Economic theory predicts that workers will demand a ‘wage premium’ to compensate them for workplace safety and health risks. In response, employers will reduce these risks until it is less expensive to pay employees additional compensation than it is to invest in additional occupational safety and health precautions. In this manner, efficient labor markets will produce the abatement of some safety and health hazards, and workers will be compensated by employers for the risks that remain.

Since the early 1900s, however, governments have rejected sole reliance on labor markets to make adjustments in occupational safety and health. Between 1911 and 1920, virtually every state in the United States enacted some type of quasi-administrative scheme to award compensation for workplace accidents. Today, all 50 states and the federal (US) government administer such programs. In 1970, Congress enacted the Occupational Safety and Health Act (OSH Act) empowering the Occupational Safety and Health Administration (OSHA) to regulate workplace conditions by, among other methods, the promulgation of safety and health regulations known as ‘standards’. Other countries have also implemented administrative regulation.

This chapter describes how the law and economics literature analyzes the role of labor markets and administrative regulation in addressing occupational safety and health. Workers Compensation is the subject of a separate chapter in this Encyclopedia. This chapter first describes how economic theory understands the relationship between labor markets and administrative regulation and the role of each in reducing workplace injuries and illnesses. The chapter then considers the performance of labor markets in producing wage premiums and how government regulation that increases workers’ information about occupational risks can improve the performance of labor markets. Finally, the chapter addresses the performance of administrative regulation in reducing occupational safety and health risks and how potential reforms of standard-setting and enforcement might increase the effectiveness of regulation. Readers seeking an overview of these subjects should see Rea (1983), Viscusi (1983, 1992), Dickens (1984), Schroeder and Shapiro (1984) and Robinson (1991).
1 Introduction
As this introduction develops, economic theory justifies administrative regulation as a remedy for the failure of labor markets to produce fully compensating wage premiums. The role of regulation is to establish the amount of accident and illness protection that would occur if labor markets operated in a fully efficient manner.

A Spillover costs
Economics recognizes two types of costs associated with the production of a product. ‘Private costs’ are the costs paid by a manufacturer that creates and sells a product. The manufacturer, for example, pays for the raw materials necessary to manufacture the product. These costs are ‘internal’ to the transaction of making and selling the product in the sense that the manufacturer pays for them. Spillover costs, by comparison, include costs associated with the creation of a product paid for by someone other than the manufacturer. That is, they are costs of production that spill over onto someone other than the manufacturer. Thus, when a worker pays for the medical and other expenses that result from a workplace accident, these expenses are spillover costs. The same cost is also known as an ‘externality’ because it is ‘external’ to the manufacturer’s production function.

For a market to be efficient, the manufacturer of a product should pay for all ‘social costs’. Social costs, which are the total of all of the costs associated with the manufacture of product, include both private and spillover costs. In an efficient market, if a worker is injured, the manufacturer will pay for the worker’s medical and other expenses and include these expenses in the price for which the product is sold. If, however, the manufacturer fails to pay for these expenses, there will be more demand for the product than if it were sold at a higher price that reflected its social costs. The result is inefficient because resources are diverted to the manufacturer and sale of some quantity of product that would not occur if the product were properly priced.

B Wage premiums
Until Coase (1960), economic theory favored government intervention either in the form of liability or a tax to address spillover costs. The goal was to use government action to force manufacturers to pay for these costs, thereby assuring that the price of products reflected their true social costs. Coase pointed out that persons who might be injured by the actions of others would negotiate with them once a property rule was established specifying whether the risk creator had the right to proceed with some activity that created spillover costs or those subject to such risks could legally prevent such activity. Absent transaction costs, Coase established
that these negotiations would produce the same level of safety as the imposition of liability or a tax. Coase recognized, however, that transaction costs could prevent bargaining from reaching the same efficient result, in which case government intervention would be justified.

The negotiation over wage premiums creates the type of bargaining that Coase predicted could lead to an efficient adjustment in spillover costs. Employers that fail to reduce workplace hazards can expect to pay increased labor costs because workers will demand additional compensation for enduring occupational safety and health risks. Assuming that workers are fully informed about job risks, workers will demand a wage premium that compensates them for any inadequacies in the expected cost of an injury or illness not covered by workers’ compensation. In addition, the employer may have to pay for the cost of recruitment and training of additional workers to replace those persons who are injured or killed and other related costs. To avoid these expenses, an employer will make safety and health improvements until the cost of additional precautions is more than the expense of paying for wage premiums, workers’ compensation and other related costs.

