Who Actually Pays for Workers' Compensation?: The Empirical Evidence

by James R. Chelius and John F. Burton, Jr.

Readers of this publication are undoubtedly aware of the national trends regarding the large — and seemingly ever-increasing costs of workers' compensation insurance. According to one estimate, these costs in 1992 reached $60 billion, which represented an 8.7 percent increase over the comparable figure for 1991.[1] The story of soaring workers' compensation costs over much of the last several decades is also familiar.[2] These cost increases have, in turn, set in motion a wave of statutory reforms ranging from incremental changes to draconian overhauls. Furthermore, the workers' compensation program shows no signs of settling into an extended period of stability.

If the continuing debate over both the appropriate level of workers' compensation costs and revisions to program characteristics that may influence these costs[3] is to be well-informed, it is important to understand who is actually — rather than nominally — paying for these costs. Resistance to costly changes is frequently strongest among those who conclude that they incur the cost of these changes. Similarly, it is only human nature not to worry about the costliness of a particular change if it is anticipated that someone else will pay the bill.

This article, which supplements our previous essay on economic theory,[4] summarizes empirical research findings regarding this critical issue of who pays for workers' compensation. Though economic theory is important in several respects, it is the empirical evidence that is ultimately the key to our understanding. Since economic theory provides a conceptual framework for empirical analysis, we will briefly summarize the salient points of our previous article, before discussing the research findings.

Why Bother with A Theory?

Economic theory is an abstraction of how the real world operates. A "good" theory captures the essence of how markets actually work, without being encumbered by many of the complexities inherent in everyday economic life. Thus, a principal virtue of a good economic theory is that the theory be simple and only as complex as is needed to help us explain the functioning of the real world.[5] Even though we must ultimately rely on empirical findings (or "real world" experience) to assess who actually pays for workers' compensation, economic theory is a valuable starting point for any investigation of market phenomena.

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As we noted in our earlier essay, "... real world marketplaces do not act as precisely or quickly as one might infer from the abstractions, but such a theoretical analysis is useful because it structures our thinking (by providing a general framework or model for analyzing a very complex and detailed array of real world market exchanges) and directs us to the right questions."[6] For example, theory alerts us to the existence of a tradeoff between wages and employment, that is, higher wages are generally associated with fewer additional hires. As we evaluate appropriate tests of who actually pays for workers' compensation, we will consider the consequences on both employment and wages. (As it turns out, relatively less is known about the employment aspects of this issue.) Again, economic theory helps us to pose the right questions, even though it might not also furnish all of the answers.

It is also important to recall that the role of a theory is to provide insight into how the real world actually operates, rather than how any of us might wish it to operate. Many negative reactions to a particular theoretical conclusion are based more on wishful thinking about how the world **should** be. It is useful to separate such normative perceptions from analyses of how the labor market and its participants actually behave, and from analyses of who thus actually pays for workers' compensation.

Conclusions Derived from Economic Theory

Workers' compensation programs, which mandate that employers provide and nominally pay for benefits to injured workers, are analogous to other government programs that are financed by a tax on payrolls. Thus, the general theory about the impact of payroll taxes is the relevant framework within which to conduct our analysis.

Our earlier review of the economic theory regarding who pays for employment-related "taxes" such as workers' compensation had five principal conclusions.[7] We initially noted that "payroll taxes (including workers' compensation) evoke responses in the marketplace that must be taken into account if we are to understand their impact." *Simply looking at who is the nominal payer of the tax does not necessarily tell the whole story or even an accurate story:* such taxes nominally paid by the employer may actually be paid

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by workers (or by other participants in the economic transactions related to the employment relationship, such as product purchasers) through a) lower wages (or, more typically, through wages that do not grow as rapidly as they otherwise would have grown) or b) through reduced employment opportunities (or, perhaps, employment opportunities that do not grow as quickly as they otherwise would have grown). These responses are not instantaneous or precise; nonetheless, the economic theory does point out the market's long-run tendencies.

We also concluded that these "*taxes are best viewed as being imposed on the employment relationship rather than on the nominal payer of the fees.*" Employers and employees are engaged in a reciprocal exchange and any burden (or subsidy) imposed on one party is going to have some implications for the other party.

Our third conclusion from economic theory regarding who pays for workers' compensation that was derived was that "*... a key influence as to who is the ultimate payer of the tax is the flexibility both employers and employees have in responding to the imposition of such a tax*" — a party's inability or disinclination to respond by adjusting the quantity of labor supplied or demanded will result in the inflexible party bearing more of the burden in the form of lower wages received by the worker or higher labor costs paid by the employer. Employers might exercise flexibility by hiring workers in another jurisdiction not covered by the tax (or in a state or country with lower costs) or by substituting capital (for example, investments in machinery) for labor. Workers might exhibit flexibility by switching to an employer offering better wages, by moving to a state with better job opportunities, or by leaving the labor force.

