

## **Introduction**

We recently examined the employers' costs of workers' compensation insurance in Ontario and British Columbia relative to their costs in several jurisdictions in the United States for the period 1975 to 1995 (Thomason and Burton 2000). During this period, in six U.S. states a public agency, typically called an exclusive state fund, was the sole provider of workers' compensation insurance, similar to the arrangements in all Canadian provinces.<sup>1</sup> In the remaining U.S. states (including the District of Columbia), private insurance carriers served as the principal financial intermediary, collecting assessments (or premiums as they are known in the U.S.) from employers and paying benefits to injured workers. (As of 1995, in 21 states with private carriers, employers could also purchase insurance from a competitive state fund.) Because we were principally interested in addressing the issue of the relative efficiency of public versus private provision of compensation insurance, we restricted our analysis to comparisons among the two Canadian jurisdictions and the 45 U.S. jurisdictions in which private insurers operated.

Economic theory offers little guidance as to whether public provision of workers' compensation insurance is more efficient than private provision and/or results in lower employer costs or vice-versa. Nevertheless, we were somewhat surprised to find that employers' costs of workers' compensation were lower in both Ontario and British Columbia, both before and after controlling for differences in other factors influencing costs, including benefit generosity.

While our results suggest that the costs of workers' compensation insurance is lower in jurisdictions with monopolistic public funds than in states in which private insurance is an option, we cautioned in the earlier paper that the inter-jurisdictional comparison of employers' costs of workers' compensation is complex, and we noted that our analyses had several limita-

tions. Among other things, we identified the following limits (Thomason and Burton 2000: 291-92):

First, our Canadian data come from only two provinces, so that is uncertain whether these results may be generalized to other Canadian jurisdictions or to other jurisdictions with a monopolistic public provider. Second, there are reasons to wonder whether our Ontario rates accurately reflect the true costs of workers' compensation. In particular, a comparison of the payroll adjusted rates for British Columbia and Ontario suggests that the adjustment for Ontario may have been too large. Third, while we attempted to derive independent variables, such as the injury rate or the PPD percentage, for Ontario and British Columbia that were comparable to those for our U.S. sample, these data come from completely different sources. They may be sufficiently different to affect the results of our regression analyses. Finally, compensation costs in either of the two countries may be affected by factors not considered in our analyses.

Due to these limitations, we concluded our chapter with the admonition that "definitive answers to the question of the relative costs of workers' compensation in Canada and the United States await further research."

In this report, we revisit the deficiencies of our earlier study and devise appropriate (or better) solutions to those limitations. While we were unable to perfectly resolve all of the data problems associated with a comparison of Ontario and U.S. workers' compensation costs, the data used in this report are substantially more accurate than the measures used in that earlier study. In addition, we extended the data series for Ontario through 1999. In a subsequent phase of this project, we hope to extend and expand our data set further, to include additional years (for jurisdictions other than Ontario) and additional jurisdictions, principally other Canadian provinces.

The specific tasks that we identified for the current study included: (1) extending and updating the data series to include additional and more recent observations for Ontario, (2) expanding the number of jurisdictions to include three U.S. states with exclusive state funds, (3) reviewing and possibly revising our application of the National Council on Compensation Insurance (NCCI) insurance classification system to Ontario assessment classes, (4) reviewing and possibly

revising our procedure for adjusting Ontario assessment rates to account for payroll limits, (5) reviewing and possibly revising our procedure for accounting for unfunded liabilities in jurisdictions with monopolistic funds, (6) examining the issue of possible health care cost-shifting in Ontario from the workers' compensation program to the general health care system (or cost-shifting from the general health care system to the workers' compensation program in U.S. jurisdictions) and accounting for the implications of any such shifting for our costs comparisons, (7) reviewing our methodology to account for the self-insurance option in U.S. jurisdictions, (8) examining and accounting for the costs implications of inter-jurisdictional differences in mandates and service provision as well as inter-jurisdictional subsidies of workers' compensation programs, and (9) examining the comparability of control variables (such as the injury rate, permanent partial disability costs as a proportion of total benefit costs, and medical costs) used in regressions to estimate and predict the efficiency of workers' compensation programs.

