2 Compensation for Accidents before Workers' Compensation

Jim Hurd, about whom we wrote in chapter 1, was just one of hundreds of workers killed in workplace accidents in Virginia each year during the early 1900s. Thousands more were seriously injured. The workplace accident toll was staggering when compared with today's much safer workplaces. Between 1890 and 1910 the plight of injured workers and their families drew increasing attention as state governments began to accumulate more accident information. Social reform groups like the American Association for Labor Legislation pressed for the introduction of social insurance, and writers like Crystal Eastman (1910) of the Pittsburgh Survey published stinging indictments of the experiences of many accident victims.

The legal rules governing workplace accident compensation at the turn of the century were based on common law rules of negligence combined with the defenses of assumption of risk, fellow servant, and contributory negligence. In the nineteenth 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. Negligence liability is viewed by some as part of a legal structure designed to promote enterprise and industry (see Friedman 1985, 300–301). Labor leaders, even as late as 1905, were still willing to work within the negligence liability system, seeking to expand liability by limiting the three defenses. Neither the employers' nor the labor leaders' views were fixed. During the first decade of the twentieth century many became increasingly dissatisfied with the operations of the system. Employers were worried about the uncertainties of possible large court awards and dissatisfied that a significant portion of what they paid out for liability insurance never reached the injured worker. Meanwhile, union leaders eliminated some of the defenses in some states, but were still unhappy with the level of payments that were reaching workers and the number who were left with no compensation at all.

Social reformers, like Crystal Eastman and the American Association of Labor Legislation, were dissatisfied with the negligence liability system because they were seeking to establish social insurance programs to aid the families of workers who were injured at work, became unemployed, or were struck down with illness. They argued that social insurance would provide workers with a cushion when ill fortune struck, while giving employers more incentives to prevent such mishaps. They considered the common law employer liability structure to be ill-designed to meet these goals. Since negligence liability based injury payments on fault, reformers argued that too many workers and their families were left uncompensated. Further, they felt that the de facto operation of negligence liability often meant that workers who legally should have received benefits often received nothing or lower payments than that to which they were entitled in theory. Thus, employers had limited incentives to prevent accidents.

In this chapter we examine how the negligence system operated both in theory and in practice. Such knowledge is essential to understanding the pressure for the introduction of workers' compensation. The chapter lays out not only the legal doctrines that were said to determine compensation but also the extent to which these legal doctrines were actually followed in compensating workplace accidents. Most accident compensation was paid out in settlements outside the court system, and we bring together the results of a range of studies that consider those payments. Finally, we address the issue of how well workers were compensated for accepting higher accident risk through the payment of higher wages.

Study of the de facto functioning of the negligence system not only provides historical context for the transition to workers' compensation, it also should inform modern debates over the relative efficiency of different types of liability rules for consumer products, auto accidents, and medical attention. Through theoretical introspection, law and economics scholars have established predictions about the relative efficiency of negligence liability and strict liability using a series of assumptions about transaction and information costs. These studies assume that the de jure rules of the negligence liability system dictated precisely how accident compensation was allocated. Given that there are significant costs associated with adjudicating decisions, it is not clear that the de facto operation of the negligence system actually followed the de jure set of rules. Court costs and other transaction costs were high enough that workers could not expect to receive the levels of compensation that they might have been entitled to under a strict reading of the common law. Moreover, using the court system entailed such costs that most disputes were settled outside the formal legal system, thus raising the question of how well the actual pattern of settlements reflected what would have been generated if the common law were strictly followed. Transaction costs might have prevented many workers with legitimate claims from receiving compensation. Conversely, some workers with better access to legal advice, nonwage income, or capital markets might have received compensation for less "worthy" claims. In other words, the de facto performance of the negligence liability system may have been far from what legal theorists assume. Thus, the study of the negligence system of the early 1900s provides an important set of facts that will enable legal theorists to modify their assumptions and hence their predictions regarding the efficiency consequences of different legal systems in modern discussions.

2.1 The Negligence Liability System

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" coworkers, 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).

A worker injured on the job 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 coworker (fellow servant) had caused the accident; or that the worker himself was negligent or had not exercised due care (contributory negligence).[1]

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, if 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 would likely not have received compensation from his employer because the steeplejack knew and accepted the risks associated with his line of work. 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 a coworker's failure to correctly prop a roof caused injury in a roof fall. Finally, under the contributory negligence defense, workers could not collect damages if they might have avoided the accident by exercising due care themselves to prevent 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.

Views on why these doctrines were established vary. 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 ensure 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 would be 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 (Adam Smith's compensating wage differential) and use this "risk premium" to buy workplace accident insurance. Finally, the fellow servant defense allegedly promoted efficient accident prevention because it gave workers an incentive to report the hazardous actions of coworkers to the employer so that the dangerous behavior could be corrected (Landes and Posner 1987, 309–11).

This theory has led to an extensive literature in law and economics comparing the relative efficiency of various forms of liability systems. Landes and Posner did not formally model the implications 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. Since Posner's (1972) seminal work, an enormous law and economics literature has developed on the subject (see, e.g., Brown 1973; Epstein 1973; Shavell 1980, 1987; Veljanovski 1982). 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.

Even if the negligence liability system had promoted efficient accident prevention, contemporary social reformers viewed the legal system as "unfair" and capricious (Eastman 1910). Lawrence Friedman (1985, 475), in his extensive history of American law, effectively summarizes a common view of the negligence system: "By the beginnings of the Gilded Age, the general features of the new tort law were crystal-clear. . . . Enterprise was favored over workers. . . . Juries were suspected—on thin evidence—of lavishness in awarding damages; they had to be kept under firm control. The thrust of the rules; taken as a whole, approached the position that corporate enterprise should be flatly immune from actions for personal injury." By the turn of the century, however, Friedman goes on to argue (1985, 484), the common law "was wildly nonuniform, full of 'unpardonable differences and distinctions.' This meant that by 1900, the rule had lost some of its reason for being. It was no longer the efficient device for disposing of accident claims. It did not have the courage of its cruelty, nor the strength to be humane. It satisfied neither capital nor labor. It 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."

From an injured worker's or his heirs' perspective, proving an employer's negligence before a court and overcoming the three defenses was a formidable task. Describing the British situation under the negligence system, which paralleled the American experience, Bartrip (1985) claims that British workers had little working knowledge of the law and lacked financial means, thus many were precluded from pursuing claims against their employers. Even though lawyers might have accepted strong cases on a contingency basis, injured workers faced relatively high expected costs of pursuing a court claim against an employer. In addition to lawyers' fees and court costs, injured workers faced delays of up to four years before a final court decision was reached (Eastman 1910, 186). After extensive interviews with families of fatal accident victims in Pennsylvania before the state had adopted workers' compensation, Mary Conyngton (1917, 104), a U.S. Bureau of Labor Statistics researcher, summarized how many of the families felt about the negligence system: "The employers were too powerful, they felt; it was useless to try to get anything. The witnesses of the accident were very apt to be in the employ of the man, or company, who had employed the decedent and fear of losing their work would keep them from testifying against their employer. . . . All in all, they thought it better to submit and not to make a bad matter worse by creating for themselves a powerful enemy. Of course for those who took this attitude, there was no delay, no expense, and no uncertainty about the question of settlement."

