Corruption, Capture and the Development of Workplace Safety Regulation through the Progressive Era

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Examples of corruption and graft in Gilded Age and the Progressive Era are easily found. The turn of the century was the heyday of muck-raking journalists and examples of city bosses and political graft are common coin in the scholarship on the era. Recently in an intriguing working paper, Ed Glaeser and Andrei Shleifer (2001) have suggested that the progressive era regulations were a response to worries about corruption and subversion of the judicial common law process that was the primary source of control over business activity in the 19th century. They assume that as the scale of enterprise increases, the companies had greater incentives to subvert the judicial process. Their model of optimal rules suggests that as the scale of enterprise rises, there should be a move from strict liability to negligence liability to regulation (or no regulation) and eventually to no regulation at all. In a sweeping discussion of the rise of all types of regulation, they offer evidence on the corruption of the courts, the reformers' interest in eliminating that corruption, and suggest that the pattern of change in rules follows the one in their model.

The Glaeser and Shleifer paper led me to reexamine my own knowledge about the changes in regulation and liability rules as we moved into the Progressive Era. Their goal was to talk about all regulatory changes, so they painted their picture with broad brushstrokes. The question that came to mind was how well do their impressions describe what happened in specific areas of regulation. Since their theoretical model is structured to deal with situations of liability and prevention of accidents, it seems natural to examine how well their predictions fit the details of the changes in liability rules and the development of regulation of workplace safety.

Changes in liability rules for workplace accidents and the regulation of workplace safety were central features of the transition from the Gilded Age to the Progressive Era. In the 1880s,

the status quo was negligence liability combined with the three defenses of assumption of risk, contributory negligence, and fellow servant for all types of employment. However, during the late 1800s and the first decade of the 19th century a number of states began restricting the three defenses with employer liability legislation, while the federal government restricted the fellow-servant defense and contributory negligence defenses for interstate railroad workers with the Federal Employer Liability Acts of 1906 and 1908. The ultimate change in liability rules was the state governments' shift to workers' compensation, a form of shared strict liability in the 1910s. The changes in liability rules were accompanied by the introduction of workplace safety regulations by the states and federal government. Between 1869 and 1900 nearly all of the mining states established some form of mine safety regulations that they continue to amend throughout the progressive era. The regulation and inspection of factories first started in 1879 and spread more slowly among the states into the 1910s. Meanwhile, both the state and federal government established railroad safety regulation.

I. Models of the adoption of regulation and the role of corruption.

The name "The Progressive Era" seems to imply that the changes in rules during the period were improvements over the status quo, and thus the legislation was passed in the public interest and was beneficial to society as a whole. Pareto optimal changes where all persons gain might come about from reductions in information, transactions, and administrative costs that reduce the deadweight loss to society. There are other scenarios, however, where there are winners and losers, and the gains to the winners might outweigh the losses. However, these assessments often depend on the relative weights assigned to the welfare of the winners of losers, and it is rare to find universal agreement on the appropriate weights.

In examining the introduction of Progressive Era labor legislation, it is most useful to think of the driving forces as being a complex interaction of interest groups and coalitions that pressed for specific legislation. In the area of workplace safety legislation, the major interest

groups were workers, employers, insurers, and social reformers. These groups could be further divided into subgroups. For example, workers might be divided along union and nonunion lines, or along dangerous and safe line. Large and small employers often had different attitudes, as did employers in unionized versus nonunion industries.

If Progressive Era social reformers, workers, and unions were the key coalitions that led to the passage of the legislation, the laws might be seen as beneficial to workers at the expense of employers. Therefore, the laws might act as a "tax" on the employers, forcing them to make costly changes that require more safety equipment or more monitoring of workers' activity to reduce accidents. Workers clearly benefit in these cases if there are improvements in workplace safety or in the payments they receive when injured without consequent reductions in wages. However, the benefits of the new laws might be mitigated to the extent that the tax lowers the demand for labor. As one example, Fishback and Kantor (1995, 2000) find that improvements in post-accident payments to workers were associated with declines in wages for nonunion workers.

On the other hand, Robert Wiebe (1962), James Weinstein (1967), Roy Lubove (1967), David Moss (1996), Price Fishback and Shawn Kantor (2000), and many others have found substantial evidence that employers and businessmen played important roles in the passage of Progressive Era safety legislation. Given that employers often were the source of significant campaign funding for governors and legislators, they likely played a significant role in shaping legislation. In the typical situation when reformers proposed a bill, employers either worked to ensure that the bill was killed or bottled up in committee. If they feared that the bill might go further, they proposed their own alternative. At the extreme the alternative might eliminate the reform altogether and shift the benefit to the employer at the expense of workers.[1] Union leaders at times in the early 1900s suggested that business interests controlled politics and therefore they distrusted some political solutions (Weinstein, 1967, 159; Skocpol 1992, 205-47; Asher 1969, 457). These fears were confirmed in some states where anti-union legislation was passed or when they saw federal antitrust legislation applied more to busting unions than to busting trusts

(Puth 1993, 485). In more cases, the employers' alternative weakened the reform bill by eliminating the reforms that taxed employers and instead codifying existing practices. One of the keys to the success of regulation was its enforcement. The teeth might be taken out of true reforms by providing inadequate inspection budgets or the provision of no penalties or miniscule fines. Many studies in the extensive literature on the impact of the federal Occupational Safety and Health Administration (OSHA) since the 1970s have suggested that OSHA has had only limited success at lowering accident rates because of the inadequacy of its enforcement resources.

In some cases, subgroups of employers might have sought to use safety legislation to make it more difficult for other employers to compete in the markets. In the modern studies of OSHA, this case has been made most strongly by Ann Bartel and Lacy Glenn Thomas. They find that OSHA has had little effect on accident rates but that employers have spent a great deal of resources to meet OSHA standards. They argue that in the political debates larger and more unionized employers who face lower costs of meeting safety standards have supported OSHA regulations as a way to limit competition from smaller employers in product markets. This explanation for safety legislation as an anti-competitive measure in the product market might not work as well at the state level where employers in many industries faced as much or more product market competition outside the state as inside the state. On the other hand, to the extent that the regulations eliminate competitors for workers in the state, it still might be a useful device.

In these interest group discussions there remains the possibility that labor legislation benefited both employers and workers. For example, Fishback and Kantor (2000) suggested that workers' compensation laws were passed because employers, workers, and insurers (in states without state funds) anticipated gains from the new law. The question then arises as to why employers and workers did not privately contract on their own for the changes enacted by the labor legislation. In the case of workers' compensation, private contracting for workers' compensation policies in which workers waived their rights to negligence suits in advance of accidents had been disallowed by a mixture of legislation and court decisions. With respect to

other regulations, there may have been situations where employers and workers in many states thought the changes would be a good idea but that they would have been put at a competitive disadvantage within their own state if they unilaterally made the move on their own. Thus, the legislation may have helped prevent a "race to the bottom." When we extend the discussion outside the borders of a single state, many employers argued against labor legislation in their own state on the grounds that they would be placed at a competitive disadvantage with respect to employers in other states (Moss, 1996). So it is certainly possible that the inter-state argument might have extended to private contracting by firms within states.

The Glaeser/Shleifer model can be put into the context of these interest group battles, as they argue that the interest groups face incentives to follow corrupt practices to achieve their ends. In particular, they focus on subversion of the judicial process by large enterprises because the primary form of rule making in the absence of regulation in the 19th century came through decisions in the common law courts. Their predictions for regulatory change are based on an elegant model of the efficient choice of liability rules in which changes in the scale of enterprise are the central feature driving changes in the optimality of different liability and regulatory regimes. The model assumes that as the scale of enterprise increases, the benefits to subverting the arbitrative process rise at a much faster rate than the costs of doing so. They also assume that the stakes in a judicial decision are greater than the stakes in regulatory decisions, which gives firms less incentive to subvert the regulatory process. When these assumptions are combined in a model of accident prevention, the model predicts that increases in scale will lead the optimal choice for liability to move from strict liability to negligence liability then to regulation (or no regulation and no liability) and ultimately to no liability and no regulation. The optimality of the choice is determined by the interplay of accident prevention, production, and subversion of the administrative regime.

In determining how much empirical weight to give to corruption and subversion we need to define the terms. Glaeser and Shleifer seem to have a relatively broad definition, ranging from

the obvious cases of bribery of judges and jurors to grayer areas where, for example, lawyers use the idiosyncracies of the judicial rules to game the system in their favor. To be more precise about what is meant, we suggest several categories of subversion. Define "corruption" as the worst form of subversion, bribery and payments that are clearly illegal and against the mores of society. "Gamesmanship" involves tactics that are within the rules but that many consider violate the spirit of fair play in the process. Gamesmanship would include such practices as the "overuse" of appeals to alter settlement negotiations, shifting jurisdictions, filing flurries of irrelevant motions, and other practices. Such gamesmanship could be limited if an honest judge practiced tighter control. There is also the prospect of "judicial capture," when an interest group essentially has the judges and the courts in their pocket. It is hard to tell whether this is subversion or just the result of the standard interest group battle predicted by our founding fathers. For example, a series of judicial decisions denying compensation to workers might be seen as judicial capture or they might just as easily be seen as the application of a set of rules applied to reach the judges' conception of the optimal course for society. Even then we might see capture if one interest group is the primary determinant of who gets to be a judge.

Corruption and capture are likely to have played roles in the legislative process that developed the new policies. Certainly, anyone reading newspapers of the progressive era can find legislative scandals. In 1911 Ohio newspapers were reporting that legislators had perfected the practice of proposing "milker" bills. Legislators agreed to propose womens' hours law legislation as a method of getting employers to increase their campaign contributions to help them fight the bill. In New York there was a major bribery scandal involving the passage of racetrack gambling legislation. Becker, Stigler, and Pelzman discuss how interest groups might capture the legislative process, and there are many public choice studies that talk of legislative capture. Once the rules are in place we might also see both capture and corruption of the regulatory process.

My reading of the The Glaeser/Shleifer model and their discussion of the rise of the regulatory regime inspired a series of hypotheses that can be tested using the transitions in workplace safety policy. My apologies to Ed and Andrei if I have mischaracterized their analysis. At any rate the issues listed are worth addressing in the study of the role of corruption, capture, and reform in any regime changes.

1) The timeline of policies displayed the following progression as the scale of enterprise rose. There was a move from strict liability to negligence liability followed by either regulation or no liability and ultimately no liability at all.

2) The scale of enterprise was an important correlate of the timing of adoption of policy changes. We might therefore expect to see that scale strongly influenced adoption patterns in cross-sectional comparisons of the states. Glaeser/Shleifer argue that the presence of large-scale enterprises are a driving force in the adoption of new policies designed to reduce their incentive to corrupt the system. On the other hand, many scholars suggest that large enterprises tended to be more progressive and pressed for the legislation.

3) The stakes in regulatory decisions were lower than they were in judicial decisions. This is an assumption of the Glaeser/Shleifer model.

4) Regulatory bodies replaced the courts in making the policy decisions.

5) Corruption, capture, and gamesmanship were major problems in the judicial system and progressive era reformers saw this as a central reason for change.

6) The new regimes were binding and had significant impact on accident rates and other economic factors. If the new regime was ineffective, it raises questions about who wrote the new policies, the purpose of the policies, and how they were enforced.

7) There was less employer capture of the legislature and the administration of regulation than of the judicial administration of negligence liability. Glaeser/Shleifer empirical descriptions emphasize that the shifts toward regulation reduce subversion by replacing the judiciary with administrative regulation. This suggests two corollaries.
    a) Employers played relatively minor roles in the legislature in writing the new policies and determining the resources available for enforcement.
    b) Employers also would have been less inclined to subvert and capture the enforcement of the new regulations.

The remainder of the paper is organized as follows. In the next section we talk about the transitions in liability rules for workplace accidents and the roles played by employers, workers, reformers, and insurers. We then discuss the introduction of regulations with an eye toward eventually testing the impact of scale on policy adoptions. Next is a discussion of the interactions

of regulation and the court system. We discuss the extent to which regulation was binding. We then discuss the extent to which employers captured the legislative and regulatory processes. Finally, we return to the predictions and summarize the preliminary conclusions we can draw about each one at this stage in the project.