In this manner, labor markets should produce the abatement of some safety and health hazards and workers should be compensated *ex ante* by wage premiums and *ex post* by workers’ compensation for the risks that remain. If workers are fully compensated for those risks, no government intervention will be required according to economic theory. Furthermore, the payment for fully compensating wage premiums is ‘efficient’ in the sense that it eliminates overproduction.

C Regulation and efficiency

As noted, Coase recognized that government action may be necessary because transaction costs can prevent market adjustments that are fully efficient. If labor markets fail to produce fully compensating wage premiums for this reason, regulators can address this shortfall by ordering employers to undertake safety and health precautions up to the point where the costs of such improvements exceed their benefits. If benefits are measured as the value of the improvements to workers, administrative regulation can produce the same investment in safety and health precautions as efficient labor markets.

In the OSH Act, however, Congress rejected economic theory as the basis for administrative regulation. As discussed in greater detail in Section 3.A, OSHA is authorized to order safety and health protection beyond the point indicated by such a cost-benefit test. Section 3.C addresses the debate in the literature concerning whether OSHA should be restricted by a cost-benefit mandate.
2 Labor markets
Coasian bargaining over wage premiums offers the prospect of causing an efficient adjustment in the level of occupational injuries and diseases as spillover costs. This section discusses the performance of labor markets in producing wage premiums, why such payments probably do not fully compensate workers for their occupational risks, and how government mandates that provide workers with additional information about these risks can improve the performance of labor markets in abating workplace safety and health risks.

A Empirical evidence of wage premiums
Viscusi and Aldy (2003), Viscusi (1983), and other analyses (listed and described in these two articles) have found empirical evidence of wage premiums. Viscusi (1983) estimates that the average annual wage premium for all job risks in the United States is about $400. Similarly, Robinson (1991) estimates that workers who were exposed to significant risks of occupational injuries received average annual wage premiums of about $300 to $500. This amounts to about a 5 to 8 per cent increase above the earnings of unexposed blue-collar workers. Leeth and Ruser (2003) find evidence of compensating wage differentials for fatal and non-fatal injury risk that vary according to gender and race.

Although workers receive only modest wage premiums, Viscusi (1993) notes the majority of labor market studies in the United States are consistent with a value of statistical life (VSL) that is between $3.0 million and $7.0 million. As explained below, the VSL concept summarizes what market evidence indicates about the willingness of people to pay for a reduction in the risk that they will be killed or injured. Viscusi and Aldy (2003) report that US labor market data typically show a VSL in the range of $4.0 to $9.0 million, with a median estimate of $7.0 million. By comparison, Mrozek and Taylor (2002) conclude that when best-practise assumptions are used, labor market studies reveal a $2.4 million VSL, with a range of $1.8 to $3.0 million. Viscusi and Aldy (2003) also summarize 20 labor market studies in both developed and developing countries published since 1990.

The VSL concept recognizes that when a group of people expend money to avoid a potentially fatal risk, they are implicitly defining a tradeoff between wealth and the probability of death. The ratio of the total amount of money spent to the probability of a fatality is expressed as a dollar value of a fatality, such as a VSL of $7.0 million. The word ‘statistical’ refers to the fact that people are spending money to reduce the probability of a fatality rather than to avoid the death of some identified person. A wage premium can be thought of as a willingness to pay for a reduction in the risk of a fatality in the sense that a worker gives up the wage premium if
she or he moves to a safer job. A small wage premium is the equivalent of a VSL of the order of millions of dollars because wage premiums are paid for relatively small risks. If one worker out of 10,000 workers will die annually from a particular safety risk, a $400 wage premium is the equivalent of a VSL of $4.0 million, as determined by dividing the $400 wage premium by the fatality risk (0.0001). Viscusi and Aldy (2003) explain the methodology used in calculating a VSL, as well as the methodological challenges that this calculation presents.

Although most studies find a correlation between risky work and additional compensation, this conclusion is challenged in Leigh (1991), Dorman (1996) and Dorman and Hagstrom (1998). The last two publications object that wage premium studies fail to account for labor market imperfections in the industries being studied. Taking into account these imperfections, Dorman and Hagstrom (1998, p. 133) found no evidence that workers received compensation for the risk of fatal and non-fatal injuries, except for one weak measure of fatality risk, causing them to conclude that their ‘results cast doubt on the very existence of compensating differentials for workers, union and non-union alike’.

B Adequacy of wage premiums

Despite the existence of wage premiums that imply a significant VSL, it does not follow that workers receive a wage premium that compensates for any inadequacies in the expected cost of an injury or illness not covered by workers’ compensation. Analysts have identified five reasons why it is likely that workers do not obtain fully compensating wage premiums.