In her classic study of how accident victims in Allegheny County, Pennsylvania, fared under the common law, Crystal Eastman (1910, 186) concluded that "[t]he immediate need here is so great, the delay of trial so long, that it is not astonishing that most cases are settled out of court." In fact, a study by the Minnesota Bureau of Labor, Industries, and Commerce (1909–1910, 167–87) found that 89 percent of the fatal accident cases, 78 percent of the permanent partial disability cases, and 99 percent of the temporary disabilities were settled without the courts. In addition, of the 994 temporary disability cases studied by the New York Commission on Employers' Liability (1910, 236–37), in only 110 (11.1 percent) did the injured worker receive some compensation through a settlement of a formal legal claim or suit.

Given that so many cases were settled out of court, the de facto operation of the negligence liability system potentially was quite different from the de jure descriptions that the law and economics and legal literatures provide. Legal scholars including Posner (1972), Landes and Posner (1987), and Richard Epstein (1982) have empirically supported their assumptions concerning the operation of the negligence liability system with analyses of court decisions from the turn of the century. In the presence of so many out-of-court settlements, however, court decisions may offer a biased view of how the common law worked in practice. Numerous studies show that modern court decisions are not a random sample of all accident cases (Priest and Klein 1984; Viscusi 1986; Hylton 1993). Legal fees, court costs, and long delays in reaching a final decision gave employers and workers an incentive to avoid the court system and these costs potentially were high enough to distort how the tort doctrines influenced the pattern of accident compensation.

To examine this question more carefully requires the collection of a complete or random sample from the universe of workplace accidents from a specific time and place. Then an analysis can be conducted on how injured workers were compensated, if at all, from court awards or out-of-court settlements. During their deliberations on switching to a workers' compensation system, various state legislatures and governors commissioned investigations into the operation of the employers' liability system in their respective states. In each investigation the commissions sampled workers, or the families of workers, injured or killed on the job and then reported how each accident victim (or heir) was remunerated. In each case they attempted to identify, with varying degrees of success, all accident victims in an area so that information was collected not only on those workers who filed suits but also on the vast majority of workers who remained outside the court system. The commissions generally succeeded in collecting information on the compensation to the heirs of fatal accident victims. The commissions had far less success in collecting full information on nonfatal accidents because they typically had to rely on reports from employers, and there is substantial evidence that employers underreported nonfatal accidents. The commissions expressed little interest in determining how well the patterns of compensation matched the tort doctrines. Yet the raw data they collected are particularly valuable for studying the de facto workings of the negligence system because they provide a sample of all accidents, not just the accident cases that were decided in the courts.

2.2 The Levels of Postaccident Compensation for Fatal Accidents

Evidence drawn from seven studies commissioned in the early 1900s, summarized in table 2.1, reveals that families of married fatal accident victims bore the preponderance of the financial burden of industrial accidents. The studies, which exclude railroad workers, reveal that the percentages receiving no compensation ranged from 22.2 percent of Minnesota families in 1909–1910 to 60.9 percent among men killed in Illinois before 1911.[2] Taking the average value across the samples, about 43 percent of the families of fatal industrial accident victims would have received no compensation at all. If the employers' liability system were operating in strict accordance with the common law rules of negligence, and according to the predictions of Posner (1972) and Landes and Posner (1987), it is not surprising that a large number of injured workers received no compensation. Table 2.2 presents evidence drawn from a variety of sources on the causes of accidents. According to these data, employers were negligent, and thus legally responsible for compensating the injured worker in a well-functioning negligence system, in 0.2 to 47.8 percent of the cases surveyed.[3] Therefore, if the liability system was functioning as legal theory predicts, anywhere from 52 to 99.8 percent of injured workers should have been denied benefits. Given these standards of comparison, the 43 percent of the families of fatally injured workers not receiving compensation possibly might even be considered low.

In order for the liability system to optimize the level of safety and accidents, once an employer's liability has been established, damages must equal the social costs of the accident (Posner 1972, 46). The economic loss of an industrial accident would include medical expenses that the injured worker incurred, the present value of lost earnings, and the monetary value attached to the injured's (or his family's) "pain and suffering." The last column of table 2.1 reports the mean ratio of death benefits to annual earnings; families receiving no compensation are included in this calculation. The mean ratio of employer-provided death benefits ranged from a low of 38.3 percent of annual earnings in Pennsylvania to 119.5 percent in Minnesota.[4] The mean expected compensation (including payments of zero) averaged about 56 percent of one year's earnings. Such low levels of expected compensation clearly created financial hardship for families whose primary wage earners were killed. The amount that families received fell far short of the forgone wages that the fatally injured worker

Table 2.1 **Compensation Paid to Families of Fatal Industrial Accident Victims under Negligence Liability**

Sample	Number of Usable Observations	Percentage Receiving No Compensation from Employers	Mean Ratio of Compensation to Annual Earnings[a]
Married nonrailroad workers in Erie County, NY, 1907–8	60	35.0	0.69
Married workers in Manhattan, NY, before 1910[b]	48	37.5	0.78
New York State Employers' Liability Commission Report on married workers before 1910	111	—	0.56
All married workers killed in work accidents in Allegheny County, PA, 1 July 1906 to 30 June 1907[c]	165	26.1	0.47
Workers in Virginia coal mines owned by Stonega Coke and Coal, 1916–18	44	29.4	0.41
Married workers in Pennsylvania, 1914	128	53.1	0.34
Nonrailroad workers in Minnesota, 1909–10	45	22.2	1.12
Nonrailroad workers in Illinois before 1911	274	60.9	0.58
Weighted (by sample size) average		44.5	0.56

Sources: Fishback and Kantor (1995, 718). The estimates from New York and Allegheny County, Pennsylvania, are from Eastman (1910, 122, 272–79). Virginia coal mine estimates are from Fishback (1987, 311–12). The Pennsylvania data for 1915 are from Conyngton (1917, 125–45). The Minnesota information comes from the Minnesota Bureau of Labor, Industries, and Commerce (1909–1910, 166–69). The Illinois data are from Hookstadt (1919, 239). In calculating the ratio of expected compensation to yearly earnings, we used the workers' reported wages for the three New York samples, and the samples from Allegheny County and Pennsylvania. Average yearly earnings for the other samples are from Paul Douglas's estimates of annual earnings in U.S. Bureau of the Census (1975, 168). The average yearly earnings for coal miners corresponds to bituminous coal mining and the average for nonrailroad workers is that for manufacturing wage earners in all industries.

Notes: All of the workers in the samples were men. In each sample there are several cases where the payments are unknown. Most of the unknown cases are situations in which lawsuits were pending. We have treated the unknowns as missing values.

[a]The mean compensation includes those families receiving no benefits.

