

ENDNOTES

¹ Nevada, which was one of the six states with an exclusive state fund during 1975-95, abolished the fund and has relied solely on private carriers since July 1, 1999.

² To the extent that the Canadian economy is similar the US economy, then we can expect that these rate groups represent a similarly large proportion of national payroll in Canada.

³ Data on the percentage of covered payroll for each rate group were obtained from the NCCI and are based on the 36 US jurisdictions for which the NCCI provided rate-making services and are based on 1978-79, 1979-80, or 1980-81 policy year data.

⁴ The six US states are: California, Delaware, Pennsylvania, Ohio, Washington, and West Virginia. Like BC and Ontario, the latter three states are exclusive state fund jurisdictions.

⁵ For all jurisdictions except British Columbia, these conversions were made with the assistance of the local rate-making organization or workers' compensation board, whichever organization is responsible for rate-making in the jurisdiction.

⁶ Rate Group No. 246 includes firms engaged in the manufacture of “[a]mmunition shells (without explosives), axles, springs, or other vehicle parts (metal), boilers, carriage mountings, chains, cranes, cream-separators, cutlery, engines, firearms, freight or passenger elevators, furnaces, gas fixtures, hardware, instruments, iron stairs, light-forgings, machinery, metal articles, metal awnings, metal ceilings, metal doors, metal roofing, metal screens, metal sheets, metal shingles, metal siding, metal window-frames, ornamental iron for buildings or fences, safes, sheet metal enameled wares or articles, sporting goods, steel barriers, steel bedsteads, steel drums, steel tanks, tinware, tools, toys, utensils and wares” (Ontario Workers' Compensation Board 1987, p. 14). The Rate Group also includes “blacksmith shops, die casting, galvanizing, heat-treating, machine shops, metal enameling, metal stamping-works, plating, tinning” (Ontario Workers' Compensation Board 1987, p. 14).

⁷ Among other things, the scope of this rate group includes the following business activities: “manufacturing ornamental and architectural metal products which are not elsewhere classified. This category include the production of art goods (excluding statues); balconies; ceilings; curtain wall; docks and accessories; fences, fencing and posts (excluding wire and wire filled); fire escapes; flooring, open steel; framing systems; gates (excluding wire); grating; grill work; ladders for permanent installation; molding; partitions; railings; store fronts, ornamental; weatherstrip and trim” (Workplace Safety and Insurance Board of Ontario, D-375-02, June 15, 2000).

⁸ Business activities in this rate group include “manufacturing stamped or pressed sheet metal barrels, cans closures, accessories, and parts. Included are products such as barrels; bottle caps; cans (food, beverage, aerosol, or garbage); caps; closures, accessories, and parts; collapsible tubes; cosmetic containers; drums; gas cylinders and parts; kegs; pails. Excluded from this category are products whose composition includes less than 50 per cent sheet metal. Sheet metal is defined as metal less than 3/16 (.188) inch (4.78 millimeters) in thickness. The thickness of the sheet metal as ordered, not the various mill tolerances considered acceptable by the industry

upon delivery, is the determining factor for classification purposes” (Workplace Safety and Insurance Board of Ontario, D-389-01, March 15, 2001).

⁹ Business activities in this rate group include “manufacturing stamped or pressed sheet metal products which are not elsewhere categorized. This category includes metal products such as awnings; chests; cooking utensils; culvert pipe (corrugated metal); ducts and pipes; eavestroughing; expanded metal; flooring (excluding open steel); food utensils; gutters; highway guard rail; license plates; portable ladders; roof deck and drainage equipment; siding; tanks, domestic hot water heater; toolboxes, tool cabinets, and tool chests. Included here is the manufacture of metal corner bead, lath, and studs except when manufactured as part of a metal framing system. Also included here is the minting of coins. Excluded from this category are motor vehicle stampings and products whose composition is less than 50 percent sheet metal. Sheet metal is defined as metal less than 3/16 (.188) inch (4.78 millimeters) in thickness. The thickness of the sheet metal as ordered, not the various mill tolerances considered acceptable by the industry upon delivery, is the determining factor for classification purposes” (Workplace Safety and Insurance Board of Ontario, D-390-01, March 15, 2001).