First, the amount of additional compensation that a worker will seek for hazardous work is a function of the worker’s knowledge and understanding of existing risks. Robinson (1991) cites national survey data that 33 to 50 per cent of workers in occupations with high rates of disabling injuries and illnesses reported that they faced no significant safety or health hazards. Carmichael (1986) adds that because the dissemination of safety information in labor markets takes time, workers may lack adequate information when they seek a job. Oi (1974) notes, however, that full information by all workers is not necessary to obtain adequate compensating wages. What is important is that the marginal worker has full information.

Second, in order to bargain for fully compensating wage premiums, workers must be able to discern marginal differences in risks between jobs in the same firm or between firms in the same industry. As Lave (1983), Dickens (1984) and McGarity and Shapiro (1993) discuss, distinctions among risks are especially difficult to make in the context of occupational illness, where huge uncertainties befuddle attempts to predict the precise effects of health risks on longevity and the quality of life once a disease has manifested itself.
Third, as Weil and Pyles (2005) and Dorman (1996) discuss, a worker’s evaluation of risk may be distorted by the way individuals process risk information. Studies in the psychological literature suggest that people do not process risk information in the rational manner that economic theory assumes. For example, people engage in several forms of ‘bounded rationality’ which simplify and filter risk perceptions. Cognitive dissonance is another factor because it induces people to ignore or alter their perceptions of risk in order to avoid unpleasant conflicts with established beliefs.

Fourth, McGarity and Shapiro (1993) argue that even educated and skilled workers may hesitate to leave dangerous jobs because the hazardous pay is inadequate. Such workers may be hesitant to change jobs because of the loss of health benefits, pension rights, and seniority, the expense and disruption of relocation, and the difficulty of becoming familiar with a new employer. Boden and Jones (1987) hypothesize that these reasons explain the relatively low wage premium received by asbestos installation workers who were familiar with the significant risks that they faced.

Finally, the amount of a wage premium appears to be related to a worker’s bargaining power. Robinson (1991) cites data indicating that only poorly educated and low-skilled workers are likely to take dangerous jobs. His calculations reveal that hazardous jobs pay 20 to 30 per cent less than safe employment after taking into account education and skill levels. Because safer employment pays more, Robinson observes that persons with training and education avoid hazardous jobs and such jobs therefore go to minority workers.

Viscusi and Aldy (2003), Boden and Jones (1987) and Viscusi (1979) have found that estimates of wage differentials are substantially higher for unionized employees than for non-unionized employees, but Viscusi and Aldy do not attribute this outcome to differences in bargaining power. Instead, they hypothesize that it may reflect the risk preference of marginal workers in non-unionized workplaces who are willing to work for smaller wage premiums. They also suggest that unionized workers may have better information about job risks supplied by their unions. Finally, Viscusi and Aldy (2003, p. 43) hypothesize that because workplace safety is a type of a public good, it will ‘suffer the common under-provision associated with such goods due to free-riding’. Collective action by labor unions results in higher wage premiums because it overcomes such free-riding.

Dorman (1996) proposes that game theory be used to study the relationship of workers and employers concerning issues such as risk compensation. He argues that because game theory accounts for strategic behavior, it can clarify how cooperation and conflict inside a corporation impacts issues of public policy such as the protection of workers.
C  Reform
As mentioned, workers may be constrained in obtaining fully compensating wage premiums for workplace safety and health risks because of the lack of information. Regulatory policies that increase workers’ access to risk information should therefore improve market performance.

OSHA’s hazardous communication standard is a good example of this type of government mandate. The standard requires chemical manufacturers and importers to evaluate the hazards of the chemicals they produce or import and to prepare labels and material safety data sheets (MSDSs) to convey the hazard information to their customers. It further requires employers with hazardous chemicals in their workplaces to make these labels and MSDSs available to their exposed workers and to train them to handle the chemicals appropriately. Carle (1988) proposes improvements in OSHA’s standard, while Viscusi (1983) proposes additional regulation. Viscusi recommends that employers be required to apprise workers of the nature of the risks that they face, the risk level of the firm (death, injury and illness rates), its relative risk as compared to other firms in the industry, and other relevant risk information. Lambert (2004) would go further and substitute an information approach for OSHA standard-setting on the ground that it would lead to more efficient regulatory results.