[b]The evidence on compensation was presented as frequency distributions across ranges of dollar amounts. The midpoint of each range was used to calculate the mean levels of compensation.

[c]The sample includes workers employed by Carnegie Steel who received compensation from the Carnegie Fund, which was a relief fund supported solely by the employer. It seems reasonable to include this because the Fund may have reduced the number of suits filed against the Carnegie Company and also was fully funded by the employer. There may be some other payments from other relief funds that were partially funded by employers, so the compensation may be overstated. Eastman (1910) is not clear about whether these are included or excluded in her samples.

Table 2.2 **Distribution of Accident Causes (%)**

Causes	Germany 1887	Germany 1908	U.S. Iron and Steel Plant	Washington State 1913	Washington State 1914	Washington State 1915	Pittsburgh Survey[a]
Employer negligence	19.8	16.8	4	0.8[b]	0.3[b]	0.15[b]	47.8[b]
Worker negligence	25.6	28.9	7	7.8	7.2	5.3	32.2
Fault of employer and worker	4.45	4.66					
Fellow servant	3.28	5.28	6	2.4	3.2	1.5	13.7
Inevitable risk of work	43.4	42.1	60	69.0	81.7	89.0	
Other							28.5
Uncertain	3.47	2.31	23	19.8	7.4	3.9	
Number of accidents in sample	15,970	46,000	[c]	[c]	[c]	[c]	410

Sources: From Kantor and Fishback (1995, 412). The German data are reported in Boyd (1912, 359–60), the iron and steel plant and Washington data are from Blanchard (1917, 10–11), and the Pittsburgh data are from Eastman (1910, 86).

Notes: The German and Washington data are reported for a period when workers' compensation was in effect in both jurisdictions. The Pittsburgh data reflect accident causes prior to workers' compensation. The iron and steel plant data cover six years, and the source did not specify the time period or the plant's geographic location.

[a]The survey includes accidents in steel manufacturing, railroading, mining, and unnamed other industries. The percentages sum to greater than one hundred because some accidents were assigned multiple causes. Of the 501 total causes of accidents reported, 37.7 percent were in the steel industry, 18.2 were in railroading, 17.2 were in mining, and 26.9 percent were in the other industries.

[b]Percentage includes accidents caused as a result of the foreman's negligence, as well as the employer's.

[c]Data not reported.

contributed to his family's household income. Depending on the discount rate, the present value of the forgone wages of a deceased worker amounted to ten to twenty times his annual earnings.[5]

The mean levels of compensation often disguise the extent of compensation that most families received. A handful of very large awards potentially could raise the mean well above the levels that most workers received. Table 2.3 shows the frequency distribution of the ratio of fatal accident payments to annual earnings in four of the samples reported in table 2.1. The distributions clearly demonstrate that most families received compensation levels at the low end of the distribution. In the Illinois and Pennsylvania samples, between 70 and 83 percent of the families received less than a half-year's earnings, while firms were more generous in Minnesota where the percentage was just barely over 50 percent. If we focus only on the people who received positive amounts—under the extreme assumption that no payment was a sign the employer was not negligent—the level of benefits still seems relatively meager. Over half of those receiving some positive amount received less than a half-year's earnings in the two Penn-

Table 2.3 **Distribution of Postaccident Compensation Relative to Annual Earnings of Fatal Accident Victims (%)**

Ratio of Benefits to Annual Earnings	Allegheny County, Pa., 1906–7	Illinois, Coal Mining, 1909	Minnesota, 1909–10	Pennsylvania, 1914
0	26.1	67.9	24.4[a]	53.1
0 to 0.5	44.2	15.2	26.7	27.3
0.5 to 1	15.2	8.9	15.6	10.2
1 to 1.5	7.3	3.6	11.1	2.3
1.5 to 2	3.6	1.8	6.7	3.1
2 to 3	1.2	0.9	0.0	2.3
3 to 4	1.8	0.9	6.7	0.8
4 to 5	0.6	0.0	2.2	0.0
5 to 6	0.0	0.9	2.2	0.8
6+	0.0	0.0	4.4	0.0
Mean (std. dev.)	0.475	0.300	1.184	0.341
	(0.729)	(0.731)	(1.759)	(0.734)
Mean for those with positive	0.642	0.934	1.567	0.727
compensation (std. dev.)	(0.782)	(1.041)	(1.866)	(0.935)
Number of observations	165	112	45	128

Sources: Allegheny County data are from Eastman (1910, 325–31), Illinois data from Illinois Employers' Liability Commission (1910, 131–38), Minnesota data from Minnesota Bureau of Labor, Industries, and Commerce (1909–1910, 166–69), and Pennsylvania data from Conyngton (1917, 152–66).

Notes: As a means of comparison, the benefits to earnings ratio under workers' compensation at the time of each state's adoption (reported in parentheses) was 2.4 in Pennsylvania (1915), 2.3 in Illinois (1911), and 2.4 in Minnesota (1913).

[a]This percentage differs from the percentage reported in table 2.1 because workers were included in this sample only if they reported annual earnings.

sylvania samples, while over half received less than a year's earnings in the Illinois Coal and Minnesota samples. In essence, the system looks somewhat like a lottery where most people received nothing or relatively small amounts that would cover burial expenses, while a few received large awards.

While many workers' families received no compensation, this result could conceivably have matched how the negligence liability system was designed to operate. Many workers' heirs might have received no remuneration because the employer was not negligent or could invoke one or more of the three defenses. The families of eligible workers, however, should have received large enough amounts to compensate them for the lost earnings of the deceased worker. The distributions in table 2.3 imply that a relatively small percentage of workers received large awards, defined as greater than four times annual earnings (roughly two thousand dollars at the time). The percentage who received more than four years' earnings was less than 1 percent in three of the samples, although it reached a high of 8.8 percent in the Minnesota sample. These percentages seem relatively low and suggest that even in cases where employers were clearly negligent, workers' families did not collect anywhere close to the present value of the deceased's lifetime of lost wages.

We can also use the distributions to compare the percentage of workers who would have been better off with the negligence payments than under the workers' compensation benefits that were later adopted. As will be seen later, the fatal accident benefits under workers' compensation provided for streams of payments with present values ranging from two to eight times annual earnings, depending on the state's compensation rules (see table 3.1). The distributions in table 2.3 show that the percentages of families that would have fared better under negligence liability than under workers' compensation was at most 15.5 percent in Minnesota, and approximately 3 percent in Illinois and Pennsylvania. The comparisons therefore imply that the vast majority of families of fatally injured accident victims could anticipate better remuneration under workers' compensation than under negligence liability.

