Policy Analysis
No. 453 September 19, 2002

Saving Lives or Wasting Resources?
The Federal Mine Safety and Health Act

by C. Gregory Ruffennach

Executive Summary

Most Americans take for granted the federal government's role in protecting workers from injuries that might occur on the job. The popular notion is that, without the Occupational Safety and Health Administration and its sister agency, the Mine Safety and Health Administration, some companies, perhaps many, would not invest in safety, which would lead to a rise in workplace accidents in the United States. The problem with the popular perception is that it is based more on faith in beneficent government than on facts about government intervention in workplace safety.

Although MSHA has claimed success, there is no reliable evidence indicating that the Federal Mine Safety and Health Act of 1977 has made the nation's mines any safer. It is actually more likely that the act's substitution of rules for results, of government vigilance for employee vigilance, and of sanctions for cooperation has slowed the historic trend toward safer mines. Despite the questionable benefits bestowed by the act, special interest groups and MSHA have successfully defended it against proposals for reform. As a result, consumers and taxpayers are left paying the substantial direct and indirect costs of federal intervention.

The best solution may be to repeal the Mine Act. Contrary to popular belief, there are substantial incentives in place that encourage mine operators to make investments in safety. One of the most notable incentives is the compensating wage differentials that miners demand for undertaking more hazardous work. By respecting the risk-for-pay decisions made by individual miners, the federal government might be able to achieve its objective of making the nation's mines safer.

C. Gregory Ruffennach is an attorney specializing in mineral law in Durango, Colorado.

Resources dedicated to the protection of adult miners at the workplace are resources that cannot be used for other purposes.

> We shall not grow wiser before we learn that much that we have done was very foolish.
>
> —F. A. Hayek

The 1977 Federal Mine Safety and Health Act (hereinafter Mine Act), which is rapidly approaching its 25th anniversary, was passed by Congress "to provide a more effective means" of preventing death and serious physical injury in the nation's mines.[1] To that end, the act created a federal law enforcement scheme consisting of regulation, inspection, and sanction. The tripartite forced compliance scheme was supposed to be more effective, not only than its forerunner, the Federal Coal Mine Health and Safety Act of 1969 (hereinafter Coal Act), but also than the other federal mining laws that preceded it. Prior to the 1969 Coal Act, the federal government did not take a forced compliance approach to mine safety. Although the Bureau of Mines, which was created as a federal agency in 1910, had limited enforcement authority at certain coal mining operations by 1952, it was predominantly an informational agency.

The Labor Department, whose Mine Safety and Health Administration is charged with implementing the Mine Act, has always maintained that the forced compliance approach required by the act has been more effective than the informational approach taken by the Bureau of Mines. In fact, former labor secretary Robert Reich has gone so far as to hold out the Mine Act as the epitome of effective government enforcement:

> It's become fashionable lately to dump on Washington, to say the federal government is just too nosy, too demanding, makes too many rules. The triumph of the mine safety and health program serves to remind us of the good that government can do.[2]

Similarly, Davitt McAteer, who held the top spot in MSHA under the Clinton administration, has repeatedly boasted that the Mine Act is a "scheme that works."[3]

Regardless of whether or not it is fashionable to "dump on" the federal government as Reich contended, it is certainly not fashionable to question the federal government's law enforcement role in mine safety. As Rep. Cass Ballenger (R-N.C.), chairman of the House Subcommittee on Workforce Protections, noted during a congressional hearing on the Mine Act in 1998,

> I am well aware of the fact that even to raise these issues is to invite criticism and demagogue, as being uncaring about miners, especially underground coal miners, whose work, I know, is hazardous and difficult.[4]

Ballenger was speaking from experience because, three years earlier, his modest proposal to reform the Mine Act along with the Occupational Safety and Health Act of 1970 was characterized by organized labor as "the Workplace Death and Injury Enhancement Act (DIE Act)."[5]

Nonetheless, after more than a quarter of a century of federal policing of the nation's mines, it is appropriate to attempt to determine whether the Mine Act has provided a more effective means of preventing miner deaths and injuries than did the informational approach that predated it. The determination is legitimate not only from a statutory perspective but also from the larger perspective of wisely allocating society's scarce resources. Although proponents of the Mine Act often tout its purported lifesaving features and even attempt to identify specific individuals who could have been saved with more vigorous enforcement,[6] it is essential to keep in mind that the resources dedicated to the protection of adult miners at the workplace are resources that cannot be used for other purposes, such as preventing the accidental deaths of children at home. While "we might all be happier in a world where there were no such constraints to force us into choices and trade-offs that we would rather not face,"[7] the fact of the matter is that, in a world with finite resources, such tradeoffs are inescapable.

Forced compliance has not been more effective in preventing death and serious physical injury in the nation's mines than the policy of information that preceded it.[8] Since the turn of the 20th century, fatalities in the nation's mines have been steadily declining irrespective of federal police intervention. In fact, on a fatality per million ton basis, it appears that the trend toward fewer fatalities in the coal mines actually slowed after the forced compliance approach was introduced.

Although that observation may come as a surprise to people like Reich, who believe in the capable beneficence of the federal government, it will not surprise those in the mining industry who recognize that forced compliance does not equate to improved safety. The Mine Act attempted to resolve a perceived, but probably not real, economic problem with a legalistic solution. The legalistic approach, which substituted rules for results, inspector vigilance for employee vigilance, and sanctions for cooperation, was inferior, in every respect, to the informational approach taken by the Bureau of Mines.

Obviously, a legalistic approach that yields no measurable benefits in terms of lives saved while diverting resources from wealth creation and even safety-related activities is not the best use of societal resources. In this regard, the necessary corollary to the sentiments expressed by Reich is that any "good that the government can do" is only good for those who reap the benefits. The Mine Act benefits Labor Department employees, organized labor institutions, large unionized mine operators, and, of course, attorneys,[9] to the detriment of the people who might otherwise benefit if those resources were put to other uses.

Because the Mine Act fails to achieve its stated objective and squanders society's scarce resources, Congress should repeal, or at least significantly amend, it.[10] In the absence of federal policing, responsibility for the safety of the nation's mines would fall on American society, state and local governments, and ultimately the individuals who make up the mining industry. In the event that there is a demonstrated market failure once the forced compliance approach is abandoned, the federal government should limit its role to the tried and true approach of providing information and, perhaps, creating monetary incentives for additional investments in workplace safety. However, law enforcement, in the limited circumstances in which it is appropriate, should be left to local authorities, which are accountable to the communities that they serve.

The Emotional Origin of Safety Regulation

The origin of federal police intervention in the nation's mines was, in large part, the November 1968 explosion in Farmington, West Virginia, that fatally injured 78 coal miners.[11] Unfortunately, the Farmington explosion was not the first or even the worst coal mine disaster in our nation's history. According to MSHA, "the deadliest year" in U.S. coal mining history was 1907, when 3,242 deaths occurred and a single mine explosion killed 358 people near Monongah, West Virginia.[12] Despite the tragic number of deaths, mine disasters, such as Farmington and Monongah, were not even the largest contributors to the loss of life in the nation's coal mines.[13]

The Farmington disaster was special because it was the first mining disaster that received nationwide media coverage. According to one account, "The resolution of the disaster . . . played out in the living rooms of America" and "created a media circus that would measure up to anything generated since."[14]

Congress, responding in large part to the publicity that the disaster received, convened hearings on coal mine safety and health. The focus of the congressional hearings was not on the testimony of safety professionals, actuaries, statisticians, and economists but on the testimony of "daughters and wives" of coal miners who had perished in the Farmington mine.[15] Such emotional testimo-

Forced compliance has not been more effective in preventing death and serious physical injury in the nation's mines than the policy of information that preceded it.

ny may have been appropriate to help a grieving nation, but it was not an appropriate foundation for a national workplace safety and health policy, which it ultimately became.

The Basic Economics of Safety

Before 1969 the federal government had taken, for the most part, a market-based approach to mine safety.[16] In a market-based approach, prices, which represent the preferences and values of individuals, are allowed to determine how much of society's scarce resources are dedicated to mine safety.[17]

The most obvious and important price affecting the amount of resources committed to mine safety is the price that a mine operator must pay for mine labor. The price of mine labor reflects, among other things, the risk preferences of the available labor pool.[18] Where the individuals in the labor pool are adverse to threats to life and limb, they will either demand additional compensation, in terms of pay or benefits, for hazardous jobs or simply refuse to undertake such work.[19]

The "risk premium" that a mine operator must pay to attract an entire workforce of miners to the mine and keep them there creates an incentive for the operator to make the mine safer.[20] Generally, when the price of risk premiums paid to miners exceeds the price of adding a safety practice or device, a mine operator will invest in improvements to make the mine safer in order to avoid paying more for labor.[21]

The "risk premium" that a mine operator must pay to attract an entire workforce of miners to the mine and keep them there creates an incentive for the operator to make the mine safer.