II. Changes in the Institutional Framework of Workplace Accident Liability and Regulation

The Glaeser-Shleifer model makes a clean prediction that as the scale of enterprise rose, there was a move from strict liability to negligence liability to regulation (or no liability). The changes in workplace accident liability don't fit such a clean picture. It appears that from the earliest published worker injury cases in the United States some subset of the common law rules of negligence and the three defenses were applied. The transition to workers' compensation was a move that mixed strict liability and regulation. The employer was committed to pay compensation for all accidents arising out of and in the course of employment, but the amounts to be paid were regulated by the state to be less than the full cost of the injury. Meanwhile, state safety regulation for mines, railroads, and factories are introduced in a number of states within 30 to 50 years of the first published worker injury cases. Regulation didn't so much replace negligence liability as it developed alongside it, as regulation had implications for the negligence court cases and the courts were the enforcers of the regulations.

II.1 Changes in Liability Rules

There has been some controversy about the development of negligence liability. In broad discussions of the courts handling of accidents of all types, some legal scholars argue that the courts made a transition from strict liability to negligence liability during the antebellum period as the courts sought to protect industrial enterprises from the high costs of accidents (Friedman, Horwitz). On the other hand, Gary Schwartz (1981) and Robert Rabin (1981) argue against any clear general shift.[2] Here we focus on workplace accidents. Martin Horwitz (1977, 208)

suggests that the issue of legal liability of employers for the injuries of workers was first posed in England in 1937 in *Priestly v. Fowler* and in a published case in the United States in 1841 in *Farwell v. Boston and Worcester R.R.*. He suggests that "there were surely many instances of worker injuries before 1840, but many were probably compensated out of benevolence or charity, depending on the extent of personal relationship between master and servant." Other studies also seem to suggest an absence of injured worker suits against employers in the early 1800s. Gary Schwartz (1981, 1737) found no such cases prior to 1840 in an exhaustive review of published case decisions in New Hampshire from 1800 to 1850. Christopher Tomlins (1988) found that prior to the *Farwell* decision the employer bore virtually no legal liability to an injured worker, although he did find an unpublished case just prior to *Farwell* that appears to have awarded an injured worker damages on grounds that seem like negligence.[3] In England in the late 18th century injured workers were the responsibility of the parish under the poor law. Employers were obligated to care for sick apprentices and slaves, but Tomlins argues that the employer did not owe free labor similar obligations. A number of American states followed the English poor law procedure, and therefore we might expect the same relationships in America in the early 1800s.

If these scholars are correct that injured worker suits against employers were not heard prior to 1837, some subset of the limitations imposed on recovery by workers in the late 19th century appear to have been in place from the very beginning. *Farwell v. Boston and Massachusetts R.R.* (1842) appears to be the first American appeals court decision on a worker injury, and the fellow-servant and assumption of risk defenses were applied there (Horwitz 1977, 209; Friedman 1985, 473).[4] Friedman (473) suggests that "within a few years of *Farwell*, the issue came up in state after state. Courts eagerly swallowed the doctrine." Tomlins (1988) and Schwartz (1981) agree.

This finding raises some questions for the Glaeser/Shleifer prediction and empirical suggestion of an initial shift from strict liability to negligence liability as the scale rose in the

early portion of the 19th century. The *Farwell* decision and the establishment of the rules for recovery precede the Civil War, railroads were still in their infancy, and the scale of industrial enterprise was nowhere near what it became after the Civil War. There also remains the question of whether subversion was important to the development of the doctrine. None of the writers on the *Farwell* case that I have read mention any taint of scandal or bribery in these cases. If the lawyers of the 19th century were anything like their counterparts today, we can rest assured that they practiced gamesmanship, but this would have been true for both representatives of the employers and of workers. On the other hand, it appears that the courts, by largely following precedents, had supplied employers with a legal set of rules that heaped much of the financial responsibility for accidents on to the workers and their families. Either the courts had been captured by industrial employers from the very beginning or the legal system firmly agreed that the appropriate policy for a developing America was to establish a negligence standard with three defenses.

Under the full-blown liability system in the late 19th century, workplace accident compensation was based on common law rules of negligence combined with the defenses of assumption of risk, fellow-servant, and contributory negligence. The negligence liability system required an employer to exercise "due care" in protecting his employees against workplace hazards. The employer was legally obligated to hire "suitable and sufficient" co-workers, to establish and to enforce proper rules of conduct within the work environment, to provide a safe workplace, to furnish safe equipment, and to provide employees with warnings and suitable instructions in the face of dangerous working conditions. Relying on Judge Learned Hand's reasoning, Richard Posner (1972, 32) and William Landes and Posner (1987, 85-87) claim that due care required that the employer prevent accidents when his costs of accident prevention were lower than the expected costs of the accident (i.e., losses to the accident victim multiplied by the probability of the accident). If a worker was injured on the job, he bore the burden of proving

that his employer had failed to exercise due care in preventing the accident and that the employer's negligence was the proximate cause of the injury. If an injured worker was able to show his employer's negligence, then he was theoretically entitled to compensation up to the amount of his financial losses from the accident (lost wages and medical expenses) plus remuneration for "pain and suffering." Even if an employer failed to conform to the letter of the law, however, he could escape liability by establishing any of three defenses: that the employee had assumed the risks associated with the employment (assumption of risk); that a co-worker (fellow servant) had caused the accident; or that the worker himself was negligent or had not exercised due care (contributory negligence).[5]

Under assumption of risk the employer could be freed from liability if the accident was caused by factors that were ordinary for that type of work, or, if extraordinary, that the risks were known and acceptable to the worker when he took the job. A steeplejack, for example, who tripped and fell off of a steeple might not have received compensation from his employer because the steeplejack knew and accepted the risks associated with his line of work. There are some infamous cases where workers reported defects in machinery to their employers, returned to work at the machines and were injured. The courts denied compensation on the grounds that the worker knew and assumed the risk when they returned to work with the machine. Under the contributory negligence defense, workers could not collect damages if they might have avoided the accident by exercising due care themselves by preventing accidents when their prevention costs were lower than the expected damage. For instance, an employer would probably not have been liable for injuries a motorman sustained if he slammed into a wall while driving too fast to make a turn. Finally, the fellow-servant doctrine meant that an injured worker was not compensated if the actions of another worker caused the accident. A miner was not likely to be compensated by an employer under the negligence system if the miner's partner's failure to correctly prop a roof caused injury in a roof fall (see Fishback and Kantor 2000, 30-33).

Views on why these doctrines were established vary. Lawrence Friedman (1985, 300-1) among many argues that the system developed to encourage the industrial enterprise. He suggests that the courts knew implicitly or even explicitly that to impose strict liability on industrial enterprises would have stunted the growth of industry. However, Gary Schwartz (1981) challenges this "industry subsidy" view with an ample number of exceptions from his analysis of cases in California and New Hampshire. Posner (1972) and Landes and Posner (1987) claim that the negligence system promoted efficient accident prevention. The negligence standard forced employers to prevent all accidents when their prevention costs were lower than the expected damages of the accident, as measured by the probability of an accident multiplied by the damage done. The contributory negligence defense was added to insure that workers prevented accidents when their prevention costs were lower than the expected damages. The primary goal of the defense was to save on court costs on the grounds that if both parties were negligent there is no reason to assign fault to one or the other (Landes and Posner 1987, 89). The assumption of risk defense was justified on the grounds that if workers knew the dangers of their work in advance, then they could negotiate higher wages for accepting the risk (i.e., Adam Smith's compensating wage differential) and use this "risk premium" to buy workplace accident insurance. Massachusetts Chief Justice Lemuel Shaw made this argument as early as 1842 (Horwitz 1977, 209; Friedman 1985, 473) in the first published workplace accident case in the U.S. Finally, the fellow-servant defense allegedly promoted efficient accident prevention because it gave workers an incentive to report the hazardous actions of co-workers to the employer so that the dangerous behavior could be corrected (309-11). The optimality of these rules is less certain in the context of of workers' limited information about their workplace accident risk, employers' monitoring costs, transactions costs of negotiating over safety issues, the costs of going to court, or the costs of negotiating settlements. Theoretical treatments of this issue suggest that the relative efficiency of strict liability and negligence liability with the three defenses depends very strongly on one's assumptions about transaction costs. Since transaction costs are obviously

present in a realistic setting, it is not clear that we can predict theoretically which liability system would be optimal in practice (see, e.g., Brown 1973, Epstein 1973, Shavell 1980 and 1987, Veljanovski 1982).

Fishback and Kantor (2000) suggest that the de facto system was one in which the legal rules provided a baseline guide as to what to expect when people went to court. However, going to court was costly; therefore, the vast majority of injury claims were settled out of court. They find evidence that the compensation in settlements was loosely correlated with the de jure rules, but there was a great deal of noise in the system. The fear of delay, of gamesmanship by the employer or the insurer, and the workers' own high costs of going to court (25 to 40 percent of the compensation in contingency fears plus emotional costs) might have prevented some workers with legitimate claims from receiving compensation. Certainly, very few workers received amounts that matched their full loss. The impact of these potential court costs also cut two ways, as some workers with more generous employers, with employers seeking to avoid the nuisance of a suit, or better access to legal advice might well have fared better than they would have been expected to under the highly restrictive de jure rules. It is important to note that the studies of accident causes that Fishback and Kantor found in the late 1890s and early 1900s often suggested that worker fault was the cause of a very large percentage of the accidents. Thus, no compensation at all might have been the legal ruling in a large percentage of cases where workers received payment. At any rate workers injured on the job typically received sums that were less than a full years' income with an occasional worker receiving a large amount. About half the families of fatally injured workers received on average about a full years' income. The views of accident causation evolved away from blaming the worker in the early 1900s with the publication of Crystal Eastman's Work Accidents and the Law. Had workers' compensation not been adopted, it is possible that more workers would have received compensation after Eastman's findings had become widespread.

In the 19th century employers seemed relatively satisfied with negligence liability as the basis for accident compensation. They emphasized the notion of responsibility and felt that they should not be forced to pay for accidents for which they were not at fault. Labor leaders, even as late as 1905, were still willing to work within the negligence liability system, seeking to expand liability by passing legislation that limited the three defenses. They focused on the existing system in part because they did not trust the legislatures, which in their view were dominated by the employers' interests (Weinstein, 1967, 159; Skocpol 1992, 205-47; Asher 1969, 457).

Neither the employers' nor the labor leaders' views were fixed. During the first decade of the twentieth century both sides became increasingly dissatisfied with the operations of the system. Employers were worried about the uncertainties of large "jackpot" court awards and dissatisfied that a significant portion of what they paid out for liability insurance never reached the injured worker. By the turn of the century, the applications of the three defenses were increasingly erratic, signaling increasing uncertainty about what the standards were. This likely contributed to the significant growth in court cases concerning workplace accidents reaching state appellate courts found by Fishback and Kantor (2000, 94-8). Meanwhile, in some state legislatures workers, reformers and union leaders managed to press through employer liability laws that restricted the three defenses, although these were often softened by limits imposed by employers. Soon, union leaders and workers became dissatisfied with the level of payments that were reaching workers and the number who were left with no compensation at all. Even though workers in more dangerous jobs typically received a wage premium for accepting the risk, the wage premia generally less than fully compensated for the full expected loss (Fishback 1998, Fishback and Kantor, 1992). Further, the workers faced limited options for using the risk premia to purchase insurance against accident risk Workers relied on fraternal societies and other community methods of insurance that offered relatively limited coverage. Even the insurers were

dissatisfied because problems with adverse selection and moral hazard limited their ability to offer much beyond limited coverage to workers' for accident risk.

Fishback and Kantor (2000) found that the majority of people in each of the major interest groups anticipated gains from the passage of workers' compensation legislation. The employers saw a reduction in uncertainty about large jury awards and managed to pass most of the increased costs of accidents back to their workers in the form of higher wages. Workers on average received higher accident payments than under negligence liability and were better insured even if their wages adjusted downward. Insurers saw an expansion in their business, despite the introduction of state insurance in a number of states. They ended up selling more workers' compensation insurance to employers than they could have to employers and workers combined under the old system.