The compensation levels described in tables 2.1 and 2.3 actually overstate the disposable income received by the deceased's family because the legal and medical expenses the families incurred are not subtracted. In the Minnesota sample legal expenses consumed 11.9 percent of the total compensation paid to the heirs of fatal accident victims. Further analysis shows that only eight of the forty-five families paid any legal expenses, and they paid an average of 30 percent of their benefits to lawyers. When medical expenses are considered, some families lost money as a result of the industrial accident. An astonishing 66 percent of the Pennsylvania families had accident-related expenses that exceeded the compensation received from the deceased's employer. Among the Illinois and Minnesota families 18.8 percent and 6.7 percent, respectively, lost money as a result of the accident (no expenses were recorded for the Allegheny County sample). Overall, these data tend to confirm social reformers' claims that the employers' liability system left "well-nigh the whole economic burden of workplace accidents to be borne by the injured workmen and his dependents" (Eastman 1910, 220).

Finally, we should emphasize that the low levels of payments for fatal accidents were not caused by any common law strictures against compensation for fatal accidents. It is true that in England prior to Lord Campbell's Act of 1846 and in the United States in various jurisdictions the common law disallowed recovery of damages where accidents led to death on grounds that "there is no mode of estimating compensation for the death of a man" (U.S. Commissioner of Labor 1908, 85). By 1907, and by the time the foregoing samples were collected, all of the states had enacted laws that gave the personal representatives of the deceased a right of action in negligence cases. These acts often included maximum limits on the recovery of damages. For example, in Virginia and Minnesota the maximum was five thousand dollars, in Illinois the limit was ten thousand dollars.[6] It turns out these limits were not binding in any but the Minnesota samples in table 2.3. For example, the Minnesota maximum of five thousand dollars was roughly eight times the average annual nonfarm earnings in 1910 of $630 estimated by Douglas (U.S. Bureau of the Census 1975, 168), while the Illinois limit was nearly sixteen times annual earnings.

2.3 Nonfatal Postaccident Compensation

Examining nonfatal accident compensation is much trickier than studying fatal accidents. The severity of nonfatal accidents varied a great deal and many of the commissions that collected the data failed to report the types of accidents or only gave broad categorizations of the extent of an individual worker's injury. Further, there is substantial evidence that the reporting of nonfatal accidents under negligence liability was far lower than it was under workers' compensation (for detailed information about the reporting of accidents, see appendix A). If there was little chance of compensation, a worker had little incentive to report an accident under the negligence system because doing so may have jeopardized his job by signaling to the employer that he was either accident-prone or a malcontent. Similarly, employers had little incentive to report accidents for which they did not compensate workers because they might alert factory inspectors and others to dangerous working conditions, which could lead to increased scrutiny and/or fines. Since the samples described here are largely based on information collected from employers, it is likely that the percentage of injured workers compensated is overstated, as would be any calculation of expected benefits.

Table 2.4 presents summary statistics from eleven studies about the amounts of compensation that workers received and the expenses that they incurred from nonfatal injuries reported by employers. In all of the studies considered, there was a group of workers that received no compensation for their financial losses. The percentage receiving nothing ranged from a low of 9.1 percent among workers with serious temporary disabilities in Minnesota to a high of 72.9 percent of the permanent partially disabled in Kansas City, Missouri, in 1912. The weighted average (by sample size) of the percentages receiving no benefits for the group of eleven samples presented in the table is 40.2 percent. Given the reporting problem we have described, the 40.2 percent figure is clearly a lower bound.

Table 2.4 reports the ratio of employer-paid compensation to the reported value of lost wages and medical expenses for those injured workers receiving some positive level of benefits from their employers. Among those workers receiving some positive amount of compensation, the data suggest that many had financial losses exceeding what they received from their employers. Illinois coal miners, Michigan workers, Minnesota workers with nonserious temporary disabilities, and New York workers with both serious and less-serious injuries did not receive enough compensation, on average, to cover their lost wages and medical expenses. The seventeen furniture workers in Michigan who received positive benefits fared the worst among the sampled workers, recovering an average of only about a quarter of their losses.

These findings present two possibilities. First, the relatively low benefits reported in the table might be evidence in support of the social reformers' claims that the negligence system was not compensating injured workers who had reasonable claims against their employers. Even if workers had legitimate cases against their employers, the costs associated with pursuing a claim made full compensation unlikely. Alternatively, the low ratio of benefits to losses for those who received compensation may be an indication that the negligence system functioned as theory predicts, but some legally "undeserving" workers who received small amounts of remuneration pushed the average ratio downward.

The data reported in table 2.4 show that some injured workers received full compensation for their accident losses. A sample of accident victims receiving positive amounts of compensation in Kansas City in 1912 and 1916 and those with permanent partial and serious temporary disabilities in Minnesota were compensated in excess of their reported lost wages and medical expenses on average. The permanently disabled workers in the 1916 Kansas City sample recovered almost 2.3 times the value of their self-reported losses. One way to read these results is to suggest that some injured workers, presumably because their employers were negligent, were remunerated for the economic costs associated with their industrial accidents. Some may have even been compensated in excess of their lost wages

Table 2.4 **Payments to Nonfatal Accident Victims under Employers' Liability**

Sample	Observations	Percentage Receiving No Benefits	Ratio of Compensation from Employers to Losses (for Workers with Positive Levels of Compensation)[a]
Michigan manufacturing workers, 1897–1903	1,532	63.2	Not available
Illinois coal mining, 1908[b]	102	52.0	0.844[c]
Kansas City, Mo., 1912, permanent partial disability	85	72.9	1.229
Kansas City, Mo., 1916, permanent partial disability	120	29.2	2.274[d]
Kansas City, Mo., 1916, temporary disability	130	42.3	1.577[d]
Stonega Coke and Coal Co., Va., 1916–18, serious accidents	210	Up to 48.6	Not available
Grand Rapids, Mich., 1910, furniture companies[b]	33	48.5	0.240
Detroit, Mich., 1910, various companies[b]	26	46.2	0.515
Minn., 1909–10, permanent partial disability	20	20.0	1.417
Minn., 1909–10, serious temporary disability	22	9.1	1.122
Minn., 1909–10, not serious temporary disability	48	29.2	0.695
N.Y., 1907, permanent partial disability	60	20.0	0.414
N.Y., 1907, temporary disability	902	39.6	0.375

Sources: Illinois Employers' Liability Commission (1910, 139–45), Kansas City (Missouri) Board of Public Welfare (1912, 15–16; 1916, 8–16), Michigan Employers' Liability and Workmen's Compensation Commission (1911, 99, 106–7), Fishback (1987, 311) summarizing Stonega Coke and Coal Co. Records, Minnesota Bureau of Labor, Industries, and Commerce (1909–1910, 172–87), and New York Commission on Employers' Liability (1910, 244–49). Some of the entries in the table were previously published in Kantor and Fishback (1995, 410).

[a]Compensation from employers might include wages paid during disability, medical expenses, and any employers' liability insurance settlements. Losses primarily include wages forgone during disability and medical expenses that the employee was left to bear. It should be noted that the samples are probably incomplete because they relied on employers' reports.

[b]The sample includes different type of accidents. The data source did not distinguish between them, however.