Our fourth conclusion from economic theory had to do with the inevitable tradeoff between wages and employment. It is an enduring fact of economic life that reactions to change take the form of adjustments in either prices or in quantities. In the case of changes in employers' costs of workers' compensation insurance, the labor market will react by changing wages, employment levels, or some combination of both. *Since there is a tradeoff between the level of employment and the level of wages, a greater impact of higher employers' workers' compensation costs on wages results in a lesser impact on employment.*

A final conclusion from our review of labor market theory was that *the value of workers' compensation to employees is another key influence on the tax's impact.* To the extent that workers' compensation is viewed by an employee as a valuable part of pay (similar to other fringe benefits that might be valued by the worker), a worker's wage will be lower than it otherwise would be. Just as an employee might use part of his or her wage earnings to purchase a supplemental disability policy, the employer's mandatory "purchase" of valued workers' compensation coverage will tend to result in lower wages.

There are four broad levels of empirical analysis....

As noted above, these conclusions derived from economic theory merely set the stage for our consideration of the empirical evidence about how labor markets actually work and, specifically, how these markets react to changes in the costs of workers' compensation insurance. These research findings are summarized in the remainder of this article.

The Empirical Evidence

There are four broad levels of empirical analysis that provide evidence pertinent to our evaluation about who actually pays for workers' compensation. Each level of analysis has its own strengths and weaknesses.

The first (and most general) level of studies examine employer and employee responses to changes in labor costs and to wage changes in general. Since an increase in the employers' costs of workers' compensation insurance potentially affects labor costs and wages, the lessons of these broader studies are quite relevant to the evaluation of who actually pays for workers' compensation. Many economists think that the conclusions from the empirical evidence in these more general studies are more valid than are the conclusions derived from studies of specific programs (such as workers' compensation or Social Security), since the more aggregated approach does not have to rely on what may be quite small differences across jurisdictions or across time within a jurisdiction to detect a statistically significant impact. There are almost always many other differences that exist across labor markets other than the differences in the program being examined, so it is usually difficult to statistically single out the impact on labor markets of any discrete policy difference (particularly if that programmatic difference is small). The more general approach of examining the reaction to wage and labor cost changes also may be better able to capture a broader range of subtle adjustments in the marketplace than would the examination of a specific policy or program.

A second category of empirical studies relevant to our evaluation of who actually pays for workers' compensation are those that examine payroll taxes in general. As we previously noted, the employer's requirement to provide workers' compensation coverage is analogous to a program financed by a payroll tax; thus, lessons from the empirical research regarding these other programs are obviously relevant. Government mandates that employers purchase particular benefits are also analogous to workers' compensation and empirical studies of these mandates provide additional insight into our question of "who pays." Unfortunately (at least in terms of research), there is a broad and uniform application of most social programs that are financed by payroll taxes; because interjurisdictional differences in such programs are thus small, it is often difficult to detect statistically significant differences across jurisdictions in the labor market reactions to programmatic changes.[8] An important advantage of payroll tax studies, however, is that there are many

similarities between payroll taxes and workers' compensation insurance, and thus the empirical evidence regarding the impact of payroll taxes and mandatory benefit purchases provides lessons that are applicable to our evaluation of who actually pays for workers' compensation.

The third category of empirical studies in our review investigates the relationship between job risks and the wages received by workers. There have been numerous articles on this topic, most of which have found that workers in dangerous jobs receive extra pay to compensate for this additional risk. These findings provide a general context for examining whether workers' compensation serves as a countervailing force; that is, does the provision of workers' compensation lessen the amount of the extra pay received by workers in dangerous jobs? To the extent that workers' compensation lessens the extra pay that is necessary to induce workers to accept and stay with risky jobs, employees are paying for workers' compensation coverage through decreases in their pay.

The final category of empirical studies that we will review are direct examinations of who actually pays for workers' compensation. The substantial interstate variations in workers' compensation programs makes such a direct examination more fruitful than is the case for programs financed by payroll taxes.

Within each of these four categories of empirical analyses, we will highlight the key findings rather than presenting an exhaustive literature review. We will focus on the major studies that are illustrative of the general consensus in researchers' findings or that are uniquely targeted to our question of "who pays."

