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"Rethinking the Great Compromise: What Happens When Large Companies Opt Out of Workers Compensation?"

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Abstract:

The "great compromise" of workers compensation, whereby workers relinquished the right to sue their employers in exchange for no-fault recovery for occupational injuries, was one of the major tort reforms of the Twentieth Century. Because participation in the workers compensation system is usually compulsory, it is difficult to forecast what the real-world effects might be of making participation voluntary. However, there is one U.S. state that permits employers to decline workers compensation coverage, and in which a significant number of firms (called "nonsubscribers") have chosen to opt out: Texas. This study is the first to examine comprehensively the impact of Texas nonsubscription on the frequency, cost, and duration of occupational injury claims. To minimize the effects of selection bias, I analyze confidential, highly granular data obtained from sixteen large companies that operate homogenous facilities across a large number of U.S. states. Using facilities and claims as the units of analysis, this paper analyzes data from the first three study participants and contains several preliminary findings. First, nonsubscription uniformly lowers the frequency of indemnity claims. Since medical-only claims tend to rise in relative (if not absolute) terms, nonsubscription may encourage some claim "migration" between the indemnity and medical-only claim categories. Second, the data suggest that nonsubscription reduces the frequency of claims associated with "hard-to-diagnose" injuries. Third, nonsubscription seems generally to reduce total programmatic costs as well as per-claim costs for medical care and wage replacement. The latter trend which appears especially pronounced among female employees. Legal costs per claim, however, reveal no consistent trends across companies. Finally, the data suggest that nonsubscription expedites the speed of the average employee's return to work. Taken as a whole, these preliminary findings suggest that for many large firms, the high cost of workers compensation insurance may outweigh the benefits of tort immunity.

Outline:

I. Introduction

The "great compromise" of workers compensation, whereby workers relinquished the right to sue their employers in exchange for no-fault recovery for occupational injuries, was one of the major tort reforms of the Twentieth Century. Every U.S. state adopted a workers' compensation law between 1910 and 1948.[1] To this day, the program remains the primary conduit of cash benefits, medical care, and rehabilitation services for workers disabled by work-related injuries and illnesses.[2] Although details such as the level and duration of benefits vary considerably across states, the hallmark of the program is its near universality. In most U.S. states, every company is required to purchase workers' compensation insurance, whether through a private insurance carrier, a state insurance fund, or self-insurance.[3] It remains an open question whether the transition from a negligence-based tort system to a no-fault strict liability system

[1] Price V. Fishback & Shawn E. Kantor, *The Adoption of Workers' Compensation in the United States*, 41 J.L. & ECON. 305, 320 (1998).
[2] Alan B. Krueger & John F. Burton, Jr., *The Employers' Costs of Workers' Compensation Insurance: Magnitudes, Determinants, and Public Policy*, 72 REV, ECON. STAT. 288 (1990).
[3] A handful of states with compulsory laws provide exemptions for very small firms with fewer than five employees. *See* JOSEPH SHIELDS & D.C. CAMPBELL, TEX. DEP'T OF INS., A STUDY OF NONSUBSCRIPTION TO THE TEXAS WORKERS' COMPENSATION SYSTEM: 2001 ESTIMATES 1, 2 n.15 (2002), *available at* http://www.tdi.state.tx.us/reports/wcreg/documents/nonsub.pdf.

enhances workplace safety, let alone allocative efficiency.[4] Yet given the virtual ubiquity of the workers compensation system, it is not surprising that most empirical scholars have taken the program's existence for granted, and focused their inquiry on how different aspects of regulatory design (waiting periods, benefit levels, experience rating, provider choice, price controls, etc.) affect employers' and employees' incentives, and in turn, the frequency, duration, and cost of claims.

This Article explores an issue that has received almost no attention in prior literature: the consequences of converting workers' compensation from a compulsory system to a voluntary one. Until the early 1970s, in fact, many state laws *were* elective.[5] By the mid-1970s, however, nearly all states amended their laws to make participation mandatory.[6] When South Carolina passed such an amendment in 1997, Texas became the only state in the U.S. with a truly voluntary program, in which a substantial number of firms choose not to offer workers' compensation coverage.[7] In 2006, for example, about 37% of Texas firms – which jointly

[4] *See* James R. Chelius, *Liability for Industrial Accidents: A Comparison of Negligence and Strict Liability Systems*, 5 J. LEGAL STUD. 293, 294 (1976) (noting that although a shift to workers compensation systems apparently lowered the non-motor vehicle machine death rate from 1900-1940, given the difficulty of measuring accident prevention costs, one cannot conclude from these findings alone that the latter system is more efficient); Gary T. Schwartz, *Reality in the Economic Analysis of Tort Law: Does Tort Law Really Deter?*, 42 UCLA L. REV. 377, 392 (1994) (noting that from an economic perspective, it is unclear whether tort or workers compensation systems provide better incentives for workplace safety); Price V. Fishback, *Liability Rules and Accident Prevention in the Workplace: Empirical Evidence from the Early Twentieth Century*, 16 J. LEGAL STUD. 305, 306 (1987) (finding that in coal mining industry, fatal accident rates rose with the shift to workers compensation in the early Twentieth Century).

[5] SHIELDS & CAMPBELL, *supra* note 3, at 1. The New York Court of Appeals' famous opinion in *Ives v. South Buffalo Railway Company*, 94 N.E. 431 (N.Y. 1911), which struck down a compulsory workers compensation statute under the state constitution, encouraged many other states to pass elective laws, while "keeping benefits low and so restricting employers' legal defenses that most employers would 'freely' elect to join the new system." Christopher Howard, *Workers' Compensation, Federalism, and the Heavy Hand of History*, 16 STUDIES IN AMERICAN POLITICAL DEVELOPMENT 28, 33 (2002). The Supreme Court's ruling in *Mountain Timber Co. v. Washington*, 243 U.S. 219 (1917), upholding the constitutionality of a compulsory law, finally put such constitutional concerns to rest. Interestingly, however, it was not until nearly half a century later that some states made their workers' compensation statutes compulsory.

[6] Shields & Campbell, *supra* note 3, at x.

[7] New Jersey is the only other state that technically does not require firms to carry WC coverage. However, given the restrictive nature of the statute, no firms in New Jersey have so far chosen to opt out. *See* Shields & Campbell, *supra* note 3, at x, n. 3.

employed nearly a quarter of Texas's workforce – were "nonsubscribers" (the term of art for firms which opt out of the program).[8] Although small employers have always been disproportionately likely to forgo participation, increasing numbers of large employers (those with 500 or more employees on payroll) have followed suit in the last decade.[9]

The prevalence of nonsubscription in Texas raises important questions about the rationale for – and consequences of – the mandatory regime that governs the remainder of the country. Virtually all historians agree that the adoption of workers compensation laws was endorsed not only by workers and insurers, but by employers as well.[10] Economic historians Fishback and Kantor, for example, have emphasized the gains to employers of reduced uncertainty in accident costs, and the capacity to offset much of the increased costs of the program through reduced wages.[11] If workers' compensation laws received broad-based employer support at the time of their passage, why have so many Texas employers chosen to forgo the benefits of the "great compromise" and expose themselves to tort liability? What are the practical effects of such an elective system for nonsubscribers and their employees? Should other states also consider making participation voluntary, at least for some categories of employers? Surprisingly, these questions have received almost no prior scholarly attention.[12]

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[8] WORKERS' COMP. RESEARCH GROUP, TEX. DEP'T INS., EMPLOYER PARTICIPATION IN THE TEXAS WORKERS' COMPENSATION SYSTEM: 2006 ESTIMATES 5 (2006) *available at* http://www.tdi.state.tx.us/reports/wcreg/documents/Employer_Participati.ppt.

[9] *Id.* at 9.

[10] *See, e.g.*, Fishback & Kantor, *supra* note 1 at 307 (noting that employers anticipated reduced uncertainty from accident costs, and were able to pass on much of increased costs to employees through wage offsets); Price V. Fishback & Shawn E. Kantor, *The Political Economy of Workers' Compensation Benefit Levels, 1910-1930*, 35 EXPLORATIONS IN ECONOMIC HISTORY 109, 111 (1998); Howard, *supra* note 5 at 6 (noting that employers' concerns about unpredictability of court system and potential for labor unrest induced them to support laws' passage).

[11] Fishback & Kantor, *supra* note 1 at 307.

[12] To date, only one scholar, Richard Butler, has compared claiming behavior among nonsubscribing and subscribing firms in Texas. Using aggregate company-level data from the Texas Workers Compensation Commission, Butler finds that reported injury rates are slightly higher, average lost work days are slightly shorter, and litigation costs are nearly identical among uncovered firms. As Butler notes, however, such differences could be explained not by workers compensation participation as such, but by self-selection among Texas firms. The fact that smaller firms are disproportionately likely to opt out of the system, for example, casts doubt on the robustness

My goal is to shed light on the real-world consequences of nonsubscription for a limited, yet important, group of Texas employers: large companies that do business in a relatively homogenous manner across numerous U.S. states. I focus on this particular segment of the Texas economy for several reasons. First, large companies are the only group for which nonsubscription rates have increased dramatically over the last decade, suggesting particular dynamism in this market segment.[13] Second, since large companies employ a large number of workers (who in turn file a large number of claims), it is much easier to derive statistically precise estimates of important programmatic outcomes such as claim frequencies and costs. Third, most large companies employ full-time professionals to oversee the administration of occupational injury claims, who are not only trained in risk management, but typically belong to professional organizations that facilitate information sharing. As such, large firms are likely to be best informed about the likely costs and benefits of nonsubscription.

Finally, and most importantly, my ability to analyze highly granular claims-level data from large multi-state firms with a relatively uniform business model enables me to mitigate (although not entirely eliminate) important sources of selection bias. The only prior study of Texas nonsubscription, by Richard Butler, used the firm as the unit of analysis. Since Butler's study compares aggregate injury rates across subscribing and nonsubscribing firms, it is subject to numerous forms of sample selection. For example, aggregate summary data reveal that nonsubscribers are generally smaller than subscribers, and their employees are disproportionately

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of Butler's findings. The reliability of Butler's findings are also limited by the fact that he relies entirely on data from 1992-1994, a period that largely preceded the dramatic inflation in workers compensation medical costs, and during which Texas nonsubscription was less prevalent among large multi-state corporations. Finally, his estimates of litigation costs are indirect projections derived from cost figures obtained from trade publications, not real cost figures, and therefore could suffer from substantial measurement error. *See* Richard J. Butler, *Lost Injury Days: Moral Hazard Differences Between Tort and Workers' Compensation*, 63 J. RISK AND INS. 405 (1996).

[13] According to survey data from the Texas Department of Insurance, the overall participation rate among companies with 500+ employees increased by 50% from 1996 to 2006 (from 14% to 21%). In contrast, the percentage of nonsubscribers either remained constant or declined in all other employer size classes. *See* WORKERS' COMP. RESEARCH GROUP, *supra* note 9 at 9.

female, younger, and lower paid. Moreover, fatality rate data suggests that in some industries, nonsubscribing firms may be intrinsically safer than their subscribing counterparts – and indeed, may have chosen to opt out of the workers system for that very reason.[14]

In contrast, this Article uses the *facility* and the *claim* – not the firm – as the unit of analysis. Specifically, I analyze confidential claims-level data from three large multi-state nonsubscribers that operate a large number of homogenous facilities in Texas as well as in numerous other U.S. states. For each firm, I compare key programmatic outcomes – including the frequency of claims, average costs per claim, and the speed of return to work – across Texas-based and non-Texas-based facilities, controlling (whenever possible) for claimant and injury characteristics. For those two firms that became nonsubscribers in the recent past and have maintained workers compensation records from prior years, I also make such comparisons between the pre- and post-nonsubscription periods. Of course, I cannot eliminate all forms of sample selection that conceivably could bias my results. For example, those large firms that forecast, *ex ante*, that becoming a nonsubscriber in Texas will cut down on total claims costs – and act confidently on that assumption – may differ in important yet unobservable ways from those that do not. However, the design of the study is intended to avoid the major forms of selection bias that afflict aggregate, firm-level studies.

In fact, even if large, multi-state firms that become nonsubscribers differ systematically (yet unobservably) from large firms that do not, this alone would not undermine the real-world relevance of the study. To the extent that Texas resembles a "natural experiment," the treatment being considered is *not* the abolishment of workers compensation, but the conversion of a mandatory system to an elective one. Regardless of whether some companies are inherently

[14] Butler, *supra* note 13 at 406-7, 413, 415, 426. *See also* SHIELDS & CAMPBELL, note 3 at xi (noting that smaller firms are significantly more likely to become nonsubscribers than large firms).

better equipped to reap the advantages of nonsubscription, they cannot do so without explicit statutory authorization. Even if the sole effect of an elective statute is to permit a subset of companies (i.e., those for whom it is advantageous) to self-select into the nonsubscribing sector, the elective nature of the statute could still be seen as having "caused" any observed disparities in the frequency, cost, or duration of claims among these companies and their employees.[15]

The empirical analysis contains several important findings. First, nonsubscription tends to depress the frequency of indemnity claims. Since medical-only claims tend to rise in relative (if not absolute) terms, nonsubscription may encourage some claim "migration" between the indemnity and medical-only categories. Second, the data suggest that for some companies, nonsubscription may also reduce the frequency of "hard-to-diagnose" injuries. Third, I find that nonsubscription usually reduces per-claim costs for both medical-only and indemnity claims. The latter trend is especially pronounced among female employees. Finally, my analysis suggests that nonsubscription expedites the speed of the average employee's return to work.

The remainder of the Article proceeds as follows. Sections Two and Three provide, respectively, general overviews of the Texas workers compensation program and nonsubscribing sector. In addition to describing general trends in nonsubscription rates, I summarize survey data on the "look-alike" plans that many nonsubscribers – particularly large firms – offer to their employees in place of workers compensation coverage. In Section Four, I briefly review prior literature on workers compensation, highlighting those strands of scholarship that bear directly or indirectly on the likely effects of Texas nonsubscription. Section Five briefly describes the three

[15] Importantly, however, in order to comprehensively evaluate the costs and benefits of such a statutory change, one would need to consider more than simply the behavior of large firms that become nonsubscribers. To the extent that the opt-out decision is characterized by adverse selection, one would need to consider whether the exit of such firms from the workers compensation system affects insurance premiums for those firms that remain. For example, if firms that opt into the nonsubscription sector are inherently *safer* than those that do not, then the exit of such firms from the workers compensation insurance pool could increase premiums in the workers' compensation sector, especially for firms that are not experience rated.

companies that are included in this draft. Section Six describes the claims data that these companies have provided for the purposes of the empirical analysis, and sketches my overall empirical strategy. Sections Seven through Nine, which present my empirical findings, focus on three distinct types of programmatic outcomes. Section Seven analyzes the frequency of claims; Section Eight compares the costs of claims; and Section Nine examines the speed with which workers return to work after sustaining an injury. Section Ten, the concluding section, highlights the main empirical findings, points out several important policy implications, and suggests several promising directions for future research.

