, New York assessments were considered as an additional loss component and, consequently, as a result of the ratemaking process, the effects of the assessments became an indistinguishable part of the manual rates. However, legislation enacted in 1993 prohibited the inclusion of the assessments in loss for ratemaking purposes which effectively removed them from the manual rates effective April 1, 1994. From this date through the present time, carrier assessments must be funded through a policyholder surcharge known as the "New York State Assessment". The NYCIRB is designated in the law with the responsibility for calculating the surcharge subject to Insurance Department approval. In determining the surcharge, the NYCIRB obtains actual carrier assessment information for each of the funds from the WCB and converts these amounts into a percentage charge that must be applied to the standard premium on each workers compensation insurance policy that contains New York exposure.

Although the calculation of the New York State Assessment is technically not a part of the ratemaking process which is described in this paper, the derivation of the surcharge is contained in the NYCIRB's general rate revision since it does affect total policyholders workers compensation costs. The derivation of the surcharge, effective as of October 1, 2001 is contained in the Appendix on Page A-8.

M. Workers Compensation Security Fund

In New York, the Workers Compensation Security Fund is a guaranty fund that assumes responsibility for the payment of claims incurred by insolvent carriers. There is a statutory

requirement to maintain a certain balance in the Fund, and the Superintendent of Insurance is authorized to impose surcharges on the private carriers when the balance goes below the statutory minimum. These then become pass-through surcharges to policyholders. The Rating Board does not perform any calculations relating to these surcharges, but does publish the percentage charge in the New York Workers Compensation and Employers Liability Manual for the industry's information.

N. Terrorism and Catastrophe Charges

As a result of the terrorism attacks on September 11, 2001, it became apparent to the insurance industry that there was now a potentially catastrophic exposure which was not contemplated in the rate structure that was in effect at that time. To address this new issue, the NYCIRB undertook an analysis in an attempt to quantify the potential rate level effects of prospective terrorism and catastrophic events in New York. As a result of this analysis, effective October 1, 2002, New York became the first state to implement a terrorism charge as part of its workers compensation premium and rate structure. Separate charges are in effect for foreign terrorism and for domestic terrorism, natural disasters and catastrophic industrial accidents.

It should be noted that the foreign terrorism charge in place contemplates the various protections offered by the federal government. As the federal involvement as a back-stop to the insurance industry changes over time, appropriate adjustments to the foreign terrorism charge will have to be made.

VI. Summary

This paper has presented the ratemaking process and the underlying principles inherent in the establishment of workers compensation rates in New York. Hopefully, upon completion, the reader will have a clear understanding of how the process works and what is involved in the development of fair and adequate workers compensation rates.

Questions regarding the material in this paper, or requests for a more detailed explanation of any of the elements of the ratemaking process, can be addressed to the Actuarial Department of the NYCIRB.

Further information with respect to the New York Compensation Insurance Rating Board, its programs, manuals and the latest New York workers compensation statistics can be found on the NYCIRB's website at www.nycirb.org.