Additionally, in recognition of the particular concerns of the Workplace Safety and Insurance Board (WSIB), we conducted separate analyses of U.S. jurisdictions contiguous to Ontario, including New York, Pennsylvania, Ohio, Michigan, and Minnesota. This is in addition to our more general analysis that includes all U.S. and Canadian jurisdictions in our data set.

This remainder of this report is presented in six sections. In the next section, we discuss in detail the methods we used to construct costs estimates for Ontario, British Columbia, and the United States jurisdictions used in this study. Our estimates of the costs of workers' compensation in Ontario and other jurisdictions are presented in the second section. In the third section, we explore two issues that may affect our U.S.-Ontario costs comparisons: potential cost shifting of medical expenses in the Ontario and U.S. workers' compensation program and the cost implications of various legislated mandates and subsidies, which may affect the comparability of our costs estimates. In the fourth, we discuss regression models used to estimate the relative efficiency of the Ontario workers' compensation program as well as the rationale for those models. The results of these analyses are discussed in the fifth section. This section also includes a dis-

cussion of the costs incurred by self-insured employers, how those costs affect our estimates, and how we have attempted to control for the impact of self-insurance in our analysis of delivery system efficiency in Ontario relative to other jurisdictions. In the six and final section, we summarize our findings and conclusions.

## **I. Methodology for Measuring Employers' Costs**

The accurate determination of the employers' costs of workers' compensation insurance in the United States and Canada is, by no means, a simple matter. In both nations, assessments (or premiums) vary across employers depending on each firm's industry and, in the United States, on the occupational composition of the employer's work force. Employers engaged in high-risk activities, such as demolition work, pay substantially higher premiums than, for example, accounting firms where the risk of occupational injury is substantially less.

### **A. Variations in Base Assessment Rates**

In nearly all North American jurisdictions, workers' compensation insurance pricing procedures begin by assigning employers to rate groups or classes, according to their inherent risk of injury, so that, for example, all retail food stores may constitute one class, iron foundries another, plumbing contractors a third, and so on. Once classified, a *base* or *manual* rate, which is expressed as a rate per \$100 of payroll, is determined for each class, based upon the historical claims experience of all firms within the class.

Because firms pay different rates depending, among other things, on differences in the risk of injury, it is important to control for this variation in risk when making cross-jurisdictional costs comparisons. Due to differences in the industrial and occupational composition of employment among jurisdictions, average costs measures that fail to account for these differences in employment composition are likely to be misleading. Assume, for example, that we are interested in comparing workers' compensation costs of two provinces, and that both provinces have only two industrial rate groups: demolition contractors and accounting firms. Further assume that

80 percent of the employment in Province A is in the demolition industry, while only 20 percent of the Province B's employees work for demolition contractors. Finally assume that assessment rates for the two rate groups are identical across provinces, e.g., employer compensation costs for the demolition industry in both provinces are \$20 per \$100 of payroll, while costs for accounting firms are \$1.00 per \$100 of payroll.

Since assessment rates for the two rate groups in this example are identical, there is no economic incentive for employers in either rate group to move from Province A to Province B or vice-versa. However, due to differences in employment composition, the average assessment rate for employers in Province A is \$16.20, while it is \$4.80 in Province B. Thus, these average costs measures would lead to the mistaken conclusion that employers in Province A would reduce their labor costs by moving to Province B.

To account for these differences in employment composition, we used a standard set of 71 rate groups taken from the classification system promulgated by the National Council on Compensation Insurance. It was convenient to use NCCI's classification system because it is widely used for rate-making purposes in the United States. Thirty-two states and the District of Columbia relied upon the NCCI as their rate-making organization during our study period, while an additional nine states used a classification scheme that is substantially similar to the NCCI's. These particular rate groups were chosen because they are common to nearly all jurisdictions and because they represent a substantial proportion (76 percent) of national payroll in the United States.<sup>2</sup> The rates for these 71 classes were then averaged for each jurisdiction using the class's share of national payroll as weights.<sup>3</sup> By calculating weighted averages using the same set of weights for each jurisdiction, we are able to control for the effects of cross-jurisdictional variation in industrial and employment composition.