II. Overview of the Texas Workers' Compensation System

Before describing the characteristics of nonsubscribers (and the benefits they offer to their employees), it is useful to lay some groundwork by sketching the basic contours of Texas's workers compensation program. Although the elective nature of Texas's workers compensation law is unique, in most other regards, the statute is not unlike those that govern many U.S. jurisdictions. To receive benefits, employees must report injuries within 30 days of the date that the injury occurred.[16] Like most states, the statute provides for full medical benefits (with no copays, time limits, or monetary caps).[17] Also like the majority of states, Texas allows employees to select their treating physician, unless their employer has taken advantage of recently legislation enabling firms to join Certified Workers' Compensation Networks.[18]

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[16] *See* OFFICE OF INJURED EMPLOYEE COUNSEL OF THE STATE OF TEX., NOTICE OF INJURED EMPLOYEE RIGHTS AND RESPONSIBILITIES IN THE TEXAS WORKERS' COMPENSATION SYSTEM 2 *available at* http://www.tdi.state.tx.us/pubs/factsheets/ierrenglish.pdf (last visited Apr. 4, 2008)

[17] *See* OFFICE OF WORKERS COMP. PROGRAMS, U.S. DEP'T OF LABOR, TABLE 5. MEDICAL BENEFITS AND METHODS OF PHYSICIAN SELECTION PROVIDED BY WORKERS' COMPENSATION STATUTES IN THE U.S. 1-2 (2006), *available at* http://www.dol.gov/esa/regs/statutes/owcp/stwclaw/tables-pdf/table5.pdf (referring to laws in effect as of January 1, 2006)

[18] See *Id.* at 3-5. For an overview of the network program, see TEX. DEP'T OF INS., WORKERS' COMP. HEALTH CARE NETWORKS, *available at* http://www.tdi.state.tx.us/wc/wcnet/index.html#certified (last visited Apr. 4, 2008). If the

Employees suffering from temporary total, permanent total, or permanent partial disabilities receive 70-75% of their weekly wage, tax-free—a relatively generous reimbursement rate by national standards.[19] Like about half of U.S. states, Texas's statute requires a 7-day waiting period before receipt of wage replacement benefits, although the first weeks' benefits can be claimed retroactively if the absence persists at least fourteen days.[20] Also like most states, the statute also provides compensation for disfigurement and occupational hearing loss.[21]

Although the basic features of Texas's workers compensation system are fairly similar to those of other states, its average costs per claim are not. A 2004 benchmarking study by the Workers Compensation Research Institute found that Texas had among the highest costs per claim overall among the 12 states analyzed. Detailed comparisons revealed that medical payments per claim and the duration of temporary disability injuries were highest among the

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employee is not in a Workers' Compensation Health Care Network, (s)he may choose any doctor willing to treat his/her injury. *See* OFFICE OF INJURED EMPLOYEE COUNSEL OF THE STATE OF TEX., *supra* note 16 at 1.

[19] Until October 1, 2006, Texas's maximum benefit amounts were relatively low by national standards. Since that date, however, the maximum rates have been increased by about 30% (to $712.11 for temporary total and permanent total disability, and $498.00 for permanent partial disability), placing them closer to the middle of the national distribution. *See* DIV. OF WORKERS' COMP., TEX. DEP'T OF INS., MAXIMUM AND MINIMUM WEEKLY BENEFITS *available at* http://www.tdi.state.tx.us/wc/employee/documents/maxminbens.pdf (last visited Apr. 4, 2008). However, the maximum periods applicable to most injury types (104 weeks for temporary total disability, 401 for unlisted permanent total disabilities, and 300 weeks for permanent partial disability) remain relatively short by national standards. *See* OFFICE OF WORKERS COMP. PROGRAMS, U.S. DEP'T OF LABOR, TABLE 6. BENEFITS FOR TEMPORARY TOTAL DISABILITY PROVIDED BY WORKERS' COMPENSATION STATUTES IN THE U.S. (2006), *available at* http://www.dol.gov/esa/regs/statutes/owcp/stwclaw/tables-pdf/table6.pdf; OFFICE OF WORKERS COMP. PROGRAMS, U.S. DEP'T OF LABOR, TABLE 7. BENEFITS FOR PERMANENT TOTAL DISABILITY PROVIDED BY WORKERS' COMPENSATION STATUTES IN THE U.S. (2006), *available at* http://www.dol.gov/esa/regs/statutes/owcp/stwclaw/tables-pdf/table7.pdf; OFFICE OF WORKERS COMP. PROGRAMS, U.S. DEP'T OF LABOR, TABLE 8. BENEFITS FOR PERMANENT PARTIAL DISABILITY PROVIDED BY WORKERS' COMPENSATION STATUTES IN THE U.S. (2006), *available at* http://www.dol.gov/esa/regs/statutes/owcp/stwclaw/tables-pdf/table8.pdf (respectively).

[20] The Texas legislature reduced the length of the "retroactive period" on September 1, 2005 (Texas Workers' Compensation Act § 408.082) from 28 days to 14 days. Because all three companies studied in this draft had opted out by this date, the 28-day provision is the only one relevant to the analysis here. Both the 14-day and 28-day "retroactive periods" are longer than those applicable in most other states. *See* OFFICE OF WORKERS COMP. PROGRAMS, U.S. DEP'T OF LABOR, TABLE 14. WAITING PERIODS (2006), *available at* http://www.dol.gov/esa/regs/statutes/owcp/stwclaw/tables-pdf/table14.pdf.

[21] *See* OFFICE OF WORKERS COMP. PROGRAMS, U.S. DEP'T OF LABOR, TABLE 11. JURISDICTIONS WHICH PROVIDE FOR DISFIGUREMENT (2006), *available at* http://www.dol.gov/esa/regs/statutes/owcp/stwclaw/tables-pdf/table11.pdf; OFFICE OF WORKERS COMP. PROGRAMS, U.S. DEP'T OF LABOR, TABLE 20. OCCUPATIONAL HEARING LOSS STATUTES. (2006), *available at* http://www.dol.gov/esa/regs/statutes/owcp/stwclaw/tables-pdf/table20.pdf.

sample group, while that the percentages of claims with more than seven days of lost time, permanent partial disability, and/or lump-sum payments were high and increasing.[22] The study authors also noted that the state had experienced significant growth in claims management expenses, due to rising expenses for cost containment services and very rapid growth in per-claim payments to defense attorneys.[23]

To the extent that the high per-claim costs signal a high level of embedded inefficiency in the Texas workers compensation system – which one might expect the free market to reduce or eliminate – then Texas is likely to provide an unusually hospitable (and profitable) environment for nonsubscribers. On the other hand, some portion of these trends may be driven by more pervasive characteristics of the state business environment that transcend the workers compensation system, such as workforce demographics, the structure of medical delivery systems, and/or legal cost trends. If so, then nonsubscribers that offer "look-alike" benefit plans – replicating many of the features that would be available through workers compensation – may face an uphill battle. Even if they are able to reap significant cost savings relative to participation in the Texas system, they may have difficulty lowering their per-claim costs to the point that they would be considered "low" by national standards.

III. Overview of Texas Nonsubscription

Little is known about the historical prevalence of nonsubscription for most of the Twentieth Century, since Texas did not collect data on nonsubscribers for the first eight decades

[22] *See* CAROL A. TELLES, DONGCHUN WANG, & RAMONA P. TANABE, COMPSCOPE BENCHMARKS: MULTISTATE COMPARISONS 199-202 (Workers' Compensation Research Institute ed., 4th ed. 1999). The other states included in the study were California, Connecticut, Florida, Illinois, Indiana, Louisiana, Massachusetts, North Carolina, Pennsylvania, Tennessee, and Wisconsin.
[23] *Id.*

after the first statute was passed in 1913.[24] In the early 1990s, however, the Texas Workers Compensation Research Center and Texas Department of Insurance (TDI) began periodically to survey employers and employees to learn more about the prevalence, attitudes, and attributes of nonsubscribers. Since these surveys shed light on the overall characteristics of Texas nonsubscribers and their employees, they provide useful background for the empirical analysis conducted in later sections of this Article.

The first such study, conducted in 1993, estimated that 44 percent of employers in Texas were nonsubscribers, and that 20 percent of workers were employed by nonsubcribing firms.[25] These overall prevalence rates have changed relatively little in recent years. The most recent study, conducted in 2006, found that although the percentage of nonsubscribing firms had fallen to 37%, the percentage of workers employed by nonsubscribers had *risen* to 23%.[26] Once a firm chooses to become a nonsubscriber, it is likely to remain so: only 5% of subscribers surveyed in 2001 reported having been nonsubscribers at some point in the past.[27] Interestingly, very large firms – i.e., those employing 500 or more employees – are the only size classification for which the percentage of nonsubscribers has *increased* since the mid-1990s.[28]

In recent years, TDI has also asked each survey participant to list the reason *why* they chose to become a nonsubscriber. The most popular single reason cited by very large firms (cited by 41% of respondents) was that the employer "felt they could do a better job than the Texas WC system of providing injured employees with appropriate medical and wage benefits." (Far fewer small and medium-sized firms listed this reason as their top choice.) The second most

[24] *See* SHIELDS & CAMPBELL, *supra* note 3 at 3.
[25] *Id.*
[26] *See* WORKERS' COMP. RESEARCH GROUP, *supra* note 9 at 7-8.
[27] *See* SHIELDS & CAMPBELL, *supra* note 3 at 18.
[28] Since the percentage of nonsubscribers was estimated to be 18% in 1995, 14% in 1996, and 21% in 2006, the precise magnitude of the increase depends on whether one uses 1995 or 1996 as the baseline year. *See* WORKERS' COMP. RESEARCH GROUP, *supra* note 9 at 9. In contrast, regardless of whether one uses 1995 or 1996 as the baseline year, the percentage of nonsubscribers fell or remained constant across all other employer size groupings.

commonly-cited reason among large employers was that "workers' compensation insurance premiums were too high."[29]

Perhaps the most remarkable finding is the frequency with which nonsubscribers – especially larger ones – offer occupational injury benefit plans to their employees, even though they are not legally obliged to do so. In 2006, for example, 92% of firms with 100 or more employees offered occupational benefits plans to their workers.[30] Since large firms employ a disproportionate number of workers, the estimated proportion of injured employees at nonsubscribing firms who received occupational benefits was 98%.[31] Coverage rates among very large firms (with 500 or more employees) were probably even higher, although the data necessary to confirm this fact are not made publicly available.

A 1997 study of injured workers sheds more light on the extent and magnitude of benefits offered by nonsubscribers with 50 or more employees.[32] Eighty-one percent of respondents indicated that their employer paid 100% of medical costs associated with one-the-job injuries, and 87% reported that their employer did so for as long as was medically necessary.[33] About 14% reported having trouble getting their employer to pay for medical treatment, usually because the insurance company declined payment for a specific medical procedure or the employer (or insurance company) did not believe the injury was work-related.[34] Only 26% employees reported being able to choose their own doctor; the remaining 74% said their employers selected their doctor for them or they selected a doctor from a company-provided list. Almost two-thirds,

[29] WORKERS' COMP. RESEARCH GROUP, *supra* note 9 at 13.
[30] WORKERS' COMP. RESEARCH GROUP, TEX. DEP'T INS., EMPLOYER PARTICIPATION IN THE TEXAS WORKERS' COMPENSATION SYSTEM: 2006 ESTIMATES (October 2006).
[31] WORKERS' COMP. RESEARCH GROUP, TEX. DEP'T INS., EXPERIENCES OF INJURED WORKERS EMPLOYED BY NONSUBSCRIBING EMPLOYERS 13 (1997).
[32] Since 91% of the employees sampled worked for firms with 50 or more employees, the report authors emphasized that the results of the survey should be construed as typical only for this employer size class. *Id.* at 6-7.
[33] *Id.* at 15.
[34] *Id.*

however, said that they could switch doctors if they were dissatisfied with the first one. When asked to rate their satisfaction with medical treatment on a scale of 1 to 5 (with 5 being "extremely satisfied" and 1 being "not satisfied"), 63% reported satisfaction levels of 4 or higher, while 18 percent reported satisfaction levels of 2 or lower.[35]

In addition to medical benefits, the majority of employees (82%) also reported receiving wage replacement (indemnity) benefits for their time out of work. Of those who received such benefits, 42% said that they received full salary, and the remaining 58% said they earned less than full salary. While 62% reported that they received indemnity benefits for the entire time they were off work, the remaining 38% received such benefits for only a portion of this period. Among workers who were off work for more than one year, only 42% received indemnity benefits for the full duration of their disability. A relatively small percentage of respondents (16%) reported having trouble obtaining their income benefit check from their employer or insurance carrier.[36] Moreover, nonsubscriber plans typically provide benefits to injured employees on the first day away from work, without being subject to the seven-day waiting period required under workers compensation.[37]

The survey of nonsubscriber employees revealed several other interesting trends. First, only 35% of respondents said they knew about their employer's nonsubscriber status at the time of hiring, although 65% indicated finding out sometime before the injury occurred. Although the Texas Labor Code requires employers to post a notice indicating whether they carry workers compensation coverage, only 55% of respondents reported having seen such a notice.[38] Second,

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[35] *Id.*
[36] *Id.*
[37] *See* WORKERS' COMP. RESEARCH GROUP, TEX. DEP'T INS., EMPLOYER PARTICIPATION IN THE TEXAS WORKERS' COMPENSATION SYSTEM: 2004 ESTIMATES (October 2004), p. 30 (noting that 75% of nonsubscriber plans have no waiting period for receipt of wage replacement benefits). *See also* Butler, *supra* note 13 at 411-12.
[38] WORKERS' COMP. RESEARCH GROUP, *supra* note 30 at 23. *See* Texas Labor Code § 406.005.

about two-thirds (68%) of respondents felt they "were treated fairly" by their employer after sustaining an injury, with 51% indicating that their employer helped them get back to work in some way, and 56% reporting that their employer was "supportive of" their return-to-work efforts.[39] Third, reported rates of attorney involvement were relatively low: only 13% of respondents said they hired an attorney, and 9% reported filing a lawsuit against their employer, as a result of their injury.[40] Finally, 46% of injured workers said they "suffered financial hardship" as a result of their on-the-job injury, and this proportion rose slightly (to 52%) among workers who were severely injured.

Many of the preceding findings should be interpreted with caution. First, many of the surveys (especially the employee surveys) do not provide detailed breakdowns for firms that employ 500+ workers, and the outcomes for such "very large" firms may differ markedly from outcomes in large and medium-size companies (with employ 50 or more workers). Second, and most importantly, the surveys are based *only* on employees of nonsubscribers. Without surveying employees that receive workers compensation coverage, there is no way to compare trends observed among survey respondents (with regard to overall satisfaction rates, frequency of litigation, etc.) to trends in the subscribing sector.

Nevertheless, the information available on Texas nonsubscribers brings several interesting patterns to light. First and foremost, most subscribers do *not* take advantage of the elective nature of Texas's statute by asking employees to shoulder the costs of any injuries that would not be compensable under the (tort) standard of employer negligence. Rather, most provide some form of "no-fault" insurance coverage for compensable and non-compensable injuries alike. Second, the "look-alike" plans typically offered by larger nonsubscribers

[39] WORKERS' COMP. RESEARCH GROUP, *supra* note 30 at 23. The 56% was calculated by summing the percentage who gave their employer's support a "4" or "5" rating on a five-point scale.
[40] *Id.*

generally contain medical and indemnity coverage provisions that resemble (although may not exactly replicate) the benefits provided under workers compensation. Third, there is little evidence of widespread dissatisfaction among injured workers employed by nonsubscribers. Although the lack of a "control" group precludes direct comparisons with the subscribing sector, the majority of nonsubscriber employees seem fairly content with the benefits received during their disability, notwithstanding that many were unaware that they were ineligible for workers compensation when hired, and/or suffered some financial hardship as a result of their injury.

IV. Literature Review

Looking beyond Texas, empirical research on the workers compensation system has burgeoned in the past three decades, in part as a response to increasing public concern over rising costs and perceived programmatic inefficiencies. Although researchers have addressed themselves to a wide variety of concerns, several lines of inquiry are especially pertinent to the themes explored in this Article.