3  Regulation
Economic theory, as noted earlier, justifies administrative regulation when labor markets fail to produce fully compensating wage premiums. This section will describe OSHA’s mandate, discuss the empirical evidence on whether regulation is effective in reducing occupational safety and health risks, and consider conflicting interpretations of this evidence. This section also describes proposals to make regulation more effective by reform of standard-setting and enforcement. The discussion of standard-setting reform discusses whether OSHA regulation should be the subject of a cost-benefit test.


A  OSHA’s mandate
The purpose of the OSH Act is ‘to assure as far as possible every working man and woman in the Nation safe and healthful working conditions’ (29 USC §651). Among its other provisions, the Act requires employers
to comply with health and safety standards promulgated by OSHA. Any such standard must establish conditions and practices that are ‘reasonably necessary or appropriate’ to provide ‘safe or healthful employment’ (29 USC §652(8)). In addition, any standard that concerns toxic materials or harmful physical agents must be established in a way that ‘most adequately assures, to the extent feasible, on the basis of the best available evidence, that no employee will suffer material impairment of health or functional capacity even if such employee has regular exposure to the hazard dealt with in such standard for the period of his working life’ (29 USC §655(b)(5)). States have the option to accept federal regulation of employers or to administer their own safety and health regulations subject to OSHA’s approval and supervision.

In *American Textile Manufacturers Institute v. Donovan* (1981), the Supreme Court held that the feasibility mandate for health standards precludes the use of a cost-benefit test for such standards. According to lower court decisions, a standard is feasible when it is technologically achievable and when employers can afford the cost of implementing it. A standard is not economically infeasible because it is financially burdensome or even because it threatens the survival of some firms in an industry.

The Supreme Court has not determined to date whether the OSH Act mandates a cost-benefit test for safety standards. These standards are subject to the edict in §652(8) that they be ‘reasonably necessary or appropriate’ to provide safe employment, which suggests to some interpreters that OSHA must meet a cost-benefit test. No lower federal court, however, has interpreted the Act to establish such a requirement.

B Empirical evidence of effectiveness

Analysts have attempted to confirm that OSHA’s activities have led to an improvement in workplace safety using a variety of approaches. These efforts have produced inconsistent results.

First, some studies project the trend of pre-OSHA injury rates and compare the projected results with the actual results. When Smith (1976), for example, compared actual injury rates in several high-hazard industries that OSHA had targeted for enforcement with projected injury rates, the actual rates were not significantly lower than projected rates. Mendeloff (1980), by comparison, found that actual injury rates were significantly lower than the projected rates for several individual types of injuries in California. His study, however, found no difference between actual and projected aggregate injury rates for California and for the nation. Curington (1986) likewise found mixed results. The frequency rate for all injuries in manufacturing industries in New York was no lower than the projected rate for such injuries, but there were reductions in injuries
resulting from being struck by a machine (43.6 per cent) and in the severity of all injuries (13.2 per cent). More recently, Lipscomb et al. (2003), using workers’ compensation data, found a 20 per cent reduction in the rate of falls among union carpenters after the state of Washington promulgated its vertical fall arrest standard for the construction industry as compared to the projected rate of injuries.

The state of Washington is one of the states that run their own occupational safety and health program under OSHA supervision. Bradbury (2006) finds that states that run their own OSHA programs experience fewer fatalities than states that utilize federal enforcement. He estimates that switching to a state-run program would save approximately 46 statistical lives in a year in the average state with federal enforcement.

Second, other studies have tested the correlation between aggregate industry-level injury rates and OSHA inspection activity. When Viscusi (1992) asked whether injury rates were affected by the frequency of OSHA inspections and penalties, he found that OSHA caused a 1.5 to 3.6 per cent decrease in the lost workday rate. The ‘lost workday rate’ measures the number of days of work that an employee misses after an injury. Viscusi indicates that his earlier studies and earlier studies by others found no measurable correlation between the number of OSHA inspections and injury rates.

Third, still other studies have sought a correlation between individual plant-level injury data and an employer’s inspection experience. Gray and Scholz (1993) found that an inspection imposing a penalty reduced injuries by 22 per cent and lost workdays by 20 per cent in the following three years. Using the same methodology, Cooke and Gautschi (1981), Robertson and Keeve (1983) and Scholz and Gray (1990) found similar impacts, but Smith (1979), McCaffrey (1983) and Ruser and Smith (1991) found no association using a different testing technique. Gray and Mendeloff (2005) found a decline in the measured impact of OSHA inspections on injury rates. They estimate an OSHA inspection imposing a penalty reduced lost-day injuries about 19 per cent from 1979 to 1985, 11 per cent from 1987 to 1991, and a statistically insignificant 1 per cent in 1992–8.