For Ontario and British Columbia, as well as the six U.S. states that did not use the NCCI's classification scheme,<sup>4</sup> it was necessary to convert the rate groups in those states to their NCCI equivalents. In this process, we asked the question: "If an employer in a particular rate

group moved from an NCCI jurisdiction to an non-NCCI state or province, what rate group or class would the employer be assigned in the non-NCCI jurisdiction?” After determining the NCCI-equivalent rate group for each jurisdiction, we used the base assessment rate associated with that rate group to calculate a weighted average for these jurisdictions, where, once again, national percentages of covered payroll are used as weights.<sup>5</sup>

For example, one of the NCCI classes used in our study was Code No. 2003, Ice Cream Mfg. & Drivers, which, according to the NCCI (1994, p.11):

“covers the manufacture of ice cream and frozen ices in various forms such as bulk, brick, cups, rolls, on sticks, decorated ice cream cakes and other fancy shapes. The basic ingredients, consisting mainly of milk, sugar, eggs, and gelatin or other stabilizers, are mixed, then pasteurized, homogenized and cooled. Fruits, flavors, or nuts are added. The ice cream is then made into the various forms or filled into different size containers and sent to hardening rooms.”

We assumed that prior to 1993, employers in this classification would be assigned to Ontario Rate Group No. 448, which included firms engaged in the manufacture of butter, cheese, and dairy products (Ontario Workers Compensation Board 1987). For the years 1993 and thereafter, we assumed that employers would be assigned to rate group 216, which includes “establishments engaged in processing, bottling, or packaging raw milk and cream. This category includes the production of: buttermilk, chocolate drink (milk base), egg nog, homogenized milk, pasteurized milk, processed fresh fluid cream, processed sour cream, skim milk, whole milk, and yogurt” (Workplace Safety and Insurance Board, p. D-216-01, January 1, 1998). As is evident, both Ontario rate groups are broader than the NCCI class. However, given the basis of our conversion process, i.e., determining the costs of workers’ compensation that an employer from a NCCI jurisdiction would pay if it moved to Ontario, this is not a problem.

On the other hand, employers in some NCCI classifications could be assigned to two or more rate groups in Ontario. An example is employers assigned to NCCI Code No. 3066, Sheet Metal Work – Shop, which is defined as (NCCI 1994, pp. 28-29):

“insureds engaged in operating a sheet metal shop wherein various products are manufactured from galvanized sheet metal or aluminum stock. The manufacturing is performed with such equipment as circular and square shears, brakes, rolls (both smooth and corrugating), punches riveters, flangers and perhaps some welding machines, both spot and continuous. Usually insureds assigned to this classification have little or no stamping or forming presses. Additionally, extensive assembling and finishing work is not contemplated under Code 3066. Some of the products falling within Code 3066 are sheet metal restaurant equipment such as steam tables, warming ovens, water coolers, sinks and counters. Sheet metal collecting jackets for hot air furnaces, air-conditioning ducts, culverts, drains, skylights, gutters, down spouts, water troughs, grain bins, and sectional buildings fabricated at the shop also fall within this classification.

This cross-reference is applied to insureds engaged in the forming of copper sheet metal products not covered by other copper metal classifications. The classification has been applied to the manufacture of copper gutters, down-spouts and weather stripping utilizing sheet metal equipment.

Code 3066 contemplates the manufacture of products requiring the sheathing of a wood core with sheet metal. Besides doors and door frames, the classification includes sash manufacturing, which, of course, covers window frames. The operations involve the usual woodworking machine exposure as well as punch pressing, sheathing and welding which are present in varying degrees. Oftentimes, these concerns fabricate the trolley or tracking devices from which metal covered doors operate.”

Prior to 1993, employers in this class who moved to Ontario would have been assigned to a single rate group (No. 246).<sup>6</sup> However, beginning in 1993 these same employers would be assigned to one of three rate groups: No. 375 – Ornamental and Architectural Metal Products;<sup>7</sup> No. 389 – Metal Closures and Containers;<sup>8</sup> and No. 390 – Other Stamped and Pressed Metal Products.<sup>9</sup>

The conversion of an NCCI classification to multiple Ontario Rate Groups raises the question of which of these rate is most appropriate for Ontario. Our solution was to take a weighted average of rates for all Ontario rate groups that matched the NCCI class using the proportion of Ontario payroll accounted for by the rate group as weights.