Appendix

WORKERS COMPENSATION - NEW YORK

Development Factors - Premiums

P.Y.		1 st Report	2nd Report	3rd Report	4th Report	5th Report	6th Report		
1990	Dev. 5/6					1,999,457,107	2,010,007,475	1.005	
1991	Dev. 5/6					2,135,263,318	2,140,562,728	1.002	
1992	Dev.5/6					2,088,631,398	2,084,619,103	0.998	
1993	Dev.5/6					2,117,319,648	2,124,368,455	1.003	
1994	Dev. 5/6					2,180,059,894	2,182,067,524	1.001	
1991	Dev. 4/5				2,176,125,690	2,184,453,903	1.004		
1992	Dev.4/5				2,121,780,006	2,141,775,566	1.009		
1993	Dev.4/5				2,075,081,296	2,082,666,739	1.004		
1994	Dev.4/5				2,179,852,692	2,192,505,905	1.006		
1995	Dev.4/5				2,009,770,478	2,007,357,253	0.999		
1992	Dev.3/4			2,158,279,749	2,170,716,008	1.006			
1993	Dev. 3/4			2,081,049,882	2,103,528,914	1.011			
1994	Dev. 3/4			2,137,084,668	2,135,729,743	0.999			
1995	Dev. 3/4			2,020,027,801	2,018,407,078	0.999			
1996	Dev. 3/4			1,766,272,091	1,769,832,223	1.002			
1993	Dev.2/3		2,119,996,689	2,133,874,966	1.007				
1994	Dev.2/3		2,130,202,512	2,150,496,293	1.010				
1995	Dev.2/3		1,947,449,190	1,956,196,858	1.004				
1996	Dev. 2/3		1,761,674,867	1,763,991,289	1.001				
1997	Dev.2/3		1,715,332,121	1,712,433,009	0.998				
1994	Dev. 1/2	2,117,697,859	2,188,696,041	1.034					
1995	Dev. 1/2	1,952,137,773	1,962,479,475	1.005					
1996	Dev. 1/2	1,703,271,947	1,719,404,416	1.009					
1997	Dev.1/2	1,672,106.164	1,725,136,258	1.032					
1998	Dev. 1/2	1.723,116,660	1,781,667,424	1.034					
				1st/2nd	2nd/3rd	3rd/4th	4th/5th	5th/6th	6th/Ull.
5 Year Average				1.023	1.004	1.003	1.004	1.002	1.000
2nd to Utl.				1.013					
1st to Utl.				1.036					
3 Year Average				1.025	1.001	1.000	1.003	1.001	1.000
2nd to Ull.				1.005					
1st to Ull.				1.030					
2 Year Average				1.033	1.000	1.001	1.003	1.002	1.000
2nd to Ull.				1.006					
1st to Ull.				1.039					
Proposed Development'		1.036							

'Proposed development based on 5 year average

WORKERS COMPENSATION - NEW YORK

Policy Year Development Factors - Indemnity Losses (Case Basis)

Policy Year	10th Report	11th Report	12th Report	13th Report	14th Report	15th Report	16th Report	17th Report		
1981 Dev. 17/18										
1982 Dev.17/18										
1981 Dev. 16/17							321,195,211	321,602,786	1.001	
1982 Dev. 16/17							347,620,221	360,898,358	1.038	
1983 Dev.16/17							396,039,194	402,773,972	1.017	
1982 Dev. 15/16						324,781,095	325,094,713	1.001		
1983 Dev.15/16						402,625,766	400,157,949	0.994		
1984 Dev. 15/16						530,896,477	531,863,550	1.002		
1983 Dev.14/15					362,839,836	364,345,433	1.004			
1984 Dev. 14/15					536,467,023	535,294,607	0.998			
1985 Dev. 14/15					581,280,475	581,137,418	1.000			
1984 Dev. 13/14				487,152,293	494,294,771	1.015				
1985 Dev.13/14				587,144,055	583,493,740	0.994				
1986 Dev. 13/14				607,154,190	612,198,175	1.008				
1985 Dev. 12/13			538,439,033	541,479,211	1.006					
1986 Dev.12/13			609,060,343	609,890,138	1.001					
1987 Dev.12/13			639,071,206	643,705,772	1.007					
1986 Dev. 11/12		562,242,581	566,649,662	1.008						
1987 Dev. 11/12		641,552,741	641,368,783	1.000						
1988 Dev. 11/12		687,651,001	691,851,957	1.006						
1987 Dev. 10/11	598,302,269	605,810,885	1.013							
1988 Dev. 10/11	697,589,495	696,439,583	0.998							
1989 Dev. 10/11	740,333,004	747,225,139	1.009							
Development			10th/11th	11th/12th	12th/13th	13th/14th	14th/15th	15th/16th	16th/17th	17th/Ult.
3 Year Average			1.007	1.005	1.005	1.006	1.001	0.999	1.019	1.051
2 Year Average			1.004	1.003	1.004	1.001	0.999	0.998	1.028	1.051
Latest Year			1.009	1.006	1.007	1.008	1.000	1.002	1.017	1.071