[c]This estimate is probably biased downward because we excluded five individuals who failed to report the value of their lost wages. Three of these people received relatively large court awards amounting to four thousand, six thousand, and eight thousand dollars, respectively. It seems unlikely that their lost wages would have been substantial enough to offset these large levels of compensation in our benefit to cost estimate.

[d]These measures tend to be biased upward because fifteen accident victims in the permanent partial sample and ten in the temporary disability sample reported that they paid their own medical expenses, but did not provide a dollar value. As a result, in estimating the ratios, we set these workers' medical expenses to zero.

and medical expenses to cover the costs of "pain and suffering." Alternatively, the excess might reflect payments covering the workers' transactions costs of negotiating compensation or a premium reflecting the workers' threatening to pursue their accident claims in the courts.[7]

2.4 The Determinants of Accident Compensation

If there were no transaction costs associated with litigating, then we would anticipate that court decisions would have closely followed the common law doctrines, as long as judges themselves were following the rules. We know, however, that there were substantial costs of going to court and that there were extensive delays, which landed injured workers or their heirs in a world of settlement negotiations, where the courts determined the amount of compensation they received if the negotiations broke down.

The economic literature on settlement negotiations suggests that when the expected court award was below the worker's costs of going to court, the employer would not pay the worker anything. In the case of workplace accidents in the early twentieth century, this scenario might have occurred when the damage suffered was relatively slight, or when the employer was likely to win in court because he could easily defend against the negligence claim and/or invoke one of the three defenses. Once the expected court award exceeds the workers' costs of going to court, however, the bargaining outcome depends on the information available to both workers and employers.[8] If both have the same information about the expected court award, we would anticipate that they would settle out of court. If the employer has information unavailable to the worker, or vice versa, there is no guarantee of a settlement. At the turn of the century, then, we should see a mixture of settlements and court decisions that may or may not reflect the ability to invoke the common law doctrines. In sum, the presence of legal costs makes the link between the common law doctrines and accident compensation tenuous if damages were below legal costs and at higher levels of damages because transaction costs and informational problems may have distorted the relationship between the theory and practice of the common law.

Even if an employer had not been legally liable for a worker's accident, he might have had other reasons for offering accident compensation. Recent research in labor economics suggests that the payment of nonwage benefits potentially can raise productivity or lower turnover.[9] For example, a number of firms, particularly large ones, sought to attract and keep productive workers by enhancing nonwage benefits. Andrew Carnegie and International Harvester both developed private schemes for compensating injured workers prior to workers' compensation, while a number of companies developed model towns to try to enhance the productivity of their workforces. Similarly, firms may have sought to limit turnover of skilled workers by developing a reputation for treating their injured workers well. One signal that employers were making payments for these reasons would be the presence of payments to workers whose expected court costs were higher than their accident costs.

How the common law affected payments to accident victims has been studied in different settings for which information was collected from a population of injured workers, not just those who received a court award. Nearly all the studies show that the common law had an impact on the probability and amounts of compensation received, although the common law was not the only factor determining accident compensation. A study of the Stonega Coke and Coal Mines in Virginia during the years 1916–1918 shows that in settings where Stonega's lawyers felt the company was potentially liable, the probability of paying accident compensation was higher, as was the amount paid.[10] The median payment to fatal accident victims was approximately two hundred dollars higher when the lawyers considered Stonega potentially liable than when they claimed the firm was not liable. Similarly, the company paid a positive amount to each of the fifty-two nonfatal accident victims when the lawyers believed the company was potentially liable. In contrast, they made payments to only thirty-four of the eighty injured workers when the lawyers did not feel that the company was liable (Fishback 1987, 311–13).[11] It is clear that the common law doctrines were not fully decisive. After all, the company did pay forty-six injured workers where the lawyers felt the company was not liable, and two of those workers received fifteen hundred dollars, which was the second smallest payment made to nonfatally injured workers. The company may have made these payments to provide benefits to workers to cut worker turnover, or they may have been paying legally unqualified workers to avoid court costs.

James Croyle (1978) found more mixed results in his study of the operation of the negligence liability system in Minnesota. The Minnesota Bureau of Labor, Industries, and Commerce (MBLIC) collected accident compensation data in 1909 and 1910 in which they attempted to gather information from both employers and injured workers or their heirs. These data therefore include compensation decisions that were made both in and out of a court setting. Croyle found that the common law doctrines were important determinants of fatal accident compensation, although they had much less impact on nonfatal accident compensation. In a regression analysis he found that the employer paid out $1,104 more in compensation to the families of fatal accident victims when the investigators considered the accident to be a result of employer negligence. On the other hand, the assumption of risk defense had little impact; when the investigators considered the accident to be caused by a normal hazard of the workplace, the fatal accident payment fell by only $56. But statistical tests did not reject the hypothesis of no effect (Croyle 1978, 294–97).[12]

Croyle also analyzed data on nonfatal accidents, but we do not believe it to be a random sample of all accidents. The sample for nonfatal accidents was collected from information reported by employers, and it is clear from archival evidence that MBLIC officials were skeptical about employers' accurate reporting of accidents. The MBLIC wrote incredulous letters to numerous employers asking them why no accidents had been reported from their firms. From this incomplete sample of nonfatal accidents, Croyle's analysis shows that employer negligence did not raise the amount paid to nonfatal accident victims, which could be a signal that employers did not report accidents in which they were grossly at fault. On the other hand, where the employers could invoke the assumption of risk defense, the payment fell by $198; when they could invoke the fellow servant defense the payment was $343 lower. There still remains some uncertainty in these estimates, however, because Croyle could not reject the hypothesis of no effect in either case. Croyle did find a difference between court decisions and settlement payments for nonfatal accidents. When he examined court decisions explicitly, employer negligence raised the level of compensation, and in situations where employers could invoke one of the three defenses the average payment to nonfatal accident victims was relatively lower (Croyle 1978, 289–94).[13]

In a study of the probability that nonfatal accident victims received compensation in Michigan between 1897 and 1903, we found that the common law doctrines had a relatively limited impact on the compensation that workers received (Kantor and Fishback 1995).[14] We tested the impact of contributory negligence in two ways. First, in a direct test we found that accidents identified as being caused by worker carelessness lowered the probability that a nonfatal accident victim received compensation by up to 29 percentage points, but in statistical tests we could not reject the hypothesis of no effect. A second, less direct test showed that workers with more experience at their firms were more likely to receive compensation from their employers. It may be that employers had more difficulty invoking the contributory negligence defense against more experienced workers.

To test how the assumption of risk doctrine affected accident compensation, we examined whether a worker who faced greater workplace accident risk was less likely to receive compensation. Employers may have been better able to invoke the assumption of risk defense when workers knew the jobs were riskier. The results show no evidence that greater accident risk raised or lowered the probability that the worker received accident compensation. Finally, we found some evidence that the fellow servant defense might have influenced the probability of payment because injured workers were more likely to receive payments from larger firms. Larger firms would have had more difficulty in invoking the fellow servant defense, all else constant. To the extent that larger firms were more hierarchical, the chances that a supervisor's behavior caused the accident increased; therefore, the firm's ability to invoke the fellow servant defense was limited by the vice-principal doctrine, which considered a supervisor's negligence to be treated as negligence by an employer. Moreover, in larger firms workers were more likely to interact with coworkers from different parts of the firm and the injured worker was likely to have had little working relationships with these people. In these cases, the issue of common employment might have been used to limit the fellow servant defense (Clark 1908, 29–42).