Although research has not revealed any studies that document the amount of differential compensation that miners receive for agreeing to undertake more hazardous work, it is worth observing that miners are better paid than nearly all other workers.[22] According to the Bureau of Labor Statistics:

> Average earnings in mining and quarrying were significantly higher than the average for all industries. Workers in underground mines also tend to earn more per hour than miners on the surface.[23]

The National Mining Association boasts that "the average miner makes $49,000 per year in salary, not including overtime, bonuses and benefits."[24]

Although the price of labor reflects the risk preferences of individual miners more than any other price, it is not by any means the only price that encourages a mine operator to commit resources to mine safety. As present MSHA administrator David Lauriski has noted, "The cost of the average lost work injury in mining could be on the order of $10,000 to $30,000 per incident."[25] The costs for accidents resulting in injury arise from investigating and reporting injuries, giving first aid, losing production, training replacement workers, and paying overtime to uninjured workers.[26] Those accident costs create a strong incentive for a mine operator to commit resources to injury prevention.[27]

The price of insurance also creates a substantial incentive for a mine operator to invest in accident prevention.[28] In all 50 states, mine operators are required to maintain workers' compensation insurance.[29] To a large extent, the mine operator's incentive to avoid the insurance costs associated with compensable injuries is a surrogate for the historical incentive to avoid tort liability.[30] However, even with the tort liability protections that state workers' compensation programs provide, the possibility of liability to third parties, and even to employees in certain cases, creates an additional incentive for mine operators to prevent injuries to employees.[31] In addition to prevention efforts, employers generally mitigate those additional potential liabilities with supplemental insurance. To the extent that workers' compensation and supplemental insurance premiums are experience rated,[32] they create an incentive for a mine operator to invest in safety.[33]

In addition to the direct incentives that a mine operator has for avoiding injury to its employees, a mine operator also has an incentive to protect its equipment and facilities.[34] In the mining industry, which is subject to fire,

explosion, and ground failure risks, the costs of an accident can be extraordinary because of the equipment and facilities that are sometimes destroyed.[35] Although losses of equipment and facilities are generally covered by insurance, the insurance, to the extent that it is experience rated, does not reduce the mine operator's incentive to focus on loss prevention. More often than not, the measures that reduce risk to equipment and facilities have the corollary benefit of reducing risk to miners.

The Informational Approach to Safety

Regardless of whether its actions were shaped by principle, political necessity, or inadvertence, the federal government's initial foray into mine safety focused on improving the market for mine safety with information rather than on displacing the market with police intervention. In 1910 Congress established the Bureau of Mines as an agency within the Department of the Interior.[36] The bureau was "an informational agency," charged with conducting research and reducing accidents.[37] The bureau attempted to improve mine safety through the dissemination of information to both miners and mine operators.[38]

Economic theory, which holds that "better information can improve the workings of the market for safety," predicts that the bureau's efforts to disseminate information would improve safety in the mines.[39] Information is essential to the proper functioning of the market for safety because the risk premiums demanded by "informed workers merit more respect than those of uninformed workers."[40] If a miner does not recognize and understand the hazards that he faces at the mine site or erroneously assumes that he is exempt from risk,[41] he may not demand an adequate risk premium from the mine operator. An inadequate risk premium does not create a sufficient incentive for the mine operator to invest in safety.

Despite the fact that it is essential to informed decisionmaking, information has deviant properties as a market good, which means that in unregulated markets for safety there may not be appropriate incentives to develop and share information.[42] With respect to the development of safety information, Rhea Graham, former director of the Bureau of Mines, explained,

> In these areas [workplace safety and health], the returns to society [based on research and development] may be large, but the returns to the individual or private company may not be sufficient to encourage investment.[43]

For example, although coal mine explosions accounted for significant loss of life and capital in the first part of the 20th century, it was the Bureau of Mines, not mine operators, that established through study and experimentation that coal dust contributed as much to the explosion problem as did methane and that rock dusting was an effective preventive measure.[44] With respect to the sharing of safety information, mine operators with poor safety records have little incentive to share hazard information with miners who might demand higher wages.[45] The Bureau of Mines attempted to fill the employee information gap, for example, by distributing 352,000 "Miner's Circulars" to coal miners in 1912.[46]

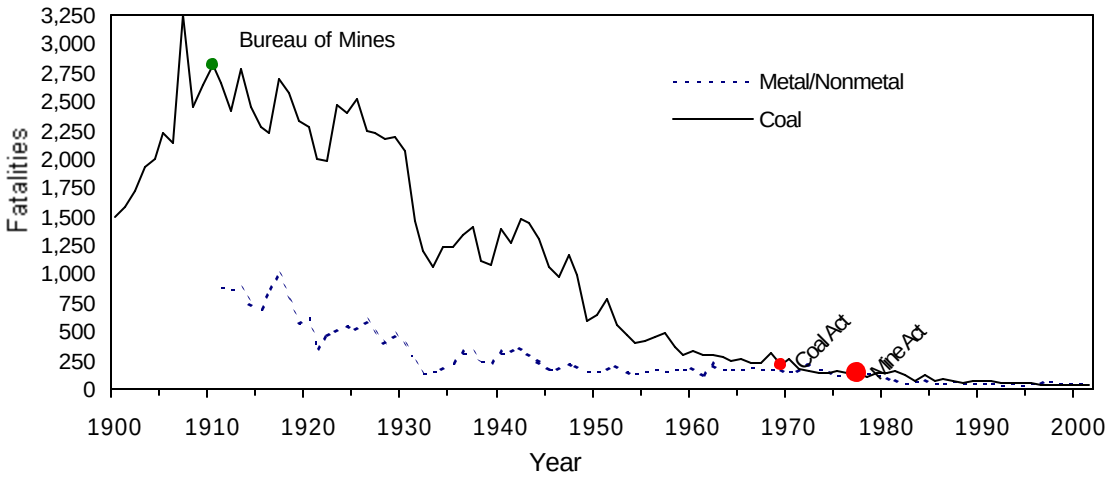
Although research has not revealed any analysis that shows a statistically significant correlation between the bureau's dissemination of information and an improvement of safety in the nation's mines, Figure 1 shows that after the bureau's creation the number of mine fatalities began a steady descent that has only recently tapered off.

Although the correlation does not establish that the Bureau of Mines contributed to the decline in mine fatalities, specific instances in which information disseminated by the bureau directly and positively affected mine safety have been well documented.[47]

Congress granted the bureau greater authority in the years following its creation,[48] but the bureau's enforcement authority at coal and noncoal mines remained minimal.[49] In 1941 the bureau was authorized to enter coal

Measures that reduce risk to equipment and facilities have the corollary benefit of reducing risk to miners.

Figure 1
Annual U.S. Mining Fatalities



Sources: Author's calculation (metal/nonmetal fatalities = coal fatalities) based on data from U.S. Department of Labor, MSHA Internet, Metal/Nonmetal Fatalities 1900 [1911] through 2001, www.msha.gov/centurystats/mnmstats.htm; and U.S. Department of Labor, MSHA Internet, Coal Fatalities for 1900 through 2001, www.msha.gov/centurystats/coalstats.htm.

The trend suggests, contrary to congressional views in 1969, that coal mine operators treated mine labor as a scarce resource that needed to be conserved.

mines, and in 1947 it was authorized to formulate a code of federal advisory regulations for mine safety. The Federal Coal Mine Safety Act of 1952, which was amended in 1966, and the Federal Metal and Nonmetallic Mine Safety Act of 1966 provided for the promulgation of mandatory standards, inspection and investigation authority, and the issuance of violation notices and withdrawal orders. However, under both acts the imposition of civil sanctions was limited to cases in which an inspector had been refused access to a mine or in which there was noncompliance with an inspector's withdrawal order. For the most part, the federal government left law enforcement at mining operations to the individual states.[50]

The Illusion of Resource Misallocation

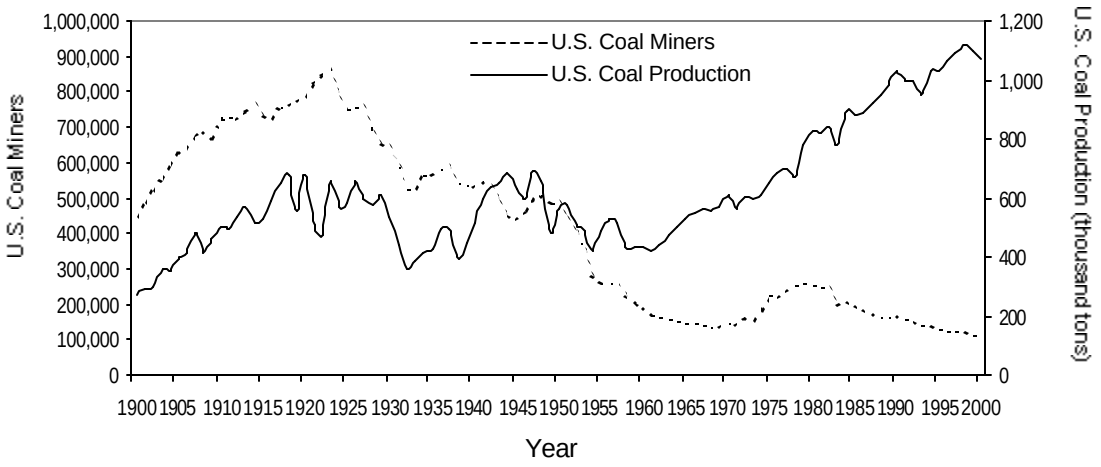
To a large extent, the 1969 Congress still considered the problems with mine safety, as exemplified by the Farmington disaster, to be economic in nature. Specifically, Congress determined that the mining industry did not properly allocate its capital and human resources. The 1969 Congress explained: "The way that we mine coal today is not humanitarian, resourceful, or efficient. It is inexcusably wasteful of our most precious asset—the human being."[51]

Despite the numerous terrible coal mine disasters that preceded passage of the Coal Act, it is unlikely that coal mine operators viewed labor as a resource that was abundant enough to be wasted in 1969. As Figure 2 illustrates, since at least 1950 the coal mining industry in the United States had been producing more tonnage with fewer miners.

The trend suggests, contrary to congressional views in 1969, that coal mine operators treated mine labor as a scarce resource that needed to be conserved.