¹⁰ Since our 71 classes account for approximately 76 percent of US payroll and since the occupational classes account for approximately 34 percent of US payroll, then we might expect, *ceteris paribus*, that 42 percent of clerical payroll would be assigned to the 67 industrial classes that we use to calculate US manual rates, while 48 percent would be assigned to the 500 industrial classes that we don’t use.

¹¹ The fourth occupation class is Truckmen: N.O.C. – All employees and drivers (NCCI Code 7219). This class is similar to the NCCI Code 7380, Drivers, Chauffers and Their Helpers N.O.C. – Commercial. The distinction is that: “while both apply only if they are ‘not otherwise classified’ Code 7219 is applicable to the transportation of goods not owned by an insured, whereas Code 7380 is applicable to the driving of vehicles and/or the transportation of goods owned by the insured. Since the Census data do not allow us to make this distinction, we decided that the payroll for all truck drivers (and related occupations) would arbitrarily be assigned to Code 7380. To find Canadian rates equivalent to US rates for Code 7219, we used Canadian rate groups associated with truck transport industries. Since the rate for Code 7219 tends to be somewhat higher than that for Code 7380, we may have biased our Ontario estimates slightly. The extent and direction of this bias would depend on the magnitude of the rates for these two classifications relative to the rate(s) for the industrial rate group(s).

¹² Some of the 67 NCCI industrial classes included drivers. In those cases, we did not exclude payroll for drivers.

¹³ Since the reliability of accident experience of individual firms is positively related to firm size, due to the law of large numbers, the degree to which a firm’s assessment rate is experience-rated also varies by the amount of the firm’s premium. Very small firms are not experience-rated, so that they pay the base assessment rate, while very large firms are perfectly experience-rated, i.e., their assessments are completely based on their own accident experience.

¹⁴ Two types of experience rating are used in North America. Prospective experience rating plans use historical accident experience to determine the current year's rates for individual firm rates. Retrospective rating plans use the current year's accident experience to adjust individual firm rates for the current year. Because many workers' compensation claims do not mature for years after the injury giving rise to the claim, retrospective rating adjustments of current year premiums rates is not made until two or three years after the current year.

¹⁵ The one exception was British Columbia, which did not provide us with manual rate data, but with data on (1) payroll and (2) actual assessment revenues (i.e., after experience-rating modification). We calculated adjusted manual rates by dividing (2) by (1) and multiplying by 100.

¹⁶ Because the impact of experience-rating can vary across rate groups, it would have been preferable to have rate-group specific off-balance factors, rather than jurisdiction-wide factors that use combined data from all rate groups in the jurisdiction. However, with the exception of British Columbia (see the previous footnote), these data were either unavailable or prohibitively expensive.

¹⁷ This section contains a brief, heuristic summary of the adjustments we made to manual rates in order to derive the employers' cost of workers' compensation insurance for US jurisdictions. A more complete description of our methodology may be found in Thomason, Schmidle, and Burton (2001). See, in particular, Chapter 3 and Appendix C.

¹⁸ The determination of the employers' cost of workers' compensation insurance has become even more complex with the advent of further deregulation in the 1980s and 1990s.

Under traditional rate regulation, rates were developed by a rating organization – in most states this was the NCCI – which was then required to submit these rates to a public regulatory agency, typically called an Insurance Commission, for approval before the rates could be implemented. The Insurance Commission was free to modify the rating bureaus rate request or to reject the proposed rate changes altogether. At any event, insurers were required to adhere to the rates approved by the Insurance Commission.