Another implication of the common law is that accident compensation should have borne some resemblance to an injured worker's losses. The Minnesota data show that the level of compensation was clearly influenced by the economic loss a worker or his family incurred as a result of an industrial accident. Croyle's regression analysis shows that families of fatal accident victims with higher annual earnings received more compensation. The increase was roughly $49 for every $1 increase in weekly earnings, which translates to a dollar increase in compensation for each dollar of annual earnings. When we analyzed similar data for Pennsylvania and Illinois coal mining, we found that $1 increases in weekly income raised the compensation by about $36 and $26, respectively, although we could not reject the hypothesis of no effect (Kantor and Fishback 1994b). Croyle's (1978, 290, 294) study of nonfatal accidents shows that payments rose by $1.36 for each $1 increase in income lost from the accident. However, this marginal payment of more than a dollar for each dollar of lost income may not have been true in other states. The Minnesota sample was one of the few samples in table 2.4 where the ratio of nonfatal accident payments to lost income exceeded one.

In summarizing the results thus far, the common law doctrines seem to have influenced the probability and level of accident payments, but they were clearly not the only influence and sometimes not even the dominant influence. Settlements were clearly influenced by institutional features. Families in Minnesota who hired lawyers typically received substantially higher payments that more than offset the cost of legal fees. For every dollar spent on legal expenses, nonfatal accident compensation rose by $2.18, while fatal accident compensation rose by $3.02.[15] Similarly, among the Illinois mining families of fatal accident victims, filing suit seems to have been a major determinant of the amount of compensation a family received. Filing a suit against a mining company raised the fatal accident payments to Illinois coal miners by $1,429. Both results, however, must be approached with caution. It is possible that the only cases that were brought to trial were those in which the employer was clearly at fault and thus the worker was likely to receive a favorable court award.

One reason why the common law might not have been the only determinant of accident compensation is that some employers might have used disability payments as a component of their employees' wage packages. By paying compensation to injured workers, even if compensation was not legally required, some employers may have been able to use this image of relative generosity to reduce turnover among their workers or raise the productivity of the workforce. One way to determine whether employers did so is to examine the probability of paying compensation at very low levels of lost time, which were below any expected measure of legal costs. Table 2.5 shows the percentage of workers who received payments and those who did not receive payments for different levels of days disabled in Michigan between 1897 and 1903. If workers faced legal costs that involved any kind of fixed charge and employers were not using disability payments to raise productivity, we would expect no payments to workers at low levels of days disabled (even if the probability of winning costly litigation was one). However, if the employers received positive productivity benefits from paying workers, then we would expect payments to workers even at very low levels of days disabled. Table 2.5 shows that a similar percentage of workers received payments in the lowest range of days dis-

Table 2.5 **Distribution of Wage Compensation by Days Disabled**

Number of Days Disabled	Number of Workers Not Receiving Wage Benefits	Number of Workers Receiving Wage Benefits
0–5	67 (67.7%)	32 (32.3%)
6–10	117 (65.4%)	62 (34.6%)
11–15	127 (65.1%)	68 (34.9%)
16–20	39 (60.9%)	25 (39.1%)
21–30	234 (64.8%)	127 (35.2%)
31–40	60 (57.7%)	44 (42.3%)
41–50	89 (61.4%)	56 (38.6%)
51–60	76 (57.1%)	57 (42.9%)
61–90	72 (64.9%)	39 (35.1%)
91–120	25 (58.1%)	18 (41.9%)
>120	69 (70.4%)	29 (29.6%)
N	975 (63.6%)	557 (36.4%)

Sources: Michigan Bureau of Labor and Industrial Statistics (1898, 31–55, 72–73, 79–92, 100–101, 108–22, 132–33, 140–51, 158–59, 165–76, 184–85; 1899, 8–37, 58–61, 69–85, 93–94, 102–15, 127–30, 138–52, 156–59, 165–80, 193–96; 1900, 6–37, 46–47, 52–68, 74–75, 83–97, 104–5, 111–27, 132–33, 139–53, 160–61; 1901, 6–37, 52–53, 61–82, 86–87, 95–111, 116–17, 124–46, 152–53, 159–76, 182–83; 1902, 186–251, 268–75, 281–319, 322–23, 328–49, 356–57, 364–83, 386–87, 392–415, 418–19, 426–53, 458–61, 466–95, 504–5; 1903, 34–39, 54–57, 82–85, 110–15, 134–35, 158–65, 184–85, 216–17; 1904, 38–43, 64–67, 96–97, 122–23, 146–47, 176–79, 202–3, 232–35).

abled, in the middle ranges, and the top ranges, which is consistent with the notion that some employers were making payments as implicit fringe benefits and not just seeking to avoid a court award. The evidence is consistent with the view that some, although clearly not all, employers were paying benefits without the threat of court suits.

Although we earlier ascribed the finding that a worker's experience within the firm raised the probability of compensation in Michigan to the employer's difficulties in invoking the contributory negligence defense, there might be two alternative interpretations for this finding. First, since injured workers who had lengthy tenures with their employers were obviously stable employees, firms may have paid disability benefits in order to keep the injured worker financially tied to the firm. Since the average amount of time that workers in the Michigan sample were out of work was about thirty-six days, employers may have used the disability payments as a way to limit turnover and to reduce costs of training new workers. Second, that firms were more likely to compensate more veteran employees is also consistent with labor economists' findings that wages tend to be positively correlated with firm tenure.[16]

Compensating injured workers might also have been a component of an efficiency wage package. Stiglitz (1987) argues, for example, that because monitoring employees is more difficult in larger firms, they will pay above-market wages in an attempt to mitigate employee shirking.[17] The opportunity cost of shirking would be relatively high for these well-paid workers because if they were detected performing substandardly, then they would forgo their above-market wage premiums. This hypothesis implies that larger firms would be more likely to compensate injured workers. In fact, we found evidence in our Michigan study that larger firms were more likely to compensate their nonfatally injured workers.

Since the compensation system involved the decisions of so many different types of people, including employers, lawyers, juries, and judges, noneconomic and nonlegal factors potentially played a role. Various decisionmakers could have sought to show sympathy for families with more dependents. However, Croyle's study of Minnesota found that the number of dependents did not have strong positive effects on the payment of compensation to fatal or nonfatal accident victims. Similarly, we found no evidence that married Michigan workers around the turn of the century were more likely to receive compensation for their nonfatal accidents.