The move to workers' compensation altered the liability rules from negligence liability to a form of shared strict liability with the passage of workers' compensation laws.[6] The laws established that all workers injured in the course of employment or in activities arising out of employment were to receive compensation from employers. James Chelius described this as shared strict liability because the states established limits on the amounts of compensation that insured that workers did not receive their full loss of income. In essence, the states had regulated the amounts to be paid to injured workers to a maximum of two-thirds or less of their income loss. Given the maximums on weekly payments, many workers received substantially less than two-thirds of their income while injured.

This transition does not seem to fit the Glaeser-Shleifer transition prediction very neatly. In one sense the shift in liability had moved in the wrong direction, as the scale of enterprise at worst stayed roughly the same, while there was a transition to strict liability. However, the transition fits their analysis to the extent that the stakes involved in many decisions were lower under the new no-fault liability. Under negligence liability the stakes in each decision were high

because each involved an all-or-nothing decision about fault. In contrast, most workers' compensation disputes arose over the extent of the injury and measures of the workers' wage in determining the appropriate values to plug into the state's formula for compensation. The remaining decisions, however, were all-or-nothing decisions with far-reaching consequences for workers' compensation policy. Decisions on what constituted a work-related injury and opinions on whether the employer was willfully negligent (which removed the restrictions on compensation) established the boundaries of workers' compensation and were similar in scope to the stakes in a major negligence case. Given the large number of settlements under negligence liability, the annual number of these boundary decisions may have been similar to the number of negligence cases that were actually decided by the courts.

One change wrought by the switch to workers' compensation was a sharp increase in the number of cases under review. Fishback and Kantor (2000) find that the reporting of nonfatal accidents jumped markedly with the introduction of workers' compensation. Now that there were assurances of compensation no matter who was at fault, workers had much stronger incentives to report their injuries. In the states that used commissions there was still a great deal of court style activity undertaken by the commissions. In Wisconsin between 1914 and 1931, roughly 6 percent of the compensation claims were disputed and the Industrial Commission held formal hearing where witnesses might be called and a decision by the commissioners made. The yearly average number of disputed cases was 1197 in Wisconsin (Brandeis, 1935, 647). While the average decision-related cost per case might have been lower under workers' compensation, the rise in caseloads may well have raised the total decision-related costs of accident compensation when compared with negligence liability.

What role did subversion and corruption by judges and juries in favor of employers play in the adoption of workers' compensation? As an experiment to test whether there was extensive publicity about judicial corruption under negligence liability, we did a word search using the

ProQuest search engine on the New York Times index for the period 1900 to 1910 using the word combination "judge" and "bribe." New York first adopted a workers' compensation law in 1910, although it was declared unconstitutional in 1911. The search led to over 500 articles, which discussed 138 different episodes of bribery, which are summarized in the cross-tabulation in Table 1. Fifty-seven episodes took place in New York, while the remainder were located in other states. Our purpose was to get a sense of the extent of publicity about judicial bribery scandals in a major newspaper. We chose the word combination to focus specifically on judges. The search unearthed five episodes where judges had reported to the press on attempts to bribe them but there was no evidence that they had accepted the bribe. In seven cases the judges were charged with and sometimes convicted of bribery or corruption. Only two of those potentially could be related to workplaces. Admittedly, this is a rough test that certainly underestimates the extent of judicial corruption. But the search led to an interesting result about the information in newspapers about the comparative amounts of corruption in the judiciary and in other parts of the government. Since bribery was an offense that led to trials with judges, the search unearthed quite a few bribery cases that were unrelated to judges. Some were still related to trials, including 12 attempts of bribery reported by the jurors and 9 where jurors were charged with accepting bribes. There were also a handful of attempts to bribe district attorneys and attorney generals. A substantial majority of the episodes related to the bribing of elected administrative officials, bureaucrats, legislators, and the police. Given the words on which we searched, it is likely that the numbers understate the extent of corruption among these other categories much more than they would for judges. The results are suggestive that the public's perception formed by reading the New York Times would have been that corruption was more common in the legislature, among elected officials and among bureaucrats than among the judiciary.[7] This raises some questions about whether reformers were convinced that a move from judicial rule making to regulation would lead to a reduction in corruption.

If reformers were trying to keep the courts out of compensation decisions, they did not fully succeed. Friedman and Ladinsky (1967, 80) suggest that "Many changes (in workers' compensation law) have also come about through judge-made law, or through judicial ratification of changes initiated by the various state commissions." Ten of the 48 states did not jettison the courts as the administrator when they switched to workers' compensation. In those states, workers and employers tried first to come to a settlement. If they could not agree, they went to the courts for the ultimate decision. Under the Glaeser/Shleifer model, we might expect that the states that chose commissions had more large-scale enterprises than those that chose to stay with the courts. Appendix A shows the results of some difference of means tests and a logit analysis of the factors determining whether the states chose the commissions (1) or courts (0) as their administrators when the passed the law. The states that chose commissions tended to be ones with more industries that were unionized, where more workers were employed by companies with more than $1 million in value added, where the number of workplace injury appeals court cases had risen, and where there were more Progressive Era voters. However, in the difference-of-means tests we could not reject the hypothesis of no difference, and the only coefficient that was statistically significant in the logit analysis was for the unions. Thus, the point estimates suggest that scale influenced the decision between courts and commission, but the imprecision of the estimates don't allow us to reject the hypothesis of no effect.

If there was gamesmanship and subversion of the negligence liability system, it might well have been practiced by the middlemen. In nearly every state liability commission report, employers and workers complained of the large transactions costs in the system. In the words of Lawrence Friedman (1985, 484), the system "siphoned millions of dollars into the hands of lawyers, court systems, administrators, insurers, claims adjusters. Companies spent and spent, yet not enough of the dollars flowed to injured workmen." We have no way of knowing how much of the transactions costs were devoted to gamesmanship, but the primary beneficiaries of the negligence system may well have been the trail attorneys, who were the one major interest group

that actively opposed workers' compensation (shades of the modern era). The transactions cost for other middlemen did not change all that much with the move to workers' compensation. The load factors used for employer liability insurance under the negligence system seemed pretty similar to those for private workers' compensation insurance. There were claims in U.S. Bureau of Labor Statistics reports that the administrative costs under workers' compensation insurance were lower for state funds than for private insurers, but the state funds did not have to hold the same levels of reserves. Rough comparisons of the timing of payments under settlements under the negligence regime and under workers' compensation schemes look quite similar in most cases. This is largely because so few cases went to trial under the old negligence system. (See Fishback and Kantor 2000).

II. 2 Safety Regulations

States began introducing regulations of dangerous workplaces soon after the Civil War, while there is record of some railroad safety regulations even in the antebellum period. The timing of state adoptions of regulations is such that it appears that the regulation of workplace safety developed with about a 30 year lag after the *Farwell* case began to establish the court doctrines for workplace accidents. The regulations did not replace negligence liability so much as they grew up alongside it. As new machinery and technologies developed to speed production and also to reduce accident risk, it appears that the regulations were expanded and revised.

Safety regulation came earliest to the most dangerous of industries, mining and railroading. Table 2 shows the timing of the introduction of coal mining safety laws. To get a sense of the importance of size of the industry, we include information in Table 2 on coal production in the state at the time of adoption, the size of individual enterprises in 1880, and the ultimate size of the industry. Pennsylvania first introduced regulations for anthracite mining in 1869, while Illinois was the first to adopt for bituminous mining in 1872. At the time of adoption Pennsylvania anthracite mines had been producing for nearly 70 years and were producing over

17 million tons per year with over 30,000 workers. The anthracite industry had reached about one-fifth of its maximum production (through 1925). The scale of individual anthracite enterprises as of 1880 was large relative to many industries. Five enterprises produced more than a million tons of coal across the mines they owned, which meant they employed more than 2000 workers. Another five produced more than 500,000 tons. Another 56 produced between 100,000 and 500,000 tons. The scale was larger than this because the anthracite industry was vertically integrated with the railroads and canals that transported coal out of the district.

Yet, bituminous coal mining was soon to dominate coal mining and many states regulated long before bituminous operations reached the scale in the anthracite industry. Total production at the time of adoption varied substantially from state to state. Roughly half the states adopted after they reached 1 million tons of production (or roughly 2000 underground workers) and half before. The bituminous mines were much smaller operations than the anthracite mines. In Pennsylvania in 1880 there were only 3 bituminous operations producing more than 500,000 tons (or had more than 1000 workers), and 44 more produced from 100,000 to 500,000 tons. Even here the vast majority of operations were much smaller. As seen in Table 2, as of 1880, it was relatively rare in the other states to see operations above 100,000 tons (or roughly 200 workers). The early regulations were rudimentary and were focused on mapping the mines, providing appropriate ventilation, and efforts to prevent explosions. Often they were targeted at smaller operations where the operators' knowledge of customary safety practices was likely to be more limited. As the technology of mining improved with the introduction of cutting machines, electricity, and mechanical motors, the regulations expanded. Both Mark Aldrich (1997) and William Graebner (1977) suggest that changes in regulations often occurred after major mine explosions. The federal government formed the Bureau of Mines in 1911, but the agency was informational and did not obtain coercive powers until 1941.

To get a sense of the importance of the overall size of the industry and of the scale of individual enterprises on the introduction of mine safety regulations, we estimated an OLS regression with the dependent variable year of adoption of the regulations on the variables coal production as of 1880 and the number of operations over 100,000 tons as of 1880.

OLS Estimates of Year of Adoption of Coal Safety Regulations on Total production and Firms with over 100,000 tons in 1880

	Coeff.	t-stat.	Coeff	t-stat.	Coeff.	t-stat.
Intercept	1888.90	908	1887.30	897	1888.91	900.76
Production 1880	-0.0008	-2.74			-0.0034	-2.1
Number of Firms over 100,000 tons, 1880			-0.32	-2.34	1.20	1.63
R-squared	0.25		0.19		0.33	
N	25		25		25	

The results show that when total production and the large firm variables are entered separately, they are both associated with earlier adoption of the laws. When both are included in the analysis total production is associated with earlier adoption, while the large firm measure is associated with later adoption. Thus, the scale of the industry as opposed to the scale of individual enterprises appears to be the factor most associated with earlier adoption of the regulations. This is a very rudimentary first cut at the data, and multicollinearity is a problem. I am collecting the data for the late 1800s that would allow estimates of adoption models with time-varying co-variates.

Railroads were the largest of enterprises, and states began to regulate railroad safety retlatively early. New Hampshire was the first to establish a Railroad Commission that regulated safety in 1844 and by 1891 34 states had some form of commission.[8] Mark Aldrich (1977 25-26) suggests that most of the commissions investigated and reported accidents and sought to use a

voluntary approach to guiding the railroads to improve their safety. The voluntary approach was most successful when it was combined with publicity, public opinion and given some teeth by liability suits. A number of states also developed a considerable body of law specifying procedures and safety devices. The Interstate Commerce Commission introduced federal safety regulations for the railroads with the Safety Appliance Act of 1893. The safety regulations in railroads were designed as much or more to save the lives of passengers and people and animals who might be hit as they were to protect railroad workers.