WORKERS COMPENSATION - NEW YORK

TREND STUDY

Analysis of Claim Cost Trends

All Medical

<u>Experience Period</u>	Avg. Claim <u>Cost</u>	<u>Fitted Claim Cost Trends</u>			
		<u>Exponential</u>	<u>Five Years</u> <u>Linear</u>	<u>Eight Years</u> <u>Exponential</u>	<u>Linear</u>
Policy Year 1991	2,082			2,231	2,217
1992	2,373			2,362	2,369
1993	2,638			2,501	2,522
1994	2,764	2,745	2,740	2,649	2,674
1995	2,830	2,859	2,861	2,805	2,827
1996	2,994	2,977	2,982	2,971	2,979
1997	3,078	3,100	3,103	3,146	3,132
1998	3,246	3,229	3,225	3,331	3,284
Average Annual Change		4.14%	4.06%	5.90%	5.54%
R Squared		0.984	0.982	0.928	0.957

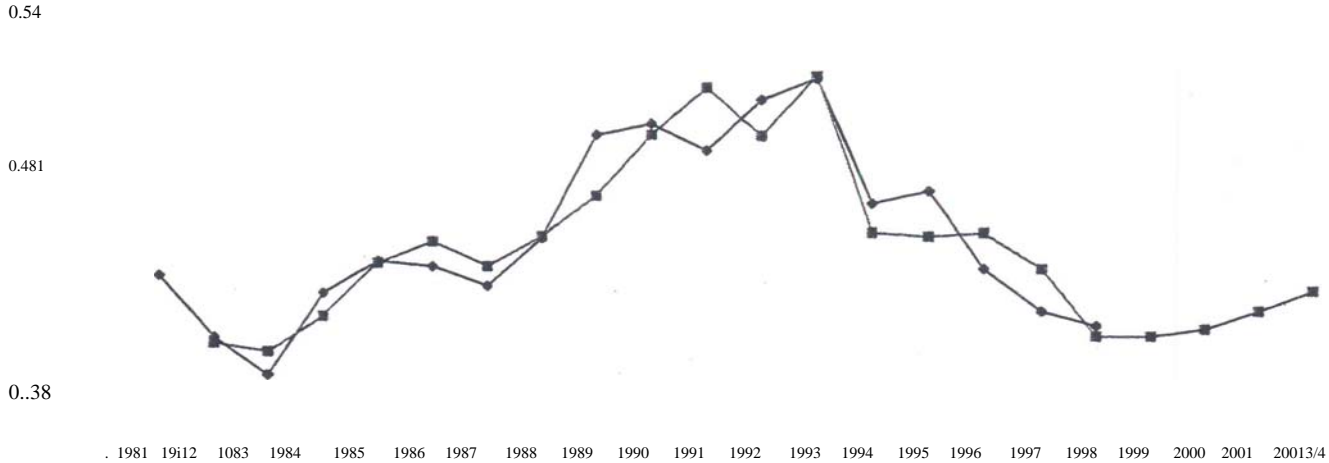
NEW YORK MODEL AND FORECASTS OF POLICY YEAR INDEMNITY LOSS RATIOS

$$L\sim NDLR_t = -4.04 + 0.21 (LPYPNFGSP)_t + 1.02 (LQYCNSTSH)_t + 0.56 (LPY8USFiE)_t + 0.14 (DV93)_t$$

(-4.36)
(2.82)
(6.32)
(7.82)
(2.83)

Number of annual observations: = 17 (1982 - 1998)
 t-values are in parentheses

R-Squared = 0.8134
 Rho = -0.0469



! - Historical - Fitted / Forecasted

Annual change in loss ratio 1997 - 2001.75 = -0.6%
 (Based on 1997 fitted and 2001.75 forecast)

Annual change in loss ratio 1998 - 2001.75 = 1.6%
 (Based on 1998 fitted and 2001.75 forecast)