Category One: General Studies of Employers and Employees

Labor market theory demonstrates that the options available to both employers and employees are important in determining the labor market response to changes in workers' compensation costs. The central issue is how employers respond to labor cost changes and how employees respond to wage changes.

The most important findings from this literature are about how workers respond to wage changes. As explained in our earlier essay on the theory of labor markets, an inability or unwillingness of workers to switch employers or stop working in response to a wage decrease will "steer" the market toward wages that are lowered by the amount of the payroll tax. While there is substantial evidence that employees are willing to switch employers in response to modest wage differences, when wages are lowered throughout the market there is much less flexibility.

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For the labor market as a whole, the evidence for adult male workers in their middle working years is that they will continue to work, irrespective of whatever changes there might be in their wages.[9] These workers will not (cannot?) withdraw from the labor force in response to a lower wage. Furthermore, while other groups (such as non-middle-aged men — both younger and older, and married women) exhibit **some** tendency to drop out of the labor force in response to lower wages,[10] these effects are not large. This small response on the part of workers in the market as a whole results in what economists refer to as an inelastic labor supply.

This lack of flexibility on the part of workers implies that much — if not all — of the impact of workers' compensation cost increases will be borne by workers in the form of lower wages. If one views workers' compensation as a program that exists in every state with relatively minor variations across states, these empirical results of little or no overall worker flexibility are the most relevant to our discussion of who actually pays for workers' compensation. In this perspective of workers' compensation as a universal system, workers have little room to escape the program's wage impact, short of withdrawing from the labor force. Thus, they continue to bear the burden of the costs of workers' compensation insurance in the form of lower wages.

Given the substantial interstate differences in workers' compensation costs as well as substantial worker mobility across states, one might anticipate that workers have more flexibility than is implied by the above evidence about the overall national market. A relative wage decline in one state as a result of higher employers' costs of workers' compensation insurance may cause workers to move to another state, thus giving them an option other than withdrawing from the labor force. If there were substantial interstate variation in workers' compensation costs and a resulting substantial interstate worker mobility, less of such wage reductions would occur. (If it is the case that wages are not reduced in response to workers' compensation cost increases, the impact would fall more heavily on reductions in employment.) There is, however, no empirical evidence on the extent of interstate worker mobility in response to changes in workers' compensation costs.

Ascertaining the dollar value that workers place on having workers' compensation coverage provides another complication. Even if workers had complete flexibility in responding to wage decreases that resulted from higher workers' compensation costs, they might not move elsewhere or stop working if they valued the benefits given in exchange for the wage decrease. If workers value the benefit provided by the tax, their supply behavior (of not changing jobs to an employer without workers' compensation coverage or an employer who is located in a state with lower costs) will result in them bearing the burden of the tax in the form of lower wages. The greater value workers place on the benefit, the greater will be the degree to which the burden of the tax will be shifted to labor in the form of lower wages. There is, however, no direct empirical evidence on the degree to which workers' compensation is valued by workers, although the indirect

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evidence examined below indicates that workers place a substantial value on workers' compensation coverage.

If one accepts the notion of little or no flexibility of supply behavior on the part of workers in response to higher workers' compensation costs (because they cannot withdraw from the labor force, they choose not to move to another state, or they value the workers' compensation coverage being mandated), the program cost will be shifted to workers no matter what the degree of flexibility exhibited by employers.

This pattern of supply behavior on the part of workers causes us to conclude that increases in workers' compensation costs are primarily shifted onto employees in the form of lower wages. This conclusion is reinforced by empirical evidence regarding employers' behavior. The consensus evidence from a number of studies of the elasticity of demand for labor indicates that employers have a substantial degree of flexibility. The "best guess" evidence indicates that, for every 10 percent increase in labor costs, employers reduce demand for workers by about 3 percent.[11] This implies that even if there were substantial employment decision flexibility on the part of employees and even if employees placed little value on having workers' compensation coverage, a large part of the cost of workers' compensation insurance would still be shifted to labor.

In conclusion, if the market's reaction to workers' compensation cost increases is the same or similar to the market's reaction to general labor cost changes and wage changes, the empirical evidence indicates that workers will pay for a substantial portion of the workers' compensation bill.