The states' interest in regulating safety in factories also developed soon after the Civil War. Massachusetts led the way in 1869 in establishing a bureau to collect information on wages and working conditions for factory workers and roughly half of the states had followed suit by 1890 (see Table 3). Elizabeth Brandeis (1935) suggests that these early bureaus were often created in response to pressures from the National Labor Union and the Knights of Labor. Information was often collected from workers as opposed to employers. Massachusetts first added teeth to enforcement efforts by establishing the first factory inspection department in 1879. As in Massachusetts, roughly 40 percent of the states added a factory inspector within 5 to fifteen years of creating a labor bureau or department (see Table 3). However, some states like West Virginia and Tennessee provided for an inspector without actually appointing one. The factory inspectors were introduced earliest by the states with the most manufacturing employment (measured by 1899 figures). We are still working on determining the precise timing of the introduction of the laws to allow us to do more formal tests of the impact of scale. The factory safety laws were amended during the progressive era in response to new technologies as well as to some grisly and unfortunate lessons learned from horrible accidents like the Triangle Shirtwaist Factory fire in New York in 1910 (see below). The big change in the 1910s was the move by a handful of states to create Industrial Safety Commissions. Wisconsin pioneered the administrative form in 1911 with a body that not only administered Workers' Compensation, but

extended itself to become a rule-making body that wrote an extensive safety code for Wisconsin industry. As seen in Table 3, 18 states had established Industrial Commissions by 1930. However, only California, Massachusetts, New York, Ohio, Pennsylvania, and Utah had made substantial use of their rule making ability (Brandeis 1935 citing work by John Andrews of the AALL).

II. 3 The Symbiotic Nature of Regulation and the Courts

The move to regulation did not eliminate the role of the courts, it just changed the types of court decisions rendered. On several dimensions regulation and judicial decisions were strongly intertwined. Courts ruled on the constitutionality of many of the laws and were charged with interpreting the law in disputes. As noted earlier, the courts ruled on what would become the boundaries for workers' compensation. We will spend more time talking about the final two dimensions. The courts were often the arbiters in decisions about closing down workplaces in violation of the law, and determined whether the law had been violated, and decided the penalties for violations. Safety regulations that were established during the negligence era often determined the standard of due care.

Courts played an important role in enforcing safety regulations. William Graebner (1976, 97-100) analyzed the enforcement of state coal mining safety regulations. "Inspectors could not assess fines on their own authority; only the courts could do this, following a conviction for violation of the law. All violations were misdemeanors, rather than felonies….Besides prosecuting, the inspector could through a variety of processes worked out in the state legislation, close a mine he thought unsafe. In most cases the law required an inspector to accomplish this by securing an injunction through the proper court. (97)" When inspectors closed mines, which they did infrequently, they "received as much opposition as aid from local courts." According to Graebner (1976, 99) "West Virginia inspectors, moreover, evidently ceased prosecuting operators and managers when it became clear that they could not be convicted….A district

inspector reported that workers had 'completely lost all confidence in the local courts…[and were] thoroughly convinced that justice could not be obtained towards the enforcement of the mining laws.'"

Similarly, in the area of factory regulations, Elizabeth Brandeis (1935, 632-3) described the inspector as "merely a special policeman assigned to discover violations of these special laws and to see that prosecutions were initiated. The court remained the fundamental agency for securing compliance." In some states inspectors were given the power to initiate and conduct prosecutions in the courts. In others the inspector reported violations to the appropriate prosecuting attorney. But this latter practice was not very effective in some states, as several legislatures adopted provisions in the law that required the prosecuting attorney to act.

A key aspect of decisions in employer negligence cases was the determination of "due care" and "assumption of risk." Generally, the standard in the absence of regulation was that of the norm for the industry and did not require the most advanced technology. When safety regulation was put in place, it served as a focal point for the due care standard. In one sense, the regulation served to ease the burden on workers in showing negligence. When the employer was shown to be in violation of a safety regulation, it helped the worker make the case that the employer was negligent. On the other hand, the violation of a regulation of miner behavior made it easier for the employer to invoke the contributory negligence defense. Further, if the employer could show he had not violated a safety regulation it substantially improved his chances of avoiding negligence.

The interaction between the application of the liability rules and defenses and regulation is aptly illustrated by the battles between employers and supreme court judges in Washington in the early 1900s. In Green v. Western American Company (1902) the Washington Supreme Court eliminated the assumption of risk defense in situations where a worker reported the lack of a safeguard to his employer and then was injured. Fearing the complete elimination of the

assumption of risk defense, employers played a significant role in the passage of Washington's Factory Inspection Act in 1903. Employers were to be considered negligent for accidents in settings where they violated the inspection acts. However, the law also provided for certifications that the employers' workplace was "safe." A number of lower courts then invoked the assumption of risk defense to prevent recovery by injured workers in several cases involving mines certified as "safe." It became clear that the employers did not control the Supreme Court, which in a series of cases reaffirmed that lack of safeguards on machines was a violation whether the mine was certified or not. In 1905 the employers went back to the legislature and succeeded in altering the language of the Inspection Act so that employers had only to provide a "reasonable" safeguard (as opposed to a "proper" one). This change in language may have worked for a while but ultimately proved to be of little help to the employers, because the Supreme Court finally eliminated the assumption of risk defense by arguing that a machine lacked necessary safeguards by virtue of being the cause an accident (Fishback and Kantor 2000, 97; Tripp 1976, 535). Not only does the Washington case show that liability decisions and regulation went hand in hand, but it also shows that the employers had been more successful in capturing the legislature when passing factory regulations than they had the judges in the liability rulings.

When we consider the interaction between negligence liability and safety regulations it adds some interesting twists to the discussion of the impact of the switch to workers' compensation on accident prevention by employers. On the one hand, the increase in the amounts that they paid to injured workers might lead them to seek improvements in safety prevention to cut their workers' compensation bill. On the other hand, the costs of violating a safety law fell significantly. Violation of the safety law no longer carried the extra penalty of a probable loss in court on a negligence claim because the switch to no-fault meant that the employer paid the compensation whether or not he was shown negligent. The potential loss of a

negligence suit (or payment of a settlement) was likely the largest of the costs to employers of not following the regulations. The typical fine was small, as was the probability of receiving one. There was the nuisance cost if the inspector pressed for a prosecution. Probably the primary factors keeping mine owners in line was their own conscience about violating a standard and the potential increase in their wage bill in the form of the risk premia they would have to add to wages to attract and keep workers if they developed a reputation for being an unsafe place to work.

III. The Success of Safety Regulation and Workers' Compensation at Reducing Accidents?

We can learn a great deal about the nature of the changes in liability rules and regulations by examining the impact that they had on accidents. Many modern studies of safety regulations suggest that federal regulations by OSHA have had limited impact. The general regulations have been relatively disappointing, although some OSHA programs have been successful (see Viscusi 1992). The studies summarized in Table 4 suggest a similar view of limited success for regulations during the Progressive Era.[9] Price Fishback (1986, 1992, pp. 115-120) estimated the impact of a wide range of coal safety regulations using a panel from the 23 leading coal states between 1903 and 1923. Many of the specific regulations enacted had little impact on fatal accident rates. Three specific regulations passed statistical significance tests in reducing accident rates: requirements that foreman visit workplaces more often, that miners use permissible explosives and that miners not ride on coal cars. Notice that all of these are devoted at least in part to monitoring and changing the behavior of miners. The regression analysis also showed that increases in the state mine inspection budget helped to lower the number of fatal accidents. Spending on factory inspection may have been less effective than spending on mine inspection. Estimates of the impact of state inspection budgets by David Buffum (1992) and James Chelius (1977) on measures of fatal accidents in industry do not find statistically significant reductions in accident risk (see Table 4).

A similar story of intermittent success might be told for railroad safety legislation. David Buffum's time-series estimates in Table 4 of the impact of railroad legislation shows that the Appliance Act of 1893, the Train Stoppage Act of 1922 and the Boiler Act of 1915 all statistically significantly lowered accident risk, but several other acts did not. As in mining, legal requirements did not always cause employers to adopt new technologies, and the new technologies did not always work as well as advertised. Mark Aldrich (1997, p. 38) finds, for example, that the Safety Appliance Act did not speed the introduction of air brakes and automatic couplers. Even when they were installed, their effectiveness was determined by how well the brakes were maintained. Further, the air brakes eliminated some forms of danger but increased the probability of other types of dangers.

Many contemporaries anticipated reductions in accident risk from the introduction of workers' compensation. In fact, the response of fatal accident rates to the introduction of workers' compensation and employer liability laws (which limited the defenses of assumption of risk, fellow servant, or contributory negligence) varied across industries. Buffum (1992) and Aldrich (1997, 296-7) find that fatal accident rates fell in railroading with the introduction of the Federal Employer Liability Act. Buffum (1992) and Chelius (1976) find evidence that state safety inspections may have lowered manufacturing accident rates, while Fishback (1992, 1987) and Buffum (1992, pp. 86, 140-142) find that workers' compensation and employer liability laws raised fatal accident rates in coal mining (see Table 4)[10] The differences may have been driven by the costs to employers of preventing the types of accidents where moral hazard, a form of gamesmanship, might have occurred.

Why do we see these differences in results for liability changes across industries? Employer liability laws and workers' compensation generally succeeded in the sense that they increased the average post-accident compensation paid to workers. Both types of laws gave employers incentive to increase their accident prevention efforts at the risk of potentially giving workers incentives to relax their efforts or increase the reporting of accidents. Employers'

increased prevention efforts appeared to have dominated in manufacturing and the railroads where their costs of preventing accidents through changes in machinery and supervision were relatively low. In contrast, in the coal industry where workers had always played a much greater role in accident prevention deep within the mines, accident rates rose. Problems with moral hazard led to the type of accidents that were very costly to the employer to prevent. Therefore, employers chose to pay the extra damages to workers. The rise in accident rates does not imply that workers' compensation lowered the welfare of coal workers. Given that most coal workers were paid piece rates, they relaxed safety precautions only because they were trading safety for higher earnings. The increased benefits offered by workers' compensation allowed workers to increase their current earnings by working faster, while compensating them better when injured.[11]

IV. Capture of the Legislative and Regulatory Process?

The relatively small impact of the safety regulations on accident risk raises the possibility that employers had captured either the legislature in creating the new rules or had captured the regulatory process. Employers played an important role in lobbying legislatures on safety legislation. It would be extreme to say that they had fully captured the legislatures because unions and reformers won a reasonable share of victories in various states.[12] In general, employers had enough clout to obtain compromises that significantly altered the bills proposed by workers and reformers before they became law. One way that they could weaken legislation was by limiting the resources devoted to enforcing the laws or by seeking relatively small fines. Once the legislation was in place, there was also the potential for capture of the administering agencies. Employers could influence the administration of the legislation by influencing the choice of inspectors, by following revolving door hiring practices, and even by illegal means. Administrative capture was a matter of degree, as the agencies in some states developed reputations for zealousness or weak enforcement. In the discussion that follows we will focus on

coal mining safety, but the situations for railroad and factory inspection legislation were quite similar.

IV. 1 Employer Influence of the Law Writing Process

The leading studies of coal mining legislation all suggest that employers significantly influenced the writing of the legislation (Fishback, 1992; Aldrich, 1997, Graebner 1977). Mark Aldrich (1997, 69-71) finds that most of the laws were "incomplete, poorly written, and hard to enforce" and often bore "the strong imprint of operator influence." In Colorado mine inspectors considered the original 1883 law to be "very incomplete" and "wholly inadequate." When the law was revised in 1913, Aldrich describes it as "the product of a committee dominated by large operators…and it largely codified their practices."

William Graebner's (1977, 72-87) description of the evolution of West Virginia mining law suggests that through 1907 the law basically had little or no bite. Mine operators and even the mine inspectors were opposed to new legislation. In cases where proposed laws limited their mining methods, the workers themselves actively opposed change. In response to a series of large mine explosions, the legislature passed a revision in 1907 in which mine operators played a major role. A couple of additional explosions led the chief mine inspector to become more activist in proposing legislation, yet an investigative committee studied many of the explosions and then published a report that concluded that changes in the law would do no good. The legislature in response to the demands of mine operators rejected all of the chief mine inspector's recommendations for new regulations. Needless to say, the United Mine Workers Journal had more than a few choice comments about the legitimacy of this legislative process.