First, a vast number of studies have looked for (and in nearly all cases, confirmed) the presence of significant moral hazard effects throughout the workers compensation system. The literature generally distinguishes two forms of moral hazard: "risk-bearing" moral hazard and "claims reporting" moral hazard. With risk-bearing moral hazard, employees take more risks on the job, *ex ante*, the greater the level of occupational injury benefits to which they are entitled, thereby affecting the real frequency of injuries. Meanwhile, claims-reporting moral hazard refers to an injured employee's greater likelihood of filing a claim, *ex post*, as the level of benefits increases. Nearly all studies examining the issue have found that increasing benefits and/or lowering waiting periods increases the frequency, cost, and/or duration of claims, apparently

confirming the presence of such moral hazard effects.[41] One such study, after attempting to distinguish the relative importance of the two types, concluded that the claims-reporting form of moral hazard is empirically larger.[42] A number of authors have confirmed (as theory would lead one to predict) that claims-reporting moral hazard effects are especially pronounced for hard-to-diagnose injuries such as muscle strains and back injuries.[43]

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[41] *See* James R. Chelius, *The Influence of Workers' Compensation on Safety Incentives*, 35 INDUS. & LAB. REL. REV. 235 (1982); John D. Worrall & David Appel, *The Wage Replacement Rate and Benefit Utilization in Workers' Compensation Insurance*, 49 J. RISK AND INS. 361 (1982); Richard J. Butler & John D. Worrall, *Workers' Compensation: Benefit and Injury Claims Rates in the Seventies*, 65 REV. OF ECON. AND STAT. 580 (1983); John W. Ruser, *Workers' Compensation Insurance, Experience-Rating, and Occupational Injuries*, 16 RAND J. ECON. 487 (1985); John D. Worrall & Richard J. Butler, *Benefits and Claim Duration, in* WORKERS' COMPENSATION BENEFITS: ADEQUACY, EQUITY, AND EFFICIENCY 57-70 (John D. Worrall & Richard Butler eds., 1985); Richard J. Butler & John D. Worrall, *Work Injury Compensation and the Duration of Nonwork Spells,* 95 ECON. JOURNAL 714 (1985); Ronald Ehrenberg, *Workers' Compensation, Wages and the Risk of Injury, in* NEW PERSPECTIVES IN WORKERS' COMPENSATION 71-96 (John F. Burton ed. 1988); Richard J. Butler & John D. Worrall, *Claims Reporting and Risk Bearing Moral Hazard in Workers' Compensation*, 52 J. RISK AND INS. 191 (1988), Thomas J. Kniesner & John D. Leeth, *Separating the Reporting Effects from the Injury Rate Effects of Workers' Compensation Insurance: A Hedonic Simulation*, 42 J. POL. ECON. 280 (1989), Alan B. Krueger, *Incentive Effects of Workers' Compensation Insurance*, 41 J. PUB. ECON. 73 (1990), Alan B. Krueger, *Workers' Compensation Insurance and the Duration of Workplace Injuries* (Nat'l Bureau of Econ. Research, Working Paper No. 3253, 1990); Richard J. Butler & John D. Worrall, *Claims Reporting and Risk Bearing Moral Hazard in Workers' Compensation*, 52 J. RISK AND INS. 191 (1991); John W. Ruser, *Workers' Compensation and Occupational Injuries and Illnesses*, 9 J. LABOR ECON. 325 (1991), Richard J. Butler, *Economic Determinants of Workers' Compensation Trends*, 61 J. RISK AND INS. 383 (1994); Bruce D. Meyer et al., *Workers' Compensation and Injury Duration: Evidence from a Natural Experiment*, 85 AM. ECON. REV. 322 (1995); Robert Kaestner & Anne Carroll, *New Estimates of the Labor Market Effects of Workers Compensation Insurance* 63 S. ECON. J. 635 (1997); Denis Bolduc et al., *Workers' Compensation, Moral Hazard, and the Composition of Workplace Injuries* 37 J. HUM. RESOURCES 623 (2002); Geetha Waehrer & Ted Miller, *Restricted Work, Workers' Compensation, and Days Away from Work*, 38 J. HUM. RESOURCES 964 (2003); Frank Neuhauser & Steven Raphael, *The Effect of Increase in Workers' Compensation Benefits on the Duration and Frequency of Benefit Receipt*, 86 REV. OF ECON. AND STAT. 288 (2004). *But see* Alan B. Krueger *Incentive Effects of Workers' Compensation Insurance*, 41 J. PUB. ECON. 73 (1990) (finding that higher benefits are not associated with higher injury claims among female CPS respondents); Alan B. Krueger & John F. Burton, *The Employers' Costs of Workers' Compensation Insurance: Magnitudes, Determinants, and Public Policy*, 72 REV. OF ECON. STAT. 228 (1990) (finding costs to be less responsive to benefit levels that previous estimates, and in some cases not significantly different from unit elastic); Darius N. Lakdawalla et al., *How Does Health Insurance Affect Workers' Compensation Filing?*, 45 ECON. INQUIRY 286 (2007) (finding that level of benefits offered by employer did not affect respondents' likelihood of filing claim in NLSY data). In a related vein, Robert Smith interprets the fact that a disproportionate number of workers' compensation claims for sprains and strains are filed on Mondays (a disparity that does not exist for harder-to-conceal injuries like cuts and lacerations) as evidence that workers are "post-dating" weekend back injuries and strains to obtain workers' compensation coverage. Robert S. Smith, *Mostly on Monday: Is Workers' Compensation Covering Off-the-Job Injuries?, in* BENEFITS, COSTS, AND CYCLES IN WORKERS' COMPENSATION INSURANCE 115-127 (Philip S. Borba & David Appel eds. 1989). A more recent empirical study, however, has disputed the existence of this so-called "Monday effect." *See* David Card & Brian McCall, *Is Workers' Compensation Covering Uninsured Medical Costs?*, 49 INDUS. & LAB. REL. REV. 690 (1996).

[42] *See* Butler & Worrall (1991), *supra* note 41.

[43] *See* Smith (1989), *supra* note 41; Butler & Worrall (1985), *supra* note 41; Worrall & Butler (1985), *supra* note 41; Jeffrey Biddle, *Do High Claim-Denial Rates Discourage Claiming? Evidence from Workers Compensation*

A second important theme to emerge from prior empirical literature is that the greater the proportion of injury costs borne by the firm and/or the more firms reap the benefits of safety enhancements, the lower the frequency of claims. For example, a number of empirical studies have found that increasing benefits – notwithstanding its claims-reporting moral hazard effects – can also enhance "real" safety levels by forcing firms to bear a relatively greater proportion of the risk of occupational injuries.[44] Along similar lines, several studies have found that the sensitivity of injury rates to benefits is lower in "experience-rated" firms, i.e., those whose insurance premiums are adjusted to reflect the historical frequency of their claims compared to similar firms.[45] Employees of self-insured (perfectly experience-rated) firms have similarly been shown to return to work more quickly than their counterparts in non-experience-rated firms.[46] Taken as a whole, these studies suggest that firms' enhanced incentives to reduce injuries in the presence of perfect experience rating (or, equivalently, self-insurance) at least partially offset moral hazard effects.

Third, as economic theory would lead one to expect, the employer's cost of providing workers' compensation has been shown to be partially offset by lower wages. Although scholars examining the wage-benefit tradeoff have derived different estimates of its magnitude, all have confirmed its existence, suggesting that workers are sufficiently well informed about the

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Insurance, 68 J. RISK & INS. 631 (2001)*;* Waehrer & Miller (2003), *supra* note 41; Bolduc et al. (2002), *supra* note 41.

[44] *See* Chelius (1982), *supra* note 41; Michael J. Moore & Kip W. Viscusi, *Social Insurance in Market Contexts: Implications of the Structure of Workers' Compensation for Job Safety and Wages, in* INSURANCE ECONOMICS 399-422 (Georges Dionne ed. 1992); Kniesner, *supra* note 41; Kaestner, *supra* note 41. *But see* Fishback (1987), *supra* note 41 at 306 (finding that adoption of workers compensation in mining industry in early 1900s increased rates of fatal injuries, presumably because of the rise in moral hazard associated with rising compensation).

[45] The theory – which these studies seem to support – is that the firm's enhanced incentives to improve workplace safety lowers the frequency of injuries, thereby dampening the moral hazard effects triggered by higher benefits levels. *See* Ruser (1991), *supra* note 41; John D. Worrall & Richard J. Butler, *Experience Rating Matters, in* WORKERS' COMPENSATION INSURANCE PRICING 81-94 (Philip S. Borba & David Appel eds. 1988); Ruser (1985), *supra* note 41.

[46] *See* Krueger, NBER Working Paper No. 3253 (1990), *supra* note 41.

existence of workers compensation to exchange at least some proportion of their wages, *ex ante*, for the insurance benefits that the system provides.[47]

Fourth, a cluster of studies comparing medical costs across the workers compensation and non-occupational health care systems have found that among comparable injuries, medical costs are generally higher in the workers compensation system.[48] Several of these authors speculated that medical providers engage in price discrimination, effectively charging workers compensation patients more for the same care.[49] However, a recent study based on analysis of claims-level data concluded that the cost differences were not driven by price discrimination, but by higher rates of utilization and the use of more costly providers within the workers' compensation sector.[50]

Fifth, two recent studies have examined whether allowing employees to choose their own physician raises the costs of medical care. Since many policymakers have endorsed limiting provider choice as a strategy to cut down on spiraling medical costs, the question is particularly timely. Although one study found that state-enforced limits on provider choice did not lower the frequency of nonfatal injuries reported to the Bureau of Labor Statistics[51], the second found that limiting provider choice *did* lower costs and shorten the time spent out of work, although it was

[47] *See* Kaestner, *supra* note 41; Moore & Viscusi (1989), *supra* note 41; Kip W. Viscusi & Michael J. Moore, *Workers' Compensation: Wage Effects, Benefit Inadequacies, and the Value of Health Losses* 69 REV. ECON. STAT. 249 (1987).
[48] *See* Joseph A. Fields & Emilio C. Venezian, *Medical Cost Development in Workers' Compensation*, 58 J. RISK AND INS. 497 (1991), Laurence C. Baker & A.B. Krueger, *Twenty-four-Hour Coverage and Workers' Compensation Insurance* 12 HEALTH AFF. 271 (1993); Karen Roberts & Susan Zonia, *Workers' Compensation Cost Containment and health Care Provider Income Maintenance Strategies*, 61 J. RISK AND INS. 117 (1994); David L. Durbin et al., *Workers' Compensation Medical Expenditures: Price vs. Quantity*, 63 J. RISK AND INS. 13 (1996).
[49] *See* Fields, *supra* note 44; Baker, *supra* note 44. *See also* Roberts, *supra* note 44 (finding that health care providers successfully circumvented fee schedules by doing more in less time and exploiting textual ambiguities).
[50] *See* Durbin, *supra* note 44.
[51] *See* Leslie I. Boden & John W. Ruser, *Workers' Compensation "Reforms," Choice of Medical Care Provider, and Reported Workplace Injuries*, 85 REV. ECON. AND STAT. 923 (2003).

also (somewhat paradoxically) associated with higher levels of employee satisfaction and similar rates of physical recovery.[52]

Finally, two other empirical studies are worthy of brief mention. In a 1989 study of Current Population Survey respondents, Alan Krueger reported a striking gender disparity: although higher benefits levels increased male respondents' likelihood of filing workers compensation claims, the same effect did *not* hold true for female respondents.[53] A second study, also analyzing gender effects, found that the median time off work was 23% longer among injured women than among injured men.[54] Secondly, a recent study that examined the speed of return to work – the only study to do so by studying an entire population of injured workers – found that workers who return to work for their pre-injury employer lose much less work time; and that absences longer than six months have a particularly deleterious effect on injured workers' future employability.[55]

Although all of these prior strands of literature provide useful insights that help to frame the present inquiry, only one scholar , Richard Butler, has specifically compared trends among subscribing and nonsubscribing firms in Texas. Using aggregate company-level data from 1992-94, Butler compares fatality rates, nonfatal claims rates, injury durations, and rates of chronic injuries (i.e., sprains and strains) across subscribing and nonsubscribing firms. He finds that fatal injury rates are often, if anything, slightly lower among nonsubscribing firms, which he construes as suggesting that "real" levels of safety probably vary little across the two sectors. He does, however, find differences in the other two outcomes variables, which he attributes to two

[52] *See* David Neumark et al., *The Impact of Provider Choice on Workers' Compensation Costs and Outcomes*, 61 INDUS. LAB. REL. REV. 121 (2007).
[53] *See* Krueger, 41 J. PUB. ECON. 73 (1990), *supra* note 41.
[54] *See* Monica Galizzi & Leslie I. Boden, *The Return to Work of Injured Workers: Evidence from Matched Unemployment Insurance and Workers' Compensation Data*, 10 LABOUR ECON. 311, 318 (2003).
[55] *Id*. at 334-335.

different forms of moral hazard. First, the fact that nonsubscribers experience slightly higher *non-fatal* injury rates, he suggests, is probably explained by the fact that most nonsubscriber plans are not subject to the seven-day waiting period that applies to workers compensation. Second, he attributes nonsubscribers' lower average claim duration, and lower average frequency of chronic conditions, to the fact that nonsubscribers rarely provide benefits for permanent partial disability. The ready availability of treatment for chronic conditions through workers compensation, in contrast, encourages covered employees to report more chronic conditions, and to prolong the duration of any given accident. [56] Although Butler tries to augment his analysis by comparing per-claim cost differences across sectors, his projections are not based on actual cost data, and therefore likely to be unreliable.[57]

Butler's findings are suggestive, and his analysis underscores not only the disparate incentives faced by workers in the subscribing and nonsubscribing sectors, but also the complexity of distinguishing the respective effects of firm self-selection, employee-induced moral hazard, and employer-induced safety effects. As Butler himself cautions, however, only limited inferences can be drawn from the data upon which his study relies, since he lacks the ability to control for cross-firm (let alone cross-claimant) disparities in risk.[58] Moreover, the time period analyzed in Butler's study is 1992-1994, before the influx of many large companies into the nonsubscribing sector, which may limit the present-day relevance of his findings. My goal is to address a similar set of issues, but to explore them using more granular data which –

[56] Butler, *supra* note 13 at 412, 426.
[57] Butler's "expected indemnity" cost index calculation of cost differences, rather than being based on actual first-level cost data, simply takes the industry-wide aggregate differences in frequencies calculated earlier as given, further assumes that benefits are comparable across sectors, and makes projections on that basis. Similarly, his calculations of legal expenses are not based on data for all claims, since TDI only records cost figures for claims that exceed $5,000. Although he also culls settlement award data from legal reporting services for 1993 and 1994, Butler notes that the available data has several important shortcomings. *See* Butler, *supra* note 13 at 429 n.28.
[58] *Id*. at 407.

although confined to a limited group of employers – enables me to draw more robust and nuanced inferences about the effects of nonsubscription on important policy outcomes.

V. Description of Study Participants and Their Benefit Plans

The data analyzed in this draft was obtained from three large multi-state firms that are Texas nonsubscribers.[59] Two of these firms (A and B) are retail companies, and the third (C) is a manufacturing company. Company C has considerably fewer facilities than either A or B, and it is also the only participant that did not hire a professional consulting firm to design and oversee its nonsubscription plan. Although confidentiality restrictions preclude me from disclosing the participants' identity, their organizational characteristics make them advantageous environments in which to analyze the effects of Texas nonsubscription. Each company operates in at least ten U.S. states, and each operates a sizable (and in the cases of A and B, very large) number of homogenous facilities. Table 1 highlights the key characteristics of the three study participants.

As is typical among large Texas nonsubscribers, all three firms provide their employees with both medical and wage replacement benefits for occupational injuries. Table 2 compares the major features of each firm's plan, relative to the benefits provided through workers compensation.

As Table 2 reveals, the plans share several important commonalities: they are all governed by ERISA; they all provide benefits starting from the first day of disability; they all require employees to report their injuries immediately (within 24 hours or by the end of the workshift); and they all limit the employee's choice of provider. Moreover, none replicates the benefits provided under workers compensation for "permanent partial" disabilities (besides

[59] In the larger study of which this Article is a part, I hope to obtain and analyze data from 10-15 large Texas nonsubscribers. As of this writing, however, I have only formalized agreements with (and obtained data from) three study participants. The analysis presented in this draft is based on the data received so far.

dismemberment), and none pays for more than 120 weeks of total disability coverage (unlike workers compensation, which provides up to 401 weeks of coverage for "permanent total" disabilities). Meanwhile, other programmatic details – such as the size of the lifetime cap (if any) on benefits, the level of death and dismembership benefits, the level and maximum duration of wage replacement benefits, and the maximum duration (if any) of medical benefits – vary across firms.

VI. Description of Data and Overall Empirical Strategy

The data analyzed for the purposes of this study consist of three interlinked files. The particular years of data available varies across companies, as well as the exact structure and scope of each data file, varies across firms. At a minimum, however, each participant provided the three types of data described below:

(1) *Texas Nonsubscription Claims File*: This file contains detailed information on all occupational injury claims filed by Texas employees during the period of nonsubscription. The information available for each claim included the date and type of injury, the facility (and state) in which it occurred, the amount and types of all payments made (including medical payments and wage replacement costs, if any), the basic demographic characteristics of the claimant. Two of the three companies also provided transaction-level information for each claim that includes detailed medical diagnosis ("ICD9") codes.

(2) *Workers Compensation Claims File*: This file contains detailed information on all workers compensation claims filed by employees in all other states during the period of Texas nonsubscription. The file typically contains the same data fields available in the Texas

Nonsubscription Claims File. In addition, two of the participants provided data on workers compensation claims filed in Texas for the period *before* nonsubscription.

(3) *Hours File*: The hours file contains historical data on the total number of hours worked during each calendar month (or company period) at each of the company's facilities nationwide.