Fourth, Baggs et al. (2003), who studied firms in the state of Washington, found that enforcement inspections at fixed worksites were correlated with a 25 per cent greater decline in compensable workers’ compensation claims than at fixed worksites with no inspection activity. The authors conclude that their findings lend support to the view expressed in Gray and Scholz (1993) that enforcement visits may trigger a reshuffling of managerial priorities and a greater attention paid to safety and health improvements in a worksite.

Finally, other analysts have measured the relationship between OSHA
inspection activity and compliance with OSHA safety regulations. Weil (2001), who studied compliance performance among the largest construction contractors in the country from 1987 to 1993, found OSHA inspections increased the probability of compliance by 6.3 per cent between the first and second inspection and by smaller probabilities for subsequent inspections. He cautions, however, that the results of the study reflect previous OSHA inspection activity and the high rate of previous compliance. Gray and Jones (1991a) found a significant relationship between OSHA enforcement and compliance at individual plants. Bartel and Thomas (1985) also found that OSHA enforcement significantly increased compliance (by a total of 26 per cent relative to no enforcement), but they found only a weak link between compliance and injury rates.

Only a few analysts have attempted to confirm that OSHA’s activities have led to an improvement in workplace health. Gray and Jones (1991b) found that OSHA inspections reduced the exposure of workers to hazardous substances and increased compliance with health regulations.

C Adequacy of administrative regulation

Bartel and Thomas (1985) explain there are two conflicting explanations for the lack of stronger empirical evidence that OSHA activity results in fewer workplace accidents and injuries. The ‘inefficiency’ explanation proposes that administrative regulation is unable to address many of the causes of workplace accidents. The ‘non-compliance’ explanation proposes that OSHA lacks the resources to undertake effective enforcement. In addition, Mendeloff (1988) offers a theory for the lack of effective regulation of health risks.

(i) The inefficiency theory

The inefficiency theory posits that administrative regulation does not increase workplace safety because there is a tenuous link between regulation and the causes of accidents. Administrative regulation focuses on making workplace equipment safer to use. Some analysts argue, however, that the cause of most accidents is a complex interaction of labor, equipment and workplace environment. In light of this mismatch, Barcow (1980) predicted that OSHA may be incapable of preventing more than 25 per cent of all workplace accidents. In addition, Rea (1981) hypothesizes that moral hazard may reduce the level of safety because workers will attempt to substitute higher wages for safer jobs.

Bartel and Thomas (1985, 1987) ask why Congress has failed to reform or even eliminate OSHA in light of its apparent inefficacy. Their answer is that OSHA regulations give large firms a competitive advantage over their smaller rivals because the smaller firms are less able to afford expensive regulations. Fuess and Lowenstein (1990) offer similar evidence for coal
mine regulation. Their study finds the imposition of expensive engineering controls shifted production to large mines by driving smaller, less safe mines out of business. Hughes et al. (1986), however, were unable to establish that OSHA’s cotton dust standard permitted large firms to gain in profitability at the expense of smaller producers.

In light of the evidence that OSHA regulation is ineffective, Miller (1984) asks whether organized labor is rational in its support of OSHA. He offers some empirical support for the proposition that engineering controls may increase the demand for labor.

(ii) Non-compliance theory The non-compliance theory proposes that OSHA lacks sufficient resources to enforce its standards effectively. This theory assumes, as discussed in additional detail in Section 3.D.(i), that employers will choose whether to comply or not with OSHA standards based on the probability of detection and the expected level of assessed penalties in the event that violations are detected. McGarity and Shapiro (1996) point out that the industries with the most significant decline in injuries and fatalities are the industries with the highest levels of enforcement. They attribute OSHA’s limited impact on aggregate injury rates to the fact that the agency’s limited resources do not permit it to inspect the vast majority of employers that it regulates. Weil and Pyles (2005) note that the annual probability is well below 0.001 that one of the 7.0 million workplaces in the United States will be inspected by OSHA.

(iii) Overregulation causes underregulation The previous theories address OSHA’s impact on workplace accidents. Mendeloff (1988) attempts to explain OSHA’s limited impact on occupational disease. He identifies OSHA’s mandate as the cause because it requires the strict regulation of toxic substances. The problem is that such ‘overregulation’ causes ‘under-regulation’. Overregulation occurs when the costs of a regulation exceed its benefits. Underregulation occurs when the costs of additional regulation are less than the benefits. Mendeloff argues that strict regulation of toxic substances causes less protection of workers than would the promulgation of regulations that met a cost-benefit test.