The mine laws were designed to influence not only the actions of the mine management but also those of the miners' themselves. Coal operators pressed for restrictions on the behavior of miners that they had had trouble enforcing within their mines. These restrictions often promoted safety but required extra effort for no obvious gain in pay on the part of the miners. For

example, both Illinois and West Virginia banned the practice of "shooting off the solid" in which miners blasted without making an undercut at the base of the seam. The practice required more explosives, produced smaller, less valuable chunks of coal, and generally was considered more dangerous. It was popular with miners because it was much less strenuous than laying on one's side and hacking away at a wall of coal and rock for several hours before blasting the coal. The miners' response was to routinely disregard these and other restrictions that they found onerous (Aldrich 1997, 58-73; Graebner 1977, 94-5).[13]

A more complex capture story suggests that progressive employers who faced lower costs in preventing accidents sought to use legislation to gain a competitive advantage by forcing their competitors to follow suit. Bartel and Thomas (1984) claim that this was a likely explanation for the lack of impact of OSHA in the late 1970s even though employers were spending substantial sums to comply with the regulations. There is some evidence that this might be true for Progressive Era Regulations. Large firms often were the first to adopt changes that were eventually written into law. These laws did impose costs. Rebecca Holmes and Price Fishback (2002) find evidence that expansions in progressive era labor laws contributed to increases in the number of clerks and salaried workers in manufacturing who may have been hired to aid in compliance. Finally, Table 4 shows that like OSHA, the factory safety legislation in manufacturing during the progressive era had limited impact.

Differences in employers' attitudes can be found in coal mining. West Virginia Governor William Dawson in 1908 described a strong divide between two groups of operators, those "who yield cheerful obedience to the law, who see in the inspector a friend and an aid, and consider the bureau of mines an institution for their benefit," while others "resist the enforcement of law, see in every inspector a spy and an enemy, and look upon the bureau as an invention of oppression (quoted in Graebner 1977, 95)." The differences in attitude likely match the difference between

those operators who wrote the law that codified their practices and made it easier for them to be enforced and those who were now constrained by the law in a new way.

IV.2 Limited Enforcement Resources

Lobbyists trying to take the teeth out of legislation often reduce the funds available for enforcement. One reason for the relatively small impact of the laws may have been inadequate budgets for inspection. Table 5 shows the number of inspectors, the number per 1000 coal miners in the major coal mining states, and inspectors' salaries from 1900 to 1930. Most states had less than half an inspector per thousand miners throughout the progressive era. This meant that in quite a few states the inspectors rarely visited mines the minimum number of times required in the mining statutes (Fishback 1992, 113; Graebner 1977). With larger budgets, the mine departments likely would have had an impact on accident rates. Econometric studies by Fishback (1986, 1992) and Aldrich (1997, 337-8) find that expansions in resources for inspection were associated with lower accident rates (see Table 4).

Inadequacy of inspection resources was an even more severe problem for the factory inspectors. There were far more factories than mines and Brandeis (1935, 632-3) states that inspectors typically investigated only upon complaint. Rarely were the factory inspectors in a position to routinely and randomly inspect most factories. Table 6 shows the appropriations for all forms of state labor administration per gainfully employed worker in mining and manufacturing in the states in 1903, 1908, and 1915. The highest expenditures were typically about 67 cents per worker at the time, about $12 per worker in year 2000 dollars.

IV. 3 Influencing the Enforcers

Although much of Graebner's (1977) work implies that many mine inspectors were honest advocates for safer mines, there was still the potential for capture of the inspection service. Salaries were low (see Table 2). Inspectors earned only about 50 percent more than the average

salaried worker in manufacturing in 1910 and less than 10 percent more in 1920. During the World War I boom, the inspectors might have fared as well or better if they had quit and gone back to mining. West Virginia Governor John Cornwell in 1919 described their rate of pay as "less than that of men who drive mules (quoted in Graebner, 90)," and resignations were common. There were few opportunities to move up within the inspection bureaucracies, so a number of state mine inspectors improved their lot by accepting positions with coal companies at 50 to 100 percent pay increases. Many state inspectors were already sympathetic to the problems mine owners faced in running mines because they had moved to the job from posts as mining managers or superintendents. Union leaders were livid when the coal mine operators in 1908 "engineered" the appointment to West Virginia Chief Mine Inspector of John Laing, himself the owner of several mining properties (Graebner 1977, 90-91).[14]

Miners, owners, and inspectors all considered the inspector positions to be political. The United Mine Workers' Journal in May 1900 claimed that mine inspection departments were "controlled absolutely by a ring of political ward heelers." Party affiliation played a strong role in the Governor's appointments of mine inspectors in Ohio. In 1908 a West Virginia inspector stated "there are coal operators who will endeavor to have a district inspector removed from office rather than obey the mining laws, or carry out the recommendations made by an inspector." Graeber suggests, as a general rule, that in the interest group struggle over inspector appointments the mine owners had the advantage, even in highly unionized states. In Illinois where the UMWA was strong, and the inspection staff had a reputation for being somewhat radical, a frustrated miner claimed. "There is not an inspector in the state who is not holding his job through the influences of some coal operator." (Quotes and sentiments from Graebner 1977, 91). Even the use of competency exams was not enough to eliminate politics from the system.

If the shift to regulation was supposed to have reduced the influence of employers' on the operations of the system, many miners were not convinced. Graebner's chapter on coal

inspections is loaded with quotes and citations to miners' complaints in letters to the United Mine Workers' Journal about the inadequacy of state regulation and the inspectors, inability or unwillingness to enforce the laws in place. Most mining laws contained fines and potential jail sentences for offenders but prosecutions, which ran through the court system, were not that common. In Graebner's (1976) study of the prosecution of mining violations in Pennsylvania, Ohio, and West Virginia, he found that there were was little evidence of prosecutions for violations prior to 1904 and none after 1912. The number of prosecutions for mining violations in the three-state area peaked at 395 in 1910 and 312 in 1911 and then trailed off to virtually nothing after 1912. With over 3200 mines and 250,000 miners in the three states as of 1909, the number of prosecutions seems ridiculously low, particularly when mine inspectors all agree that nearly every mine they inspect usually has some violations that need to be corrected. Further, the probability of paying penalties was even lower. In Ohio in 1911 the total amount collected in fines under a new mining law came to $400, and this was a law described as having strong penalty provisions. Enforcement was focused less on mining officials than on the miners themselves. Miners accounted for 159 of the 163 prosecutions in West Virginia in 1910. Pennsylvania was the only state he found where there were prosecutions of superintendents, but not many. Of 489 prosecutions between 1908 and 1911 in Pennsylvania, 392 were directed at mine workers, only 27 at superintendents and 70 at foreman and fire bosses (Graebner 1976, 97-100.)

Aldrich (1997, 72) summarized the frustrations with the problems of enforcing the laws: "Trying to put the best face on matters, West Virginia's chief inspector, James W. Paul, announced what could well have been the motto of every inspector in the country: 'The law is not wholly ignored in any part of the state.'" While we have emphasized problems with enforcement in this section, it should be noted that there were a variety of mechanisms aside from fines that led to compliance with the regulations. Even if there was never a fine or a prosecution,

the mine inspectors' reports were public information and a mine that developed a reputation for constantly violating the regulations could find it harder to attract and keep workers during mining booms. Probably as important, although we as economists are only now giving credence to such ideas, is that a substantial share of the mine operators were law-abiding citizens who felt obligated to follow the laws that had been passed by the legislature.

V. Summarizing the Problems: The Case of The Triangle Shirtwaist Fire

In March 1911 the fire at the Triangle Shirtwaist Company led to the deaths of 146 workers, as they either died in the fire or plummeted to their deaths from the eighth floor of the Asch Building. The investigations that followed illustrate many of the points made above about carefully worded regulations, inadequate enforcement, "friendly" enforcement, interest group struggles, the role of the courts in regulation, as well as the harshness of the employer liability rules.[15]

Just prior to the fire the State Labor Department had inspected the factory in response to a complaint and had found the company in compliance with their rules. However, on the day of the fire, many workers reported that a key door to a stairway was locked, which was a violation of the factory regulations. There was intense debate during the manslaughter trial over whether the door was locked and whether there was a key in the door (Stein 1962, 181-9). The inspector reported an inadequate fire escape, but jurisdictions over fire escapes had become a complex issue. The factory inspection laws gave the inspector the power to demand a proper fire escape but the factory inspectors claimed that the courts had ruled that fire escapes were outside the labor department's jurisdiction.[16] Building safety came under the jurisdiction of the New York City Superintendent of Buildings, to whom a report had been forwarded by the labor inspector. New York City law did not require fire escapes, but did require buildings the size of the Asch building to have three staircases. When the Asch Building was being planned in 1900, the building inspector, who had been promoted to Superintendent of Buildings by 1911, had told the architects

that they needed an additional staircase, and that the fire escape should reach the ground. State labor department rules required that the stairwell doors should open outward *where practicable*. The architects sought exceptions, arguing that the fire escape acted as a third staircase, that they would build the fire escape to reach the yard, the building was fireproof, and that there was not room in the staircases for it to be *practicable* for the doors to open outward. After the plans were approved, the fire escape that was built ended at the second floor, violating the agreement (Stein 1962, 23-4). The Asch building should not be singled out. Even though the block contained several other garment factories, none of the neighboring buildings included fire escapes.

With the fingers pointing their way, Building Department officials defended themselves by saying that the department had no power to police. "We must enforce all our rulings through the civil courts. When we bring an action, there is invariably a long fight. The record will show the owner is usually the victor." The department had only 47 inspectors to inspect 50,000 buildings. In that year the Fire Department had designated over 13,000 buildings as dangerous, but the department could only inspect 2,051. "The Asch building conformed to the law when it was built," although, as noted above, not to the plans that had been approved by the building inspector. The department conceded that it did have the power to order changes to update the buildings. But, they were also sensitive to the costs to building owners and employers. "We do not hear of violations of the law in the old buildings unless they are particularly called to our attention." "It would work a great hardship on the owners of buildings to require changes. This is especially true of fire escapes." (quotes and material from Stein 1962, 116).

Interest group pressures on regulators in the insurance industry also may have contributed to the dangers in the garment district. The Asch building at the time relied upon a system of fire buckets filled with water that was legal but proved inadequate. Experts claimed that an automatic sprinkler system would have put out the fire before it threatened lives. Sprinklers led to lower insurance rates but there were high up-front costs. Arthur McFarlane, an insurance

expert writing in Collier's magazine claims that a group of 10 insurers had developed an innovative way to finance the introduction of sprinklers into garment factories. They would install the sprinkler systems and then continue to charge the higher rates as if sprinklers were absent until the systems were paid for. When the plan proved popular, McFarlane claims that brokers and agents who were losing business forced the withdrawal of the New York Fire Insurance Exchange license to sell insurance from the ten insurers, and nine gave up the plans. (Story in Stein (1962, 169-171).

The sometimes harsh nature of the negligence liability rules also is apparent in the Fire. We do not have a complete accounting of the disposition of lawsuits and settlements between Triangle's insurers and the families of the victims. One problem in learning about the disposition of cases is that many settlements are not public record and often require silence. The settlements that were publicly reported were meager. Up to $500,000 in claims in civil suits had been filed by October 1911. Only one civil suit came to a publicly noted verdict and it was dismissed when the jury could not agree on a ruling (McEvoy 1995, 638). On March 11, 1914 the New York Times did report that 23 individual suits against the owners of the building had been settled for $75 per life lost because they anticipated little chance of winning the suit. There was still some question about the suits against the owners of the company who were renting the building ("Settle Triangle Fire Suits," New York Times 3/12/14, p. 1). The Red Cross had disbursed $81,126 for relief to 166 cases (94 with one or more deaths and 72 without). (Stein 1962, 128-131, 207). Had the first New York workers' compensation law of 1910 not been declared unconstitutional by the New York appeals court, the new system would have paid the families of the workers who died roughly four year's of income up to a maximum of $3,000 each. The companies' owners received compensation from their insurers for damages to the factories and lost inventory. Any bills they faced for liability claims by workers were also footed by the insurance companies.