## **B. Occupational Insurance Classifications**

While most of the NCCI rate classifications are based on the industry in which the employer operates, there are four occupational classifications, which account for a significant share of national payroll and which are among the 71 NCCI classes used in this study. The largest of

these includes clerical occupations and accounts for over 25 percent of total national payroll. This is problematic because neither British Columbia nor Ontario has comparable occupational classes; in both provinces these occupations are included as part of the several industrial rate groups. In our previous study, we used only the Canadian equivalents of the 67 NCCI industrial classifications to calculate Canadian rates and argued that (Thomason and Burton 2000: 294, note 15):

“If the occupational composition of the 67 U.S. industrial classes (with respect to these four occupational rate groups) is approximately the same as that which exists in the economy as a whole, then the payroll weighted average rates in the two jurisdictions are comparable”

However, since we wrote this, we have concluded that Canadian rates based on the 67 industrial classes are not comparable to U.S. rates. The average of the U.S. rates include clerical employees (as well as the workers in the other three occupational classes) who work throughout the economy and not just in those 67 industrial classes. Importantly, the payroll weights for these classes reflect that fact. For example, the clerical class accounts for 25.425 percent of national payroll in the United States. If these occupational classes were eliminated, then some of that payroll (approximately one half) would be assigned to the 67 NCCI industrial classes that we use to compute average manual rates for U.S. jurisdictions, but the remainder would be assigned to the other 500 industrial classes used by the NCCI.<sup>10</sup> By incorporating the NCCI clerical class into our calculation of the average rate for U.S. jurisdictions, and using the U.S. national payroll weight of 25.425 percent, we undercount clerical payroll in Ontario and British Columbia relative to that in the U.S. Since clerical jobs are less risky than most (if not all) jobs included in the industrial classes, then our methodology in the earlier study overestimated the costs of workers' compensation in Canada relative to that in the United States.

To derive more comparable (and more accurate) costs estimates for British Columbia and Ontario, we identified rate groups in British Columbia and Ontario that are comparable to the

NCCI occupational classifications. For the post-1992 Ontario rates these classes are shown in Table 1.

To calculate the average base assessment rates for post-1992 Ontario, we used the base rates for these four rate groups and the associated payroll weights for the four NCCI occupational classifications.

Because the industrial rate groups for the two Canadian provinces include payroll that, in the United States, would be assigned to the four occupational classifications, it was also necessary to adjust the base assessment rates for these industrial classes. To this end we used employment and wage data from the 1991 Canadian Census to estimate, for each Canadian equivalent of the 67 NCCI industrial classes, the share of payroll accounted for by three of these occupational classes (clerical office employees; drivers, chauffeurs, and their helpers; and salespersons, collectors, or messengers – outside).<sup>11,12</sup> We then recomputed the base assessment rates for each Canadian-equivalent industrial class according to the following formula:

$$R_a = R_u - \sum_{i=1}^3 p_o^i \times r_o^i$$

where  $R_a$  is the adjusted base rate for the Canadian-equivalent industrial class,  $R_u$  is the unadjusted rate for that class,  $p_o^i$  is the share of payroll accounted for by the  $i$ th occupational class, and  $r_o^i$  is the associated Canadian base rate for the  $i$ th occupational class. The result is that the Canadian rates have been reduced to make them comparable to the insurance rates paid in U.S. jurisdictions.