Mendeloff contends strict regulation leads to less protection of workers because employers are more likely to engage in vigorous resistance to overly strict regulations. As a result, OSHA spends inordinate time and resources defending strict standards. If OSHA balanced costs and benefits, Mendeloff suggests OSHA could successfully promulgate more standards because regulated entities would be less likely to challenge more lenient regulations in court. Moreover, if more lenient regulations were challenged, OSHA would be more likely to prevail. In this manner, workers
ultimately would receive more protection from a more lenient approach. Although each OSHA regulation would be less protective of workers, the sum total of protection for workers would be greater because the agency could promulgate more standards overall.

McGarity and Shapiro (1993) and Shapiro and McGarity (1991) object that employers will oppose even lenient regulations. They offer evidence that employers gain financial benefits from delaying even modest health and safety regulations. If the problem is employer intransigence, McGarity and Shapiro propose that Congress change OSHA’s statutory mandate to make it easier for OSHA to prevail when it is sued. They also propose reforms to the rulemaking process that would permit OSHA to speed up rulemaking and make it more effective, including a revised priority-setting process and adoption of the types of regulations that yield the greatest protection for workers.

C Reform of standard-setting

Mendeloff (1988) proposes that OSHA should balance costs and benefits in health regulation because employers would be less likely to challenge more lenient regulation in court. Other analysts, such as Viscusi (1983, 1992), favor adoption of a cost-benefit standard for OSHA safety and health regulation because this approach is more consistent with economic theory. As related earlier in Section 1.C, economic theory favors a cost-benefit approach for regulation because it equates the marginal benefits of safety and health improvements with the marginal cost of such precautions. More generally, Sunstein (2002a) argues for using cost-benefit analysis to rationalize all types of safety, health and environmental regulation.


Proponents of a cost-benefit test for OSHA claim OSHA regulations often impose costs that exceed benefits, sometimes by hundreds of millions of dollars. For example, Morrall (1979) objected to OSHA’s noise regulation because it mandated the use of expensive engineering controls rather than much less expensive personal protection equipment such as ear plugs. Analysts have made similar criticisms of other workplace safety regulation. Similarly, French (1988) suggests that railroad safety regulation in the United States is inefficient because excessive burdens are imposed on firms. Cost-benefit opponents deny that it leads to the type of regulatory excesses identified by cost-benefit supporters. Ackerman and Heinzerling
(2004), for example, argue that evidence backing up claims that safety, health and environmental regulation is inefficient is speculative and not empirically sound.

More generally, cost-benefit opponents claim cost-benefit analysis is too unreliable to constitute an effective method to implement regulations. They point out that because current risk assessment techniques do not permit precise calculations of the number of lives saved or injuries avoided, monetary estimates of benefits are likewise imprecise. Furthermore, because the methods used to monetize benefits are contestable, opponents note that a cost-benefit approach ordinarily raises methodological issues that are expensive and time-consuming for agencies to resolve and defend in court. They therefore favor a technology-based approach, such as that used by OSHA, because it more simply establishes industry-wide limitations on the basis of the level of precaution that the best performers in the industry are capable of achieving. Supporters of cost-benefit analysis, such as Sunstein (2002b), counter that careful use of the technique can address these limitations and that the methodology is useful and necessary despite the limitations.

Finally, critics charge that use of a cost-benefit standard as the primary decision criterion effectively elevates economic efficiency to a ‘meta-value’ that trumps all other conflicting values. McGarity and Shapiro (1993) contend that OSHA’s mandate, which reflects both economic and non-economic considerations, rejects the idea that the maximization of material wealth is the only goal of a good society. Instead, it seeks to balance ‘efficiency’, ‘fairness’ and other important social values.

D Reform of enforcement

According to Weil (2007), there are two sets of behavioral assumptions that underlie OSHA’s enforcement model. Under a prosecutorial model, employers decide whether to comply with regulations based on the deterrence effects of inspections and fines. Under the cooperative model, non-compliance arises because employers and employees lack information and guidance about regulatory requirements. Proposals to reform OSHA enforcement practices differ depending on which model is used. Reforms based on the first model seek to increase the deterrence impact of OSHA inspections and fines. Reforms based on the second model employ consultation and education to increase compliance.

(i) Prosecutorial approach

The traditional theory assumes that firms will act in accordance with the model of compliance originally set out by Becker (1968), in which regulatory compliance is a function of benefits as compared to costs. This means employers will comply with OSHA
regulations when it costs less to comply than to risk an adverse OSHA inspection. The risk to an employer of an inspection is a function of the probability that the firm will be inspected and the amount of the penalties that OSHA will assess if violations are detected.