General Payroll Tax Studies

There have been many empirical studies that examine the impact of payroll taxes and their close cousin of government mandates that require employers to provide certain benefits, such as the requirements in some countries that mandate paid vacations. Empirical analyses of the extent to which employers, who nominally pay for payroll taxes, actually shift the cost of such taxes onto employees have produced a wide range of estimates. This diversity of findings probably reflects the difficulties of isolating, in a statistical model, the effect of payroll taxes on labor markets, particularly since labor markets are also affected by many other factors. This lack of consensus in the research findings has led one leading contributor to this literature to conclude that the consideration of employer and employee responses to general cost and wage changes (described above as the category one studies) is more useful in ascertaining "who pays" for such programs.[12]

Because payroll taxes are lower in the United States than in most other industrialized nations, some of the more useful studies of payroll taxes have analyzed the experience in other economies. One of the most widely cited studies of the impact of payroll taxes analyzed the Swedish labor market. In Sweden, payroll taxes are very high, having grown from 6 percent in 1950 to 40 percent in 1979; during the 1970s alone, Sweden's payroll taxes increased from 14 to 40 percent. With such dramatic increases, one does not need quite as fine a level of precision to detect labor market reactions as is necessary in most other environments. This study of the Swedish labor market found that *within one year*, approximately 50 percent of the payroll tax increase had been shifted to labor in the form of lower wages, and concluded that "[l]abor will presumably bear the full burden of payroll tax increases in the form of lower wages in the long run, but it may take quite a while before the long run is reached."[13]

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A recent empirical examination of the impact of a state government mandate that employers pay for maternity coverage to the same extent as comparable medical conditions provides significant insight into how the labor market reacts to the imposition of requirements that employers provide certain benefits.[14] We highlight this maternity coverage study because of its perceptive analysis and because this mandate, as with workers' compensation coverage, provides benefits that employees are likely to view as valuable. The imposition of this maternity coverage obligation by several states in the mid-1970s, as well as a subsequent federal mandate affecting all states as of late 1978, establishes a quasi-experimental situation that is rarely available to researchers in the social sciences. The fact that the mandate applies only to a readily identifiable group of workers further sharpens the precision of the analysis, as it lessens the number of confounding influences that may also have a bearing on the labor market.

This study utilized data on individual workers and a variety of specifications of the statistical model in comparing wages of married females aged 20 to 40 (and their husbands) in states that had passed such legislation to the wages of the same demographic group in states that had not passed the legislation. The study found, on the basis of this interstate comparison, that the wages of the married females in the states mandating maternity coverage were lower (after statistically controlling for other possible influences) than were the wages of the comparable group of married females in states without such mandates. This cost shifting (in the form of lower wages) occurred despite the presence of anti-discrimination legislation which would seem to make it difficult to pass along the cost of mandated coverage in the form of lower wages among the group being provided with such coverage.

The subsequent implementation in 1978 of a federal mandate to provide maternity benefits that was applicable to **every** state provided another opportunity to assess the labor market impact of this payroll tax. Since this mandate applied to all married women, it might be anticipated that the labor market reaction would be less pronounced than in the instance in which the mandate was only in effect in only a few states. Within a short period of time after the federal mandate took effect, however, most of the cost of

providing this maternity coverage was shifted to the affected workers in the form of lower wages.[15]

In conclusion, our summary of the Swedish payroll tax and maternity coverage empirical studies — which are two of the more interesting and most representative analyses of payroll taxes and employer mandates — reveals that a substantial amount of costs nominally paid by employers are actually shifted onto employees in the form of lower wages. While not every empirical study has reached this conclusion, there is a consensus among most payroll tax studies that employees absorb most of the cost of payroll taxes. Furthermore, the research findings from the two studies we have summarized indicate that the cost shifting has occurred over a fairly short period of time.

Compensating Wage Differentials

Another area of empirical research that is relevant to our discussion of who actually pays for workers' compensation is the matter of whether workers are paid higher wages to work in risky jobs. The assertion that workers must be paid higher wages in order to induce them to accept and stay with dangerous jobs is a labor market theory that is over 200 years old.[16] Over the last two decades, this theory has been subjected to substantial empirical testing.[17]

This notion of "compensating wage differentials" (a term that economists use for this higher pay for dangerous jobs) is very difficult to study because of the myriad factors that have to be accounted for in a statistical model in order to isolate the impact of risk on wages. The theory does not say that wages in dangerous jobs necessarily will be higher than the wages in a less dangerous job, but rather that wages in a given dangerous job are higher than they would be if the risks were lower. The "compensating wage differential" theory that extra pay is required to attract and retain employees in less attractive jobs applies not just to job attributes such as on-the-job risk but also to any unattractive feature of a job such as low status or a high probability of being laid off.

The findings from the empirical literature on compensating wage differentials for risk are quite consistent: most studies conclude that there are indeed compensating wage differentials for risk as measured by the likelihood of workplace fatalities.[18] Though estimates of the actual level of compensating wage differentials vary, in general, wages are "... one-half to 2 percent higher for workers in manufacturing industries with the average risk of job fatalities (about 1 in 10,000 per year) than for comparable workers in industries with half that level of risk."[19] Clearly then, the labor market does react (to some degree) to the degree of danger on the job. There is, however, no standard by which to measure whether such premiums fully compensate workers for risk or whether such premiums are just a partial payment for a danger that, if fully accounted for, would yield even higher wages.