Beginning in the early 1980s, many states have further deregulated their workers' compensation insurance markets in a number of ways. First, some states no longer require the prior approval of rates by the Insurance Commission; insurers are free to implement rate changes before the Commission approves them, although the Commission retains the authority to modify or reject the insurers' rate changes after the fact. Second, many states no longer require insurers to adhere to rates promulgated by the state rating organization; insurers may develop their own rates, which may or may not be subject to the prior approval of the Insurance Commission. Finally, in some jurisdictions, the rating organization may no longer promulgate fully developed manual rates; rather, the rating organization publishes loss costs or pure premiums, i.e., the rating organization's estimate of the cost of cash benefits, medical care, and (in most jurisdictions) loss adjustment expenses. Fully developed rates include a loading factor, i.e., an allowance for underwriting and marketing expenses as well as profits, in addition to the pure premium.

In other words, under more recent deregulatory initiatives that permit employers to deviate from rating bureau rates, there is no single state-wide manual rate that is charged to all employers in a single jurisdiction. In addition, in loss cost or pure premium states, the rating organization does not promulgate manual rates, so that it becomes necessary to calculate the average loading factor charged employers in the jurisdiction.

For those states that adopted one of these more comprehensive forms of deregulation (e.g., no longer requiring adherence to bureau rates or prohibiting the rating bureau from publishing fully developed rates, it was necessary to adjust our procedures for estimating adjusted manual rates. Further discussion of the methodology used for jurisdictions that have adopted these types of deregulation may be found in Appendix C of Thomason, Schmidle, and Burton (2001).

¹⁹ That is, these measures of the ratio of the average workers' compensation assessment in the jurisdiction to the average payroll. Since the same unit of measurement is in both the numerator and denominator, these are, in essence, percentages.

²⁰ Because we use total-market adjustment factors, which do not account for differences in these factors across rate classifications, some bias is introduced into these sectoral cost estimates. Unfortunately, rate group or sector-specific data on these adjustment factors was unavailable.

²¹ It is possible to account for price differences among treatments by normalizing according to a universal metric, such as the price per unit of "health improvement" or price per unit of "patient quality of life", etc.

²² The US data were collected by the Workers' Compensation Research Institute (Tanabe 1998) and represent the fee schedule in effect in each of these jurisdictions in March 1998. The remaining US jurisdictions do not have fee schedules. The Workplace Safety and Insurance Board provided Ontario data.

²³ Walker (2001) reports that actual waiting time exceeded clinically reasonable waiting time (as determined by medical specialists) in 86 percent of the comparisons involving all 10 provinces and 13 medical specialties. Waiting time was 69 percent higher in 2000-01 than in 1993, and "academic studies of waiting time have found that Canadians wait longer than Americans, Germans, and Swedes (sometimes) for cardiac care, although not as long as New Zealanders or the British." Kirkey (2001) reported on two studies documenting the long waits for care in Canada and the consequences of the delays. One study, published in the *Canadian Medical Association Journal*, reported that 37% of patients faced at least one "inappropriate" delay in the process leading up to their surgery for cancer in regional cancer centers, which both increased the likelihood of not being cured and caused "psychological devastation" on those patients affected by the long delays. The second study by Quebec doctors found that patients forced to wait more than 97 days for cardiac bypass surgery fared significantly worse before and after surgery than patients who are treated within three months. Only about 56% of those with the delayed operation return to work, compared to 85% of the patients treated sooner.

²⁴ There are a number of studies suggesting that some forms of intensive treatment of back disorders are not cost-effective. Citations to a number of these studies are included in Mustard et al. 1998.

²⁵ In the subsequent discussion on the evidence of shifting of medical costs in the U.S., we present evidence from Card and McCall (1996) that is inconsistent with the findings of Smith (1989).

²⁶ These limits include: deductibles (whereby the individual pays for the first \$X of incurred medical expenses; co-insurance (whereby the insurance company assumes liability for a portion of incurred expenses, e.g., 80 percent, while the patient is responsible for the remainder); and maximums (whereby the insurance company's liability is limited to a maximum annual or lifetime amount). Furthermore, a non-trivial portion of the US workforce lacks health care coverage altogether.

²⁷ Canadian workers' compensation programs pay for some medical expenses that are not covered by provincial health care insurance. These include payments for prescription drugs (until recently) and prosthetic devices.