Nowhere is the conservation of coal mine labor in the United States more evident than in a comparison between coal mining in China and in the United States. In China, where labor is abundant and capital is scarce, it is estimated that around 20,000 coal miners were fatally injured while producing about 1.2 billion tons of coal in 1999.[52] In the same year, in the United

Figure 2
Conservation of Coal Mine Labor



Sources: Number of miners based on U.S. Department of Labor, MSHA Internet, Coal Fatalities for 1900 through 2001, www.msha.gov/centurystats/coalstats.htm; coal production based on data from Energy Information Administration, Coal Products Publications, Coal Data: A Reference, Table 18, U.S. Production Trends in Bituminous Coal and Lignite, 1900–1993 (total production, thousand short tons), 1995, pp. 65–66, http://tonto.eia.doe.gov/FTPROOT/coal/006493.pdf; Pennsylvania Department of Environmental Protection, Mining and Reclamation, 2000 Annual Report on Mining Activities, Table 1, Anthracite Statistical Summaries 1870 to 2000 (production, net tons), www.dep.state.pa.us/dep/deputate/minres/bmr/annualreport/2000/table_01.htm (1990 to 1993 anthracite production data); and Energy Information Administration, Coal Products Publications, Coal Industry Annuals 1994–2000 (thousand short tons), http://tonto.eia.doe.gov/FTPROOT/coal/coalpubs.htm (1994–2000 coal production data, including Pennsylvania anthracite operations but excluding silt, culm, refuse bank, slurry dam, and dredge operations).

States, where capital is abundant and labor is scarce, only 29 miners were fatally injured while producing approximately 1.1 billion tons of coal.[53]

Thus, it appears that the resource allocation issue that Congress was determined to address in 1969 may not have been as bad as Congress made it out to be, if it existed at all. In 1969, 203 coal miners died producing 570,670 thousand tons of coal; whereas 35 years earlier, in 1934, 1,226 coal miners died producing 416,166 thousand tons of coal.[54] Although Congress heard it otherwise, the clear trend, for whatever reasons, was toward conserving the lives of coal miners.[55]

The New Regulatory Road

Ironically, although the 1969 Congress characterized the problem as one of resource allocation, it did not opt for an economic solution to the perceived problem. Instead, Congress and the Nixon administration, both of which consisted of more lawyers than economists, determined that "a strong law is necessary to protect the men who extract one of our Nation's most vital resources."[56] The "strong law" was, of course, the 1969 Coal Act, which put in place a law enforcement scheme of regulation, inspection, and sanction for the nation's coal mines. The Coal Act assigned "legal rights and duties," placing the "duty" to maintain a safe workplace on the coal mine operator and granting the "right" to a safe workplace to the coal miner.[57]

The 1969 Congress charged the Bureau of Mines with implementing the new assignment of safety duties and rights within the nation's coal mines. In 1973 the Department of the Interior transferred the bureau's new enforcement functions to the Mine Enforcement Safety Administration.[58] The enforcement powers transferred to MESA, which at the time of

It appears that the resource allocation issue that Congress was determined to address in 1969 may not have been as bad as Congress made it out to be, if it existed at all.

There were valid reasons to treat underground coal miners differently than other groups of miners.

enactment were unique to the Coal Act, included the imposition of monetary penalties for all violations of mandatory federal coal safety and health standards as well as criminal penalties for knowing and willful violations of the standards.[59] The use of "first-instance" sanctions marked a significant departure from prior federal policies,[60] which left law enforcement to the various states and, to a large extent, left mine safety to the economic marketplace.

Unfortunately, passage in 1969 of the Coal Act with its forced compliance approach did not put an end to disasters in the coal mining industry. As Congress noted in 1977:

> At Buffalo Creek, in February, 1972, 125 persons died when a dam burst sending a near tidal wave of murky water through the seventeen mile long valley, while the mining enforcement agency questioned its authority to regulate the coal mine impoundment dam in question.
>
> At Blacksville, in July 1972, nine miners at work behind a piece of equipment that caught fire were trapped and died in the mine because those at the scene of the fire had not been adequately trained in emergency procedures.
>
> At Scotia, in March, 1976 twenty-three miners and three Federal inspectors died in two explosions of accumulated methane gas when the mine safety enforcement effort was unable to detect and address chronic conditions of inadequate ventilation in that mine.
>
> Near Tower City, Pennsylvania, in February, 1977, nine miners died when water from an underground source inundated active workings, sending tons of water and debris coursing through the mine.[61]

On the basis of those tragedies, the 1977 Congress concluded that "review of . . . six years of enforcement of the Coal Act, requires the Committee to report that fatalities and disabling injuries in our nation's mines are still unacceptably and unconscionably high."[62]

Having reached that conclusion, the 1977 Congress did not deduce that forced compliance might not meaningfully improve workplace safety; rather it surmised that a more stringent law with broader coverage was required. The 1977 Congress reasoned that

> mine operators [must] still find it cheaper to pay minimal civil penalties than to make the capital investments necessary to adequately abate unsafe or unhealthy conditions. . . .[63]

Following that curious reasoning, the 1977 Congress resolved to "strengthen" the 1969 Coal Act.

The Special Interest Influence

Before the Mine Act was passed in 1977, the Coal Act provided protection to only the nation's coal miners. Congress had determined that "coal miners deserve the safest, healthiest work environment our technology will enable us to provide," but it did not make a similar determination with respect to noncoal miners.[64]

However, as is often the case when one group gets special treatment from the government,[65] other groups soon demanded similar treatment.[66] True to that principle and seven years after the enactment of the Coal Act, the United Steelworkers of America complained that "there is absolutely no reason why miners in one segment of the mining industry should be given different statutory rights than miners in another segment of the industry."[67] After all, the May 1972 carbon monoxide asphyxiation of 91 miners at Sunshine Silver Mine in Idaho demonstrated, quite horrifically, that death in the workplace was not unique to coal miners.[68]

Actually, there were valid reasons to treat underground coal miners differently than other groups of miners. In 1977 underground anthracite coal miners had significantly higher injury incidence rates than did all other types of miners.[69] Nevertheless, organized mine labor was able to convince Congress that the

strengthened scheme of regulation, inspection, and sanction should be extended to all miners.[70] Some scholars opined that, to a large extent, organized mine labor used the legislative process to achieve what it had been uninterested in achieving[71] at the bargaining table.[72]

Thus, with passage of the Mine Act in 1977, Congress provided special protections for "the sacred lives of those members of our society who toil in the mines to keep our country running efficiently."[73] However, Congress afforded less extensive protections under the Occupational Safety and Health Act of 1970 for other American workers who toiled in the factories, fields, and forests to keep our country running efficiently, despite the fact that some of those workers were exposed to greater workplace hazards than even underground anthracite coal miners.[74]

The Neglected Constitutional Constraints

To a certain extent, however, Congress was powerless to protect the lives of all miners at the behest of the labor organizations. The U.S. Constitution expressly enumerates the powers of the federal government. One cannot find among those enumerated powers a power to police the nation's mines, or any workplace for that matter. Though Congress's intentions to protect sacred human life were honorable, the Tenth Amendment of the Constitution reserves such police powers to the individual states.[75]

The Constitution, however, does grant Congress the power "to regulate commerce."[76] Thus, when Congress initially resolved to protect the lives of coal miners in 1969, it declared,

> [T]he disruption of production and the loss of income to operators and miners as a result of coal mine accidents or occupationally caused diseases unduly impedes and burdens commerce.[77]

The 1969 declaration was not without precedent or context. In 1940 the federal government actually seized the nation's coal mines to avert a labor dispute that might have disrupted the supply of coal during a period of increasing hostility abroad.[78] In 1969, at the dawn of the so-called energy crisis, America was facing concerns about future energy supplies.[79] Even in that historical and geopolitical context, the specific nexus between interstate commerce and particular coal mine disasters was not entirely clear.

The nexus was even less clear in 1977 when Congress expanded the Coal Act to cover noncoal mines.[80] The reality, in 1977 and even in 1969, was that Congress was enacting social measures aimed at minimizing "the grief and suffering of miners and their families" at the behest of labor organizations and was not especially concerned about commerce between the states.[81]

The Forced Compliance Approach

Echoing the concerns about resource allocation first raised in 1969, the "first priority" of the Mine Act was to establish the miner as the mining industry's "most precious resource."[82] The 1977 Congress, however, did not opt to increase the value of the miner through economic means, such as a tax on injuries.[83] Instead, the 1977 Congress, following the lead of the 1969 Congress, attempted to protect miners by granting them legal rights, specifically "the right to a safe workplace."[84]

To ensure that the right of miners to a safe workplace was vigorously protected, the 1977 Congress moved MESA from the Department of the Interior to the Department of Labor and renamed it the Mine Safety and Health Administration. Historically, the Department of Labor, which housed the Occupational Safety and Health Administration, had been the governmental entity charged with protecting federal rights granted to workers.[85]

MSHA was charged with implementing a tripartite forced compliance scheme, similar to but more stringent than the scheme created by the 1969 Coal Act. First, Congress directed

The U.S. Constitution expressly enumerates the powers of the federal government. One cannot find among those enumerated powers a power to police the nation's mines, or any workplace for that matter.