These findings set the stage for the next category of studies that directly analyze the impact of workers' compensation. To the extent that a worker receives extra pay for bearing the risk of a dangerous job, the amount of this compensating wage differential should be lessened by the presence of a workers' compensation benefits provision system and the more generous these benefits, the less should be the extra pay for risk.

Direct Examinations of Workers' Compensation Programs

The fairly recent availability of data bases in which individual workers are the unit of observation has resulted in several recent studies of who pays for workers' compensation that, in our opinion, are very sound.[20] Furthermore, the substantial variation across states in the cost of workers' compensation provides an almost unique arena within which to analyze a program's impact on employee pay.[21]

The first empirical studies that directly examined the impact of workers' compensation on wages date only to the early 1980s. Representative of three studies published in 1983 is one by Stuart Dorsey and Norman Walzer.[22] Dorsey and Walzer used data from a national sample of blue collar workers in order to statistically evaluate the relationship between workers' compensation costs and wages; other factors that may also influence the level of wages (such as education and age) were also taken into consideration in their empirical model.[23] Dorsey and Walzer found that, for nonunion workers, over 100 percent of the costs of workers' compensation were shifted onto employees in the form of lower wages. Specifically, they concluded that for every 1 percent increase in workers' compensation costs, wages declined by 1.4 percent.[24]

More recent empirical studies of the impact of increases in workers' compensation costs have been done by Michael Moore and W. Kip Viscusi.[25] They used three "general purpose samples" of household heads in the labor market, in examining the relationship between wages and higher workers' compensation benefits. As was the case in the previously cited empirical studies, the statistical models used by Moore and Viscusi also take into consideration other factors that may have a bearing on wages.[26]

Moore and Viscusi found that higher workers' compensation benefits were associated with substantially lower wages, after statistically controlling for the influence of other factors. The degree of this tradeoff was so pronounced that, from an employer's perspective, higher workers' compensation benefits may well pay for themselves. Specifically, they assert that

> [u]nder a wide range of assumptions a substantial wage offset is generated by the provision of [workers' compensation] benefits. This offset is expected on economic grounds since boosting one attractive feature of the compensation mix (workers' compensation) will reduce the wages needed to make a hazardous job acceptable to the worker.
>
> ... [a]lthough workers' compensation increases do not provide an economic 'free lunch' to firms, they are cheaper fare on average than is generally believed.[27]

The conclusion that may be inferred from the findings of this study — that

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higher workers' compensation benefits, from the employer's perspective, more than pay for themselves in the form of lower wages — is a radical one that undoubtedly will be sharply contested by many members of the workers' compensation community. Moore and Viscusi also point out that the level of the estimated wage/benefit tradeoff appears to have diminished as benefits have gotten more generous over the past two decades; as such, employer resistance to benefit hikes is not totally counter to their conclusion that workers' compensation pays for itself.

Another aspect of the Moore and Viscusi analysis is worth mentioning. Many people are dubious about the market's ability to react to relatively subtle factors such as the dangerousness of jobs or the level of workers' compensation benefits. As we noted above, however, the evidence is quite strong that workers are paid greater wages in more dangerous jobs and that this higher wage is offset by workers' compensation. Yet, many people (principally, those who are not economists) remain skeptical.

The skeptics argue that few workers are aware of job risks and thus few workers are able to use such information in deciding where (or whether) to work. Neither every worker nor even a large proportion of workers needs to be initially aware of these factors in order for these factors to still have profound implications for the workings of the labor market. One of the most important ways by which workers actually become aware of the existence of such factors is by accepting an offer of employment for a particular job. After getting a close-up look at the job, the worker may discover that the job is more dangerous than he or she originally assumed and the worker may then quit. (The speed of this act is, of course, dependent on whether the worker has other employment opportunities.)

Moore and Viscusi investigate the relationship between on-the-job danger and the worker's inclination to quit, as well as the relationship between job risk and actual quitting. They observe that more dangerous jobs are associated with more intended quits and more actual quits, although only the intended quit relationship was statistically significant. More to the point of our discussion of "who pays," however, is their finding that more generous workers' compensation benefits reduce quit rates, as well as workers' intentions to quit dangerous jobs. While these results do not provide direct evidence regarding who actually pays for workers' compensation, they certainly demonstrate that employees react to different risk levels and the lessening of their financial burdens from such risk through the provision of workers' compensation. It is strong confirmatory evidence for the hypothesis that the labor market takes job risks and workers' compensation into account.