The overarching goal of the empirical analysis is to assess how each firm's replacement of workers compensation benefits with a custom-designed "look-alike" plan has affected key programmatic outcomes. If nonsubscribers' objective is to minimize the total cost per employee of providing occupational safety and health benefits,[60] and they have sufficient information to rationally weigh the costs and benefits associated with each alternative, one would expect total programmatic costs per facility to decline with nonsubscription. Yet beyond this standard "revealed preference" argument, it is difficult to generate strong hypotheses about the likely effects of nonsubscription on specific programmatic outcomes. For example, although nonsubscribers' freedom to implement alternative dispute resolution procedures may cut down on legal costs, their newfound liability to tort judgments may force them to pay occasional windfall judgments. Similarly, although nonsubscribers' ability to cap the total duration or value of benefits, and to constrain their employees' choice of provider, may help contain costs for any given claim, the provision of benefits from the very first day of lost work may exacerbate both "claims-reporting" and "risk-bearing" moral hazard. Therefore, even if one hypothesizes by revealed-preference logic that total costs are likely to fall, the precise *mechanisms* whereby these

[60] If workers are willing to forgo a higher percentage of their wages in exchange for "look-alike" benefits plans than for workers compensation coverage, then under certain conditions, nonsubscription could still be cost-efficient even if its total programmatic costs were higher. Given the absence of any empirical evidence suggesting that workers value "look-alike" plans *more* highly than traditional workers compensation coverage, however, this possibility seems remote.

cost savings are achieved are theoretically indeterminate, and cannot be resolved without empirical investigation.

To shed light on these empirical questions, I compare, in turn, three key programmatic outcomes at the facility and claim levels: the frequency of claims; the cost of claims; and the speed of employees' return to work. Since the dataset obtained from the three participants have different strengths and weaknesses, not all of these questions could be answered with a similar degree of precision and confidence for all three firms. Most importantly, only Companies B and C could provide data from the period prior to nonsubscription. Therefore, only for Companies B and C can I exploit *both* cross-sectional variation (between Texas and other states) and variation over time (between the pre- and post-opt out periods within Texas).

The fact that the benefits plans provided by all three participants begin providing coverage on the *first* day of disability – unlike workers compensation, which does not start providing coverage until at least three days after the date of injury (eight days in Texas) – poses unique methodological challenges. As noted earlier, shorter waiting periods have been shown to raise the frequency of claims, *ceteris paribus,* and therefore one might expect this plan characteristic in itself to raise the frequency of claims among Texas-based nonsubscribing facilities.[61] Importantly, however, the disparity in waiting periods will also, in a more mechanistic sense, shift the overall *distribution* of claims across sectors. For example, suppose that a Texas employee suffers an injury that results in three days of lost work. If the employee is covered by workers compensation, then the claim will be coded as a "medical only" claim, because the worker will receive no indemnity benefits (since the total duration did not exceed seven days). However, if the identical employee is covered by a participant nonsubscriber's

[61] *See, e.g.,* Butler, 61 J. RISK & INS. 383 (1994), *supra* note 41; and Krueger, 41 J. PUB. ECON. 73 (1990), *supra* note 41.

ERISA plan, then the claim will be coded as an "indemnity" claim since wage replacement benefits begin on the *first* day of lost work. The above comparison is complicated even further by the fact that under the Texas workers compensation law, the first seven days of lost work become compensable retroactively if the worker loses twenty-eight days (or more) of work.[62] In future work, I plan to formally model this shift in the distribution of injury types and build it into each stage of the empirical analysis, so as to better distinguish the "mechanistic" effect of the waiting-period discontinuity from the truly "behavioral" effects of nonsubscription on programmatic outcomes.

In this draft, however, my aim is more modest. For each of the three dimensions of variation analyzed, I conduct preliminary empirical analyses in an effort to uncover the *overall* cross-sectoral trends in each company. Using a combination of descriptive comparisons and basic regression models, I seek to discern the overall trends for each company; examine whether these trends differ by employee demographic characteristics and/or injury type; infer which hypotheses these findings appear to support or undermine; and (finally) consider whether the main results vary across study participants.

Although the employee attributes examined – sex, age, tenure, full/part-time status – are self-explanatory, two other independent variables used throughout the analysis require further elaboration. First, as noted earlier, a number of prior studies have found that the prevalence of claims-reporting moral hazard is most pronounced for hard-to-diagnose injuries, such as muscle strains and back injuries.[63] The lack of a waiting period in nonsubscribers' "look-alike" plans therefore may increase the relative frequency of hard-to-diagnose injuries. On the other hand, if providers hand-picked by nonsubscribers engage in more vigilant screening in an effort to reduce

[62] As of September 1, 2005, the retroactive period was shortened to fourteen days. *See supra*, note 20.
[63] *See supra* note 42, and accompanying text.

claims-reporting moral hazard, one might expect the frequency of hard-to-diagnose injuries to fall with nonsubscription. To test the net effect of these countervailing factors, I estimate several models of claims frequency that include a dummy variable for "difficult-to-diagnose" injuries.[64] Second, Company C (the manufacturing firm) produces two different types of products, which are produced at separate plants. To account for the possibility that inherent levels of risk differ across the two types of plants, I include a dummy for "product type" in all models that pertain to Company C.

Since the precise analytical techniques used vary not only across substantive issues, but also across companies, each of the next three sections describes the methodologies used in greater detail, before discussing the substantive findings.

VII. *Comparisons of Claim Frequency*

A cluster of complex (and frequently offsetting) factors are likely to affect the frequency of claims in the nonsubscribing sector. On one hand, the lack of a waiting period for receipt of wage replacement benefits may encourage both risk-bearing and claims-reporting moral hazard, thereby increasing the *total* frequency of claims. At the same time, the absence of a waiting period will "mechanistically" convert short- term claims involving fewer than seven days of lost work (which would be medical-only claims under workers compensation) into indemnity claims under the nonsubscribers' look-alike plans. On the other hand, if nonsubscribers' costs of providing private insurance are more closely "experience rated" than workers' compensation

[64] Prior studies have measured hard-to-diagnose injuries in several different ways. In this Article, I define them as all claims for which the "nature of injury" field is coded as either "carpal tunnel syndrome," "strain," or "all other cumulative injuries." The advantage of this approach is that these three categories were consistently available for all three companies, they compose a similarly sizable fraction of all injuries (between 31% and 43%) for all three companies, and they are likely to capture the bulk of injuries for which diagnosis is difficult and/or subjective. In future work, I will seek to develop more refined and medically precise way to distinguish between easy- and difficult-to-diagnose injuries.

premiums, they may have greater incentives to implement costly safety improvements (especially to avoid exposure to tort liability). Nonsubscribers also have a number of important tools at their disposal to deter fraud and generally reduce the frequency of claims, such as requiring immediate reporting of injuries, and sending employees to hand-picked doctors who may be less likely to approve paid indemnity leave. It is an open question, then, whether the total frequency of claims will fall, and if so, whether similar trends will hold for indemnity and medical-only claims, respectively.

Figure 1 provides a first look at the data by comparing trends in the annual frequency of total workers compensation claims (per 2000 hours worked) in Texas during the nonsubscription to all other states in which each company operates, and (when available) to Texas during the pre-nonsubscription period. The data immediately reveal one striking and consistent trend: the frequency of indemnity claims is uniformly (and substantially) lower in the post-nonsubscription period. For medical-only and total claims, however, the three companies reveal erratic trends.

Table 3**,** presenting the "baseline" frequency models, formalizes the above comparison by modeling the number of indemnity claims, medical-only claims, and total claims per facility (respectively) as a function of hours worked. Since claims are "count" data characterized by overdispersion, I use negative binomial models in all specifications, and include "period" dummies (which correspond closely to calendar months) to account for time effects.[65] Since Company A lacks data for the pre-nonsubscription period, it includes only a "Texas" dummy, whereas the models for Companies B and C include a "Texas" dummy as well as an interaction term ("Texas x post") to capture the marginal effect of a claim's originating in Texas during the post-nonsubscription period.

[65] Although the exact definition of a company "period" differs slightly across firms, it usually corresponds very closely to Gregorian calendar months.

The baseline frequency models corroborate the results revealed in Figure 1. First and foremost, nonsubscription is uniformly and significantly associated with a decline in the frequency of indemnity claims, although the magnitude of the effect differs across firms.[66] Yet examination of the medical-only models suggests a more mixed picture. For Company A, medical-only claims are significantly lower in Texas as compared to other states, a disparity that could be attributable (at least in part) to nonsubscription. Yet for both Companies B and C, the relative frequency of medical-only claims *increases* significantly in the post-subscription period. (For Company B, the absolute number of medical-only claims still falls slightly after nonsubscription, whereas for Company B, both the absolute and relative frequencies of medical-only claims rise markedly.) For both companies, the rise in medical-only claims is sufficiently large to bring about a net relative *increase* in the frequency of total workers compensation claims. Taken together, the results for Companies B and C suggest that nonsubscription may cause some "migration" of claims across categories. In other words, some claims that would have been indemnity claims under workers compensation may become medical-only claims in the presence of a nonsubscriber plan. It is also possible that the lack of a waiting period increases claims-reporting moral hazard, although the effect is apparently confined to medical-only claims.

Table 4 extends the analysis by estimating models of claim frequency that account for different employee attributes. My goal here is to discern whether the disparities identified in the baseline frequency model vary significantly by employee attributes such as age, gender, tenure, and/or part-time employment status. Importantly, my modeling strategy differs significantly

[66] In this table – as in all subsequent tables – the disparities observed for Company A are more difficult to interpret, since they account only for cross-sectional variation across states, and thus any observed disparity may be driven by Texas-specific factors that apply equally to subscribers and nonsubscribers. For clarity's sake, however, I occasionally describe the common trends observed across all three companies without making note of this distinction.

between Company A on one hand, and Companies B and C on the other. For Company A, I estimate a cross-sectional model (the only type of model that can be run with the data available) that incorporates a full set of employee attributes – gender, above-median age, above-median tenure, and part-time status. For Companies B and C, in contrast, I disregard cross-sectional variation and analyze *only* whether the change in claim frequency pre- and post-nonsubscription *in the Texas data* is significantly linked to claimant attributes.[67] For Company B, data are available only for gender and age; for Company C, only data on gender are currently available.[68] As before, I model the frequency of claims at the facility level, using negative binomial models, and include time (period) dummies.

The results of the analysis suggest that the trends identified in the baseline model are probably *not* driven by any particular group of employees. It is true that in the model pertaining to Company A, several employee attributes (female, higher-tenure, and part-time status) are significantly linked to lower claims frequency. However, since the model is purely cross-sectional, it is uncertain whether this result reflects the effect of nonsubscription as such, or simply disparities in relative claim filing among different segments of the Texas workforce that are unrelated to nonsubscription. For Companies B and C, moreover, no single employee-attribute interaction term significantly predicts claim frequency. (The sole exception is age in Company B's medical-only model, the only attribute that was *not* significant in the Company A models.)

[67] It would be possible to preserve cross-sectional variation in the model and include "triple interaction terms" to identify Texas-specific demographic effects. However, my objective here is to identify whether some employees *in Texas* are particularly responsive to the transition to nonsubscription. Including data from all other states – whose workforces may have different mixes of attributes – could actually obscure any such trends.

[68] I am currently trying to acquire more detailed demographic data from Company C. If such data can be obtained, I will be able to analyze a fuller set of demographic characteristics for Company C in future drafts of this Article.

Finally, Table 5 tests whether the observed trends in claims frequency are especially pronounced for hard-to-diagnose injuries, as prior scholarship might lead one to predict.[69] My modeling strategy is identical to that used for the employee-attribute models, except that now the independent variable of interest is the interaction effect between post-implementation and hard-to-diagnose injuries ("post x hard-to-diagnose"). Interestingly, these results *do* lend some credence to the hypothesis that nonsubscription depresses the frequency of hard-to-diagnose injury claims. Not only are the coefficients on the interaction negative and significant for Company A, but more importantly, they are robustly negative, significant, and large for Company B (particularly for indemnity claims). For Company C, in contrast, the coefficient is uniformly insignificant and of fluctuating sign. In addition to the fact that Company C is much smaller than the other two participants, with much fewer claims, the disparity could be explained by the fact that Company B has made careful screening of claims an important cornerstone of their program.[70]

Taken as a whole, then, the analysis of claims frequency yields several important results. The most striking and robust finding is the strong negative association between nonsubscription and the frequency of indemnity claims. Although the absolute number of medical-only claims has also tended to fall, in relative terms (as compared to other states) their frequency may actually *increase* in the wake of nonsubscription. This interesting disparity could be explained, at least in part, by the "migration" of indemnity claims to the medical-only category. Although these trends do not seem to be driven by any particular group of employees, the data suggest that

[69] *See supra* pages 28-29, and accompanying notes.
[70] Company B carefully selects and monitors its health care providers to ensure that they are engaging in "objective medical care" in the sense that only those injuries that are truly disabling are approved for wage-replacement benefits. Phone interview with line manager for nonsubscription program at Company B's third party administrator (April 1, 2008).

nonsubscription is especially likely to reduce the frequency of "hard-to-diagnose" injuries (at least in some firms).

VIII. *Comparisons of Costs*

If firms are rational and well-informed, one might expect nonsubscription to reduce the total (net) costs of benefits, at least among firms which self-select into the nonsubscribing sector.[71] Figure 2, which examines *total* yearly costs (per hour worked) for Texas and all other states, lends substantial credence to this hypothesis. Both Companies A and B, total costs are not only substantially lower in Texas than in other states, but also fall more in the wake of nonsubscription than do total costs in other states. The trends for Company C are less clear: total costs in Texas start to decline in the year *before* nonsubscription (counterbalancing a rising cost trend in other states), and after a multi-year decline, attain a level only slightly lower than that of other states in the most recent calendar year. Overall, however, the data are consistent with the view that nonsubscription tends to lower total programmatic costs per employee.

Yet even if nonsubscription lowers *total* costs per employee, this does not imply that it reduces costs per claim, since the fall in costs could be driven entirely by changes in frequency. On theoretical grounds, moreover, one would expect nonsubscription to produce countervailing effects on per-claims costs. In and of itself, the typically higher wage replacement rate (90% for companies A and B, as compared to 70-75% under workers compensation) will inflate the firm's per-claim cost of indemnity claims.[72] Meanwhile, the availability of wage replacement benefits from the very first day of lost work will increase the mean cost of *all* workers' compensation claims, *ceteris paribus,* while depressing the average cost of indemnity claims. On the other

[71] *See supra* at 26.
[72] Since workers' compensation benefits are untaxed, and occupational benefit plans constitute taxable income, the worker's net rate of wage replacement may increase or decrease with nonsubscription, depending on his/her marginal tax rate.

hand, cost-containment strategies – such as limits on provider choice and dollar and/or duration caps on the availability of benefits – are likely to depress per-claim medical and indemnity costs. Per-claim legal costs are also subject to offsetting effects: although the use of mandatory arbitration provisions (and internal appeals procedures) may help reduce costs for ordinary claims, such cost savings may be offset by a handful of "windfall" tort judgments. Therefore, the net change in mean costs for any *given* claim or worker – with respect to indemnity costs, medical costs, and/or legal costs – is empirically uncertain.

Figure 3 offers a preliminary glimpse of per-claim costs by displaying the distributions of three different cost measures: the combined medical and indemnity cost of indemnity claims; the medical cost of medical-only claims; and the legal cost of all workers compensation claims. Importantly, each of these graphs presents the total frequency of claims per 2,000 hours worked (rather than a density function).[73] As with the earlier analysis of claims frequency, the most striking trends emerge for indemnity claims: nonsubscription seems to shift the distribution of both medical and indemnity costs "leftward" for indemnity claims, such that higher-cost (lower-cost) claims compose a much smaller (higher) portion of the total distribution. (Although the trends for Company C are less clear, they seem to follow a similar general pattern, at least for indemnity costs.) In contrast, the distribution of medical costs for medical claims differs only slightly across the nonsubscription and workers' compensation regimes, and in an inconsistent manner across companies.