MSHA to promulgate mandatory safety and health standards for all of the nation's mines.[86] Second, Congress required MSHA to enter all surface mines at least twice a year and all underground mines at least four times a year, without warrant or notice, to assess compliance with the federal standards.[87] Third, Congress directed MSHA to penalize any and all instances of noncompliance through the use of first-instance civil fines and criminal sanctions, not only against mine operators but also against directors, officers, and agents of mining corporations as individuals.[88]

In passing the Mine Act, the 1977 Congress did not intend the forced compliance approach to augment the market-based approach that predated the 1969 Coal Act; rather, Congress intended police intervention to supplant the market for safety. The 1977 Congress believed that its attempt to eliminate the hazards associated with mining through forced compliance would be so successful that it would actually reduce the labor costs,[89] injury or downtime costs,[90] and workers' compensation costs[91] that had traditionally created incentives for mine operators to invest in safety. Simply put, Congress fully expected forced compliance

> [t]o provide more effective means and measures for improving the working conditions and practices in the Nation's coal and other mines in order to prevent death and serious physical harm, and in order to prevent occupational diseases from originating in such mines.[92]

The Mine Act was supposed to be "more effective" than not only the Coal Act but also the market-oriented, informational approach to mine safety that existed prior to 1969.

In passing the Mine Act, the 1977 Congress intended police intervention to supplant the market for safety.

The Mine Act Touted as a Model Law

In 2000, in MSHA's annual budget request, Davitt McAteer, former MSHA administrator, told Congress that "the Federal Mine Safety and Health Act has been an *extraordinarily effective* law."[93] McAteer did not cite any studies that established the effectiveness of the Mine Act to support his sweeping conclusion.[94] In fact, he offered only one statement that could arguably be construed as support for his bold claim of effectiveness:

> I am proud to say that the last five years have been the safest on record for the U.S. mining industry. It entered the 20th century with the worst safety and health industrial record in this country or abroad—we enter this century with the best mine safety and health record among major producing countries in the world, a proud accomplishment.[95]

Presumably, because the U.S. mining industry went from "worst" to "best" in the 20th century, Congress was expected to infer that the Mine Act had been "extraordinarily effective." The Labor Department has not always been so bashful. In 1995, for example, Labor Secretary Reich told Congress that "coal miners are five times less likely to be killed on the job than they were in 1969, and metal miners twice less likely to die—*largely because* we had the Mine Act and MSHA in place."[96]

In fact, Clinton administration Labor Department officials were so enamored with the Mine Act's forced compliance approach that they vigorously defended it against reform in the mid-1990s. In 1995 Congress, lead by Rep. Cass Ballenger, appeared to be ready to test the waters with a modest reduction of MSHA's enforcement authority, justified on cost-cutting grounds, as part of the Republican Party's Contract with America.[97] However, the Labor Department vigorously defended the statute as originally enacted in 1977. McAteer told Congress:

> The dramatic improvements in mine safety and health are proof that the Mine Act and MSHA are working. We do not claim sole credit for the success of the last twenty-five years. . . . There are many fac-

> tors that help explain why things have improved. *It is clear, however, that without federal intervention, conditions in the mines would not have improved.*[98]

The Labor Department, which was supported by organized labor[99] and even by some large mine operators, successfully defeated the reform initiative with the help of a veto threat from President Clinton.[100]

Oddly, the 1995 Congress, still in its cost-cutting mode, subsequently decided to eliminate the Bureau of Mines, which, unlike MSHA, did not have police powers.[101] At the time the bureau was eliminated, there were legitimate questions about whether large mining entities had sufficient incentive and capitalization by the end of the 20th century to conduct safety research and development on their own and about whether such research is more appropriately conducted at universities.[102] Nonetheless, the renewed commitment to MSHA's forced compliance approach at the apparent expense of the Bureau of Mines' informational approach, without closer examination of the actual effects of the different approaches,[103] raises the question of whether the priority of the Congress and President Clinton was the safety of the nation's miners or the appeasement of their special interest constituents.[104]

In addition to successfully defeating reform of the Mine Act, Clinton administration Labor Department officials actually worked to expand its reach. Then–secretary of labor Reich told Congress, "All workers should enjoy the gains in safety and health achieved for miners by MSHA and the Mine Act."[105] In this regard, it is worth noting that for the last 25 years MSHA has been expanding its jurisdiction to workplaces that would not traditionally have been considered mines.[106]

MSHA has even pushed the forced compliance approach beyond the boundaries of the United States and its territories. On January 10, 2001, President Clinton signed the International Labor Organization's Convention 176, which is based on the principles embodied in the Mine Act.[107] With the signing, then–secretary of labor Alexis Herman commented:

> Ratification of Convention 176 signals U.S. commitment to safety and health protection for workers in one of the world's most dangerous occupations. . . . I would like to commend the Mine Safety and Health Administration's former assistant secretary, Davitt McAteer, the United Mine Workers of America, and the National Mining Association for their work in negotiating Convention 176. . . . Convention 176 reflects that experience and helps to strengthen labor standards worldwide.[108]

According to McAteer, who visited Ukraine on MSHA business in 1999, Convention 176 "is just one aspect of our growing involvement in international activities."[109]

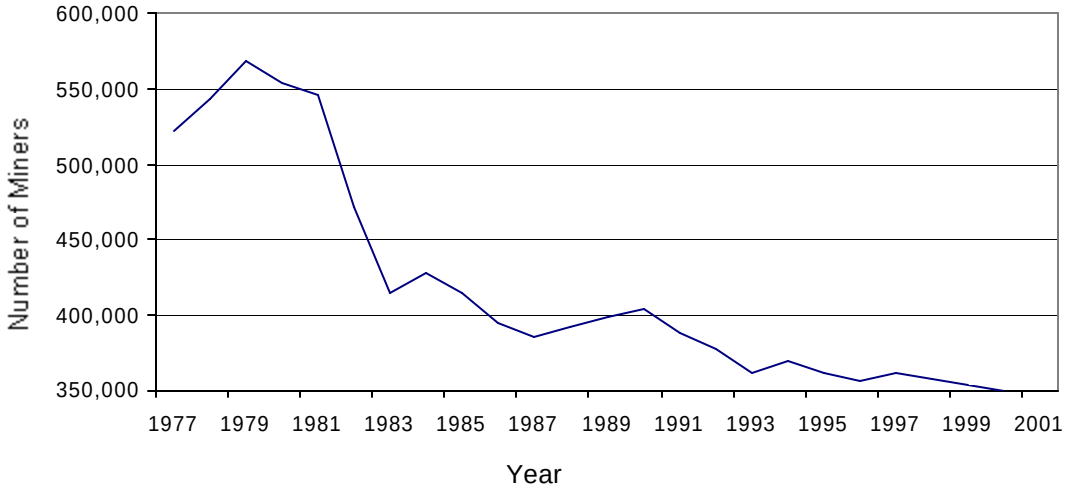
The Truth about the Mine Act

Before providing all workers in the United States with Mine Act–type protections and before pushing the legislative model abroad, it is fair and necessary to ask whether the Mine Act has provided a "more effective" means of preventing death and serious injury than did the federal policy of no police intervention that preceded it. With all due respect to McAteer, "the dramatic improvement in mine safety" is not "proof that the Mine Act and MSHA are working." The declining number of fatalities and the declining fatality rates provide little, if any, information about whether MSHA has improved the safety of miners in the last 25 years.[110]

In fact, it is disingenuous for MSHA to claim success on the basis of the favorable trends in mine safety[111] because, as Figure 1 clearly shows, the trends did not begin in 1977 with the enactment of the Mine Act or even in 1969 with the enactment of the Coal Act. The fact that mining fatalities, in absolute numbers, or even on a rated basis, have continued to decline after federal inter-

It is disingenuous for MSHA to claim success on the basis of the favorable trends in mine safety because the trends did not begin in 1977 with the enactment of the Mine Act or even in 1969 with the enactment of the Coal Act.

Figure 3
The Loss of U.S. Mining Jobs after Enactment of the Mine Act



Sources: Author's calculation (metal/nonmetal miners + coal miners) based on data from U.S. Department of Labor, MSHA Internet, Metal/Nonmetal Fatalities 1900 [1931] through 2001, www.msha.gov/centurystats/mnmstats.htm; and U.S. Department of Labor, MSHA Internet, Coal Fatalities for 1900 through 2001, www.msha.gov/centurystats/coalstats.htm.

Even assuming that the trend toward safer mines accelerated after 1969 or after 1977, there would still be questions about causation because a correlation, by itself, does not establish cause and effect.

vention does not establish that forced compliance contributed to the decline.

Even assuming that the trend toward safer mines accelerated after 1969 or after 1977, there would still be questions about causation because a correlation, by itself, does not establish cause and effect. For example, using the Labor Department's simplistic reasoning, it could be argued that MSHA's forced compliance model, which was expanded in 1977, has been extraordinarily effective at eliminating mining jobs in the United States (Figure 3).