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The most recent empirical study that directly examines the issue of who pays for workers' compensation provides, in our assessment, the strongest results. Jonathan Gruber and Alan Krueger used data from a national sample of individuals in five narrowly defined, high-risk jobs.[28] The data, covering a five-year period, included the following private sector occupations: carpenters, truck drivers, nonprofessional hospital employees, gasoline station employees, and plumbers. The use of these narrowly defined work activities, coupled with the substantial interstate cost differences in workers' compensation, lends itself to more precise estimates than was the case with some of the studies we previously discussed.[29]

Gruber and Krueger found that in four out the five activities studied — all except plumbers — higher workers' compensation costs were associated with lower wages. In the full sample of five activities, the statistical model that took into consideration state effects other than workers' compensation (and thus is the preferred specification) found that the effect of increases in workers' compensation costs on wages was substantial and statistically significant. Gruber and Krueger concluded that 86.5 percent of workers' compensation costs were shifted onto workers in the form of lower wages.

Gruber and Krueger also used aggregated, firm-level data, in an effort to confirm their wage results and to investigate the impact of workers' compensation costs on employment. For this analysis, they utilized data from two years (1979 and 1988) on firms that employed carpenters, truck drivers, gasoline station employees, and plumbers,[30] as well as data on firms engaged in the agricultural machinery, excavation, gas and oil distribution, lumber sales, masonry, and road and street construction industries (these additional firms were engaged in relatively high-risk activities that provided a good match with the workers' compensation cost data). Changes in wages and employment were correlated with workers' compensation cost changes between 1979 and 1988.

When the focus of the analysis in this firm-level data set was restricted to the activities that they had investigated in their first set of models, the results were the same as before: 86 percent of the workers' compensation cost increases were shifted onto workers. When the focus of analysis in this firm-level data set was expanded to all ten activities, Gruber and Krueger found that 56 percent of workers' compensation cost increases were shifted onto workers in the form of lower wages.

Economic theory suggests that to the extent that workers' compensation costs are not fully shifted onto employees (that is, employers still bear part of the cost), employment levels may also be affected. Since Gruber and Krueger had found much — but not all — of the cost of workers' compensation was passed along to employees, it might thus be expected that cost increases would also result in employment decreases.[31] Gruber and Krueger tested the employment/cost increase relationship, using the firm-level data pertaining to the four activities of the first sample and to all ten activities in their data set. In both samples, the estimated relationships indicate that cost increases were associated with employment decreases; however, the relation-

ships were too imprecise to be statistically significant. Thus, they could not conclusively state that cost increases were associated with employment decreases.

A recent study by David Durbin did focus explicitly on the relationship between workers' compensation costs and employment levels.[32] Durbin used state-level data from selected years between 1981 and 1989, and concluded, from the results of a statistical model that took into consideration a variety of factors, that each 10 percent increase in workers' compensation costs (which was the approximate average annual increase during this period) resulted in, roughly, 900,000 lost jobs. If those jobs had not been lost, the national unemployment rate for 1991, for example, would have been 5.9 percent, rather than the actual rate of 6.7. While the aggregated nature of the data, the limited years, and possible difficulties with some of the measures give us some hesitation with the specific job loss estimate, the basic notion that some of the increase in workers' compensation costs results in employment losses is probably valid.

Conclusion

Empirical analysis of the important policy question of who actually pays for workers' compensation is clearly important. Notwithstanding this importance, such empirical research is a difficult and messy business. The data are usually flawed in some manner, the variables used are often approximations of what we would actually prefer to be able to measure, the time needed for the labor market to react to cost increases is always unclear (and thus we may not be focusing on the "right" time period), and the list of other, possibly confounding factors to be statistically controlled for is long. Labor market analysis is not like the repeated trials in a laboratory experiment, in which it is possible to confirm one's hypothesis by achieving the same results in repeated trials. Any one economic study can be subjected to criticisms and to a litany of reasons why it does not conclusively answer the question that the researcher hoped to answer.

Nevertheless, despite all these difficulties, and despite all of the limitations of individual empirical studies, there is, in our estimation, a broad consensus that may be inferred from a large number of empirical analyses using different data and different statistical models. We have a reasonable degree of confidence that social science research has indeed provided an answer to our question of who actually pays for workers' compensation: *a substantial portion of workers' compensation costs (and even, according to some estimates, all of the costs) are shifted onto workers.*

In our view, increases in the cost of workers' compensation and in the costs of other programs financed by payroll taxes are one of the reasons why there has been so little wage growth over the past two decades. If one has a negative reaction to the conclusion that workers pay much, if not all, of the bill for workers' compensation, the corollary is likely to provide better news. Given the tradeoff between wages and employment, the more workers' compensation cost increases affect wages, the less they will affect employment.