Figure 4 visually juxtaposes the distribution of legal costs per claim across the workers' compensation and nonsubscribing sectors. Once again, Companies A and B exhibit very similar trends. While the proportion of claims with non-zero legal costs falls slightly, among this small

[73] Smoothed frequency distributions were constructed in the same manner as a histogram, except that frequency values were normalized by the number of hours worked in the relevant period and were demarcated by a median spline plot instead of vertical histogram bars.

minority of claims, the fraction in the two highest cost categories ($10,000-$100,000 and $100,000 and up, respectively) rises dramatically. The net impact of these costly outliers differs across companies: For Company A, mean legal costs turn out to be lower in Texas, whereas the reverse is true for Company B. Meanwhile, Company C exhibits a unique pattern. Although the fraction of claims with positive legal costs falls with nonsubscription, this trend is *not* counterbalanced by an increase in very costly claims. Moreover, the proportion of moderately costly claims ($1,000-$10,000) increases only slightly. As a result, mean legal costs per claim for Company C decline rather dramatically (from $235 to $8) in the wake of nonsubscription.

Tables 6 and 7 provide "baseline" comparisons of five different measures of per-claim costs. I use OLS models with period dummies, in which the claim (rather than the facility) is the unit of analysis. Table 6 compares logged indemnity costs per indemnity claim; logged medical costs per indemnity claim; and logged medical costs per medical-only claim. Meanwhile, the left-hand and middle columns of Table 7 present baseline models of legal costs for indemnity and medical-only claims, respectively. [74] Comparing these five "baseline" models across the three firms presents a mixed picture of the effect of nonsubscription on per-claim costs. For Company A, per-claim costs are significantly lower in Texas, across all cost categories, than in other states. The fact that Texas is generally a high-cost state suggests that this disparity could be due (at least in part) to nonsubscription.[75] The baseline results for Company B mostly mirror this trend, since the interaction term between Texas and nonsubscription is robustly negative and significant in all medical and indemnity cost models. The only exception is legal costs, which

[74] Importantly, in all models of legal costs, the dependent variable was an actual (unlogged) dollar value, and thus the results are sensitive to the presence of outlying "windfall" tort judgments in the wake of nonsubscription.
[75] *See supra*, pages 9-10, and accompanying notes.

show inconsistent trends – rising for indemnity claims, and falling for medical-only claims.[76] Finally, the baseline cost models for Company C exhibit a very different pattern: although medical costs per claim significantly *rise* in the wake of nonsubscription, indemnity costs and legal costs are seemingly unaffected.

In the next stage of the analysis, my goal is again is to probe whether the trends observed in per-claim costs differ across employees with different attributes. Table 8 presents employee-attribute models for medical and indemnity costs, and the right-hand columns of Table 7 present a similar model for legal costs associated with all workers compensation claims. Only one robust finding emerges from these models: being female tends to magnify the negative association between nonsubscription and costs per indemnity claim. Interestingly, although this result holds for both the medical and indemnity cost components of indemnity claims, it does *not* hold for medical-only claims. The fact that women seem *more* responsive to nonsubscription seems counter-intuitive in light of Alan Krueger's finding that higher benefit levels do not increase female respondents' likelihood of claims filing.[77] On the other hand, given Galizzi and Boden's finding that median time off work is generally 23% longer among injured women than among injured men, one might expect more vigilant screening to have the largest effect on this group.[78]

First and foremost, then, analysis of workers compensation costs confirms the expectation that for employers that opt out the system, nonsubscription reduces the total per-employee costs of occupational benefits. Moreover, for two of the three companies analyzed,

[76] Detailed analysis of the legal cost data for Company B reveals that the rise in costs per indemnity claim after nonsubscription is driven entirely by several claims that resulted in very costly tort judgments. Given the presence of such extreme outliers, using the *log* of legal costs as the dependent variable changes the sign of the interaction term. (Using a log specification mutes the value of extreme outliers.)
[77] *See* Krueger, 41 J. PUB. ECON. 73 (1990), *supra* note 52.
[78] *See* Galizzi & Boden (2003), *supra* note 53, at 318.

nonsubscription also seems to *lower* the per-claim costs of both medical-only and indemnity claims, although it did not have a significant effect on total legal costs. Finally, data from two of the companies analyzed suggests that per-claim costs may fall disproportionately among female employees in the wake of nonsubscription.

IX. *Comparisons of Speed of Return to Work*

From a public policy perspective, one of the most important metrics of programmatic "success" is the speed with which injured employers return to work. Not only do extended absences from work due to occupational injuries and illnesses tend to depress injured workers' future productivity and earnings, but the macroeconomic costs of lost work (or restricted work) have been estimated at $171 billion per year.[79] In this final section, therefore, I examine the extent to which nonsubscription affects the speed of employees' return to work after an injury.

A few important caveats are in order. First of all, since only Companies A and B could provide any information regarding the duration of lost work periods, the analysis in this section was confined to those two firms. Secondly, since all state workers compensation programs, like Texas, impose multi-day waiting periods prior to the receipt of benefits, using the number of "indemnity" lost days (available from Companies A and B) as a proxy for the "true" number of lost days is problematic. For example, a claim that receives three days of indemnity payments under a nonsubscriber plan would correspond to three days of lost work, whereas a claim that receives three days of indemnity payments under workers' compensation would (in Texas) imply ten calendar days of lost work. Moreover, in Texas, workers' compensation claims resulting in anywhere from zero to six days of lost work are empirically indistinguishable, since none would receive any indemnity payments. Fortunately, besides data on "indemnified" lost work days,

[79] *See* GALIZZI & BODEN, *supra* note 53, at 312.

Company B was also able to provide information on the "real" number of days lost (across all U.S. states) for the period *after* Texas nonsubscription. Therefore, one can make accurate cross-sectional return-to-work comparisons between Texas claims (in the post-opt-out period) and claims originating in all other U.S. states during these years.[80]

Figure 5 visually compares the distribution of indemnified lost-work days per claim (and for Company B, "real" lost work days) during the nonsubscription period to the distribution of claims found in all other states (and additionally, for Company B, to the pre-nonsubscription period). The trends for indemnified lost days are striking and uniform for both companies. As compared to both other states and the pre-nonsubscription period, the distribution of lost days in the wake of nonsubscription is far more heavily weighted toward the low end of the distribution. Interestingly, although Company B claims with up to seven lost days are actually *more* prevalent with nonsubscription, the prevalence of claims with at least a month of lost time are uniformly less prevalent (as compared to all other U.S. states and/or the pre-nonsubscription period).

Table 9 augments the above comparisons by modeling the number of days lost for Companies A and B. I estimate two alternative baseline models of lost days for Company B: one using the number of "indemnified" lost days (which is available for all years), and the other using the number of "true" lost days (which is available only for the post-nonsubscription period). Although two of the three "baseline" models (one for each company) rely purely on cross-sectional variation, all three tend to corroborate the pattern suggested in Figure 5: the

[80] "Real" lost days were calculated using "time tracking" data provided by the company. For some claims, the total number of indemnified lost days recorded on the claim exceeded the number of "real" lost days recorded on the same claim. The company advised that this occurrence, which was observed for approximately 5% of all claims, reflected an undercount in the recorded number of "real" lost days, rather than an overcount in the number of indemnified lost days, and that the number of indemnified lost days more accurately reflected the amount of time lost for these claims. Accordingly, for this subset of claims, I replaced the "real" lost days value with the indemnified lost days value before calculating Figure 5 and estimating the models displayed in Table 10.

number of days lost per indemnity claim is significantly and substantially lower in the presence of nonsubscription.

As one would expect given the earlier finding that women's costs per indemnity claim fall the most with nonsubscription, the employee-attribute models presented in Table 10 indicate that at Company B, female employees' number of indemnified lost days is even more likely to fall after nonsubscription than that of their male co-workers. Similarly, in the cross-sectional model of "real" lost days for Company B, the coefficient on "Texas x female" is also negative and significant. Both specifications for Company B also show a significant positive correlation between age and the number of lost days, suggesting that the duration of work absences falls the most among younger workers. However, Company A exhibits different trends. The "Texas x female" interaction term is negative but insignificant, and *tenure* is the only employee attribute that significantly depresses the number of lost days. The lack of a consistent effects across companies (and the lack of tenure data for Company B) make it difficult to ascertain whether the speed of return to work varies robustly with any of these attributes.

Notwithstanding the inherent limitations of the available data, the final phase of the empirical analysis indicates a large and robust positive correlation between nonsubscription and the speed of employees' return to work. Although short absences may become more frequent with nonsubscription, the right tail of the distribution – involving extended absences of two months or more – become far less prevalent during periods of nonsubscription. Although the strength of this effect occasionally varies among employees with different attributes, the inconsistency of such disparities suggests that it is premature to make strong predictions about which employees' absences are likely to contract the most in response to nonsubscription.

X. Conclusions & Suggestions for Future Research

Although participation in the workers compensation system is compulsory for virtually all private-sector employers, Texas's unique law – the only truly elective statute in the U.S.[81] – represents a valuable opportunity to explore the "path not taken." Unlike in every other U.S. state, a large minority of Texas firms (about 37%) have elected to become "nonsubscribers" and opted out of the workers compensation system. Remarkably, the prevalence of nonsubscription has been on the rise among very large firms, whose "deep pockets" might make them particularly averse to lawsuits by employees injured on the job. Why are large employers choosing to forgo the benefits of tort immunity? What are the real-world consequences for those firms that choose to become nonsubscribers? These questions have received almost no prior scholarly attention.

This Article is the first to comprehensively examine the effects of Texas nonsubscription on the frequency and cost of claims, and on the speed of employees' return to work, using firm-level microdata. I focus on a limited, yet important, segment of the Texas labor market: large employers that operate many homogenous facilities across many U.S. states. Rather than letting injured workers without viable tort claims bear the costs of their own occupational injuries, most employers of this type offer "look-alike" benefits plans to their Texas employees containing many of the benefits traditionally available through workers compensation. In order to isolate the effects of nonsubscription, I compare claim frequencies, claim costs, and average number of lost work days *within* each firm across its Texas-based and non-Texas-based facilities, controlling (whenever possible) for claimant and injury characteristics. For those two firms that recently became nonsubscribers and have preserved their historical claims data, I also compare outcomes in Texas across the pre- and post-optout periods. This study design enables me to derive statistically meaningful estimates of important programmatic outcomes for each

[81] For a list of the minor exceptions to this rule, *see supra* notes 3 & 7.

participating firm, while avoiding many forms of selection bias that may arise from comparing aggregate outcomes across groups of heterogenous companies.

The empirical analysis contained in the paper yields several important findings. First, my analysis of claim frequency data suggests that nonsubscription depresses the prevalence of indemnity claims. Since medical-only claims also tend to rise in relative (if not absolute) terms, it is possible that nonsubscription encourages some "migration" of indemnity claims to the (less severe) medical-only category. The data on claim frequency also suggest that nonsubscription tends to reduce the frequency of "hard-to-diagnose" injuries[82]. In the second phase of the empirical analysis, my results lend substantial, albeit qualified, support to the view that nonsubscription lowers the total costs (per employee) of providing occupational safety and health benefits. Morever, I find that nonsubscription generally reduces per-claim costs for both medical-only and indemnity claims – a trend which is especially pronounced among female employees. Finally, my analysis of the data on indemnified lost work days suggests that nonsubscription expedites the speed of employees' return to work.

Taken as a whole, my results suggest that for some large companies, the voluntary provision of "look-alike" occupational injury plans, whose provisions may in some respects be more generous than those provided through workers compensation, is an effective cost-cutting measure. This phenomenon seems to be driven by several important trends. First, the data suggest that exposure to tort liability – the primary risk that companies sought to avoid as a result of the "great compromise" – is a paper tiger. It is true that for some large companies, average legal costs per claim may rise, sometimes even substantially, in the wake of nonsubscription. Yet this cost increase is generally offset by much larger declines in both the frequency and per-claim costs of indemnity claims. Not only are fewer costly indemnity claims filed, but those

[82] For an explanation of how "hard-to-diagnose" injuries are defined for my purposes, see *supra*, note 64.

employees that do file them tend to lose substantially fewer days of work, thereby lowering both the direct costs (in the form of wage replacement) and indirect costs (in the form of lost productivity, hiring of temporary workers, etc.) of workplace injuries.

In the larger project of which this Article is a part, I plan to significantly enlarge the number of study participants, thereby enhancing the likelihood that my findings are truly representative of the experience of large, multi-state nonsubscribers. Expanding the number of study participants will also enable me to explore why the trends I identify in this Article are not uniform across all three companies (with Company C frequently exhibiting idiosyncratic trends), and whether, for example, programmatic outcomes differ systematically by size, industrial sector, and/or other company attributes. Finally, through interviews with risk management executives, I hope to better understand *why* large firms choose to become nonsubscribers, and whether the timing of this decision is systematically correlated with other firm-specific trends. Gaining insight into each of these areas will help me discern whether, and to what extent, selection bias is likely to limit the generalizability of my findings.

I also plan to undertake several other refinements in future work. First, I hope to modify my models to account for the mismatch in waiting periods across the workers compensation regime and nonsubscribers' look-alike plans, so that I can better distinguish the "mechanistic" effect of this discontinuity from moral hazard effects. Third, by analyzing transactional-level data containing detailed medical diagnosis codes ("ICD-9 codes"), I hope to improve my ability to compare similar injuries, further reducing the chance that the disparities I observe are driven by subtle forms of selection and/or aggregation bias. Finally, by analyzing transaction-level data containing billing information and detailed medical procedure codes, I will explore whether

nonsubscribers' enhanced control over medical care providers alters the mix, utilization rates, and/or cost of treatments administered for similar workplace injuries.

Although the analysis conducted in this project will illuminate many real-world consequences of nonsubscription for an important and growing segment of Texas employers, several other critical questions merit further inquiry. First, my data do not allow me to test for the possibility of cost-shifting. For example, it is possible that some claims that would be treated as indemnity claims under workers compensation do not disappear with nonsubscription, but are simply treated through a combination of ordinary (non-occupational) health care coverage and/or private disability insurance. If nonsubscription causes many workers compensation claims to "migrate" to non-occupational benefit programs, then the *net* effect of nonsubscription on firms' personnel costs could still be negative, notwithstanding the immediate cost savings identified in this article. Second, the experience of small- and medium-sized firms may be very different from that of the large firms analyzed in this study, and future work focusing on this group of employers would provide a much more complete picture of nonsubscription's statewide effects.

Finally, although my data enable me to probe the consequences of nonsubscription for large firms, they shed relatively little light on the impact of nonsubscription on their employees. For example, although the reduction in the number of lost work days may be advantageous from the employer's perspective, some workers may return to work *too* quickly to recover fully, thereby suffering long-term adverse health consequences. In short, it is possible that nonsubscription lowers net employee satisfaction, and/or increases economic hardship for employees that suffer the most severe injuries. Probing whether nonsubscription is a Pareto improvement, or simply redistributes economic surplus from employees to employers, is therefore a particularly vital topic for future inquiry.

Table 1: Major Characteristics of Study Participants (Over Entire Sample Period)

Firm Characteristic	Company A	Company B	Company C
Sector	Retail	Retail	Manufacturing
Number of U.S. states in which firm operates	At least 20	At least 20	At least 10
Number of facilities nationwide	At least 1000	At least 1000	At least 40
Number of facilities in Texas	At least 100	At least 100	At least 5
Annual WC claims nationwide	At least 5,000	At least 10,000	At least 1000
Annual WC claims in Texas	At least 250	At least 500	At least 100
Years of "pre-" data available	0	5	2
Years of "post-" data available	5	3	5
OSHA-reportable claim rate for states other than Texas (quartile relative to subindustry)[83]	Second[84]	Second[85]	Unavailable[86]

[83] Owing to the limits of the available data, it is only possible to compare the companies' OSHA-reportable claim rates to the relevant subindustry quartiles during the post-nonsubscription period. Accordingly, in order to capture the relative safety level of the companies *in the workers' compensation regime* (as opposed to the nonsubscription regime), we restricted the calculation of this statistic to states other than Texas. Quartiles designate the next highest quartile boundary: a company whose claim rate falls in the second quartile has a claim rate between the 25th and 50th percentiles of the company's 5-digit NAICS code subindustry. Quartile boundaries for subindustries were obtained from the Bureau of Labor Statistics Web site (http://www.bls.gov/iif/oshsum.htm). Since the BLS data is stratified by establishment employment size, in each case, we compared the company's rates to those of companies within the same establishment employment size stratum, defined by the number of full-time worker equivalents employed at the establishment. (A full-time worker equivalent is defined as 200,000 hours worked per year.)

[84] Quartile statistic is based on data from 2005 and 2006; the company's claim rate fell into the second quartile for both years. The data necessary to make the comparison between the company's OSHA-reportable claim rate and the BLS subindustry quartiles are available for those years only. The claim rate for this company falls roughly in the middle of the second quartile for its subindustry.