In determining whether it is cost-effective to comply with administrative regulations, a firm may also take into account potential reputational impacts. Fry and Lee (1989) propose that the ‘real teeth’ of OSHA citations may be the impact on the stock market value of a firm. They found that the announcement of fines produced an immediate and pronounced decline in the value of the firm subject to the penalties. They hypothesize the decline may reflect the additional costs a firm can expect, such as the need to make safety improvements. If the employer’s reputation is adversely affected, however, there may also be worker turnover, increased demands for wage premiums, or other adverse consequences.

In light of the traditional model, Viscusi (1986a, 1986b) proposes that OSHA should increase the frequency with which it inspects the most dangerous workplaces and that it should assess larger fines for serious violations. McGarity and Shapiro (1993) support these recommendations and amplify how they might be implemented. Gray and Mendeloff (2005) urge OSHA to focus inspections on smaller workplaces because their research indicates that smaller worksites are more dangerous than larger ones and because OSHA inspections have a greater impact on reducing the injury rate at smaller firms than larger ones. They would also have OSHA inspect non-union worksites more frequently, based on evidence that OSHA inspections appear to have a greater impact on reducing injuries at such worksites than at unionized worksites.

OSHA, however, has a potential problem in targeting inspections. Ruser and Smith (1988) demonstrate that using injury records to target inspections creates an incentive for employers to underreport injuries in high-hazard industries.

(ii) Cooperative model The cooperative model of enforcement rejects the purely economic understanding proposed by Becker. Proponents of this model, such as Bardach and Kagan (1982), point to research indicating that employers (and other regulated entities) differ concerning their willingness and capacity to comply with regulations. While some firms are ‘good apples’, who will in good faith attempt to comply with regulations, others are ‘bad apples’, who will resist compliance solely on the basis that the benefits of doing so exceed the costs. Bardach and Kagan recommend that enforcers recognize this distinction and adjust their enforcement approach accordingly. While a prosecutorial approach is appropriate with bad apples, they warn it can backfire and decrease compliance by good
apples, who will respond better to consultation and education efforts. They, along with Howard (1994) criticize OSHA for zealously enforcing detailed rules in circumstances where enforcement is counterproductive, unfair or even nonsensical.

More recently, Lobel (2005) contends that OSHA should adopt a framework of administrative governance which integrates cooperative public and private efforts to promote occupational safety and health. This adjustment is necessary because there are clear limitations to traditional enforcement methods including, most importantly, that firms have motivations that go beyond costs and monetary incentives in determining their compliance and resistance to occupational safety standards and enforcement. To be more effective, OSHA therefore needs to understand these motivations and incentives and build cooperative programs that take advantage of them.

Using survey evidence, Vickers et al. (2005) find small business firms in Great Britain have a limited understanding of occupational safety and health regulatory requirements. Their evidence also suggests a complex set of internal and external factors leads firms to differ substantially in the priority they accord to health and safety and in their responsiveness to statutory legal requirements. The article proposes a typology of business attitudes involving five categories that is more nuanced than the good apple versus bad apple categories discussed earlier.

Lobel (2005) and others endorse joint employer–employee health and safety committees as a new governance reform. These committees, which are responsible for monitoring workplace conditions, can improve safety by focusing the attention of employers and employees on workplace hazards and by providing a forum for the exchange of information. The committees can also give workers a voice concerning safety issues in non-unionized workplaces. According to Finkin (2002), a dozen states have laws requiring employers to establish employer–employee health and safety committees.

Rea (1983) discusses Canadian laws that require such committees. He notes that because joint safety committees were already in existence in larger unionized establishments, the main impact of the legislation has been to extend the practice to small firms and non-unionized workplaces. Walters and Haines (1988) find, however, that workers in Ontario have only weak links with their health and safety representatives and few workers made use of this resource. Rabinowitz and Hager (2000) find that Canada, in comparison to the United States, provides employees with substantially enhanced rights to participate in safety and health decision-making and to refuse unsafe work. They conclude that such enhanced employee rights are necessary adjuncts to cooperation and consensus in safety and health regulation and enforcement. McGarity and Shapiro (1993) support similar reforms for the United States. Weil (2007) indicates that his research
demonstrates that workers are more likely to exercise their legal rights when they have an agent that assists them which, in most cases, is a union.