We think that injured workers, organized labor, the business community, and policy makers should be aware of the fact that the empirical research indicates that the costs of workers' compensation insurance are largely shifted onto workers. We realize that neither an injured worker trying to make ends meet on the basis of indemnity benefits nor a firm that is trying to remain competitive in what it perceives to be an unfavorable business climate will necessarily accept such evidence. Nonetheless, in our view, the "data speak" on who actually pays for workers' compensation. The data also "tell" us that workers not only pay for workers' compensation, but that to a large extent this method of financing workers' compensation is a fair deal for workers, since more expensive benefits lead to a roughly equivalent drop in wages.

Having allowed the data to speak to these findings, and having at the outset of this article counseled against allowing normative views to influence one's research, we will conclude with some "should" statements, which are inevitable in discussing the policy implications of empirical research. Our task should be to develop a more efficient, effective, and fair system for compensating injured workers as well as encouraging prevention and return-to-work. Employers and employees are in this together and the goal of reform should be to create programs that are more valuable to both parties: providing a given level of benefits with lower costs in the delivery system is an example of a win-win situation. It is important that we do a better job at developing relationships and institutions that reflect this mutuality of interests.

ENDNOTES

1. John F. Burton, Jr., "Workers' Compensation Costs, 1960-1992: The Increases, The Causes, and The Consequences," in *1994 Workers' Compensation Year Book*, eds. John F. Burton, Jr. and Timothy P. Schmidle (Horsham, PA: LRP Publications, 1993), Table A-1, p. I-14.

2. Employers' costs of workers' compensation insurance as a percent of payroll have risen from 0.93 percent (in 1960) to 2.50 percent (in 1992); there was not an unremitting increase, however, as costs actually declined between 1980 and 1984. Ibid.

3. For a recent empirical analysis of these factors, *see:* Richard A. Victor et al., *Cost Drivers in Six States* (Cambridge, MA: Workers Compensation Research Institute, 1992).

4. James R. Chelius and John F. Burton, Jr., "Who Actually Pays for Workers' Compensation?" *Workers' Compensation Monitor* 5, No. 6 (November/December 1992): 25-35.

5. Creating a good theory that simplifies aspects of the real world but that captures its essence is very difficult. In developing a theory, one never knows for sure which real world complexities are important and which are extraneous (at least for purposes of explanation). The test of whether a theory is useful has nothing to do with the internal consistency or elegance of the abstraction, but rather must always be based on an examination of the real world.

6. Chelius and Burton, "Who Actually Pays for Workers' Compensation?," pp. 27-28.

7. Chelius and Burton, "Who Actually Pays for Workers' Compensation?" All quotations in this section of the article are

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from this source.

8. Perhaps the most notable example is Social Security, for which the taxes are uniform across all states.

9. For a comprehensive summary of this empirical research, *see:* Mark R. Killingsworth, *Labor Supply* (Cambridge, England: Cambridge University Press, 1983).

10. For example, younger people may go back to school, older workers might retire, and married women might choose to engage in non-market work.

11. Daniel S. Hamermesh, *Labor Demand* (Princeton, NJ: Princeton University Press, 1993), p. 135.

12. *See,* for example, Hamermesh, *Labor Demand,* pp. 172-173 and 181-182.

13. Bertil Holmlund, "Payroll Taxes and Wage Inflation: The Swedish Experience," *Scandinavian Journal of Economics* 85, No. 1 (1983), p. 13.

14. Jonathan Gruber, "The Incidence of Mandated Maternity Benefits," *The American Economic Review* 84, No. 3 (June 1994), pp. 622-641.

15. The evidence from the state and federal mandates is that 75 percent of the cost of providing the coverage was shifted to the affected workers in the form of lower wages.

16. Adam Smith, *Wealth of Nations* (New York: Modern Library, 1937). Book I, Chapter 10. (The *Wealth of Nations* was originally published in 1776).

17. If the labor market is facile enough in its operations to adjust to the level of risk, it is likely that this labor market reaction will also incorporate the additional influence of workers' compensation benefits provision. The importance of this topic goes beyond the indirect evidence that it provides about the market's ability to react to subtle factors. If such wage premiums exist, they would provide employers with a financial incentive to reduce risks through the labor cost savings such improvements in safety would provide.