[85] Quartile statistic is based on data from 2006. The data necessary to make the comparison between the company's OSHA-reportable claim rate and the BLS subindustry quartiles are available for that year only. The claim rate for this company falls close to the median for its subindustry.

[86] The company did not make OSHA-reportable claim data available at the level of granularity that would make it possible to perform the comparison for states outside of Texas only. The company's OSHA-reportable claim rate for *all* states (including Texas) falls in the first quartile for its subindustry for years 2005 and 2006.

Table 2: Major Characteristics of Participants' Benefits Plans

Plan Attribute	**WC**	**Company A (retail)**	**Company B (retail)**	**Company C (manufacturing)**
Plan Type	Statutory	ERISA	ERISA	ERISA
Filing deadline	30 days	24 hours[87]	End of work shift	End of work shift
Medical Benefits	100% of costs; no dollar or duration limit	100% of costs for 120 weeks or max med improvement	100% of costs for 120 weeks or max med improvement	100% of costs
Waiting period	7 days (1st week paid if disabled 28+ days[88])	0 days	0 days	0 days
Replace-ment rate as % of AWW	70-75% (untaxed)	90% (pre-tax)	90% (pre-tax)	75% (pre-tax)
Max dollar amount	$712	$800	[none]	$600
Max wks of disability coverage	104 for temp; 401 for perm	120	120	104
Permanent partial disability	70% of wage up to $498 weekly max, up to 300 wks	None	None	None
Provider Choice	May choose own PCP unless employer belongs to WC network	Assigned to facility's approved PCP	Must be treated by approved dr. in approved facility	Must be treated by approved dr. in approved facility
Death Benefits	75% pre-injury pay	$250,000	$150,000	Up to $100,000
Dismem-berment	100% of pre-injury pay for life	Up to $250k	Up to $150,000	Up to $100,000
Dispute Resolution	[none]	[none]	Mandatory arbitration	Mandatory arbitration
Total cap on benefits	None	None	$200,000	$250,000

[87] Technically, the plan requires employees to report an injury by the end of the work shift. In practice, however, the Company approves claims that are filed within 24 hours of their occurrence.
[88] The retroactive period was shortened to 14 days effective September 1, 2005.

Table 3: Claim Frequency: Baseline Models

	Company A			Company B			Company C		
	Total claims	Indemnity claims	Medical-only claims	Total claims	Indemnity claims	Medical-only claims	Total claims	Indemnity claims	Medical-only claims
Texas	-0.385** (0.022)	-0.898** (0.053)	-0.253** (0.024)	-0.0744** (0.016)	0.234** (0.035)	-0.134** (0.017)	-0.0835 (0.079)	-0.142 (0.15)	-0.0529 (0.088)
Texas x post				0.0688** (0.025)	-0.453** (0.064)	0.163** (0.028)	0.236* (0.097)	-1.762** (0.27)	0.471** (0.11)
Natural log of hours	1.151** (0.014)	1.148** (0.027)	1.152** (0.016)	1.092** (0.0099)	1.374** (0.024)	1.040** (0.011)	1.071** (0.021)	0.899** (0.040)	1.122** (0.023)
Product type dummy							0.448** (0.033)	0.453** (0.062)	0.455** (0.036)
Period dummies	Included	Included	Included	Included	Included	Included	Included	Included	Included
Constant	-11.28** (0.14)	-12.54** (0.26)	-11.61** (0.16)	-10.52** (0.10)	-15.22** (0.25)	-10.18** (0.11)	-10.09** (0.24)	-9.868** (0.47)	-10.84** (0.27)
Observations	> 100,000	> 100,000	> 100,000	> 100,000	> 100,000	> 100,000	> 2,500	> 2,500	> 2,500

NOTES:

All models are negative binomial models, in which the dependent variable is the number of injury claims. Standard errors are presented in parentheses. Levels of significance are as follows: ** 1%, * 5%, ^ 10%. The "Texas x post" dummy (when applicable) takes a value of 1 for all periods in Texas during which the company was a nonsubscriber, and 0 otherwise. The unit of observation is facility × company time period. Claims were designated as "medical-only" or "indemnity" models depending on whether indemnity costs (for indemnity claims) or only medical costs (for medical claims) were incurred. Claims from the first period of every Company B facility that opened during the sample period were dropped, because some of these claims pertain to hours worked during the pre-opening period. Claims that could be matched to individual facilities (which constituted less than 1% of all observations for each company) were dropped from the analysis. Claims from two states in which one or more companies operated, but for which claims data were unavailable or of poor quality, were omitted from the analysis. "Product type" dummy pertains to facilities that manufacture one of two products produced by Company C. Besides the specifications presented above, I conducted the following robustness checks:

(1) I re-estimated the models of indemnity claims and medical-only claims by replacing the Texas dummy term (and Texas x Post interaction term, where applicable) with a slate of non-Texas state dummy variables (one for each non-Texas state in which the applicable company operates) and (where applicable) a Texas x Pre interaction term. This allowed us to assess the relative "rank" of the effect of Texas post-nonsubscription vis-à-vis the effect of other states. The results of this comparison are as follows. For Company A, in the model of indemnity claim frequency, Texas "ranked" lowest among all states (i.e. all state dummy terms exhibiting statistical significance had a positive coefficient value). In the model of medical claim frequency, Texas ranked lower than all but approximately 10% of states (i.e. approximately 10% of the state dummy variables were significant with a negative coefficient value, with the remaining 90% taking on positive coefficient values). For Company B, in the model of indemnity claim frequency, Texas in the post-nonsubscription period "ranked" above approximately 50% of states and below approximately 50% of states. In the model of medical claim frequency, Texas in the post-nonsubscription period "ranked" above approximately 80% of states and below approximately 20% of states. For Company C, in the model of indemnity claim frequency, Texas ranked lowest among all states. In the model of medical claim frequency, Texas "ranked" highest among all states.

(2) I re-estimated all models using ordinary least squares and Poisson regression models (respectively) rather than a negative binomial regression model. The resulting parameters exhibited significance levels identical to or more significant than those presented above, with identical signs on statistically significant parameters.

Table 4: Claim Frequency – Employee Attribute Models

	Company A		Company B		Company C	
	Indemnity claims	Medical-only claims	Indemnity claims	Medical-only claims	Indemnity claims	Medical-only claims
	Sample: All states	Sample: All states	Sample: Texas	Sample: Texas	Sample: Texas	Sample: Texas
Texas	0.0871 (0.13)	0.675** (0.050)				
Post			-0.693** (0.13)	-0.378** (0.047)	-1.811** (.312)	0.087 (0.114)
Female	0.503** (0.021)	0.381** (0.012)	0.567** (0.068)	0.291** (0.033)	-0.680* (0.291)	1.029** (0.164)
Older	0.707** (0.021)	-0.0382** (0.012)	0.626** (0.069)	-0.190** (0.033)		
Higher tenure	0.546** (0.021)	0.0245* (0.012)				
Part time	0.321** (0.020)	0.603** (0.013)				
Texas x female	-0.469** (0.11)	-0.397** (0.048)				
Texas x older	0.0579 (0.12)	0.0456 (0.048)				
Texas x higher tenure	-0.273* (0.11)	-0.322** (0.048)				
Texas x part time	-1.653** (0.13)	-1.200** (0.050)				
Post x female			-0.0319 (0.12)	0.0829 (0.052)	-0.784 (0.635)	0.070 (0.196)
Post x older			0.626** (0.069)	0.235** (0.052)		
Post x higher tenure						
Post x part time						
Natural log of hours	1.142** (0.027)	1.141** (0.016)	0.922** (0.069)	0.872** (0.032)	0.337 (0.275)	0.670** (0.101)
Product type dummy					2.071** (0.407)	1.009** (0.150)
Period dummies	Included	Included				
Constant	-16.45** (0.26)	-14.85** (0.16)	-12.89** (0.68)	-10.33** (0.32)	-5.362^ (2.782)	-1.421** (0.240
Observations	> 500,000	> 500,000	> 20,000	> 20,000	> 500	> 500

NOTES: All models are negative binomial models, in which the dependent variable is the number of injury claims. Standard errors are presented in parentheses. Levels of significance are as follows: ** 1%, * 5%, ^ 10%. The "post" dummy (when applicable) takes a value of 1 for all periods in Texas during which the company was a nonsubscriber, and 0 otherwise. The unit of observation is facility × company time period x employee attribute combination. Claims were designated as "medical-only" or "indemnity" depending on whether indemnity costs (for indemnity claims) or only medical costs (for medical claims) were incurred. Claims from the first period of every Company B facility that opened during the sample period were dropped, because some of these claims pertain to hours worked during the pre-opening period. Claims that could be matched to individual facilities (less than 1% of all observations for each company) were dropped. Claims from two states in which one or more companies operated, but for which claims data were unavailable or incomplete, were omitted. "Higher tenure" and "older" are both defined as any values above the median for the respective company. "Product type" dummy pertains to facilities that manufacture one of two products produced by Company C. In addition to the specifications presented above, I re-estimated all models using OLS and Poisson regression models (respectively). The resulting parameters exhibited significance levels identical to or more significant than those presented above, with identical signs on statistically significant parameters.

Table 5: Claim Frequency
Injury Type Models

	Company A		Company B		Company C	
	Indemnity claims	Medical-only claims	Indemnity claims	Medical-only claims	Indemnity claims	Medical-only claims
	Sample: All states	Sample: All states	Sample: Texas	Sample: Texas	Sample: Texas	Sample: Texas
Texas	-0.559** (0.069)	-0.125** (0.028)				
Post			-0.154^ (0.083)	0.00218 (0.034)	-2.744** (0.453)	1.761** (0.205)
Hard to diagnose	0.313** (0.020)	-0.452** (0.012)	0.478** (0.068)	-0.119** (0.033)	-0.904** (0.313)	1.093** (0.229)
Texas x hard to diagnose	-0.694** (0.11)	-0.383** (0.051)				
Post x hard to diagnose			-1.123** (0.13)	-0.595** (0.054)	1.753** (0.589)	-1.98** (0.258)
Natural log of hours	1.148** (0.027)	1.151** (0.016)	0.921** (0.069)	0.874** (0.033)	0.362 (0.295)	0.765** (0.12)
Product type dummy					2.075** (0.440)	0.833** (0.176)
Period dummies	Included	Included				
Constant	-13.40** (0.26)	-12.09** (0.15)	-11.76** (0.68)	-9.511** (0.32)	-5.755^ (2.993)	-9.565** (1.232)
Observations	> 100,000	> 100,000	> 10,000	> 10,000	> 500	> 500

NOTES:

All models are negative binomial models, in which the dependent variable is the number of injury claims. Standard errors are presented in parentheses. Levels of significance are as follows: ** 1%, * 5%, ^ 10%. The "post" dummy (when applicable) takes a value of 1 for all periods in Texas during which the company was a nonsubscriber, and 0 otherwise. "Hard to diagnose" injuries are defined as those claims for which "nature of injury" is coded as either "carpal tunnel syndrome," "strain," or "other cumulative injury." The unit of observation is facility × company time period x hard-to-diagnose. Claims were designated as "medical-only" or "indemnity" depending on whether indemnity costs (for indemnity claims) or only medical costs (for medical claims) were incurred. Claims from the first period of every Company B facility that opened during the sample period were dropped, because some of these claims pertain to hours worked during the pre-opening period. Claims that could be matched to individual facilities (which constituted less than 1% of all observations for each company) were dropped from the analysis. Claims from two states in which one or more companies operated, but for which claims data were unavailable or of poor quality, were omitted from the analysis. "Product type" dummy pertains to facilities that manufacture one of two products produced by Company C. Besides the specifications presented above, I re-estimated all models using an ordinary least squares regression model and Poisson model, respectively, rather than a negative binomial regression model. The resulting parameters exhibited significance levels identical to or more significant than those presented above, with identical signs on statistically significant parameters.

Table 6: Medical and Indemnity Costs: Baseline Models

	Company A			Company B			Company C		
	Indemnity costs	Medical costs for indemnity claims	Medical costs for medical-only claims	Indemnity costs	Medical costs for indemnity claims	Medical costs for medical-only claims	Indemnity costs	Medical costs for indemnity claims	Medical costs for medical-only claims
Texas	-2.007** (0.098)	-0.944** (0.077)	-0.214** (0.026)	0.344** (0.059)	0.439** (0.048)	0.178** (0.017)	0.485* (0.24)	0.455* (0.202)	0.131^ (0.073)
Texas x post				-1.676** (0.11)	-0.989** (0.086)	-0.268** (0.027)	0.581 (0.49)	0.996* (0.407)	0.459** (0.087)
Product type dummy							-0.251* (0.097)	-0.340* (0.080)	-0.241** (0.030)
Period dummies	Included	Included	Included	Included	Included	Included	Included	Included	Included
Constant	8.747** (0.13)	8.947** (0.099)	6.123** (0.046)	7.677** (0.15)	8.244** (0.12)	5.650** (0.037)	8.599** (0.36)	9.294** (0.302)	5.933** (0.111)
Observations	> 10,000	> 10,000	> 20,000	> 10,000	> 10,000	> 50,000	> 1,000	> 1,000	> 5,000

NOTES:

All models are OLS models, in which the dependent variable is the log of dollars paid. Standard errors are presented in parentheses. Levels of significance are as follows: ** 1%, * 5%, ^ 10%. The "Texas x post" dummy (when applicable) takes a value of 1 for all periods in Texas during which the company was a nonsubscriber, and 0 otherwise. The unit of observation is the claim. Claims were designated as "medical-only" or "indemnity" depending on whether indemnity costs (for indemnity claims) or only medical costs (for medical claims) were incurred. Claims from the first period of every Company B facility that opened during the sample period were dropped, because some of these claims pertain to hours worked during the pre-opening period. Claims that could be matched to individual facilities (which constituted less than 1% of all observations for each company) were dropped from the analysis. Claims from two states in which one or more companies operated, but for which claims data were unavailable or of poor quality, were omitted from the analysis. "Product type" dummy pertains to facilities that manufacture one of two products produced by Company C. Besides the specifications presented above, I conducted the following robustness checks:

(1) I re-estimated the models of indemnity claims and medical-only claims by replacing the Texas dummy (and Texas x Post interaction term, where applicable) with a slate of non-Texas state dummy variables and (where applicable) a Texas x Pre interaction term. This allowed us to assess the relative "rank" of the effect of Texas post-nonsubscription vis-à-vis the effect of other states. The results of this comparison are as follows. For Companies A and B, in the model of indemnity costs and the model of medical costs for indemnity claims, no state dummy exhibited a negative and significant coefficient, indicating that Texas in the post-nonsubscription period was among the states with the very lowest indemnity costs, and also among the states with the very lowest medical costs for indemnity claims. In the model of medical costs for medical claims, approximately 50% of states exhibited positive and significant coefficients for Companies A and B (indicating that these states had higher costs than did Texas in the post-nonsubscription period), while approximately 15% of states exhibited negative and significant coefficients (indicating that these states had lower costs than did Texas in the post-nonsubscription period). Coefficients on the remaining 35% or so of states were insignificant. For Company C, in the model of indemnity costs, the majority of state dummies exhibited insignificant coefficients. The significant coefficients all exhibited negative signs (indicating that these states had lower costs than did Texas in the post non-subscription period). In the models of medical costs, the vast majority of state dummies exhibited negative and significant coefficients (indicating that these states had lower costs than did Texas in the post-nonsubscription period); no state dummies exhibited positive coefficients.

(2) I re-estimated all models using the unlogged cost as the dependent variable. The resulting parameters exhibited significance levels identical to those presented above, with identical signs on statistically significant parameters, with the following exception: in the unlogged specification of the model of indemnity costs for Company B, the effect of the Texas dummy term became insignificant.

(3) I re-estimated all models using incurred cost (which includes prospective "reserves"), rather than paid cost, as the dependent variable. The resulting parameters exhibited significance levels identical to or more significant than those presented above, with identical signs on statistically significant parameters.