Discrimination was also a potential problem for immigrant workers in the courts. Foreign-born workers might have been less likely to receive compensation due to limited understanding of American law and language or financial constraints that discouraged them from seeking a claim against their employers. In the Michigan nonfatal accident sample we found no evidence of lower probabilities of compensation for immigrants, but it should be noted that 82 percent of Michigan's foreign-born workers were from the United Kingdom, Germany, Scandinavia, or Canada (U.S. Bureau of the Census 1903, 732–35), and McGouldrick and Tannen (1977) argue that such northern European workers faced less discrimination and fewer language and financial barriers than workers from southern and eastern Europe.[18] In a study of fatal accident payments to the families of Illinois coal miners, we also found that nativity had no effect on the levels of payments their families received (Kantor and Fishback 1994b).

Organized labor, in calling for workers' compensation legislation, often saw insurance companies as barriers to compensation and an unnecessary financial burden on limited accident funds. Robert Asher (1969, 464) provides a colorful description of the workers' logic: "The insurance companies had only one motive—profit. Whenever possible, the insurance companies intimidated workers into accepting reduced settlements. In court the insurance companies often won cases on meaningless technicalities. In short, the interest of the casualty insurance companies dictated a policy of opposition to all employee claims. The casualty companies cared little about the suffering of injured workers. But many employers wanted to help injured workers for humanitarian reasons or because they reasoned that contented employees were better workers and were less likely to join unions. Because they could not afford to self-insure, these employers had to let the profit-seeking casualty companies with which they insured handle relations with injured laborers as the insurance companies saw fit." In our analysis of the Michigan data on nonfatal accident compensation, however, we found that 23.7 percent of the firms carried liability insurance, implying that the great majority of firms self-insured. Regression analysis of the probability that a worker received accident compensation contradicts the claims of organized labor. The probability that disabled workers received compensation actually was 3.6 to 6.4 percentage points higher if their firms had liability insurance, although we cannot reject the hypothesis of no difference.

2.5 Preaccident Compensation: Risk Premiums in Wages

Postaccident compensation was not the only form of compensation that workers received for risking bodily injury at work. Studies of recent data suggest that workers often receive higher wages when faced with more dangerous jobs (see Moore and Viscusi 1990). There is also evidence that at least some groups of workers received preaccident compensation in the form of risk premiums in wage rates under the negligence liability system. Recall that a well-functioning labor market and the presence of risk premiums in wages was a key reason why Landes and Posner (1987, 309–11) felt that the assumption of risk defense was not unreasonable or could contribute to efficiency.

We found some evidence of payment of higher wages to workers in more dangerous industries in samples of male workers from several states between 1884 and 1903 (Fishback and Kantor 1992). In a Kansas sample of workers from 1884 to 1887, we found that an increase in the expected income loss from workplace accidents led to a rise in wages that paid for 63 percent of the additional loss. In a Maine sample from 1890, wages rose enough to cover approximately 38 percent of the additional expected loss, while in California the wages rose enough to cover 220 percent of the additional expected loss. We did not find risk premiums in the wages paid to women in Indianapolis in 1892 or to children in New Jersey in 1903, possibly because the level and variation of accident risks were smaller for those groups than for men.[19]

There was also evidence that higher accident risk was rewarded with higher wages in jobs within the same industry. In coal mining in the early 1900s, Fishback (1992, chap. 6) found evidence that work inside the mine where there was greater accident risk paid about 14 percent higher wages than work requiring similar skill outside the mine. In another study of the railroad industry between 1892 and 1909, Kim and Fishback (1993, 811–13) found that railroad workers in jobs with higher fatal and nonfatal accident risk received higher wages. The wages adjusted to changes in fatal accident risk in ways that implied that the railroad labor markets evaluated the life of a railroad workers at roughly thirty thousand to thirty-six thousand dollars in 1967 dollars, which was roughly equivalent to the present value of the lifetime stream of earnings of a railroad worker. The wages adjusted to nonfatal accident risk in ways that implied a market value of a nonfatal accident of slightly more than a year's income.[20]

2.6 Summary

Under the negligence liability system, compensation for fatal accidents was relatively meager. The nature of the liability rules meant that a substantial number of families of fatal accident victims received no compensation. Among those who did receive compensation, the amounts were generally less than a year's income, often little more than payment for burial expenses. Less than 4 percent of the heirs of fatal accident victims received levels of compensation that exceeded the levels they would have received under workers' compensation had that system been in place at the time of their accidents. Similarly, substantial numbers of nonfatal accident victims received no benefits.

Did accident compensation in the early twentieth century, prior to workers' compensation, follow the dictates of the common law system with its three defenses? The fact that numerous injured workers received no benefits could be seen as roughly consistent with the common law doctrines. However, there were substantial delays in court decisions and substantial costs of going to court, thus the vast majority of accident compensation decisions were made outside the courtroom in settlement bargaining. Analyzing how accident victims or their heirs were compensated around the turn of the century suggests that the impact of the common law defenses on accident payments was filtered through a settlement bargaining process that was influenced by legal costs and private information. There is evidence that the common law doctrines guided the de facto system of accident compensation, but other factors clearly influenced who received compensation. Some employers may have used accident compensation as a means of offering nonwage benefits to their workers. Certainly, in some settings they were paying benefits to workers who experienced damages so small that they had no credible threat of taking the employer to court. In other cases, employers paid damages to workers for accidents where they did not consider themselves liable. By offering the implicit promise that they would take care of their injured workers, larger employers may have been able to lower their monitoring costs and reduce turnover among workers who had firm-specific experience.

The presence of legal costs and informational asymmetries made the impact of the common law indirect and complex. For example, analysis of several accident samples shows that the effect of the common law doctrines on the probability and levels of accident payment were not always substantial. The primary role of the common law seems to have been in determining whether the injured worker had a credible threat of pursuing a court case against his employer (i.e., did his expected award in court exceed his legal costs).

Our exploration into the determinants of accident compensation casts some doubt on generally held impressions of the system. We found little evidence that the system was more sympathetic to workers with families. We found no consistent evidence that immigrant workers received less. Nor did we find evidence that workers were less likely to receive payments when insurance companies were involved. On the other hand, workers could enhance the amounts and probability of payment by hiring a lawyer, who effectively served as their advocate in working through the legal system. But hiring a lawyer meant enticing him with a portion of any award that was won or by paying him an upfront fee, which was something most injured workers probably could not easily afford.

Major changes in the common law might have been reflected in a lowering of the worker's legal cost threshold, which would have expanded the range of remunerable accidents. Eliminating the three defenses, for example, presumably would have lowered legal costs by eliminating the debate over the applicability of the defenses in each particular case. The negligence of the employer, the basis for any compensation under the common law, would still require a court decision and some unknown number of workers would still be left uncompensated for their accidents. In fact, it was for this reason that social reformers in the early twentieth century extolled the virtues of workers' compensation and its guarantee of post-accident compensation.

Notes

1. For lucid discussions of the employers' liability system see Clark (1908), Weiss (1966), and Epstein (1982).

2. Interstate railroad workers are excluded from the analysis here, and from consideration in most of the book, because they were covered under the Federal Employers' Liability Acts of 1906 and 1908. Intrastate railroad workers and non-train personnel for interstate lines, such as repairmen permanently stationed in a local workshop, would have been covered under a state's workers' compensation law, however.