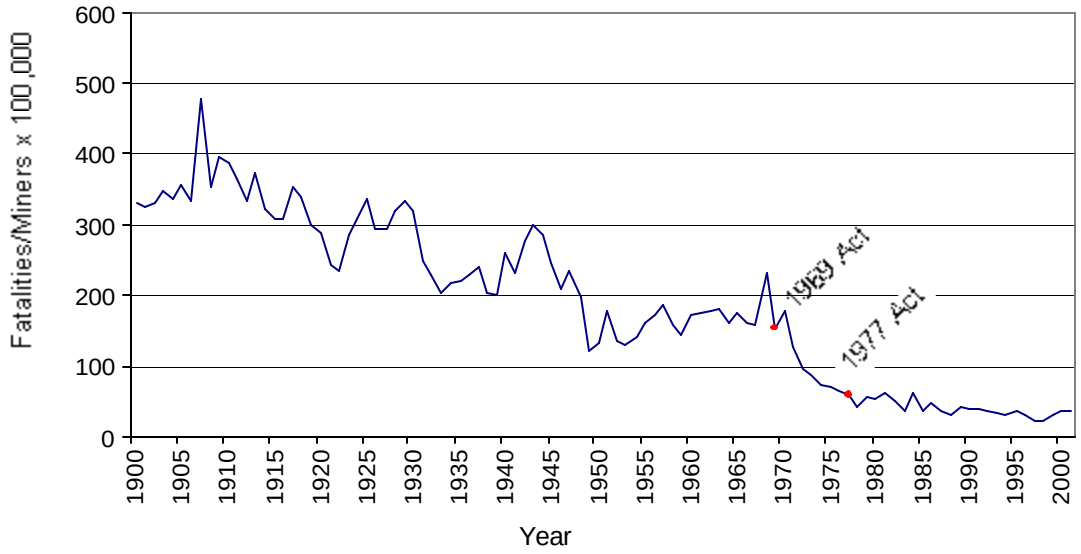
Although the creation of MSHA coincides with the loss of 30 percent of all U.S. mining jobs in the last 25 years, that correlation, by itself, does not prove that the Mine Act eliminated mining jobs. Thus, without the benefit of a statistical analysis that establishes that the trend toward safer mines accelerated after passage of the acts and without a tested theory of causation, MSHA's claims are pure puffery.[112]

There is one 1980 study that at first glance appears to support some of MSHA's self-aggrandizing conclusions.113 Professors Michael Lewis-Beck and John Alford concluded, on the basis of a multiple interrupted time series (MITS) statistical analysis, that "the 1941 and 1969 federal safety legislation appears to have diminished significantly the risk of receiving a fatal injury while mining coal."114 To a certain extent, the time series data, which they developed, statistically quantify the declines in fatalities per number of coal miners after 1969 that can be observed using MSHA's data (Figures 4 and 5).

In addition to attributing statistical significance to the downward slope in coal mining fatality rates after 1969, the professors further concluded that the observable decline was attributable to "regulatory influences" and not changes in mine size, technology, or the type of mining.[115]

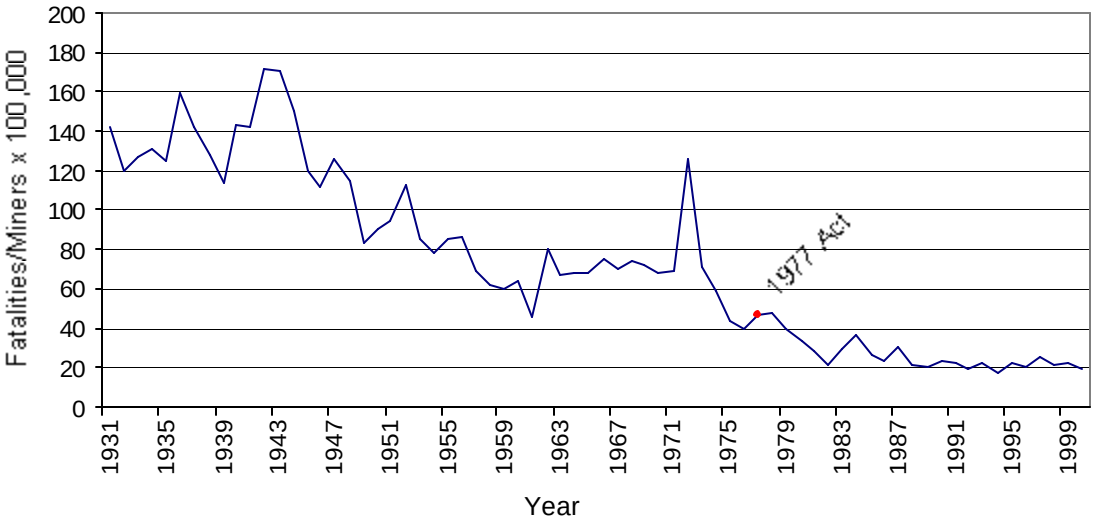
While the Lewis-Beck and Alford study is certainly a step in the right direction in terms of attempting to determine whether forced compliance influenced the trend toward fewer mine fatalities, it is by no means the end of the story. In this respect, their ultimate conclusion, that "it is possible for Congress to enact

Figure 4
U.S. Coal Mining Fatalities per 100,000 Miners



Source: Author's calculation ([fatalities ÷ number of miners] × 100,000) based on data from U.S. Department of Labor, MSHA Internet, Coal Fatalities for 1900 through 2001, www.msha.gov/centurystats/coalstats.htm (sand and gravel workers included beginning in 1958, office workers in 1973).

Figure 5
U.S. Metal/Nonmetal Mining Fatalities per 100,000 Miners



Source: Author's calculation ([fatalities ÷ number of miners] × 100,000) based on data from U.S. Department of Labor, MSHA Internet, Metal/Nonmetal Fatalities 1900 [1911] through 2001, www.msha.gov/centurystats/mnm stats.htm (sand and gravel workers included beginning in 1958, office workers in 1973).

laws that successfully regulate American business for some public purpose, such as safer coal mines,"[116] sounds more political than analytical or factual. Although their analysis may be more glamorous than the numbers that MSHA tosses around on Capitol Hill, it is no more compelling for at least a half dozen reasons.

First, as is the case in any time series analysis, the study, by selecting independent variables, arbitrarily defines the data set. Lewis-Beck and Alford selected 1941, 1952, and 1969 because federal legislation affecting mine safety was enacted in those years. The particular problem with that approach is that Lewis-Beck and Alford neglected to include the 1910 creation of the Bureau of Mines. Their exclusion of the 1910 legislation is totally inconsistent with their inclusion of the 1941 legislation, which allowed the federal government to make recommendations to mine operators, because it is identical in principle to the approach taken by the federal government in 1910. By erroneously treating the Mine Inspection Act of 1941 as "the 'first' law" affecting the mining industry,[117] the study ignores the important and continuing contribution of the Bureau of Mines that began in 1910, thereby exaggerating the purported observed effects of the other laws.

Second, the more general problem with preselecting variables is that it imposes preconceived ideas on the data instead of allowing the graphic representation of the data to suggest areas of inquiry. At least with respect to safety issues, the starting point should be to identify statistically meaningful trends and then to work backwards, hypothesizing about the factors that may have contributed to the trends. In that regard, eyeballing Lewis-Beck and Alford's man-hour data points suggests that the steep downward trend, which they attribute to the 1969 act, actually began 10 years earlier in 1960, which incidentally coincides with the introduction of the roof-bolting machine to underground coal mining.[118] Although the MITS approach might be useful in supporting a preconceived idea (to the extent that the data cooperate), it is not especially appropriate in a field where proper identification of causes and effects can be a matter of life and death.

The steep downward trend in fatalities coincides with the introduction of the roof-bolting machine to underground coal mining.

Third, the Lewis-Beck and Alford study relies on a simplistic data set. While the use of conglomerated data is certainly convenient and possibly appropriate to show general trends, it does not have as much explanatory power as the unconglomerated data.[119] Inside the Bureau of Mines' data set are potential subsets of data: surface versus underground, bituminous versus anthracite, western versus eastern, large mine versus small mine, state versus state, and even union versus nonunion. Each subset may tell a different story about the effects of federal legislation. In addition, because they looked at only the national trends, Lewis-Beck and Alford made no attempt to differentiate between mining disasters and normal-course-of-work fatalities. A large disaster, such as Farmington where 78 miners died in a single accident, can distort short-term and long-term trends, such as the downward trend in coal mine fatalities that appears to have begun in the early 1960s.

Fourth, Lewis-Beck and Alford greatly exaggerate the utility of MITS analysis in making cause and effect determinations. They conclude that "beyond doubt, the harsher provisions of the 1969 Act have made the coal mines safer."[120] However, of the "numerous" variables that might affect mine safety, their study attempts to account for only three, for which they "managed to assemble satisfactory data."[121] Lewis-Beck and Alford considered only mine size, mining technology, and type of mining. There are numerous other possible macro explanations that might account for the favorable trends in coal mining fatalities, including, but not limited to, the replacement of tort liability with workers' compensation, the subsequent reform of workers' compensation, the development of third-party and product liability doctrines, the standard of living, the proliferation of mass media communications, the mass consumption of automobiles, the build-out of the medical infrastructure, and even U.S. participation in foreign wars. They also did not evaluate

numerous potential mining-specific explanations for the favorable trends in fatalities, including, but not limited to, the price of coal, national demand for coal, the nature of the mining labor force,[122] the consolidation of mine operators, state mining laws, and geographic mining activity. As the study concedes, those other unaccounted-for variables might "contribute significantly to an explanation of mine safety."[123]

Fifth, with regard to the variables that Lewis-Beck and Alford attempted to take into account (mine size, mining technology, and type of mining), it is not altogether clear that simply treating them as "third variables" adequately captures the extent of their effect on mine safety.[124] Moreover, the indicators that they selected to represent those variables are also questionable. For example, using productivity as the sole indicator of advances in mining technology would not capture technological innovations that substantially enhance safety without significantly affecting production, such as the proliferation of permissible explosives, permissible equipment, rock-dusting applicators, self-rescuers, rollover protection, fire alarm and suppression systems, ventilation techniques, and roof bolting. In addition, to the extent that the federal legislation may be responsible for declines in productivity, the full effect of non-safety-specific innovations might actually be hidden by their "third variable" approach.

There Is No Evidence That the Mine Act Has Effectively Reduced Fatalities

The sixth and most important reason that the Lewis-Beck and Alford study does not withstand scrutiny is that it relies on an inferior measure of mine safety progress. A comparison of (1) annual fatalities per 100,000 miners, which is MSHA's version of Lewis-Beck and Alford's annual fatalities per million man-hours,[125] and (2) annual fatalities per million tons mined shows discrepant trends.