**Table 1**  
**NCCI Occupational Classes and Ontario Equivalents**

NCCI Occupational Classification		Ontario Equivalent Rate Group	
<u>Code</u>	<u>Classification</u>	<u>Rate Group</u>	<u>Classification</u>
7219	Truckmen N.O.C.	570	General Trucking
7380	Drivers, Chauffeurs and Their Helpers N.O.C. - Commercial	586	Taxicabs and Limousine Services
8810	Clerical Office Employees	927	Supply of Clerical Labor
8742	Salesperson, Collectors, or Messengers - Outside	617	Other Products, Wholesale

### C. Experience Rating Modifications

Other aspects of the workers' compensation rate-making process further complicate the task of accurately determining the employer's costs of workers' compensation insurance. For example, most North American jurisdictions use some form of *experience-rating modification* to further adjust rates for individual firms. That is, base or manual assessment rates are adjusted to account for individual firms' accident experience. As a result, the rate paid by high risk firms is increased above the base assessment rate while the rate paid by low risk firms is reduced.<sup>13,14</sup> Since these adjustments are made relative to an "average" rate for the rate group, we might expect that experience rating plans would be "revenue neutral", i.e., experience rating will have no effect on the average rate paid by firms within a given classification or rate group. However, historical data suggests that experience rating reduces the average rate paid by firms by 5 to 15 percent relative to the base rate. A possible explanation is that the incentives inherent in experience-rated workers' compensation assessments induce firms to improve workplace safety and more aggressively manage workers' compensation claims and, consequently, ameliorate their accident experience (Thomason and Pozzebon 1999).

The extent to which experience rating plans result in an adjustment to the average workers' compensation insurance rate varies substantially across jurisdictions, due, in part, to inter-jurisdictional differences in the characteristics of the plans. To account for these variations, we obtained data on two variables: (1) the revenues or premiums that would have been collected if firms were not experience rated – this variable can be calculated by multiplying the exposure base (typically, total payroll of the insured enterprise) for each employer by the manual or base assessment rate, and (2) the sum of the experience rating adjustments for all firms, which would be a negative figure for firms with "better than average" loss experience and positive for firms with "worse than average" experience. The difference between (2) and (1) is known as an *off-balance*. The ratio of (2) to (1) is termed the *off-balance factor*.

We collected jurisdiction-wide data on the off-balance factor for each jurisdiction and year in our sample.<sup>15</sup> To adjust for the effect of experience rating, we multiplied the weighted average manual rate by these off-balance factors.<sup>16</sup>

#### **D. Additional Adjustments – U.S. Rates<sup>17</sup>**

While most Canadian provinces make no further adjustments in workers' compensation assessment rates, the rate-making process in the United States is more complicated. Competitive pressures in private insurance markets have led insurance carriers to invent pricing mechanisms that allow them to price discriminate among insureds, i.e., to offer insurance rates that more accurately reflect the cost of insurance for individual insureds. For example, in almost every state, employers are assessed a flat charge, known as an *expense constant*, to cover the costs of servicing a policy. In some states, employers are assessed an additional amount, termed a *loss constant*, which accounts for the generally inferior safety record of small businesses. Large employers that pay premiums in excess of a particular amount will also receive *premium discounts* to reflect economies of scale in carrier expenses. Employers who purchase insurance from mutual companies or participating stock companies may receive dividends that decrease policyholders' net costs to levels below that charged by nonparticipating stock companies, especially for large employers. These constants, premium discounts, and *dividends to policyholders* are not reflected in the manual rate.

In recent years, the rate making process has grown even more complex as states have increasingly deregulated their workers' compensation insurance markets, which have traditionally been highly regulated. Two competitive pricing devices introduced in the 1970s are *deviations* and *schedule rating*. In a state allowing deviations, individual carriers may use the manual rates promulgated by the rating organization or may deviate from those rates. The deviations offered by a particular carrier must be uniform for all policyholders in the state in a particular insurance class (although different deviations may be used for different classes), and they typically must be approved by the regulatory agency prior to implementation. Under schedule rating plans, insur-

ers can change (usually decrease) the insurance rate the employer would otherwise pay through debits or credits based on a subjective evaluation of factors such as the employer's loss control program. While the adjustments are specific to the individual employer, the schedule-rating plan itself is uniform across insureds and insurers.