18. For a study that did not find compensating wage differentials existed, *see:* J. Paul Leigh, "No Evidence of Compensating Wages for Occupational Fatalities," *Industrial Relations* 30, No. 3 (Fall 1991), pp. 382-395.

19. Ronald G. Ehrenberg and Robert S. Smith, *Modern Labor Economics: Theory and Public Policy,* 5th edition, (New York: Harper Collins, 1994), p. 249.

20. In studies using aggregated data, observations are averages of individual observations. These averages may mask interesting individual characteristics and responses.

21. Compare, for example, the difficulty of evaluating the impact of the federally mandated payroll taxes for Social Security with the difficulty of evaluating the impact of interstate variations in workers' compensation costs. The uniformity of Social Security taxes across states, by necessity, limits the focus of empirical research to the impact of such taxes over time, rather than to differences across jurisdictions.

22. Stuart Dorsey and Norman Walzer, "Workers' Compensation, Job Hazards, and Wages," *Industrial and Labor Relations Review* 36, No. 4 (July 1983), pp. 642-654. *See also:* Richard J. Arnould and Len M. Nichols, "Wage-Risk Premiums and Workers' Compensation: A Refinement of Estimates of Compensating Wage Differentials," *Journal of Political Economy* 91 (Summer 1983), pp. 332-340; and Richard J. Butler, "Wage and Injury Rate Response to Shifting Levels of Workers' Compensation," in John D. Worrall, ed., *Safety and the Work Force: Incentives and Disincentives in Workers' Compensation* (Ithaca, NY: Cornell ILR Press, 1983), pp. 61-86.

23. Other "control" variables in the wage equations were education "squared" (squared terms are used to account for nonlinear relationships), age "squared," race, gender, marital status, usual hours worked, the injury frequency rate, and the injury severity rate.

24. The empirical results concerning a sample of unionized workers did not produce a similar result regarding cost shifting; indeed, workers' compensation cost increases were found to be associated with **higher** wages. There is no compelling explanation for this anomalous result.

25. Michael J. Moore and W. Kip Viscusi, *Compensation Mechanisms For Job Risks* (Princeton, NJ: Princeton University Press, 1990).

26. Their "control" variables included gender, race, health status, experience, experience "squared" (to account for the nonlinear effects of experience), job tenure, job tenure "squared," education, lost workday cases (a measure of risk), replacement rate (a measure of workers' compensation benefits), city size, union status, whether or not the individual was a blue collar worker, and geographic region.

Specifically, the generosity of workers' compensation benefits was measured by computing the percentage of the individual's wage that would be replaced if he or she were to suffer a temporary total injury. This measure was a proxy for the generosity of the full range of workers' compensation benefits in each state. Because Moore and Viscusi had no direct measure of the riskiness of each individual's job, the average, industry-wide frequency rate of injuries was used as a proxy for the riskiness of an occupation within that industry.

27. Moore and Viscusi, *Compensation Mechanisms for Job Risks,* p. 68.

If a mandatory program results in a greater than 100 percent offset in wages (thus indicating a high value is placed on that benefit by workers), this indicates that the voluntary market had failed to reflect the mutual interests of employers and employees. In a well-functioning market, it is in the employers' interest to offer a highly valued benefit that can be provided at less cost than its monetary value to employees.

28. Jonathan Gruber and Alan B. Krueger, "The Incidence of Mandated Employer-Provided Insurance: Lessons From Workers' Compensation Insurance," in *Tax Policy and the Economy,* David Bradford, ed. (Cambridge, MA: MIT Press, 1991), pp. 111-143.

29. Worker's compensation costs were measured by the manual rate in each state, year, and occupation. As is the usual procedure with such empirical studies, "control" variables were also used to statistically isolate the effects of the variables of interest. These "control" variables included gender, race, education, work experience, experience "squared," whether or not the individual was an apprentice, whether or not the individual was working part-time, whether or not the individual lived in a metropolitan area, marital status, state, and year.

30. Data on nonprofessional hospital employees (as used in the individual data base) were not available in the aggregated, firm-level data.

31. Though this argument is usually couched in terms of employment decreases, the actual labor market situation may be a failure of employment to grow as much as it would have in the absence of the workers' compensation cost increases. Given the existence of a statutorily-specified minimum wage, the pay of low-wage workers may not have sufficient room to adjust (decline) as a result of increases in workers' compensation costs, and thus more of the labor market reaction pertaining to these workers may take the form of lessened employment opportunities.

32. David Durbin, "Workers Compensation: Business at Risk," *NCCI Digest,* VIII, No. 1 (May 1993), pp. 23-42.