One interpretation of the discrepancy, which appears in Figure 6, is that fatality rates per miner and, by extension, rates per man-hour,[126] do not accurately represent the favorable trend in mine safety improvement.

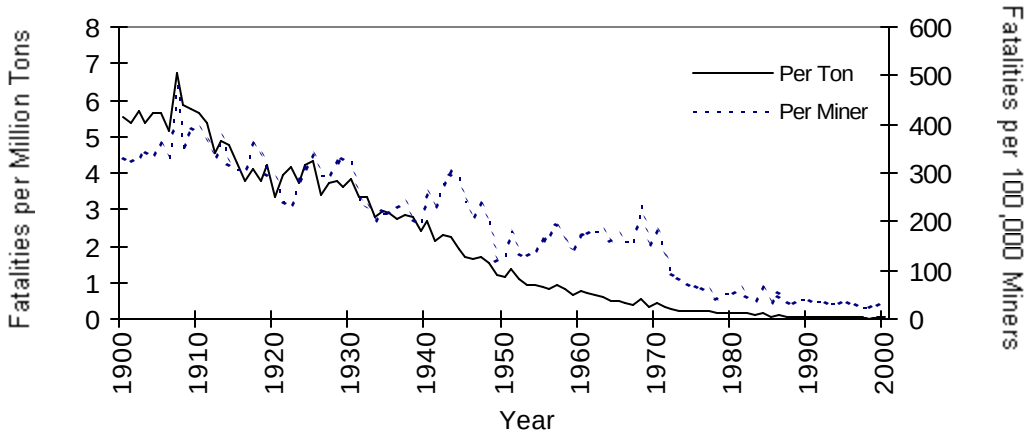
The fatalities per million tons rate, which shows a near continuous downward trend, is a superior measure of mine safety. Fatality rates based on tonnage are superior to fatality rates based on miners or man-hours because they reflect changing exposure to mine hazards more accurately. Although a man-hour rate reflects exposure somewhat better than does the number of employees, a man-hour rate does not adequately capture a miner's exposure to hazards because it assumes that the pace of mining per hour is constant over time. The reality is that miners move more ground in one hour today than they did in 1900.[127] It is generally accepted that the more ground is moved, the more hazards will be encountered.[128] For that reason, the fatalities per million tons rate, which better captures the hazards encountered during mining, is a better means of assessing safety progress within the coal mining industry.[129]

Fatalities per million tons is a superior measure of intraindustry safety progress from a public policy perspective as well.[130] It directly correlates coal output, which public policy aims to maximize, and fatalities, which public policy aims to minimize. By directly comparing the two most relevant variables, the possibility of a false safety gain is eliminated. When using fatalities per million man-hours, changes in productivity can conceal changes in safety. A decline in productivity, resulting from more miners mining less coal, can make the mines appear safer even when fatalities in the more dangerous mining occupations do not decline in absolute numbers. For example, adding miners to do nonproduction work, such as liaising with MSHA inspectors or filling out paperwork, away from the face of an underground coal mine can lower fatality rates per man-hour or per miner without lowering the fatality rate per ton.[131]

In this connection, Labor Department employee Hal Sider, in an unheralded but

A comparison of annual fatalities per 100,000 miners and annual fatalities per million tons mined shows discrepant trends.

Figure 6
Divergent U.S. Coal Mining Fatality Rates



Sources: Fatalities per ton, author's calculation (fatalities ÷ tons × 1000) based on data from U.S. Department of Labor, MSHA Internet, Coal Fatalities for 1900 through 2001 www.msha.gov/centurystats/coalstats.htm; Energy Information Administration, Coal Products Publications, Coal Data: A Reference, Table 18, U.S. Production Trends in Bituminous Coal and Lignite, 1900–1993 (total production, thousand short tons), 1995, pp. 65–66, http://tonto.eia.doe.gov/FTPROOT/coal/006493.pdf; Pennsylvania Department of Environmental Protection, Mining and Reclamation, 2000 Annual Report on Mining Activities, Table 1: Anthracite Statistical Summaries 1870 to 2000 (production, net tons, converted to thousand tons), www.dep.state.pa.us/dep/deputate/minres/bmr/annualreport/2000/table_01.htm; and Energy Information Administration, Coal Products Publications, Coal Industry Annuals 1994–2000 (thousand short tons), http://tonto.eia.doe.gov/FTPROOT/coal/coalpubs.htm. Fatalities per miner, author's calculation ([fatalities ÷ number of miners] × 100,000) based on data from U.S. Department of Labor, MSHA Internet, Coal Fatalities for 1900 through 2001, www.msha.gov/centurystats/coal stats.htm

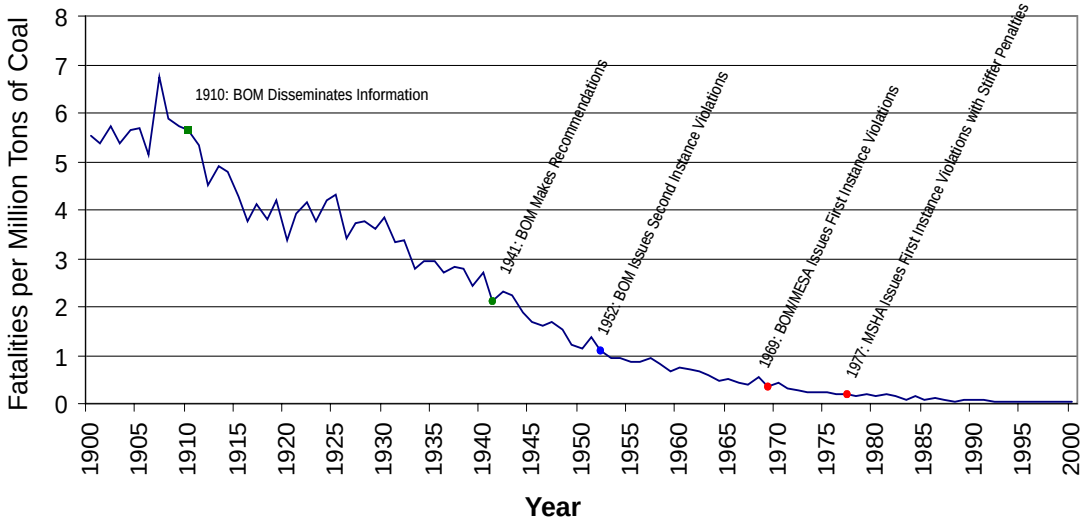
The improvement in fatalities per million man-hour data that followed the 1969 Coal Act might actually reflect a decrease in exposure to hazards resulting from each employee mining less coal and not from a genuine improvement in mine safety.

important statistical analysis,[132] found that the "spectacular decline in productivity during the 1970s" was not the result of improvements in safety conditions but rather the result of a simple decline in the production of marketable output.[133] The converse and corollary implication of Sider's analysis is that the productivity declines that followed the 1969 Coal Act[134] may also explain the improvement in the fatality per man-hour rate observed by Lewis-Beck and Alford.[135] In other words, the improvement in fatalities per million man-hour data that followed the 1969 Coal Act might actually reflect a decrease in exposure to hazards resulting from each employee mining less coal and not from a genuine improvement in mine safety. The clear implication of Sider's analysis is that the beneficial safety effects of the Coal Act observed by Lewis-Beck and Alford are illusory.

In sum, while the man-hour and employee rates may be useful for comparing mining with other industries and for informing miners about the relative risks that they face compared with workers in other industries, the per ton rate is superior as an intraindustry measure of safety progress. For example, the per million ton measure is used to compare the safety of mines in different countries whose productivity rates may vary considerably.[136] Although MSHA does not use the measure on a regular basis, the agency has used it when it helps make a point.[137] Figure 7 isolates and enlarges the fatalities per million tons trend set out above in Figure 6.

The implications of Figure 7 are profound. It appears that the federal government intervened at a point when safety gains on a per million ton basis were already declining at a rapid rate. Moreover, unfavorable changes in the trend that coincide with federal intervention raise serious questions about whether forced compliance may actually have even been detri-

Figure 7
Behind the Curve: Increased Intervention by the U.S. Government in Mine Safety May Have Decreased the Rate of Decline in Coal Fatality Rates



Sources: Author's calculation (fatalities ÷ tons × 1000) based on data from U.S. Department of Labor, MSHA Internet, Coal Fatalities for 1900 through 2001, www.msha.gov/centurystats/coalstats.htm; Energy Information Administration, Coal Products Publications, Coal Data: A Reference, Table 18, U.S. Production Trends in Bituminous Coal and Lignite, 1900–1993 (total production, thousand short tons), 1995, pp. 65–66, http://tonto.eia.doe.gov/FTPROOT/coal/006493.pdf; Pennsylvania Department of Environmental Protection, Mining and Reclamation, 2000 Annual Report on Mining Activities, Table 1: Anthracite Statistical Summaries 1870 to 2000 (production, net tons, converted to thousand tons), www.dep.state.pa.us/dep/deputate/minres/bmr/annual report/2000/table_01.htm; and Energy Information Administration, Coal Products Publications, Coal Industry Annuals 1994–2000 (thousand short tons), http://tonto.eia.doe.gov/FTPROOT/coal/coalpubs.htm.

mental to mine safety.[138] An MITS analysis of the data, akin to Lewis-Beck and Alford's study, would almost certainly show that each successive stage of increasing federal intervention, especially after 1941, progressively slowed the trend toward safer coal mines. Thus, it is entirely possible that the federal government not only got to the safety-improvement celebration late but may also have broken up the party.