As was the case for experience rating, these additional adjustments to U.S. manual rates were made using statewide insurance data. The NCCI and the various state rating organizations routinely collect data that allow us to calculate the effect of these various adjustments on the employers' costs of workers' compensation insurance. A description of these data may be found in Thomason, Schmidle, and Burton (2001, Appendices B and C). As was the case for the off-balance factors used to determine the effect of experience rating on employer costs, we used jurisdiction-wide, rather than rate-group specific, data to make these adjustments.<sup>18</sup>

In those U.S. states that allow private insurance carriers to provide workers' compensation insurance, carriers have the option to reject applicants who are considered undesirable because they were unusually hazardous relative to other firms in their rate group, had a poor loss record, or were so small that the premium did not adequately compensate insurers for their expenses. Because workers' compensation insurance coverage is mandatory, if the state does not have a competitive state fund that is obliged to accept all employers, firms that are unable to purchase insurance in the voluntary market must obtain coverage from an assigned risk program.

There are two types of assigned-risk programs (Williams 1969: pp. 48-49). Under one approach, employers who are unable to obtain coverage are assigned to individual carriers in proportion to the carriers' market shares in the state. Under the second, an assigned-risk pool underwrites coverage. Each employer insured by the pool is assigned to one of a limited number carriers; this carrier is responsible for claims administration for the pool. All carriers insure policies written by the pool in proportion to their shares of the voluntary market.

Since risks insured in the assigned risk or residual market have generally poorer loss records than risks insured in the voluntary market, the employers' costs of workers' compensation

insurance is generally higher for residual market firms. States use a variety of means to distinguish rates paid in the voluntary and residual market. Some states assess different manual rates in the two markets. Others eliminate or modify premium discounts for large policyholders. Still others use either use an experience-rating plan to increase the effect of an employer's own experience on the premiums paid by the employer. Finally, in some states, premium surcharges are added in the residual market to the premiums that the employer would otherwise pay.

Regardless of the mechanism used to establish rates for the residual market, it was necessary to account for the costs of workers' compensation for employers in both the residual and voluntary markets for those states with an assigned-risk program. As indicated, in some jurisdictions this meant calculating separate manual rate (weighted) averages for the two markets. In others, it was necessary to multiply either the voluntary or residual market rate by an assigned-risk adjustment factor. Once again market-wide factors were used to adjust manual rate (weighted) averages. When separate rates were calculated for the residual and assigned-risk markets, it was necessary to blend these to obtain a single adjusted manual or base rate; this was accomplished by taking a weighted average, where the shares of the voluntary and residual markets served as weights.

## **E. Additional Adjustments – Canadian Rates**

### **1. Payroll Adjustment**

In the United States, manual rates are multiplied by the insured's total payroll to determine the insured's premium payment. However, in all Canadian jurisdictions, a payroll limit, which is expressed as the maximum annual assessable earnings ceiling for a single employee, is used for this calculation. In other words, Canadian provinces first determine an employer's assessable payroll by taking the lesser of each covered employee's annual earnings and the maximum assessable earnings ceiling and then summing across employees. The firm's assessments are equal to the base assessment rates multiplied by total assessable earnings (as subsequently adjusted for firm' accident experience if experience rating programs apply).

Since the United States and Canada use different exposure bases (total payroll and assessable payroll, respectively) to calculate premiums, manual rates for the two countries are not comparable. Assume, for example, that bakeries in New York pay benefits of \$2.00 per \$100 of payroll. If there were no loading for expenses or profits, then bakeries would pay \$2.00 per \$100 of payroll for workers' compensation insurance. Assume that the total payroll for the Acme Bakery of Watertown, New York was \$1 million, which means that Acme would pay \$20,000 in premium to cover the \$20,000 in benefits received by the firm's workers. Assume that if Acme moved from Watertown to Brockville, Ontario, its total payroll and the workers' compensation benefits paid to the firm's workers would not change, but that Acme's assessable payroll due to the maximum earnings ceiling is \$800,000. In order to generate enough premiums to pay the \$20,000 in benefits, the insurance rate in Ontario would have to be \$2.50 per hour ( $\$800,000 \times \$2.50 \text{ per } \$100 = \$20,000$ ). In order to obtain comparable U.S. and Canadian rates, it is necessary to convert Canadian rates to their total payroll equivalents. To do so, we multiply the base assessment rate by the ratio of assessable to total payroll. For the previous hypothetical, the total payroll equivalent rate per \$100 of payroll for Ontario would be \$2.00 ( $\$2.50 \times (\$800,000/\$1 \text{ million}) = \$2.00$ ).