In response to the public clamor over the fire, the New York legislature in June 1911 established a Factory Investigating Commission. Despite appropriations that would only cover the cost of one good lawyer (Stein 1962, 209), the findings of the commission's exhaustive investigation led to an overhaul of the State Labor Department and a series of new regulations. The regulations expanded the discussion of fire escapes and fire exits, and called for fire drills and fire alarms, and added new regulations in response to what they had found. Appropriations for labor issues in New York quadrupled between 1911 and 1915 to over a million dollars with the expansion of duties and the development of a workers' compensation commission. Although this is described as the golden era of labor regulations in New York, the amount of funds available for enforcement were still quite limited. Table 6 shows that the new million dollar budget still came to only about 69 cents per manufacturing worker. Probably no more than half of the budget was devoted to inspections. Thus, 35 cents per worker put New York factory inspection budgets below the bituminous coal mining inspection budgets for Pennsylvania (52.6 cents) and about on par with West Virginia mining inspection (35 to 40 cents). The increase in budgets probably did put a dent in accidents, but problems with lack of enforcement still arose. An editorial in the New York Times claimed that of 3,711 violations by factories of the new stairway regulations, "only 246 owners complied with the law, and two prosecutions were begun!" (The Industrial Commission, New York Times 2/23/16, 12).

Problems with inadequate inspections remain today, but the sanctions when caught are much greater. Arthur McEvoy (1995, 648-650) contrasted a North Carolina fire in 1991 with the Triangle Fire. The North Carolina factory had not been inspected by the fire inspector in the eleven years that it had been open, and there were only a dozen inspectors in North Carolina to inspect 150,000 plants. However, after the fire, the owners paid $800,000 in fines for safety violations and the owner was sentenced to 20 years in prison for manslaughter. The company's insurers settled 101 civil claims for $16 million.

VI. **Summary**

The transitions in workplace accident policy offer a complex picture of the changes in regulation. Some of the hypotheses inspired by my reading of Glaeser and Shleifer, are supported, others are contradicted, and still others receive mixed support. The summary restates the various hypotheses followed by preliminary conclusions.

1) The timeline of policies displayed the following progression as the scale of enterprise rose: a move from strict liability to negligence liability followed by either regulation or no liability and ultimately no liability at all.

The timing of regime changes suggests that there may never have been a golden era of strict liability for workplace accidents in the early 19th century. Starting with the first recorded cases in the U.S. some subset of negligence liability and the three defenses was applied to cases where workers sued employers for compensation. The transition to workers' compensation was a move to regulated strict liability. The shift to strict liability seems to contradict the Glaeser/Shleifer prediction, although the regulation of the amounts paid is consistent with their prediction in the sense that the stakes in any compensation decision were smaller than under negligence liability.

2) The scale of enterprise was an important correlate of the timing of adoption of policy changes in cross-sectional comparisons of the states.

The preliminary work suggests that the scale of industry and possibly the scale of individual enterprises played a role in the timing of the adoption of coal mining regulations and of adoption of factory inspection. We are still collecting data to allow us to flesh out these tests. These findings are consistent with the Glaeser/Shleifer story that subversion of the judiciary by large firms was a key to the adoption of regulations. It is also consistent with descriptions by other scholars that large employers were among the most progressive firms and were advocates of reforms that met with success in the legislature.

3) The stakes in regulatory decisions were lower than they were in judicial decisions.

The shift to workers' compensation from negligence liability lowered the stakes of many compensation decisions because most disputes centered on the workers' pay rate and extent of injury. On the other hand, the stakes were as high as under negligence liability when disputes arose over willful negligence and whether the accident was job-related. In the area of regulatory enforcement, generally the stakes were relatively low because fines were small, violations were treated as misdemeanors, citations and prosecutions were limited. However, the low stakes may be signs of employer capture of the legislature in determining the penalties and capture of the enforcement process when the penalties were applied.

4) Regulatory bodies replaced the courts in making the policy decisions.

If reformers were trying to eliminate the courts from the equation, they did not succeed. The courts continued to play important roles with the transition to safety regulation and workers' compensation. The courts interpreted the regulations, which at times were vaguely written and determined their constitutionality. When inspectors discovered violations they had to rely on the courts to make the ultimate determination of whether there was a violation and then establish the penalty to be paid.

Regulation during the negligence liability regime established standards for due care in determining compensation. The regulations sometimes aided workers in obtaining compensation when employers had violated safety regulations, but in other cases the absence of a violation made it easier for employers to deny compensation. Further, violations of safety statutes on worker behavior made it easier for courts to apply the contributory negligence doctrine. Under workers' compensation, 10 states continued to rely on the courts to administer the system, while the courts were final arbiters in appeals of administrative hearings on compensation.

5) Corruption, capture, and gamesmanship were major problems in the judicial system and progressive era reformers saw this as a central reason for change.

Measuring corruption and capture is difficult. Glaeser and Shleifer see the meager payments to workers under negligence liability case as a series of examples of subversion of the compensation process. There is no doubt that the liability doctrines of the late 19th century were harsh. That large numbers of injured workers received no compensation might be a sign of employer capture of the judicial process but it may also reflect the views at the time that the employer was not at fault in the vast majority of cases. Given such attitudes, settlements that average about a year's income for those receiving positive amounts may reflect benefits that a worker's family would not have received in court. Circa 1900, we see a shift in views of accident causes that might have led to expanded payouts, which is one reason why employers sought the change to workers' compensation. The fact that most favors the subversion story is that even workers who received compensation in court often received less than full coverage of their losses.

In terms of pure corruption, our survey of the New York Times suggests that newspaper readers were not inundated with constant tales of judicial corruption. If anything, they were more likely to consider corruption in the legislature and in the administrative process as more common problems.

6) *The new regimes were binding and had significant impact on accident rates and other economic factors.*

Econometric studies of the safety regulations and workers' compensation suggest that they had relatively limited impact on accident rates during the Progressive Era. These results are similar to results found for OSHA in the modern era.

7) There was less employer capture of the legislature and the administration of regulation than of the judicial administration of negligence liability.

a) Employers played relatively minor roles in the legislature in writing the new policies and determining the resources available for enforcement.

b) Employers also would have been less inclined to subvert and capture the enforcement of the new regulations.

The lack of impact of most forms of regulation is consistent with the notion that employers played a major role in the writing of the safety laws and had significant influence over their enforcement. Employers had significant power in state legislatures and there is ample

evidence that they played important roles in determining the scope of the safety laws, the penalties written into the laws, and the resources appropriated for enforcement. It is unlikely that employers had fully captured the legislative process because reformers and workers won a number of victories. In a number of cases, legislation passed because reformers and workers were joined by leading employers, often large ones, to pass legislation that codified the leading employers' safety practices. Thus, progressive employers could use the legislation to gain a competitive advantage while also improving overall safety in industry. In other cases, employers sought safety legislation that restricted workers' practices that they were having trouble controlling.

Employers also had significant influence over enforcement. They influenced the size of the penalties in the legislature, they often played significant roles in determining the identity of the inspectors, and they were successful in defending themselves against prosecution in court. It is hard to tell whether employers had captured the regulatory process to a greater extent than the judicial process. Reformers who thought they were eliminating capture and corruption by moving to workers' compensation and regulation were likely disappointed by the outcome.

How big a role did corruption, capture and gamesmanship play in the move to new policies? I have spent most of the paper focusing on corruption and capture because those are the themes of the conference, but my sense is that pure corruption played a minor role and capture a limited one. Progressive Era reformers who had fought for their programs in the state legislatures were aware that they were not going to eliminate the influence of employers. They pressed so hard because they felt that the new policies restricted certain forms of behavior and provided for better accident compensation for workers. Reformers certainly talked about trying to eliminate corruption, but I believe it to be only a small part of the transition. Even if we eliminated corruption and capture entirely from the discussion, the reformers felt that these changes would constrain noncorrupt behavior significantly. For example, most reformers and workers saw

workers' compensation less as liability reform and more as social insurance. They wanted to make sure that all injured workers received payments that would keep them off the dole. Under any kind of fault-based system, even if administered with no monkey business, they could never have achieved this goal. In the reformers' push for social insurance, they also pressed for goals like state funded health insurance and unemployment insurance. In these cases prior corruption was not an issue because employers had never been obligated to provide these forms of insurance in the first place.

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Table 1
Incidents of Bribery in New York Times Articles between January 1, 1900 and December 31, 1910 from ProQuest Search with word combination "bribe" and "judge"

	Charged	Attempted
JUDGE	7	5
OTHER COURT OFFICIALS		
court witness	0	1
juror	9	12
prosecutor	1	3
OTHER OFFICIALS		
bureaucrat	17	8
elected official	22	3
legislator	20	2
police	11	4
voters	2	1
	89	39

Source: Using the ProQuest search engine for the Historic New York Times, we typed in the word combination "bribe" and "judge" for the period January 1, 1900 through December 31, 1910. We then read through the articles and treated multiple articles about the same episode as one episode. We also categorized the type of person who was alleged to have been bribed, solicited bribes, or someone had attempted to bribe them. The bribe attempts refer to incidents where someone reported an attempt of a bribe that appears to have been unsuccessful. Many of the charges were situations where someone was charged with bribery but the ultimate result is unknown.

Table 2
Year of Adoption of State Coal Mining Law and Coal Production Information

	Year State Mining Law Adopted	Net Tons produced in Year of Adoption (000)	Estimate of Workers in Year of Adoption	Operations producing more than 100,000 tons, 1880	First year listed for sustained coal production	First Year over 1 million tons	Max Annual Tons Ever as of 1925 (000)
Pennsylvania Anthracite	1869	17,083	34,166	66	pre 1820	1837	99,611
Illinois	1872	3,360	6,720	4	1833	1864	89,291
Iowa	1873	392	784	2	1840	1875	8,966
Ohio	1874	3,268	6,536	6	1838	1858	45,878
Maryland	1876	2,128	4,256	7	pre 1820	1865	5,532
Pennsylvania Bituminous	1877	14,000	28,000	37	1840	1850	173,781
Indiana	1879	1,196	2,392	2	1840	1873	30,678
Missouri	1881	1,960	3,920	0	1840	1876	5,667
Tennessee	1881	840	1,680	1	1840	1883	6,662
West Virginia	1883	2,336	4,672	1	1863	1873	122,380
Colorado	1883	1,230	2,460	0	1864	1882	12,278
Kansas	1883	900	1,800	0	1869	1884	7,561
Washington	1883	245	490	1	1860	1888	4,082
Kentucky	1884	1,550	3,100	2	1828	1879	55,068
Wyoming	1886	829	1,658	1	1865	1882	9,438
Michigan	1887	71	142	0	1860	1901	2,036
Montana	1889	363	726	0	1880	1895	4,532
Arkansas	1889	280	560	0	1880	1898	2,234
Alabama	1891	4,760	9,520	0	1840	1883	20,457
Oklahoma	1891	1,091	2,182	n.a	1880	1891	4,849
New Mexico	1891	462	924	n.a.	1881	1899	4,023
Utah	1896	419	838	n.a.	1877	1900	6,005
North Dakota	1905	317	634	n.a.	1884	1922	1,385
Texas	1907	1,648	3,296	n.a.	1884	1901	2,355
Virginia	1912	7,847	15,694	0	1822	1888	12,799

Sources: Year State Mining Law Adopted is from Aldrich (1997, 70). Coal tonnage estimates are from U.S. Department of Mines (1925, 528-33). Rough estimate of number of workers is based on annual average tons produced per worker of 500 net tons. From 1900 onward the average tons per worker per year ranged from 680 to 800. We used a smaller figure to reflect lower productivity prior to 1900 when cutting machines were less prevalent. The number of operations producing over 100,000 tons was tabulated from the 1880 Mining Census. U.S. Bureau of the Census 1886, 600-900. Companies with more than one mine in a county were counted as one operation. There were some companies that had mines in multiple counties, but this was much more common later than 1880.