Policy Years	Historical loss Ratios	Fitted! Forecast Loss Ratios
1981	0.456	IN/A
1982	0.421	0.418
1983	0.400	0.413
1984	0.446	0.433
1985	0.464	0.463
1986	0.461	0.475
1987	0.450	0.461
1988	0.477	0.478
1989	0.534	0.500
1990	0.540	0.534
1991	0.525	0.560
1992	0.553	0.533
1993	0.565	0.566
1994	0.495	0.479
1995	0.502	0.477
1996	0.459	0.479
1997	0.435	0.459
1998	0.427	0.421
1999	#NIA	0.421
2000	#NIA	0.425
2001	#NIA	0.435
2001.75	#NIA	0.446

PYINDLR = policy year indemnity loss ratio, developed and on-level
 PY?NFGSP = real private nonfarm gross state product
 PYCNSTSH = construction employment share of nonfarm emp
 PYBUSALE = business bankruptcy filings
 DV93 = dummy variable for 1993

Model is in logarithmic form.

Forecast values provided by Economy.com:
 PYCNSTSH PY?NFGSP

Forecast values provided by NCCI:
 PYBUSALE

All variables with "PY" prefix are on a policy year basis. Although the values displayed are rounded, the calculations themselves are carried to the full precision of the computer.

New York Workers Compensation
Determination of Industry Group Differentials

Industry Group	Policy Year	Standard	Incurring USP	Loss Ratio	Number of	Group Credibility	Indicated		Differential	Final
		Earned Premo On 10/00 Level	Losses on 10/00 Level		Cases		Credo Wt'd Ind. Loss Ratio	Group Adjustment Factor	Ind. Group Differential	
Food&Bev Mfg.	1996	79,406,846	87,017,962		2,235					
	1997	83,960,579	88,967,354		2,056					
	1998	82,567,724	85,334,201		1,873					
	Total	245,935,149	261,319,517	1.063	6,164	0.696	1.083	0.957	1.000	0.956
Chemical Mfg.	1996	32,098,245	21,108,855		648					
	1997	33,246,964	30,421,335		663					
	1998	33,666,230	34,171,340		661					
	Total	99,011,439	85,701,530	0.866	1,972	0.325	1.043	0.922	1.000	0.921
All Other Mfg.	1996	342,372,647	357,451,653		10,026					
	1997	368,755,235	376,694,778		9,639					
	1998	360,026,462	360,800,362		9,057					
	Total	1,071,154,344	1,094,946,793	1.022	28,722	1.000	1.022	0.903	1.000	0.903
Contracting	1996	562,122,406	638,918,709		8,773					
	1997	616,524,706	638,301,521		8,156					
	1998	699,348,536	777,834,616		8,541					
	Total	1,877,995,647	2,055,054,846	1.094	25,470	1.000	1.094	0.967	1.010	0.977
Stores&Dealers	1996	284,158,622	309,724,405		8,156					
	1997	288,533,598	308,832,905		8,156					
	1998	283,377,991	311,571,470		7,685					
	Total	856,070,212	930,128,781	1.087	23,997	1.000	1.087	0.960	1.011	0.970
Prof&Office	1996	497,987,875	565,836,583		12,047					
	1997	535,950,895	530,854,045		11,328					
	1998	378,508,962	495,110,569		10,255					
	Total	1,412,447,732	1,591,801,197	1.127	33,630	1.000	1.127	0.996	0.961	0.957
Services	1996	805,852,124	1,151,203,869		25,521					
	1997	846,511,378	1,007,747,675		24,461					
	1998	894,842,058	1,014,620,958		24,343					
	Total	2,547,205,561	3,173,572,501	1.246	74,325	1.000	1.246	1.101	1.005	1.107
Miscellaneous	1996	192,883,741	201,437,871		5,255					
	1997	186,554,993	192,207,905		4,324					
	1998	193,129,245	218,216,973		4,118					
	Total	572,567,979	611,862,750	1.069	13,697	1.000	1.069	0.944	1.024	0.967
Mar,ADM, Fed	1996	6,732,754	5,500,083		126					
	1997	6,617,271	5,345,525		170					
	1998	7,420,343	5,944,452		137					
	Total	20,770,368	16,790,060	0.808	433	0.118	1.091	0.964	1.003	0.967
Allind Groups	1996	2,803,615,258	3,338,199,990		72,787					
	1997	2,966,655,621	3,179,373,043		68,953					
	1998	2,932,887,552	3,303,604,942		66,670					
	Total	8,703,158,431	9,821,177,975	1.128	208,410		1.132	1.000	1.000	1.000