In our earlier study, we used a national (Canada-wide) payroll distribution based on data from the Labor Market Activity Survey to estimate gross payroll for all covered employers in the province. By centering the distribution on the industrial aggregate average wage for Ontario workers, we were able to estimate the proportion of payroll below the earnings ceiling. This proportion was then multiplied the province-wide average base assessment to obtain gross payroll.

In this study, we adjusted Ontario rates by using rate group-specific information on assessable and gross payroll to obtain the assessable to gross payroll ratio, which was then used to convert each rate group's base assessment rate to a total payroll equivalent assessment rate. In other words, data on gross and assessable payroll for each rate group was used to calculate a

gross to assessable payroll ratio for each rate group, which was then multiplied by the group's base assessment rate.

The Workers' Compensation Board of British Columbia provided us with data on gross rather than assessable payroll. In other words, the British Columbia rates were equivalent to those in the U.S.

## **2. Adjustments for the Unfunded Liability**

In addition to the payroll adjustment, due to the sizable unfunded liability incurred by the Ontario Workers' Compensation Board in the 1980s, we also derived costs measures that both include and exclude payments toward the unfunded liability.

In the 1970s, the Workers' Compensation Board of Ontario began to accumulate an unfunded liability as claims reserves for future benefit payments were inadequate to fund incurred liabilities. By 1983, the present value of the unfunded liability had grown to almost \$4 billion. The Board responded to the growing deficit by initiating a plan to amortize the debt over a thirty-year period. The unfunded liability was re-amortized each year using a thirty-year horizon, from 1983 through 1998, and each employer's insurance premium included a charge for this debt-reduction plan.

To address the problem of the Ontario unfunded liability and its impact on the employers' costs of workers' compensation insurance, we derived five different estimates of employer costs. Three of these were estimated using class-specific assessment rate information. These are: (1) Rate I, the "new claims costs" rate, which includes the costs of new claims and overhead expenses only; (2) Rate II, known as the "target" rate, which adds to Rate I the cost of the assessment toward the unfunded liability based on the 30-year amortization schedule; and (3) Rate III, which is Rate II adjusted by adding or subtracting a "transition amount", which was designed to limit large increases in the employers' costs of workers' compensation due to the Board's debt reduction efforts. Rate III represents the rates actually paid by employers for workers' compensation insurance, which we therefore designate as the "actual" rate.

In addition to these three costs estimates, which adjust for the unfunded liability using class-specific estimates that amortize the liability over a thirty-year period, we also derived two additional estimates using system-wide data on the unfunded liability that assume a zero-deficit annually. Rate IV is similar to the deficit-adjusted costs estimate that appeared in Thomason and Burton (2000). In part, we present our data for Rate IV to facilitate a comparison with our earlier work. We derived this estimate of Rate IV by increasing (or decreasing) Rate I, the “new claims costs” rate, by an amount that would eliminate the deficit (or surplus) incurred in that year for injuries that occurred in that year.

In other words, we calculated a deficit adjustment factor that is equal to:

$$D = 1 - \left( \frac{[R - E] \times \left[ 1 - \frac{I}{A} \right]}{R} \right)$$

where  $R$  is revenue,  $E$  is expenses,  $I$  is investment income, and  $A$  is investment assets. Importantly,  $E$  excludes expenses due to a retroactive increase in benefits enacted by the provincial legislature. The second term in the numerator ( $1 - I/A$ ) was included to add (or subtract) investment income that would (not) have been received if the Ontario WCB had not incurred a deficit (surplus).

Finally, Rate V is a deficit-adjusted costs measure using system-wide data that is identical to Rate IV except that Rate V also includes assessments for retroactive benefit increases in the year in which these increases were first effective. Thus, if the Ontario enacted a provision in 1995 that retroactively increased benefits for workers injured in earlier years, Rate V for 1995 would include the present value of these increases (while Rate IV would not include the value of the retroactive increases). The rationale for each of these five measures of the employers’ costs of workers’ compensation is discussed below.