Table 3
Year of Introduction of Factory Safety Law with Inspector, Department of Labors, and Industrial Commissions Devoted to Safety

State	Year of Factory Safety Law with inspector, blank means no law by 1924	Year Labor Commission or Bureau of Labor Statistics, or Factory Safety Inspector	Industrial Commissions with quasi-legislative powers for safety	Extent of Code-Writing by IC	Manu. Wage Earners, 1899
Alabama	1907	1907			52711
Arkansas	*h	1913			31525
Alabama	*d	1925 *d	1925	few	3126
California	1885	1885 or earlier	1913	extensive	77224
Colorado	1911	1887 or earlier	1915	no codes	19498
Connecticut	1888 or earlier	1887 or earlier			159733
Delaware	1893	1893			20562
Florida		1893 ag dept collects statistics on manufactures			35471
Georgia	1916	1911			83336
Iowa	1897	1887 or earlier			44420
Idaho	*g	1887 or earlier	1917	no codes	1552
Illinois	1893	1887 or earlier			332871
Indiana	1899	1887 or earlier			139017
Kansas	1901	1887 or earlier			27119
Kentucky	1903	1894 or earlier			51735
Louisiana	1908	1900			40878
Massachusetts	1879	1869	1913	extensive	438234
Maryland	1898	1887 or earlier	1828	no codes	94170
Maine	1887	1887 or earlier			69914

Michigan	1893	1887 or earlier			155800
Minnesota	1891	1887 or earlier			64557
Missouri	1889 or earlier	1879			107704
Mississippi	1914	1914			26799
Montana	*i	1895 or earlier	1915	no codes	9854
North Carolina		1887 or earlier	1931		72322
North Dakota	1905	1899	1919	no codes	1358
Nebraska	1895	1895 or earlier	1929	no codes	18669
New Hampshire	1917	1893 or earlier	1917	no codes	67646
New Jersey	1877	1887 or earlier			213975
New Mexico	*e	*e			2490
Nevada	1915	1915	1919	few	504
New York	1882	1887 or earlier	1913	extensive	726909
Ohio	1893 or earlier	1877	1913	extensive	308109
Oklahoma	1910	1907			2381
Oregon	1907	1903	1920	few	14459
Pennsylvania	1895 or earlier	1872	1913 for mines only	extensive	663960
Rhode Island	1896 or earlier	1887 or earlier			88197
South Carolina	1912	1912			47025
South Dakota	*f	1890 or earlier			2224
Tennessee	1897	1884 or earlier	1923	few	45963
Texas	1911	1911			38604
Utah	1917	1892*a	1917	extensive	5413
Virginia	1919	1897			66223
Vermont	1912	1917			28179
Washington	1903	1910	1919	few	31523
Wisconsin	1883	1887 or earlier	1911	extensive	137525
West Virginia	1899	1891 or earlier			33080
Wyoming	1917	1917			2060

Sources: For dates of adoption of inspectors and departments of labor we used a mixture of Brandeis (1935, 628-645) and the U.S. Commissioner of Labor (1896). More research needs to be done on the actual year of introduction. The phrase "or earlier" means that the Commissioner of Labor listed the law in codes as of that year. The actual law might have been earlier. The earliest commissioner of labor was in Massachusetts in 1869 and the earliest factory inspector was in Massachusetts in 1879. For information on Industrial Commissions we relied on Brandeis (1935, 654), who was citing work of John Andrews of the American Association of Labor Legislation. Manufacturing Wage Earners are from the 1899 Census of Manufactures.

Some states with relatively few manufacturing workers did have mine inspectors.
*a Utah the legislature had authorized a bureau of labor statistics or labor department earlier.
*b In Tennessee and West Virginia there were no regular inspectors. Commissioner merely had the power.
*c Alabama had mine inspector and later board of arbitration but no offical department of labor.
*d Arizona had a mine inspector as of 1908.
*e New Mexico had a mine inspector as of 1908.
*f South Dakota had a mine inspector as of 1903.
*g Idaho had an inspector of mines 1893 or earlier.
*h Arkansas had an inspector of mines 1894 or earlier.
*I Montana had a mine inspector 1895 or earlier.

TABLE 4
IMPACT OF SAFETY REGULATION AND LIABILITY LAWS ON ACCIDENT RISK

Type of Law	Citation	Dependent Variable	Sample	Other Controls	Results
Safety Legislation and Inspection Budgets	Fishback (1992, p. 115-125)	Fatal Accident Rate in Bituminous Coal Mining	Panel of 23 Coal States, 1903-1930	State Effects, Coal Price, Machinery, Days Worked, Workers' Compensation, Employer Liability Laws, Bureau of Mines	Of 14 Specific Regulations, only bans on riding coal cars, requiring use of permissible explosives, and foreman visits to workplace reduced accident rates in statistically significant fashion. Higher state spending on mine inspection lowered accident rates.*
State Regulatory System Using Enforceable Safety Standards	Chelius (1977, p. 79)	Nonfatal Machinery Accidents per Member of Labor Force in State as Ratio to National Average	Panel of 26 States from 1900 to 1940	State Effects, Dummy for presence of regulation	Presence of System did not reduce accident risk
State Inspection Budget	Buffum (1992, p. 149)	Nonfatal Machinery Accidents per Member of Labor Force	Panel of 26 States from 1900 to 1940	Employer Liability Law, Workers' Compensation Laws, % Employed in Mining, % in Railroads, % Female, % Foreign Born, % Illiterate, % Union, % Large Firms, U.S. National Average	More Spending lowers Accident Risk but not Statistically Significant
State Inspection Budgets	Buffum (1992, p. 109-111, 153)	Fatal Industrial Accidents per 100,000 Workers	Panel of 8 States from 1900 to 1940	Workers' Compensation, Employer Liability Law, % Employed in Mining, % in Railroads, % Female, % Foreign Born, % Illiterate, % Union, % Large Firms, U.S. National Average	Workers' Compensation Raises Accident Rate* and Employer Liability Lowers Accident Rate
Railroad Safety Laws	Buffum (1992, 92-98, 143)	Railroad Workers killed per 100,000 Accidents	Time Series of National Averages, 1888-1940	Tons Hauled per Train Mile, Real Income of Railroads, Dummy for FELA 1908, Dummy for War Years	Appliance Act (1893), Train Stops (1922), Boiler Act of 1915 all lowered fatal accident rates.* Handhold (1894), Drawbar (1895), Air Brake (1899), Ash Pan

					(1908), Boiler Act of 1911 did not lower fatal accident rates.
Workers' Compensation and Employer Liability	Chelius (1977, p. 79)	Nonfatal Machinery Accidents per Member of Labor Force in State as Ratio to National Average	Panel of 26 States from 1900 to 1940	State Effects, Dummy for presence of regulation	Workers' Compensation and Employer Liability Each Lower Accident Rate*
Workers' Compensation and Employer Liability	Buffum (1992, p. 102-103, 149)	Nonfatal Machinery Accidents per Member of Labor Force	Panel of 26 States from 1900 to 1940	Spending on Factory Inspection, % Employed in Mining, % in Railroads, % Female, % Foreign Born, % Illiterate, % Union, % Large Firms, U.S. National Average	Workers' Compensation and Employer Liability Each Lower Accident Rate, but not statistically significant
Workers' Compensation and Employer Liability	Buffum (1992, p. 109-111, 153)	Fatal Industrial Accidents per 100,000 Workers	Panel of 8 States from 1900 to 1940	Spending on Factory Inspection, % Employed in Mining, % in Railroads, % Female, % Foreign Born, % Illiterate, % Union, % Large Firms, U.S. National Average	Workers' Compensation Raises Accident Rate* and Employer Liability Raises Accident Rate
Workers' Compensation and Employer Liability	Fishback (1992, p. 115-125)	Fatal Accident Rate in Bituminous Coal Mining	Panel of 23 Coal States, 1903-1930	State Effects, Coal Price, Machinery, Days Worked, Vector of 14 Safety Laws, Strike Activity, Spending on Mine Regulations, Bureau of Mines	Workers' Compensation Raises Accident Rate by 28 percent*; Employer Liability Raises Accident Rate by 20 percent*

Source: Reprinted from Fishback (1998).

Table 5
Enforcement of Bituminous Coal Mining Safety Regulations, 1901-1930

	Number of Inspectors				Number of Inspectors per 1000 Underground Workers				Annual Salary of Inspectors			
	1901	1910	1920	1930	1901	1910	1920	1930	1901	1910	1920	1930
Alabama	3	3	7	10	0.20	0.16	0.34	0.48	1200	1400	2000	3000
Arkansas	1	1	1	1	0.39	0.21	0.30	0.25	1500	2000	2000	3000
Colorado	2	4	7	7	0.28	0.30	0.64	0.74	1500	1540	3000	3000
Illinois	7	10	12	12	0.19	0.15	0.16	0.26	1800	1800	1800	1800
Indiana	3	4.275	6	6	0.26	0.22	0.22	0.55	1200	1200	1200	2500
Iowa	3	3	3	3	0.27	0.20	0.28	0.41	1500	1800	2700	3000
Kansas	4	6	6	5	0.45	0.51	0.79	1.34	1100	960	1650	1800
Kentucky	2	6	8	8	0.23	0.35	0.20	0.16	1200	1350	1800	1800
Maryland	1	1	1	3	0.21	0.20	0.22	1.02	1500	1500	1500	2500
Michigan	1	1	1	1	0.49	0.32	0.52	0.84	1100	1460	1800	1800
Missouri	1	2	3	3	0.11	0.23	0.44	0.68	1500	1800	1800	2400
Montana	1	1	1	1	0.55	0.32	0.29	0.63	2000	2500	2500	2500
North Dakota	0	1	1	1	0.00	2.50	1.33	1.32		2500	2500	2500
New Mexico	1	1	1	1	0.50	0.34	0.34	0.40	2000	2000	2400	2400
Ohio	8	12.75	13	18	0.28	0.30	0.31	0.80	1200	1375	2100	2100
Oklahoma	1	4	4	4	0.18	0.55	0.58	0.88	2000	1500	1800	1800
Pennsylvania	12	23.3	30	30	0.14	0.15	0.21	0.26	3000	3000	4260	4800
Tennessee	1	4	4	4	0.13	0.40	0.43	0.61	1800	1700	2000	2200
Texas	0	1	1	1	0.00	0.28	0.39	0.88		2000	2000	2000
Utah	1	1	miss	miss	0.70	0.42	miss	miss	2000	2000	miss	miss
Virginia	0	0	2.83	3	0.00	0.00	0.27	0.30			1750	2570
Washington	1	1	2	3	0.27	0.20	0.50	1.26	1500	2400	3000	3600
West Virginia	6	13	20	29	0.22	0.22	0.24	0.32	1200	1800	3000	3400
Wyoming	1	2	2	3	0.25	0.31	0.32	0.70	2000	2000	2600	3600
U.S. Average									1610	1808	2224	2612
Coal Miners' Earnings									465	533	1659	1142
Earnings Salaried Manu.									1043	1188	1999	2635

Sources: Inspection Information from mining laws and state appropriations, see Fishback 1992. Average annual earnings of coal miners, Fishback 1992, 80-81. Average annual earnings for Salaried workers in manufacturing are from Census Manufacturing Reports.

Table 6

Appropriations for State Labor Departments per Worker in Mining and Manufacturing, 1903, 1910, 1915

	1903	1910	1915
New England			
CT	$0.135	$0.128	$0.124
ME	$0.050	$0.105	$0.091
MA	**$0.207**	**$0.291**	$0.520
NH	$0.035	$0.032	$0.117
RI	$0.072	$0.126	$0.143
VT	$0.000	$0.000	$0.106
Mid-Atlantic			
DE	$0.013	$0.038	$0.183
NJ	$0.084	$0.102	$0.204
NY	$0.117	$0.142	**$0.691**
PA	$0.175	$0.213	$0.416
Mideast			
IL	$0.177	$0.207	$0.284
IN	$0.131	$0.130	$0.223
MI	$0.134	$0.128	$0.120
OH	**$0.193**	$0.244	**$0.654**
WI	$0.155	$0.176	$0.302
Midwest			
IO	$0.100	$0.118	$0.140
KS	**$0.188**	$0.219	$0.207
MN	$0.107	**$0.319**	$0.525
MO	$0.166	$0.208	$0.234
NE	$0.089	$0.070	$0.109
ND	**$0.259**	**$0.428**	**$0.607**
SD	$0.115	$0.088	$0.174
South			
VA	$0.023	$0.054	$0.069
AL	$0.053	$0.106	$0.192
AR	$0.040	$0.039	$0.097
FL	$0.000	$0.000	$0.029
GA	$0.000	$0.000	$0.050
LA	$0.067	$0.037	$0.058

MS	$0.000	$0.000	$0.053
NC	$0.033	$0.027	$0.029
SC	$0.000	$0.090	$0.080
TX	$0.000	$0.044	$0.121
KY	$0.116	$0.119	$0.109
MD	$0.106	$0.141	$0.218
OK	$0.141	**$0.381**	**$0.598**
TN	$0.085	$0.181	$0.223
WV	$0.171	**$0.274**	**$0.698**
Mountain West			
AZ	$0.000	$0.000	$0.455
CO	**$0.246**	**$0.413**	**$0.724**
ID	**$0.293**	**$0.448**	**$0.609**
MT	**$0.445**	**$0.633**	**$0.761**
NV	$0.000	**$0.493**	**$0.874**
NM	**$0.191**	$0.152	$0.195
UT	**$0.230**	$0.152	$0.317
WY	**$0.320**	**$0.387**	$0.348
Pacific			
CA	$0.046	$0.060	$0.116
OR	$0.053	$0.039	$0.147
WA	$0.072	$0.143	**$0.710**

The ten highest figures in each year are in bold type.