Gunningham and Johnstone (2000) propose another type of new governance reform – a ‘two track’ regulatory system that offers firms a choice of traditional forms of regulation or the adoption of safety management systems (SMS). In traditional enforcement, regulators determine whether a firm has complied with regulatory standards. In an SMS approach, regulators determine whether a company has established an appropriate safety management system and whether it has effective internal controls to ensure internal compliance with that system. One advantage of the SMS alternative is that it permits employers to fine-tune safety systems to fit their particular situations. In return, the regulatory agency can ask for higher levels of safety than required by existing regulations.

Estlund (2005) doubts that American workers can be effective advocates for their interests in administrative governance types of programs due to the low rate of unionization in the United States and the lack of other effective legal protections. Her proposed solution, ‘monitored self-regulation’, employs independent monitors who would oversee self-regulatory programs and safeguard their integrity. Estlund contends auditors can give a voice to employees and create market pressure on firms to live up to their commitments by releasing public reports. Gunningham and Johnstone (2000) discuss the use of third-party monitors to audit firms using SMS in a two-track regulatory system.

Lobel (2005) distinguishes administrative governance with its more cooperative elements from cooperative policies that are a political cover-up for deregulation. Similarly, Shapiro and Rabinowitz (1997) warn that excessive reliance on cooperation is likely to undermine compliance because, while employers may prefer cooperative policies, voluntary cooperation will break down if firms in compliance with OSHA standards must compete with firms who use voluntary cooperation as a way of avoiding compliance. Brown (1994) claims that regulators in British Columbia have relied too heavily on a cooperative approach. He cites statistics indicating that most employers were not punished for regulatory violations, a significant percentage of them committed repeat violations of the same regulation previously violated, often multiple times, and this pattern held for both high risk and less serious violations.

Shapiro and Rabinowitz (2000) also express skepticism about the effectiveness of cooperative policies based on evidence of the impact of such programs in workplace and environmental contexts. They acknowledge the potential of cooperative approaches to induce greater protection than relying solely on prosecutorial methods, but find that such approaches only work in narrowly circumscribed circumstances and, in these contexts,
provide for less protection than traditional enforcement. Baggs et al. (2003) report that they were unable to find an association between consultation activities and a decrease in workers’ compensation rates in their study of employers in the state of Washington.

By comparison, Scholz and Gray (1997) find evidence that cooperation works to reduce injury rates. Testing the impact of OSHA inspections that did not impose a sanction on 6800 plants, they found that complaint inspections that provided information were followed by a decrease in injury rates in the first (2.6 per cent) and second years (5.5 per cent), while inspections that did not provide information were followed by an increase in injury rates in the second year (3.4 per cent) and overall (3.3 per cent). Although inspections imposing penalties produced a greater decline in injury rates in the first (6.9 per cent) and second (5.7 per cent) years following an inspection, Scholtz and Grey conclude their study indicates the efficacy of cooperative methods of enforcement.

4 Conclusions

Occupational safety and health regulation is justified, according to economic theory, if labor markets fail to produce fully compensating wage premiums for employees who face occupational safety and health risks. Wage premiums have been empirically verified, but it is probable that workers are not fully compensated for accident and diseases risks after taking into account workers’ compensation. Government action that provides workers with more and better information about these risks should prompt workers to seek more adequate compensation.

There is mixed evidence as to whether OSHA regulation is effective in reducing workplace injuries and there is disagreement about why OSHA has not been more effective. One explanation is that there is a tenuous link between regulation and the causes of accidents, another is that OSHA lacks sufficient resources to enforce its regulations effectively, and a third is that OSHA’s failure to follow a cost-benefit test encourages employer intransigence.

The discussion of standard-setting reform in the literature centers on whether OSHA should adhere to a cost-benefit test. This approach would be consistent with economic theory, but it is opposed, among other reasons, because cost-benefit analysis is too unreliable to constitute an effective method to implement regulations and because economic efficiency should not be the only normative value that administrative regulation pursues. There is also a debate as to whether OSHA regulations are as highly inefficient as OSHA’s critics claim.

The discussion in the literature concerning reform of enforcement proceeds on two tracks. Based on a prosecutorial model, reformers urge
OSHA to maximize the impact of its inspections and fines by better targeting of employers with poor safety and health records. Based on a cooperative model, reformers urge OSHA to engage in information and educational efforts that integrate the agency, employers and employees in joint efforts to promote occupational safety and health, such as employer–employee health and safety committees. Although there is agreement that such efforts can be effective, there is disagreement regarding in what circumstances a cooperative approach will be more effective than a prosecutorial approach.

Bibliography