Table 7: Legal Costs – Baseline and Employee Attribute Models

	Company A			Company B			Company C		
	Legal costs for indemnity claims	Legal costs for medical-only claims	Legal costs for all claims	Legal costs for indemnity claims	Legal costs for medical-only claims	Legal costs for all claims	Legal costs for indemnity claims	Legal costs for medical-only claims	Legal costs for all claims
	Sample: All states	Sample: All states	Sample: All states	Sample: All states	Sample: All states	Sample: Texas	Sample: All states	Sample: All states	Sample: All States
Texas	-694.7** (230)	-38.88^ (21.1)	-268.8 (184)	-301.0* (117)	9.347** (1.64)		192.47 (538.39)	1.007 (40.03)	-16.009 (123.92)
Post						7.485 (296)			
Texas x post				2041** (212)	-14.74** (2.55)		-1072.87** (334.8)	-25.34 (47.58)	-270.09^ (162.65)
Female			125.8** (25.7)			0.852 (135)			104.62^ (59.36)
Age			10.24** (1.04)			1.471 (5.29)			
Tenure			0.0254** (0.0049)						
Part time			106.1** (29.6)						
Texas x female			148.3 (107)						
Texas x age			3.960 (4.30)						
Texas x tenure			-0.0828** (0.023)						
Texas x part time			136.5 (126)						
Post x female						145.4 (214)			-61.53 (192.79)
Post x age						3.931 (8.08)			
Product type dummy							-730.4** (217.25)	-31.85^ (16.28)	-189.74** (50.57)
Period dummies	Included	Included	Included	Included	Included		Included	Included	
Constant	2704** (296)	36.82 (37.6)	190.9* (96.9)	1155** (285)	0.770 (3.72)	-11.55 (188)	1813.91* (804.96)	35.27 (60.74)	-388.13* (189.05)
Observations	> 5,000	> 20,000	> 20,000	> 10,000	> 50,000	> 5,000	> 1,000	> 5,000	> 5,000

NOTES:

All models are OLS models, in which the dependent variable is the total dollars paid for legal costs. Standard errors are presented in parentheses. Levels of significance are as follows: ** 1%, * 5%, ^ 10%. The "Texas x post" dummy and "post" dummy (when applicable) take on a value of 1 for all periods in Texas during which the company was a nonsubscriber, and 0 otherwise. The unit of observation is the claim. Claims were designated as "medical-only" or "indemnity" depending on whether indemnity costs (for indemnity claims) or only medical costs (for medical claims) were incurred. Claims from the first period of every Company B facility that opened during the sample period were dropped, because some of these claims pertain to hours worked during the pre-opening period. Claims that could be matched to individual facilities (which constituted less than 1% of all observations for each company) were dropped from the analysis. Claims from two states in which one or more companies operated, but for which claims data were unavailable or of poor quality, were omitted from the analysis. "Product type" dummy pertains to facilities that manufacture one of two products produced by Company C. "Age" is a continuous variable defined in years, and "tenure" is a continuous variable defined in days. I did not perform a robustness check using incurred rather than paid cost figures for this table because one of the three companies was able to provide only paid – and not incurred – legal cost data. Finally, I re-estimated all models using the logged legal cost as the dependent variable. The resulting parameters exhibited significance levels identical to or more significant than those presented above, with identical signs on statistically significant parameters, with the following exceptions: (i) For Company A, in the logged specification of the model of legal costs for medical claims, the effect of the Texas dummy term became significant at the 10% level. (No reductions in significance levels were observed in the employee attribute model.) (ii) For Company B, in the logged specification of the model of legal costs for indemnity claims, the effect of the Texas x post interaction term became insignificant and negative. (iii) For Company C, in the logged specifications of the models of legal costs for indemnity claims and legal costs for medical claims, the effect of the Texas dummy term and the effect of the Texas x post interaction term both became insignificant.

Table 8: Medical and Indemnity Costs: Employee Attribute Models

	Company A			Company B			Company C		
	Indemnity costs	Medical costs for indemnity claims	Medical costs for medical-only claims	Indemnity costs	Medical costs for indemnity claims	Medical costs for medical-only claims	Indemnity costs	Medical costs for indemnity claims	Medical costs for medical-only claims
	Sample: All states	Sample: All states	Sample: All states	Sample: Texas	Sample: Texas	Sample: Texas	Sample: Texas	Sample: Texas	Sample: Texas
Texas	-1.508** (0.37)	-0.599* (0.30)	0.0584 (0.091)						
Post				-1.658** (0.29)	-0.855** (0.26)	0.0203 (0.071)	0.514 (0.387)	0.929* (0.438)	0.526** (0.104)
Female	0.168** (0.037)	0.212** (0.030)	0.0717** (0.014)	0.178^ (0.11)	0.195* (0.095)	0.0245 (0.033)	0.381 (0.347)	0.177 (0.393)	-0.039 (0.164)
Age	0.0186** (0.0016)	0.0185** (0.0012)	0.00984** (0.00056)	0.0292** (0.0039)	0.0247** (0.0035)	0.0112** (0.0013)			
Tenure	0.000104** (0.0000063)	0.0000439** (0.0000050)	0.0000237** (0.0000027)						
Part time	-0.250** (0.042)	-0.0862** (0.033)	-0.0479** (0.016)						
Texas x female	-0.778** (0.20)	-0.541** (0.16)	-0.0360 (0.053)						
Texas x age	0.00279 (0.0085)	0.0000946 (0.0068)	-0.00667** (0.0021)						
Texas x tenure	-0.0000637 (0.000042)	-0.0000161 (0.000033)	0.00000448 (0.000012)						
Texas x part time	-0.379 (0.26)	-0.116 (0.21)	-0.0560 (0.062)						
Post x female				-0.473* (0.19)	-0.423* (0.17)	-0.0551 (0.052)	-1.594^ (0.829)	-1.125 (0.938)	0.314 (0.195)
Post x age				0.000171 (0.0070)	-0.00393 (0.0062)	-0.00107 (0.0020)			
Period dummies	Included	Included	Included						
Product Dummies							0.023 (0.349)	0.267 (0.395)	-0.044 (0.085)
Constant	7.547** (0.14)	7.883** (0.11)	5.701** (0.051)	6.139** (0.16)	7.390** (0.14)	5.606** (0.046)	8.474** (0.305)	8.776** (0.345)	6.077** (0.100)
Observations	> 5,000	> 5,000	> 20,000	> 500	> 500	> 5,000	>75	>75	>500

NOTES:

All models are OLS models, in which the dependent variable is the total dollars paid for costs. Standard errors are presented in parentheses. Levels of significance are as follows: ** 1%, * 5%, ^ 10%. The "post" dummy (when applicable) takes on a value of 1 for all periods in Texas during which the company was a nonsubscriber, and 0 otherwise. The unit of observation is the claim. Claims were designated as "medical-only" or "indemnity" depending on whether indemnity costs (for indemnity claims) or only medical costs (for medical claims) were incurred. Claims from the first period of every Company B facility that opened during the sample period were dropped, because some of these claims pertain to hours worked during the pre-opening period. Claims that could be matched to individual facilities (which constituted less than 1% of all observations for each company) were dropped from the analysis. Claims from two states in which one or more companies operated, but for which claims data were unavailable or of poor quality, were omitted from the analysis. "Product type" dummy pertains to facilities that manufacture one of two products produced by Company C. "Age" is a continuous variable defined in years, and "tenure" is a continuous variable defined in days. Besides the specifications presented above, I conducted the following robustness checks:

(1) I re-estimated all models using the unlogged cost as the dependent variable. The resulting parameters exhibited significance levels identical

to or more significant than those presented above, with identical signs on statistically significant parameters, with the following exceptions: (i) For Company A: in the unlogged specification of the model of medical costs for indemnity claims, the effect of the Texas x female interaction term became significant at the 10% level and the effect of the part-time dummy term became insignificant; and in the unlogged specification of the model of indemnity costs, the effects of the Texas, female, and Texas x female terms became insignificant. (ii) For Company B, in the unlogged specifications of both the model of indemnity costs and the model of medical costs for indemnity claims, the effects of the Texas x Post interaction term and Post x female interaction term became insignificant.

(2) I re-estimated all models using incurred cost (which includes prospective "reserves"), rather than paid cost, as the dependent variable. The resulting parameters exhibited significance levels identical to or more significant than those presented above, with identical signs on statistically significant parameters.

Table 9: Lost Days
Baseline Models

	Company A	Company B	
	Indemnified lost days	Indemnified lost days	"Real" Lost days
	Sample: All states (post-nonsubscription)	Sample: All states	Sample: All states, post-nonsubscription
Texas	-1.706** (0.088)	0.197** (0.044)	-1.323** (0.066)
Texas x post		-1.516** (0.079)	
Period dummies	Included	Included	Included
Constant	5.532** (0.098)	5.132** (0.11)	4.605** (0.099)
Observations	> 5,000	> 5,000	> 5,000

NOTES:

All models are negative binomial models, in which the dependent variable is the total number of days lost (either indemnified lost days or "real" lost days). Standard errors are presented in parentheses. Levels of significance are as follows: ** 1%, * 5%, ^ 10%. The "Texas x post" dummy (when applicable) takes on a value of 1 for all periods in Texas during which the company was a nonsubscriber, and 0 otherwise. The unit of observation is the claim. The sample includes all claims with at least one lost day of the applicable type (indemnified or "real"). Claims from the first period of every Company B facility that opened during the sample period were dropped, because some of these claims pertain to hours worked during the pre-opening period. Claims that could be matched to individual facilities (which constituted less than 1% of all observations for each company) were dropped from the analysis. Claims from two states in which one or more companies operated, but for which claims data were unavailable or of poor quality, were omitted from the analysis. "Real" lost days were calculated using "time tracking" data provided by the company. For some claims, the total number of indemnified lost days recorded on the claim exceeded the number of "real" lost days recorded on the same claim. The company advised that this occurrence, which was observed for approximately 5% of all claims, reflected an undercount in the recorded number of "real" lost days, rather than an overcount in the number of indemnified lost days, and that the number of indemnified lost days more accurately reflected the amount of time lost for these claims. Accordingly, for this subset of claims, I replaced the "real" lost days value with the indemnified lost days value before estimating the displayed models. Besides the specifications presented above, I conducted the following robustness checks:

(1) I re-estimated the models of indemnity claims and medical-only claims by replacing the Texas dummy (and Texas x Post interaction term, where applicable) with a slate of non-Texas state dummy variables and (where applicable) a Texas x Pre interaction term. This allowed us to assess the relative "rank" of the effect of Texas post-nonsubscription vis-à-vis the effect of other states. For all three models, Texas in the post-nonsubscription period ranked lower than all other states (i.e. all state dummies exhibiting statistical significance had a positive coefficient value).

(2) I re-estimated all models using OLS and Poisson models, respectively, rather than a negative binomial regression model. The resulting parameters exhibited significance levels identical to or more significant than those presented above, with identical signs on statistically significant parameters.

Table 10: Lost Days
Employee Attribute Models

	Company A	Company B	
	Indemnified lost days	Indemnified lost days	"Real" lost days
	Sample: All states (post-nonsubscription)	Sample: Texas	Sample: All states, post-nonsubscription
Texas	-1.705** (0.38)		-1.870** (0.21)
Post		-2.642** (0.24)	
Female	0.206** (0.028)	0.210* (0.089)	0.159** (0.032)
Age	0.0110** (0.0012)	0.0187** (0.0035)	0.0188** (0.0012)
Tenure	0.0000259** (0.0000048)		
Part time	0.00738 (0.031)		
Texas x female	-0.142 (0.18)		-0.381** (0.15)
Texas x age	0.00847 (0.0082)		0.0188** (0.0057)
Texas x tenure	-0.0000778* (0.000037)		
Texas x part time	-0.298 (0.26)		
Post x female		-0.482** (0.17)	
Post x age		0.0213** (0.0064)	
Period dummies	Included		Included
Constant	4.821** (0.11)	3.989** (0.14)	3.704** (0.11)
Observations	> 5,000	> 500	> 5,000

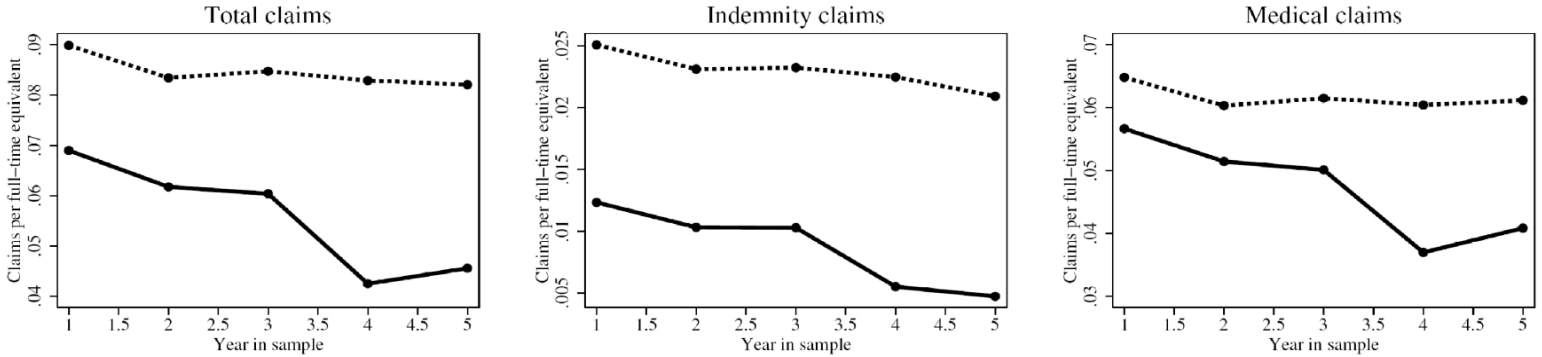
NOTES:

All models are negative binomial models, in which the dependent variable is the total number of days lost (either indemnified lost days or "real" lost days). Standard errors are presented in parentheses. Levels of significance are as follows: ** 1%, * 5%, ^ 10%. The "post" dummy (when applicable) takes on a value of 1 for all periods in Texas during which the company was a nonsubscriber, and 0 otherwise. The unit of observation is the claim. The sample includes all claims with at least one lost day of the applicable type (indemnified or "real"). Claims from the first period of every Company B facility that opened during the sample period were dropped, because some of these claims pertain to hours worked during the pre-opening period. Claims that could be matched to individual facilities (which constituted less than 1% of all observations for each company) were dropped from the analysis. Claims from two states in which one or more companies operated, but for which claims data were unavailable or of poor quality, were omitted from the analysis. "Age" is a continuous variable defined in years, and "tenure" is a continuous variable defined in days. "Real" lost days were calculated using "time tracking" data provided by the company. For some claims, the total number of indemnified lost days recorded on the claim exceeded the number of "real" lost days recorded on the same claim. The company advised that this occurrence, which was observed for approximately 5% of all claims, reflected an undercount in the recorded number of "real" lost days, rather than an overcount in the number of indemnified lost days, and that the number of indemnified lost days more accurately reflected the amount of time lost for these claims. Accordingly, for this subset of claims, I replaced the "real" lost days value with the indemnified lost days value before estimating the displayed models. As a robustness check, I re-estimated all models using OLS and Poisson models, respectively. The resulting parameters exhibited significance levels identical to or more significant than those presented above, with identical signs on statistically significant parameters.