²⁸ Richard Allingham and Donna Bain provided the data on payments from the WSIB to the OHIP.

²⁹ Specifically, they used demographic and job-related characteristics to estimate a regression equation predicting medical coverage. The resultant regression equation was then used to predict the probability of medical coverage for workers' compensation claimants in their Minnesota claims sample.

³⁰ Most U.S. workers' compensation agencies have an internal (rather than an external) appeals body that is dedicated to the resolution of workers' compensation disputes. However, the workers' compensation statutes in most U.S. jurisdictions lack a privative clause that prevents the parties from obtaining relief in court if they have exhausted the internal appeals process and are dissatisfied with the outcome. Most of the costs of this extra-statutory appeal process is generally borne by the parties themselves and so is not included in the adjusted manual rate. However, our sense is that only a small fraction of claims are ever appealed to the courts – much smaller than the proportion of Ontario claims that are appealed to the WSIAT (Thomason 1992).

³¹ Economic theory and existing empirical evidence suggests that workers pay much of the costs of workers' compensation insurance through a reduction in the wages. See Chapter 8 of Leigh et. al (2000).

³² Specifically, the Office of the Employer Adviser provides representation for employers with fewer than 100 employees. The Office of the Employer Adviser also provides advice, information, and education on topics such as claims management, return to work programs, as well as appeals and mediation to both large and small employers.

³³ The Mine Rescue program “trains volunteers at Ontario's underground mines to deal with emergencies, and also equips mine rescue stations around the province.”

(<http://masha.on.ca/news/minerescue.htm>, October 2, 2001). It is likely that miner owners in the United States perform some of these functions themselves. To the extent that they do, the costs of the Mine Rescue Program should not be deducted from Ontario costs.

³⁴ As indicated by the discussion, it is appropriate to deduct the costs of some, but not all, mandates. Unfortunately, we were only able to obtain data on the cost of specific mandates for a handful of years. The adjustments depicted in Figure 20 subtract the total cost of *all* mandates from the actual and current cost estimates from Figure 1.

³⁵ Prior to 1985, the SWAs were the only legislated mandate funded by workers' compensation assessments.

³⁶ Because the insurers' income varies substantially over the course of the insurance cycle, it is necessary to use a relatively long time series to estimate corporate income taxes.

³⁷ The nine competitive state funds that are included in the 1999 data in Table 4 are Arizona, California, Idaho, Kentucky, Minnesota, New York, Oregon, Texas, and Utah.

³⁸ The six competitive state funds that are not included in the 1999 data in Table 4 are Colorado, Maryland, Montana, Oklahoma, Pennsylvania, and South Carolina.

³⁹ The six exclusive state funds during most of the period were Nevada, North Dakota, Ohio, Washington, West Virginia, and Wyoming. The Nevada fund was privatized on July 1, 1999.

⁴⁰ The insurers' equity could obviously be used in other ways to generate income. For example, the insurer could invest in government securities to achieve a certain rate of return. So it is reasonable for insurers to expect that they would receive a return that is, on average, at least equal to the interest that they would receive on government securities. However, securities are a relatively risk-free investment, while, as indicated, equity in an insurance company is not. For this reason, we might expect the insurers' return on equity to be higher than the interest rate on government bonds. Economists define a "normal" rate of return on an investment as that which a competitive financial market yields on investments with similar risk and liquidity characteristics.

⁴¹ Once again, this discussion is necessarily general and heuristic. A more comprehensive description of our methodology may be found in Appendix D of Thomason, Schmidle and Burton (2001).