2001 Pure Premiums

CLASS: 3028 PIPE OR TUBE MFG. IRON OR STEEL &

POLICY YEAR	PAYROLL (IN HUNDREDS)	SERIOUS LOSSES		NON-SERIOUS LOSSES		MEDICAL LOSSES	TOTAL LOSSES	PURE PREMIUM	
		NO. CASES	AMOUNT	NO. CASES	AMOUNT			SERIOUS	NON-SERIOUS
1994	91390	1	53487	41	231527	168559	453573		
1995	78582			15	71922	106278	178200		
1996	100507	2	312598	33	156926	172995	642519		
1997	89824	2	1132247	18	125895	296964	1555106		
1998	80637	1	666406	12	307540	201464	1175410		
TOTAL	440940	6	2164738	119	893810	946260	4004808	4.909	2.027

SERIOUS CRED.	19	2	P.P. INDICATED ON LEVEL OF UNDERLYING	3.924	4.011
NON-SERIOUS CRED.	80	3	P.P. PREV. FORMULA ON LEVEL OF UNDERLYING	1.252	3.151
MEDICAL CRED.	65	4	P.P. DERIVED BY FORMULA	1.760	3.84
20 PER CENT LIMIT		5	P.P. UNDERLYING PRESENT RATE	1.252	3.151
		6	P.P. PROPOSED	1.679	3.66

CLASS: 3030 IRON OR STEEL WORKS SHOP-STRUCT. &

POLICY YEAR	PAYROLL (IN HUNDREDS)	SERIOUS LOSSES		NON-SERIOUS LOSSES		MEDICAL LOSSES	TOTAL LOSSES	PURE PREMIUM	
		NO. CASES	AMOUNT	NO. CASES	AMOUNT			SERIOUS	NON-SERIOUS
1994	215949	12	2111039	64	210592	581455	2903086		
1995	199401	11	965785	66	325190	565558	1856533		
1996	209022	8	1199151	44	233036	1213390	2645577		
1997	258726	6	968053	46	339498	536249	1843800		
1998	243398	6	753437	62	880719	722786	2356942		
TOTAL	1126496	43	5997465	282	1989035	3619438	11605938	5.324	1.766

SERIOUS CRED.	99	2	P.P. INDICATED ON LEVEL OF UNDERLYING	4.255	3.495
NON-SERIOUS CRED.	100	3	P.P. PREV. FORMULA ON LEVEL OF UNDERLYING	5.486	2.849
MEDICAL CRED.	100	4	P.P. DERIVED BY FORMULA	4.267	3.495
		5	P.P. UNDERLYING PRESENT RATE	5.663	2.943
		6	P.P. PROPOSED	4.263	3.492

CLASS: 3040 IRON WORKS SHOP-ORNAMENTAL & D

POLICY YEAR	PAYROLL (IN HUNDREDS)	SERIOUS LOSSES		NON-SERIOUS LOSSES		MEDICAL LOSSES	TOTAL LOSSES	PURE PREMIUM	
		NO. CASES	AMOUNT	NO. CASES	AMOUNT			SERIOUS	NON-SERIOUS
1994	352262	21	2684979	103	521216	1270170	4476365		
1995	342905	21	2825529	91	459531	956341	4241401		
1996	335918	15	1574983	87	444339	1030583	3049905		
1997	381905	13	3213666	89	727983	835436	4777085		
1998	403713	4	544281	86	1071021	609Q 1?1	2225214		