The Reasons Forced Compliance Does Not Protect Miners

Alleging that federal intervention has been detrimental to mine safety is considered heresy even by critics of the forced compliance model, who at least pay homage to the historic role that forced compliance has played in bringing mine safety to where it is today.[139] In addition, attempting to establish that the Mine Act has stalled the trend toward fewer mine fatalities presents the same statistical and causation hurdles that proponents of the enforcement model have conveniently ignored in touting the lifesaving benefits of the Mine Act. Nonetheless, a comparison of the forced compliance and market models suggests that it is entirely possible that Congress may have actually done more harm than good with the Coal and Mine Acts. Each of the three component parts of the forced compliance approach is inferior to the equivalent feature of the market-based approach that it tried to replace and, more important, may impair the effectiveness of the market-based counterparts.

The Substitution of Rules for Results

In the market-based approach to mine safety there are no restrictions on the means by which mine operators achieve reductions in

It is entirely possible that the federal government not only got to the safety-improvement celebration late but may also have broken up the party.

It has never been established that regulation of mining operations prevents accidents.

injuries. Mine operators are free to use employee bonuses, engineering controls, behavior-based programs, or whatever else works to bring down injury rates. In contrast, the forced compliance model depends entirely on the administration and enforcement of regulations to reduce accidents. There are numerous shortcomings inherent in the regulatory approach.

First, it has never been established that regulation of mining operations prevents accidents. Conventional wisdom holds:

> The risks regulated by these two agencies are well understood. We know we need regulations on ladders, slippery floors, lighting, and similar matters in order to protect workers. We know from experience that these agencies' regulations prevent deaths. We do not want to meddle with success.[140]

However, even scholarly proponents of forced compliance have conceded the possibility that safety regulations might not have any positive impact on accident rates.[141] As set out above, a preliminary look at the fatalities per million tons data suggests that forced compliance might have actually slowed the trend toward fewer fatal injuries at coal mines.[142]

Regardless of whether any accidents can be prevented with regulations, it is clear that all accidents cannot be eliminated through regulation. One occupational safety and health scholar has noted that even in less dynamic OSHA-regulated environments, "most workplace injuries are not caused by violations of standards, and even fewer are caused by violations that inspectors can detect."[143] There have been fatalities at mining operations where even MSHA, which strives to cite a violation in every fatality case,[144] has conceded that there was no violation of the regulations.[145] It is simply impossible to address all conceivable hazardous conditions and practices through regulation.

In response to the fact that it is impossible to regulate every conceivable hazard at mining operations, many of MSHA's regulations are deliberately vague with respect to the specific conditions or practices that are required or prohibited. For example, many of the metal/nonmetal regulations simply instruct mine operators to be "safe" and to avoid practices or conditions that may create a "hazard" or be "dangerous."[146] Although it has been held by the courts that such "performance" regulations meet the minimum requirements of due process[147] and although such "performance" regulations do afford the mine operator flexibility in achieving compliance,[148] the reality is that such regulations provide no meaningful guidance to mine operators about what conditions may be hazardous or how to eliminate them. While such regulations are ideal for 20/20 hindsight enforcement, they are worthless as guidelines for the prevention of accidents.[149]

The regulations that are specific enough to provide guidance to mine operators are often too prescriptive. Many MSHA regulations, particularly ones governing coal mining, are so specific that they discourage innovation.[150] Mine operators are generally reluctant to implement high- or even low-tech safety innovations because doing so, in many instances, requires the mine operator to petition MSHA for a variance.[151] Under MSHA's regulations, such variances, even if granted on the first go around, take a minimum of 60 days.[152] It often takes many months or sometimes even years to get a variance.[153] In some instances, where the mine operator cannot convincingly persuade an Arlington, Virginia, bureaucrat that its innovative approach will not diminish safety in any way, variances are not granted at all.[154] The limitations of such a system in an industry in which conditions change hourly are obvious. Indeed, all but the most ardent advocates of regulation have conceded that regulations do not induce innovation.[155]

Perhaps the biggest failing of MSHA's regulations is their relentless focus on the "unsafe condition and unsafe act" approach to mine safety to the detriment of other more innovative approaches. Almost all of MSHA's regulations address workplace conditions. While there are a few regulations that prohibit unsafe actions, they have not been particularly effective

at changing behavior.[156] In this connection, modern accident prevention theory, which focuses on behavior-based approaches to improving safety, has passed by MSHA's regulatory approach, which remains firmly rooted in the "unsafe-act/unsafe-condition" theory developed in the first third of the 20th century.[157] Although MSHA regulations do not preclude mine operators from implementing behavior-based safety programs, the perception in the industry is that MSHA, whose focus is on assigning blame to the mine operator and protecting employee rights, is not receptive to behavior-based approaches.[158] Moreover, smaller mining operations, which often do not have the resources to implement two types of safety programs, are forced to focus their available resources on a safety program that is geared toward regulatory compliance.[159]

The Substitution of Inspector Vigilance for Employee Vigilance

The keystone of the market-based approach to mine safety is the strong incentive that an individual miner has to provide for his own safety and well-being. In contrast, the regulatory approach to safety embodied in the Mine Act, which essentially creates a miner's entitlement to a safe workplace, largely exempts miners from responsibility for their own and others' safety. Instead, the Mine Act approach relies primarily on periodic, mandatory inspections conducted by federal mine inspectors to enforce compliance with the regulations. The forced compliance approach is inferior to the market approach, not only because inspectors are incapable of doing a better job than miners at ensuring a safe workplace, but also because forced compliance creates a moral hazard for the miners.

Although the 1977 Congress recognized that the individual miner had an essential role even in the forced compliance approach to mine safety,[160] the Mine Act placed the entire responsibility for safety on the mine operator. The 1977 Congress explained:

> Thus, while miners are required to comply with standards insofar as they are applicable to their own actions and conduct, except with respect to the penalty for smoking in a mine, (Section 111(i)), neither the bill, nor current law contemplates that citations and penalties be issued against miners. Operators have the final responsibilities for affording safe and healthful workplaces for miners, and therefore, have the responsibility for developing and enforcing through appropriate disciplinary measures, effective safety programs that could prevent employees from engaging in unsafe and unhealthful activity. [161]

Thus, even though the Mine Act pays lip service to the important role of miners,[162] the act exempts the individual miner from any civil or criminal liability, with the one exception related to smoking, regardless of whether he puts himself, others, or the mine operator's equipment at risk. With respect to smoking, the average civil penalty issued to miners when they are caught by MSHA is only $181.[163]

As a proxy for the vigilance of miners,[164] the Mine Act relies on regular federal inspections to ensure that mine operators are in compliance with the federal safety regulations. Under the Mine Act, MSHA is required to inspect surface operations twice a year and underground operations four times a year.[165] Former MSHA administrator McAteer has emphasized the importance of federal inspections under the Mine Act:

> I wish I could say that it is now safe to relax our vigilance on miners' safety and health, but that simply is not the case. Even with strong enforcement, criminal violations of federal mine safety standards have led to mine disasters such as the Southmountain mine explosion that killed eight Virginia coal miners less than three years ago. Less vigilance through inspections invites a greater danger of mining accidents.[166]

In the endless pursuit of ever-greater vigilance, it is not uncommon for federal mine

The regulatory approach to safety embodied in the Mine Act, which essentially creates a miner's entitlement to a safe workplace, largely exempts miners from responsibility for their own and others' safety.

inspectors to spend weeks or even months at particular mining operations.[167]

The fundamental problem with inspector vigilance is that there can never be enough of it. As McAteer explained:

> Mines are complex. By definition, the working environment changes all the time. As mined material is removed, an entirely new workplace is created in as little as 24 hours. Roof conditions vary from place to place. Explosive methane may be liberated. Mechanical systems may fail. A mine that is safe one day may be dangerous the next. A mine with a good safety record may confront new challenges daily. Personnel changes, too, can make a dramatic difference in the safety of a mine.[168]

Extending McAteer's reasoning to its logical conclusion, every work crew at every mine on every shift would have to include one full-time federal mine inspector in order for the inspections to have a realistic chance of effectively ensuring compliance with federal regulations at all times.

In addition to not having a realistic opportunity to be vigilant,[169] federal inspectors do not have the same incentives as employees to ensure that the workplace is safe.[170] An employee who fails to discover a hazard may lose his life or limb or the life or limb of a friend, whereas an inspector who fails to discover a hazard may not even get a reprimand.[171] Moreover, while most MSHA inspectors have good intentions, there are some who have been corrupted by bureaucratic apathy, political pressure, career advancement goals, a desire for job security, abuse of power, or personal animosity.[172]

The fundamental problem with inspector vigilance is that there can never be enough of it.