3. Since the German and Washington samples reflect accident causes under workers' compensation, the percentages reflecting employer negligence might be biased downward because of the moral hazard (on the part of workers) associated with no-fault insurance.

4. These figures represent gross compensation and ignore the legal expenses that the victim's family often paid. In the 1909–1910 Minnesota study, legal expenses consumed 11.9 percent of the total compensation paid to the families of fatal accident victims. At the higher end of the scale, in forty-six fatal accident cases in Erie County, New York, between 1907 and 1908, the New York State Employers' Liability Commission calculated that 26.3 percent of the gross amount that employers paid to families went to lawyers (Eastman 1910, 290). The introduction of workers' compensation did not completely eliminate the need for lawyers, however. An injured worker or his family may have had to hire a lawyer if the case was contested. Assuming lawyers collected 25 percent of the families' gross compensation in the contested cases, Conyngton's (1917, 110–37) data suggest that lawyers' fees accounted for between 0.9 and 2.7 percent of the total awards under the new system.

5. The present value of the stream of earnings at the time of the accident is the amount of money that would have to be invested at that time to generate the workers' stream of annual earnings. For example, if we put twenty thousand dollars into the bank today at an interest rate of 5 percent compounded annually, we could pay a worker one thousand dollars per year forever. The present value of the stream of one thousand dollars per year forever is twenty thousand dollars.

6. All forty-eight states had such laws by 1907. See U.S. Commissioner of Labor (1908, 85–87). New York, Oklahoma, Pennsylvania, Utah, and Wyoming declared in their constitutions that the amounts recoverable could not be restricted. Maximums were imposed of four thousand dollars in Massachusetts; ten thousand dollars in Illinois, Indiana, Kansas, Missouri, Ohio, Virginia, West Virginia, and Wisconsin; seventy-five hundred dollars in Oregon; seven thousand dollars in New Hampshire; and five thousand dollars in Arizona, Colorado, Connecticut, Maine, Minnesota, and Wyoming. In other states no maximum was named.

7. In a study of modern product liability claims and compensation for bodily injury, Viscusi (1986) found similarly that the amount of the bodily injury payment is often comparable to the size of the loss, although the elasticity of bodily injury loss with respect to the bodily injury payment was below one for the average loss and declined as the loss increased.

8. See Kantor and Fishback (1995). The presence of legal costs has led to a literature on the modeling of settlement negotiations, surveyed by Cooter and Rubinfeld (1989). See also Bebchuk (1984), Daughety and Reinganum (1993), Wang, Kim, and Yi (1994), and Spier (1994).

9. See Lazear (1979), Hutchens (1987), Jovanovic (1979), Altonji and Shakotko (1987), Abraham and Farber (1987), Brown (1989), Topel (1991), and Hersch and Reagan (1990).

10. See Fishback (1987, 311–13). Examples of accidents for which the Stonega lawyers felt the company might be liable include roof falls where an inexperienced miner was working alone, roof falls in haulage ways where the company was responsible for propping the roof, equipment accidents where it was hard to determine who was at fault, and cases where machinery was defective. If an experienced miner was hurt in a roof fall, the lawyers were unlikely to consider the company to be liable. Virginia never passed an employers' liability law that limited the employers' defenses. The Virginia legislature adopted workers' compensation in 1919.

11. The total number of accident victims described in this paragraph does not equal the totals reported in table 2.4 because there were a number of cases where there was missing information about the amount received or the lawyer's opinion.

12. Croyle tried to examine differences between court decisions and settlements, but his sample included only five court decisions, which we feel to be too small a sample from which to derive much information.

13. Croyle included railroad workers in his analysis, which potentially is a problem because the common law doctrines differed for railroad and nonrailroad workers. Railroad workers involved in interstate commerce were covered by the Federal Employers' Liability Act which limited the contributory negligence and fellow servant defenses. Minnesota never passed an employer liability act for nonrailroad workers, but they did have one for railroad workers.

14. Compared to the studies of the negligence liability system reported in table 2.4, the Michigan workers tended to receive accident benefits at a lower rate than their peers. Whereas the weighted average of accident victims receiving no benefits was 40.2 percent in the samples reported in table 2.4, 66.8 percent of the Michigan workers in the Bureau of Labor and Industrial Statistics's data received no wage benefits. The 66.8 percent figure, however, is less than the maximum receiving no benefits found in the table—72.9 percent of the Kansas City workers sampled in 1912 recovered nothing from their employers. Note that 66.8 percent of injured workers receiving no compensation is consistent with the data on accident causes presented in table 2.2. According to those estimates, between 52 and 100 percent of injured workers would have been legally entitled to nothing from their employers under a strict reading of the common law.

15. Croyle found that filing a lawsuit substantially lowered fatal accident payments in Minnesota but raised nonfatal accident payments. However, he also included legal expenses in the analysis, which is highly correlated with litigation. Further, legal expenses are problematic given that many lawyers charged contingency fees. Thus, in Croyle's regression analysis the legal expenses are strongly correlated with the payment because many times they are calculated as a percentage of the payment. We have reestimated the analysis using a dummy variable for the presence of a lawyer and found a positive and statistically significant impact. If the case was decided in court, we found no influence on the amount paid to fatal accident victims.

16. One interpretation of the finding that firms were more likely to compensate their more veteran injured employees is that the disability benefits were a component of a pay-sequencing package. That is, in order to elicit diligent work from their employees, firms may have offered workers less than their marginal revenue

products in the early years of a long-term relationship, and then "overpayment" in later years. See Lazear (1979) and Hutchens (1987). Alternatively, the better fringe benefits associated with longer tenure may simply indicate that these workers were more productive than their coworkers because they had good "job matches," as Jovanovic (1979), Altonji and Shakotko (1987), and Abraham and Farber (1987) argue. Finally, the higher earnings may have been compensation for the worker's investment in firm-specific human capital. See Brown (1989), Topel (1991), and Hersch and Reagan (1990).

17. Brown and Medoff (1989) empirically find a positive relationship between plant size and wages. For general studies of the presence of efficiency wages, see Katz (1986) and Krueger and Summers (1988).

18. The ethnic mix of the sample is representative of the ethnic mix of the Michigan workforce. Foreign-born workers composed 35.1 percent of the workers in the sample compared with 32.4 percent of Michigan's workforce in 1900 (U.S. Bureau of the Census 1904, 306–11).

19. In this same study, we also found evidence that adult workers received higher wages to compensate for longer layoffs (Fishback and Kantor 1992).

20. The evaluation of the value of accidents comes from examining the impact of a change in accident risk (*dp*) on changes in wages (*dw*). The change in the wage (*dw*) would be equal to the change in accident risk (*dp*) times the value of the loss from the accident (V): $dw = dp \times V$. The analyses cited gave information on *dw* and *dp*, which allowed the scholars to solve for V.