Source: State government appropriations on labor programs includes spending on factory inspection, labor bureaus, mining inspection, bureaus of labor statistics, boards of arbitration, boiler inspector, and free employment bureaus. The data were collected from appropriations to state labor departments reported in the states' volumes of statutes. For each state-year observation we collected the appropriations for factory inspection, boards of conciliation and arbitration, bureaus of labor, bureaus of labor or industrial statistics, free employment bureaus, boiler inspection (but not ship boiler inspection), mining inspection, industrial welfare commissions, and industrial commissions from the states' session laws. In many states appropriations were given for all labor spending without separating out what share went to each division. In a few states, Iowa for example, the statute volumes offered the exact amounts spent by the state treasurer. Some states were either missing appropriations volumes or the appropriations were unnecessarily obtuse. In those states we used interpolations to fill any gaps. In interpolating we tried to be sensitive to the fact that many states were on a two-year cycle and often gave the same amount of appropriations in both years of the cycle. Maryland and Michigan offered extremely uninformative appropriations information. For Michigan we collected the appropriations data from the Michigan Auditor General's Annual Report for years between 1900 and 1920. For Maryland we collected information from the Maryland Bureau of Statistics and Information, Annual Reports.

We then divided the real expenditures by an estimate of the number of workers gainfully employed manufacturing and mining in the state. The employment estimate was determined by calculating the share of total U.S. gainfully employed in each state for the years 1900, 1910, 1920, 1930, and 1940 from series D-26 in U.S. Bureau of Census (1975, 129-31). The shares between the census years were calculated using straight-line interpolations. We then multiplied the shares for each state and year by total employment in the U.S. in each year (series D-5 in U.S. Bureau of Census 1975, 126) to create an estimate of employment in each state. To get mining and manufacturing employment we multiplied the percentage in mining and manufacturing from the Census for each state multiplied by the employment figure.

Appendix I
Factors Influencing the Choice of Administrative Form for Workers' Compensation.

The shift to workers' compensation did not lead to the elimination of a final arbiter. States chose different means of administering workers' compensation. Ohio, Washington, ND, and a handful of others established monopoly state insurance funds where the ultimate arbiter was a commission. Others chose some form of state administration, where the state agency held hearings. In many states these might be appealed to the courts. Ten 10 states chose to administer workers' compensation in a way that mimicked the de facto administration of negligence liability before.[17] These states chose a system where the employer and worker came to a settlement agreement within the terms of the law. Disputes over the appropriate settlement were then put directly into the court system.

If the Glaeser/Shleifer hypothesis is correct, it may be that states that stayed with the court method of administration might have been states where subversion of the judiciary was less of a problem, or potentially these were states where the scale of business was smaller. There are no direct tests of corruption because it is likely that most forms of subversion never came to light. We can test for a relationship between the scale of activity in the various states and the choice of workers' compensation administration. In addition, if employers were using delaying tactics through overuse of appeals, we might see the use of commissions to replace courts more often in areas where there were more appeals court decisions relative to the number of workers. Appendix Table 1 shows the mean values in states choosing commissions and choosing courts for a number of factors that might have influenced the decision. Our measure of scale is the number of manufacturing wage earners in thousands who were employed in establishments with more than $1 million in value added as of 1909. We looked at two measures to get a sense of appeals: a measure of the number of appeals-- the average annual number of appeals on workplace accident liability cases (in nonrailroad settings) per gainfully employed worker in the three years prior to the introduction of workers' compensation--and a measure of increasing appeals activity, the ratio of the average annual number of appeals in the three years prior to adopting workers compensation to the average annual number of appeals in 1904-1906. If scale and subversion of the process was related to the choice, we should see higher means for these variables in commission states than in court states. We have also included some other measures that might be related to the choice. As a measure of interest in reform we include the percent voting Progressive for president in 1912. As a measure of union strength, we include an index that compares the extent to which workers were employed in manufacturing industries that tended to be unionized nationwide. Unions were often strong advocates for commissions. One reason is that they often had success in influencing the commissions, who in turned lobbied for better benefits (see Fishback and Kantor 2000, 273-275) We also included an index measure of accident risk that shows which states had more employment in more dangerous industries (see Fishback and Kantor 2000, Appendix I for sources).

As can be seen in the table, states that chose commissions tended to have more workers in large establishments and to have a bigger increase in accident liability cases, but did not tend to have more appeals court cases per worker. However, the variances of the factors are large enough that we cannot reject the hypothesis of no difference in difference of means tests.

We have run a multi-variate version of the analysis with a simple logit where the choice to have a commission is a function of the scale variable, the number of court appeals per worker, the union index, an index of accident risk, and the percent voting Progressive for President. In particular, we added the index of accident risk as a control for the danger in industry. The coefficients in the analysis all have the expected signs, but we can only reject the hypothesis of no effect in the case of the unionization index. The impact of the unionization index could be an example of overcoming subversion since they were likely to be dissatisfied with the prior regime, however, it may also be the case that they were just more successful in an interest group battle.

Appendix Table 1
Means for States that Chose Commissions or Courts to Administer Workers' Compensation

	Means			Diff of Means
	Commission	Courts	Difference	test statistic
Average Annual Appeals Court Cases per gainfully employed worker in three years prior to adoption of workers' compensation	0.17	0.23	-0.06	-0.26
Appeals court cases relative to 1904-1906	2.45	1.52	0.92	0.28
% voting Progressive in 1912 Presidential Election	24.83	23.31	1.52	0.11
Thousands of Manufacturing Wage Earners in Establishments with over $1 million in value added, 1909	48.90	15.46	33.44	0.40
% of wage earners in establishments with over $1 million in value added, 1909	22.76	23.67	-0.91	-0.04
% of wage earners in corporations, 1909	76.41	79.79	-3.38	-0.30
Index of Unionization, 1909	8.94	6.92	2.02	0.44
Index of Accident risk, 1909	1.70	1.84	-0.15	-0.15
Year adopted workers compensation	17.37	14.50	2.87	0.31
Appropriations for Labor Bureaus per gainfully employed worker in 1967$, 1909	0.18	0.13	0.05	0.23
% of gainfully employed in manufacturing, 1910	25.11	23.94	1.17	0.06
% of gainfully employed in mining, 1910	3.11	4.31	-1.20	-0.17

Logit Multivariate Results for Choice of Commission (1) or Courts (0)

Variable	Estimate	P-Value
Intercept	-5.4118	0.0841
No. of Manufacturing Workers in Establishments with more than $1 million in value added	0.0331	0.2271
Number of appeals court cases relative to 1904-1906	0.1503	0.4882
Unionization Index	0.3572	0.0379
Percent voting Progressive for President, 1912	0.02	0.7124
Accident Risk Index	1.283	0.1679

ENDNOTES

[1]For economic models in which the political process may be captured, see Stigler (1971), Becker (1983), Peltzman (1976).

[2]In general discussions of strict and negligence liability in a variety of settings, Horwitz (1977) and others argue that strict liability was the primary rule prior to the introduction of negligence liability. However, the cases they cite that establish a strict liability standard in the early 1800s for injuries are all related to collisions, stranger cases, trespass, or liability in nonemployment cases. Even in this arena of cases Robert Rabin (1981) and Gary Schwartz (1981) offer effective challenges to this view, arguing that a negligence standard had been used in cases prior to the alleged shift from strict liability in the 1800s.

[3]The case was filed by the same lawyer against the same company the year before the Farwell case. Whereas the injured worker lost the case in *Farwell*, the injured worker in the prior case won a judgment of $3,000 in a ruling that suggested the railroad was negligent. Tomlins suggests that since *Farwell* was published, it carried much greater doctrinal weight.

[4]I used Lexis/Nexis to search for published anthracite coal injury cases in all Pennsylvania courts for the period 1830 to 1840 using the following word combinations: "injury and employer", "employer," "mining,""mine", "coal," "injury and master," "negligence and master," I found no examples of suits where workers sued their employer for damages for a workplace injury.

[5]For lucid discussions of the employers' liability system see Clark 1908, Weiss 1966, and Epstein 1982.

[6] Indemnity for railroad interstate workers and maritime workers continued under the common law negligence standards. The Federal Employers' Liability Acts of 1906 (declared unconstitutional) and 1908 sharply limited the fellow-servant defense and switched from contributory negligence to comparative negligence. Later amendments eliminated the assumption of risk defense. See Kim 1988, Kim and Fishback 1993.

[7]We did discover that some of the judges that presided over some of these bribery trials were later charged with corruption in the 1930s in a series of scandals related to patent trials. See Borkin (1962).

[8] We are working to find more details on the timing of the adoption of the railroad commissions.

[9] Studies of child labor laws and womens' hours laws suggest that these progressive era laws also had relatively limited impact. For child labor, see Moehling (2001), Sanderson, 1974; Osterman 1980; Brown, Christiansen, and Phillips, 1982, Carter and Sutch 1996b. For womens' hours laws, see Goldin (1996) and Whaples 1990a, 1990b). For a broader discussion of the issues involved, see Fishback (1998).

[10]To avoid problems with reporting of accidents, all of the studies of the impact of workers' compensation on accident risk have focused on fatal accidents.

[11]Another potential explanation might be differences across industries in the extent of experience-rating, i.e., the adjustment of insurance rates to reflect differences in accident rates. Although we don't have full information, the workers' compensation rates across industries seemed to be closely tied to the differences in accident experience. However, experience-rating for firms within industry was less successful. Unfortunately, no one as yet has successfully uncovered whether experience rating across firms within manufacturing was better than within coal mining.

[12] For example, in the struggles over the specifics of workers' compensation benefit levels, states with more industries where unions were important tended to offer higher benefit levels. Unions and progressive reformers succeeded in obtaining state insurance of workers' compensation benefits in nearly half of the states despite the active opposition of insurance companies (Fishback and Kantor, 2000).

[13] Mark Aldrich (1997, p. 211-258) suggests that the safety legislation often had complex effects on mine safety. Requirements for new technology or practices that seemed reasonable on the surface were often resisted by miners. In some settings the new technology created new safety hazards. In other settings miners worried that employers might claim that use of the technology allowed them to eliminate other safety precautions.

[14]From my coal studies I remember an episode in the 1920s where the coal operators in West Virginia went to the Governor and had a chief inspector removed from office, but I am still trying to track down the source.

[15] These accounts are based on Stein (1962). See also McEvoy (1995).

[16]For the text of the law, see U.S. Commissioner of Labor 1907, 912-3. The quotes from factory inspectors are in Stein (1962, 23-4) I have not yet found the ruling. The U.S. Commissioner of Labor (1907, 913) does not report such a court ruling as of 1907.

[17] The states that chose administration through the courts were Kansas, New Hampshire, Rhode Island, Arizona, Minnesota, Louisiana, Wyoming, New Mexico, Alabama, and Tennessee (Fishback and Kantor 2000, 103).