SERIOUS CRED.	98	2	P.P. INDICATED ON LEVEL OF UNDERLYING	4.771	3.513
NON-SERIOUS CRED.	100	3	P.P. PREV. FORMULA ON LEVEL OF UNDERLYING	3.448	3.459
MEDICAL CRED.	100	4	P.P. DERIVED BY FORMULA	4.745	3.513
		5	P.P. UNDERLYING PRESENT RATE	3.445	3.459
		6	P.P. PROPOSED	4.741;	3.513

J
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NEW YORK WORKERS COMPENSATION

CONSTRUCTION CLASSIFICATION PAYROLL LIMITATIONS

Construction Payroll Limitation Law

Eff. 10/1/2001
\$800 Limitation

		<u>Effect on Manual Rates</u>			
		<u>Statewide</u>	<u>Territory 1</u>	<u>Territory 2</u>	<u>Territory 3</u>
1	Estimated 10/01 - 10/02 Construction AWW	\$1,044	\$1,243	\$996	\$778
2	Ratio of Cap Amount to Construction AWW	---	0.644	0.803	1.028
3	Ratio, 'R', to Enter Wage Distribution Table	---	0.64	0.80	1.03
4	Table 'A' Value	---	0.27014	0.417849	0.601612
5	1-'A' Value	---	0.729860	0.582151	0.398388
6	'R' x (1-'A')	---	0.469849	0.467753	0.409447
7	Table 'B' Value	---	0.124635	0.230848	0.398249
8	1-'B' Value	---	0.875365	0.769152	0.601751
9	Indicated Off-Balance at \$800 Cap (8)- (6)x100	31.7%	40.6%	30.1%	19.2%
10	Proposed Off-Balance at \$800 Cap	31.6%	40.5%	30.0%	19.0%
11	Current Off-Balance at \$900 Cap	24.5%	32.0%	23.0%	15.0%
12	Percentage Change in Off-Balance $\{(1+(10)/(1+11))-1.0$	5.7%	6.4%	5.7%	3.5%

* Source: Standard Wage Distribution Table

Territory 1: Counties of Bronx, Kings, Manhattan, Queens, Richmond

Territory 2: Counties of Dutchess, Nassau, Orange, Putnam, Rockland, Suffolk, Westchester

Territory 3: All Other Counties

New York Workers Compensation
Determination of New York State Assessment

I. Calculation of Indemnity Portion of Total Losses

Projected Incurred Losses for Policies Incepting 10/1/01 - 10/1/02:				Ratio	
Indemnity	\$711,916,272	x	(1.0161\2.75)=	\$743,680,881	0.642
Medical	\$397,608,333	x	(1.0161\2.75) =	\$415,349,005	0.358
				\$1,159,029,886	1.000

Note : Policy year on-level developed losses are from Exhibit B and have been projected using trend from Exhibit D.

II. Determination of New York State Assessment

In general, assessments, as a percentage of premium, are calculated as (assessments/losses) x (expected losses/premium). However, the 1993 legislation treats the policyholder surcharge as premium for tax purposes, so that expected losses must become expected losses plus tax. From Exhibit E, the pure expected losses are .736/1.188(LAE) = .620. The loading for tax results in .620/(1-.028) = .638.

Assessment	Actual Ass'mnt To Carriers as % of <u>Indemnity Loss#</u> (1)	New York State Assessment <hr style="width: 50%; margin: 0 auto;"/> <u>% of Std. Premo</u> <u>[(1)x.642x.638]</u> (2)
Workers' Compo Board	0.064	0.026
Reopened Case Fund	0.053	0.022
Special Disability Fund	0.218	0.089
Interdepartmental Exp.	0.013	0.005
Special Funds Cons. Comm.	0.004	0.002
Total - All Assessments	0.352	0.144

Assessments as percentages of Indemnity loss have been obtained from the Workers' Compensation Board and the Special Funds Conservation Committee.