⁴² Injury distributions were provided by the NCCI with two exceptions. First, the injury distribution was identical across states and provinces with respect to all parameters, except wages. We used national wage distributions, one for US jurisdictions and one for Canadian provinces. The US wage distribution was provided by the NCCI and was based on data collected as part of the *Current Population Survey* conducted by the Bureau of Labor Statistics. The Canadian distribution was obtained from the 1986-87 and 1988-89 *Labour Market Activity Surveys*. To obtain a distribution specific to each jurisdiction, we centered these national distributions on the average weekly wage of each state and province after this average wage rate to account for differences in industrial composition among jurisdictions. Specifically, we calculated an average wage for each jurisdiction, by averaging wage rates for two or three-digit industries, using the industry's share

of national (US) employment as weights. Second, because the basis of permanent disability compensation for Ontario is unique, we used two Ontario distributions to calculate expected long-term benefits for Ontario. The latter exception represents a modification of the methodology used in our earlier study, where we used the same permanent disability distribution for Ontario that we used for US jurisdictions.

⁴³ The Council of State Governments promulgated the original version of the Model Act in the 1960s. We are using the revised version of the Model Act (Council of State Governments 1974). It embodies a consensus with respect to a standard of benefit adequacy among the various workers' compensation stakeholders programs in the United States.

⁴⁴ Actual expenditure data are inferior to an "expected" index in two ways. First, actual expenditures are affected by inter-jurisdictional differences in the severity and frequency of workers' compensation claims. Second, these data are tied to the currency, which necessitated converting the data into real terms to reflect the influence of inflation and translating the data for Ontario and British Columbia into US dollars. We converted the nominal Canadian cost data into real US dollars by first converting Canadian into US dollars using the Parity of Purchasing Power Index and then inflating these nominal US dollars into their real 1995 equivalent using the US Consumer Price Index (CPI). Nominal medical costs for US jurisdictions were similarly converted to constant 1995 dollars using the US CPI.

⁴⁵ Missing observations on Ontario incurred medical costs were imputed using a regression equation that estimated incurred costs as a function of current medical costs as well as a trend variable, trend squared, and trend cubed.

⁴⁶ We used the following industry divisions: agriculture, forestry, and fishing; mining; manufacturing; construction; transportation and public utilities; wholesale and retail trade; finance, insurance, and real estate; and services.

⁴⁷ In our previous study, we lacked industry level data for Ontario for 1995 and for the years before 1983.

⁴⁸ In all US states, claimants only become eligible for compensation benefits if their disabilities last longer than certain number of days, known as a waiting period, which is between three and seven days. Because the denominator in this ratio is the number of compensable claims, i.e., claims deemed eligible for compensation, and because there is variation in the waiting period, it was necessary to adjust the denominator for each US state to reflect its waiting period. We did this by using a national distribution of injuries by duration to calculate the ratio of total claims to the number of claims with durations equal to or longer than the waiting period, i.e., claims that would be deemed compensable in the state. We then multiplied this ratio by the compensable claims in the state to estimate the total number of claims.

⁴⁹ About 25 US states that allow insurance carriers to offer workers' compensation insurance have also created a fund, managed by a public board, that provides workers' compensation insurance coverage to employers. These funds are known as competitive state funds since they com-

pete with private sector firms. Prior research has indicated that states with competitive funds have higher costs than states without such funds (Thomason, Schmidle, and Burton 2001).

⁵⁰ To correct for heteroscedasticity problems associated with the jurisdiction size, we estimated weighted least squares regressions, using nonfarm employment as weights. An analysis of the residuals from these weighted least squares regressions revealed that the heteroscedasticity problem had been resolved.

⁵¹ The regression was estimated using 971 usable observations. The adjusted r-square for the regression equation was 0.962.

⁵² Not all US firms are allowed to self-insure. Self-insured firms are obliged to meet certain fiscal conditions to ensure that they are able to meet their legislative obligations under the workers' compensation statute. Consequently, self-insurance is not an option for very small employers.

⁵³ Self-insurance is limited to Schedule 2 employers, which are government entities – like municipalities or school boards – or employers that are in the federal jurisdiction – such as railways, airlines, and telecommunication companies. An examination of the NCCI classifications used to compute our adjusted manual rates reveals that only one, Police, includes Schedule 2 employers. Since police account for only 0.615 percent covered payroll, we think it unnecessary to adjust our Ontario rates to account for the self-insurance.