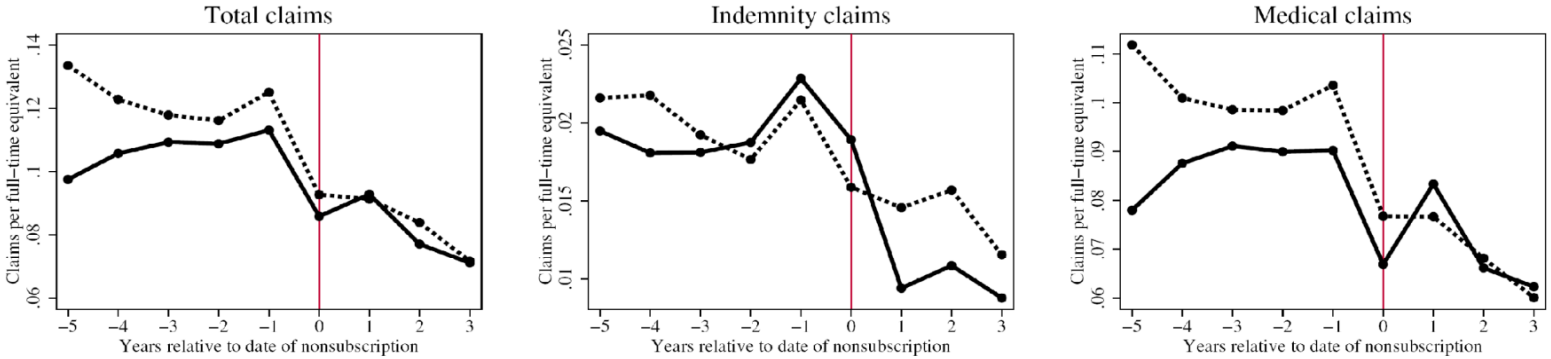
Figure 1: Trends in Annual Frequency of Claims per 2,000 Hours Worked

(vertical line indicates year of nonsubscription)

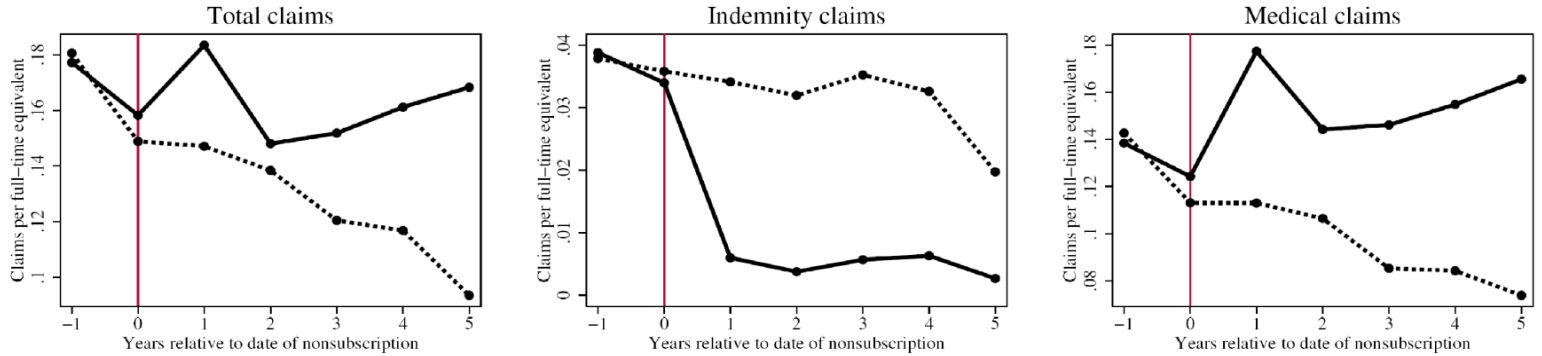
Company A:



Company B:



Company C:



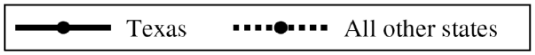


Figure 2: Trends in Total Program Costs per 2,000 Hours Worked
(vertical line indicates year of nonsubscription)

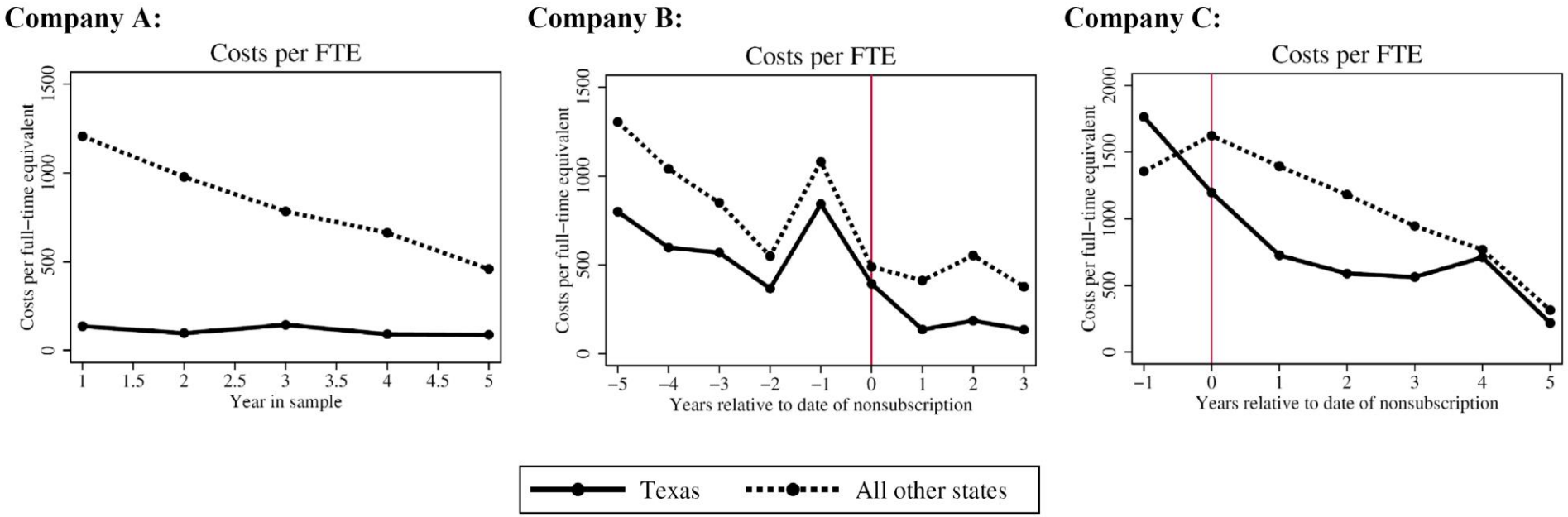


Figure 3: Frequency of Claims per 2,000 Hours Worked, Disaggregated by Log of Costs

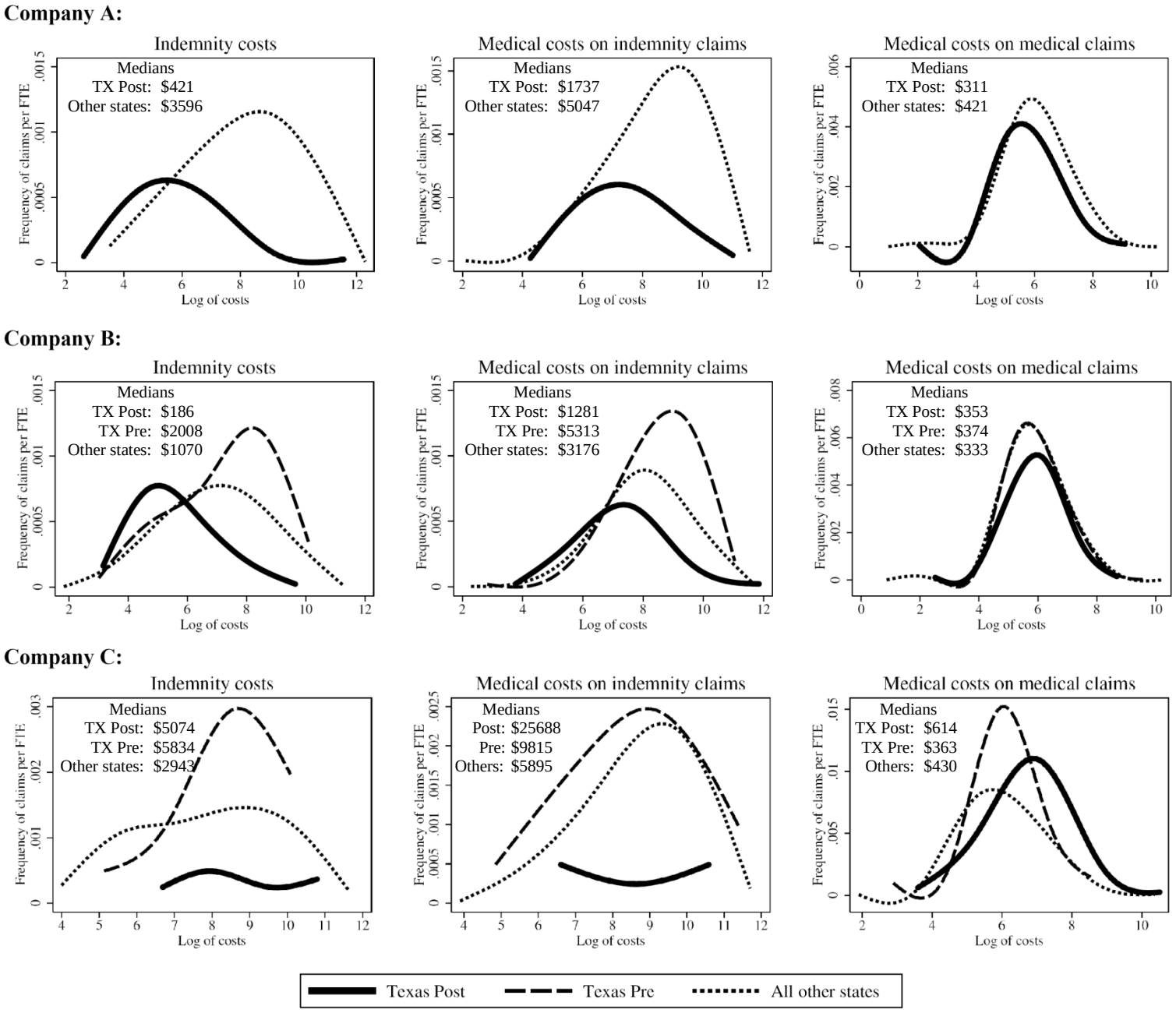
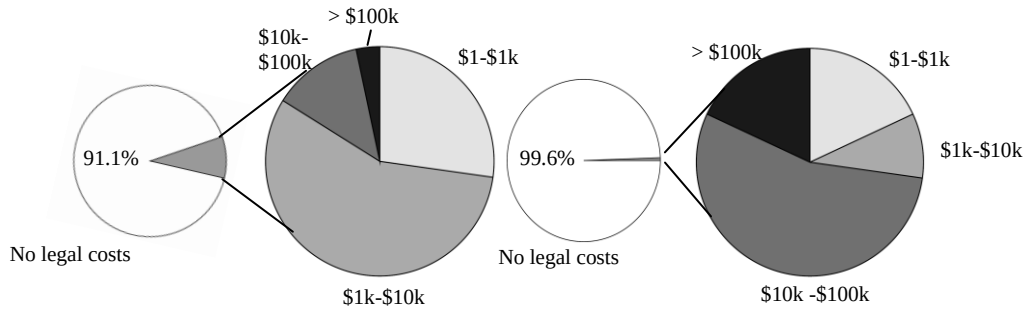


Figure 4: Distribution of All Workers Compensation Claims by Total Legal Costs

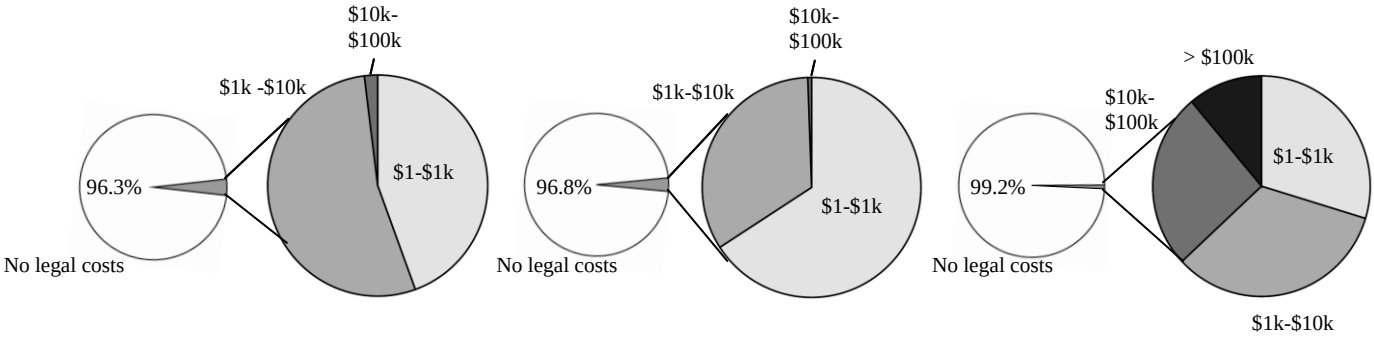
Company A:



All other states
(mean: $406)

Texas
(mean: $215)

Company B:

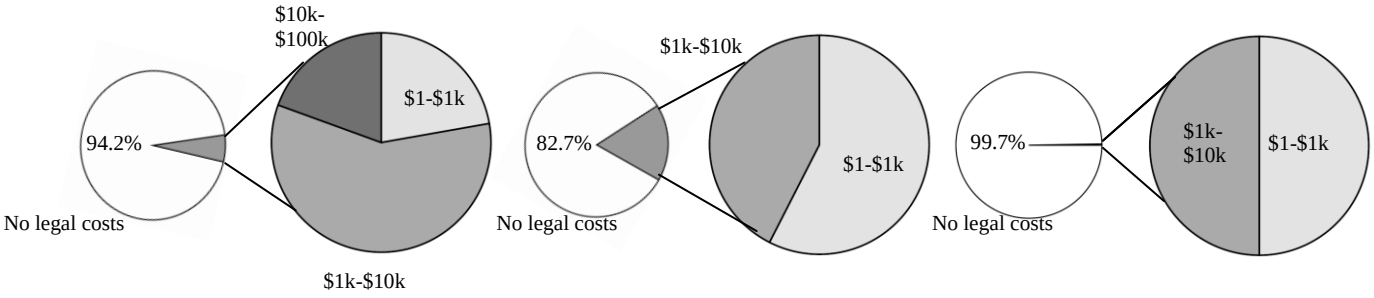


All other states
(mean: $82)

Texas "Pre"
(mean: $37)

Texas "Post"
(mean: $269)

Company C:



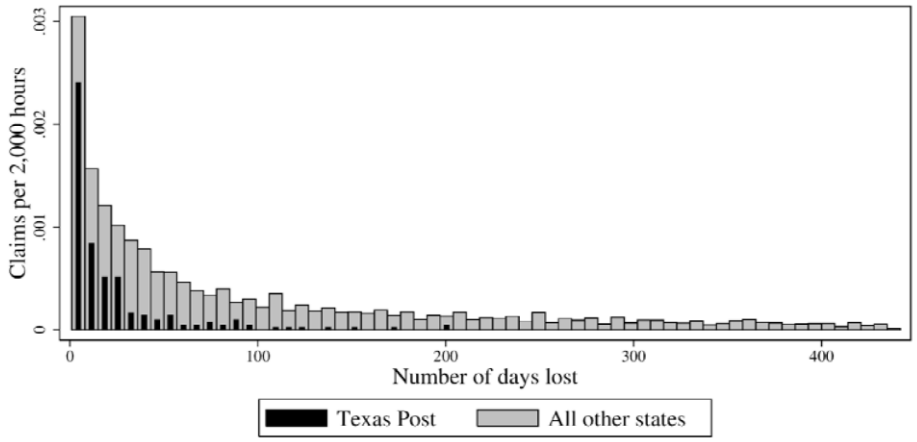
All other states
(mean: $352)

Texas "Pre"
(mean: $235)

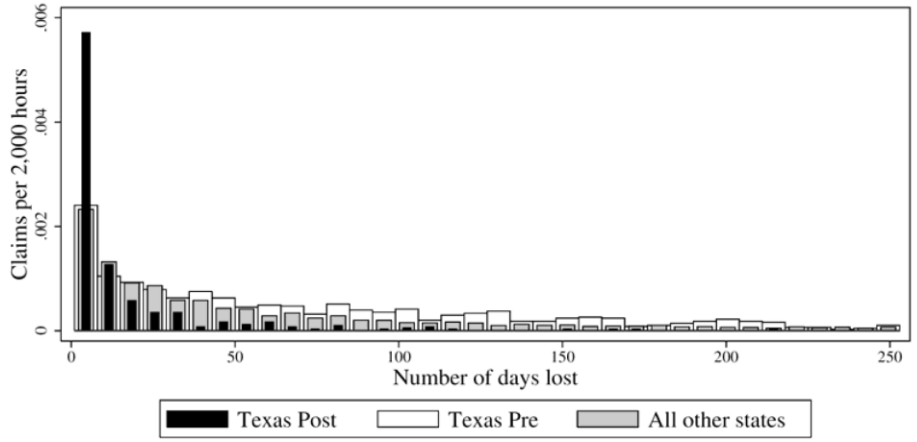
Texas "Post"
(mean: $8)

Figure 5: Frequency of Lost Days per 2,000 Hours Worked, Disaggregated by Number of Days Lost (in 7-day increments)

Company A: Indemnified Lost Days



Company B: Indemnified Lost Days



Company B: "Real" Lost Days