Compounding the problem of incentives is the problem of competence. Frequently, MSHA inspectors are not qualified to perform the inspections to which they are assigned.[173] Even where the MSHA inspector may have general information about safe work practices and conditions as contained in the regulations, he usually lacks specific information about the mine and its miners. Essentially, an MSHA inspector makes his compliance determinations in an information vacuum. For example, the MSHA inspector may not know (or may not care to know) that safety resources have not been committed to a particular area of the mine because it does not present any safety risks.[174]

Perhaps the greatest problem with federal inspections is not that they can never augment employee vigilance but rather that, to some extent, they have become a substitute for employee vigilance. As is often the case with entitlement schemes, the Mine Act has created a moral hazard, whereby miners have reduced incentives to provide for their own safety as well as the safety of others. Although it is difficult to measure the impact of the moral hazard on the behavior of miners, there are plenty of anecdotal accounts of employees who have not taken responsibility for their own personal safety.[175] For example, miners have stated:

> [Without MSHA] no one will be there to make sure I bother putting on a hard hat or my hardsole boots, and, who needs to carry that old self rescuer anyway?[176]

And

> I have worked where the continuous miner operator cut coal without ventilation curtains and in high concentrations of methane and even cutting cross sections together in unsupported roof and cutting deep cuts out from unsupported roof. All of this in violation of the approved mining plan.[177]

Moreover, the fact that numerous lawsuits have been brought against MSHA alleging negligent inspection indicates that there is at least a general perception in mining communities that MSHA serves as the ultimate guarantor of the safety of miners working in the nation's mines.[178]

In this connection, the irony of McAteer's testimony to Congress regarding South-mountain is that the disaster was attributable not to a failure of federal vigilance but rather to lack of

miner vigilance. In all likelihood, the Southmountain explosion was ignited by one or more individual miners who decided to smoke cigarettes in a mine that was known to contain high concentrations of methane.[179]

The Substitution of Sanctions for Cooperation

An essential element of the market-based approach to mine safety is adequate information. Miners need information in order to demand adequate risk premiums, and mine operators need information in order to be innovative accident preventers. In contrast, the forced compliance approach relies on sanctions to coerce compliance with regulations. While the threat of sanctions that comes with the Mine Act has probably been insignificant in reducing accidents, it has been instrumental in cutting off the information exchange between mine operators and government.

Although the 1977 Congress attempted to supplant the market for safety with police intervention, it was not successful. The fallacy of that approach lies in the numbers. Under the Mine Act, the maximum civil penalty is $55,000 per violation. However, the act requires that MSHA consider negligence, gravity, abatement efforts, history of violations, size of the mine operator, and ability to pay in assessing civil penalties.[180] As a result, the average regular civil penalty assessment in fiscal year 2000 was $255.[181] A substantial number of assessments were issued at the mandatory minimum civil penalty of $55.[182]

Regardless of whether or not such nominal penalties create incentives for regulatory compliance,[183] they are insignificant when compared with the other monetary incentives that are in place to encourage operators to invest in accident prevention. In 2000 MSHA collected just over $17 million in civil penalties from the mining industry.[184] In contrast, the mining industry probably paid hundreds of millions, perhaps even billions, in risk premiums, in injury costs, and for workers' compensation and insurance premiums.[185] Although plenty of sanction-motivated, compliance-related activity certainly occurs in the mining industry,[186] the threat of sanctions is not by any measure the primary incentive that drives mine operators to prevent accidents.[187]

Of course, not all penalties assessed by MSHA are $255 or less. In cases involving injuries to employees, MSHA often issues substantial penalty assessments.[188] The average civil penalty assessment in accident-related cases was $31,000 in FY 2000.[189] To the extent that such penalties add to the cost of injuries, they may augment the preexisting market-based monetary incentives for mine operators to prevent future injuries. In this connection, injury-related assessments function much like an injury tax.[190] However, unlike an injury tax, which is applied across the board, an injury-related civil penalty assessment is unpredictable.[191] It depends on whether MSHA's accident investigation team can identify a legally valid causal link to a regulation.[192] It also depends on the secretive workings of the assessment office[193] as well as the views of the Federal Mine Safety and Health Review Commission and the courts.[194] Because the penalty assessment cost cannot be estimated in advance and factored into decisions about investments in accident prevention programs, its effectiveness as an incentive is probably minimal.

Although the Mine Act's civil penalty scheme probably does not create significant incentives for accident prevention, it does create a substantial disincentive to cooperation with the federal government. MSHA has made it all too clear that it is not a public service agency as was the Bureau of Mines. As former administrator McAteer explained:

> We have two responsibilities that are sometimes at odds. First just like the state police, we must enforce the law and we mean to do that. Second, when we identify a problem we will use whatever means available, such as public service announcements, to get the message out. But we are not a public service or advisory agency. We have to carry out our enforcement responsibility.[195]

While the threat of sanctions has probably been insignificant in reducing accidents, it has been instrumental in cutting off the information exchange between mine operators and government.

There is no evidence that forced compliance has been more effective than nonintervention.

In a demonstration of the agency's commitment to enforcement at the expense of assistance through information, McAteer eliminated MSHA's technical support group in the western United States, where mining is on the rise, and transferred its remaining functions to his home state of West Virginia, where mining is on the decline.[196] Although the credibility and utility of the technical support branch under the direction of an enforcement agency has always been suspect,[197] the move was nonetheless symbolic of MSHA's steadfast commitment to the enforcement approach.

McAteer emphasized enforcement during his tenure, but he candidly conceded that the Mine Act's enforcement approach was not "the way to win friends and influence people."[198] Because the Mine Act imposes civil and criminal penalties for noncompliance, mine operators and their agents treat MSHA inspectors as policemen and MSHA technical support personnel as potentially hostile expert witnesses instead of safety professionals.[199] As a result, MSHA's relationship with the mining industry has almost always been adversarial and confrontational.[200] Hence, mine operators frequently joke that the two biggest lies in the mining industry are told by the MSHA inspector who says "I am here to help" and the mine operator who replies "we're glad you're here."

Although the impact of the government's adversarial relationship with the mining industry on mine safety has not been studied, it is likely that the dearth of meaningful information exchange has been damaging in comparison with the apparent success of the cooperative approach demonstrated by the Bureau of Mines in the early part of the 20th century.[201] In all but exceptional cases, cooperation and information sharing are superior to punishment and adversarial relations.[202]

The Possibility of Diminishing Returns

Although it is fair to say that MSHA will never concede that the Mine Act and its predecessors may have slowed the trend toward fewer mine fatalities, MSHA has at least recognized that the trend has slowed. McAteer noted:

> We [have] taken fatalities and accidents from a very high number down to a lower number, but now we need to take it to the next level. And why can't we do that? . . . Why can't we find the solution?[203]

Assistant Secretary of Labor Dave Lauriski, now head of MSHA, similarly commented that there had been "a flattening of those numbers—over the past five years in particular."[204]

It is possible that the reason the mining industry cannot bring mine fatalities to the "next level" is that the Mine Act is interfering with safety progress. Forced compliance may well be part of the problem, not part of the solution.

It is alternatively possible that the trend toward fewer fatalities has reached the point of diminishing returns. In absolute numbers, mine fatalities dropped from 1,688 in 1931 to 72 in 2001, a 96 percent reduction.[205] It may be that the mining industry has already eliminated the easy-to-prevent fatalities and that the final 4 percent present a more difficult challenge. Perhaps, with current mining technologies and methods, a certain number of fatalities cannot be eliminated at all.[206]

Regardless of the explanation for the flattening, the fact of the matter is that there is no evidence that forced compliance has been more effective than nonintervention. On a fatalities per million ton basis, coal mine fatalities appear to have declined faster before forced compliance than they did after. Because in all likelihood the Mine Act has not met its stated statutory objective, its forced compliance provisions should be reviewed and possibly repealed.

The Cost/Benefit of Forced Compliance

Even assuming that all mining deaths are ultimately preventable and further assuming, purely for the sake of argument, that

forced compliance contributes to prevention, the forced compliance provisions of the Mine Act still should be repealed. If one assumes that the Mine Act saves a substantial number of lives each year (which, given the foregoing, is a rather dubious assumption), the estimated costs of forced compliance still exceed its benefits by more than a factor of four. From a cost/benefit perspective, the Mine Act is simply not a wise use of the resources that society chooses to commit to lifesaving.

The Costs of Forced Compliance

The most obvious cost associated with forced compliance is the annual cost of administering the Mine Act. In FY02 Congress appropriated $246 million to MSHA.[207] To a certain extent, the forced compliance budget should be offset by civil penalty collections by MSHA, which totaled about $17 million in FY 2000. In addition, $27 million was appropriated for the technical support branch, which is involved in some nonenforcement activity.[208] However, the budgeted amount does not include amounts appropriated to the Department of Labor for attorneys in the Solicitor's Office who litigate Mine Act cases or investigators in the Inspector General's Office who investigate inspector corruption. The budgeted amount also does not include approximately $4 million appropriated to the Federal Mine Safety and Health Review Commission, which adjudicates disputes between mine operators and MSHA.[209] To put the costs of administering the Mine Act in perspective, the federal government spends approximately $12,300 per inspection[210] and $1,863 per assessed violation,[211] or $702 per miner.[212]

The $246 million that the federal government spends on forced compliance pales in comparison with the amount spent by the mining industry to comply with MHSA's regulations.[213] For example, operators have to commit resources to installing guards, buying ladders, building berms, installing roof bolts, and keeping fans running. Because mine operators have significant incentives, other than the threat of sanction, to prevent accidents, there is no doubt that significant resources would be committed irrespective of compliance obligations. However, as the National Mining Association has emphasized:

> Many of the current requirements of the Mine Act contain extraordinary obligations on the mining industry without contributing to a reduction in occupational injuries and illnesses. The regulations divert finite resources from effective accident prevention and have diminished the well-founded principles of the Mine Act.[214]

In addition to diverting resources from other safety-related activities, compliance with regulations that do not contribute to a reduction in injuries also diverts finite resources from production.

The inspection phase of MSHA's forced compliance program also has costs. Every time a MSHA inspector enters a mine, he ties up company personnel who have other safety and production responsibilities. For example, MSHA's walkaround inspections pull supervisors away from their work areas and safety personnel away from training and workplace examination duties.[215]

More important, as a result of an inspection, mine operators are often required to direct immediate resources to items and tasks that they do not perceive as genuine or high-priority safety hazards or even as compliance obligations. For example, in one reported case, an MSHA inspector required a mine operator to replace a General Electric toaster oven and a Proctor Silex toaster that were located in the mine office because he believed that the toasters, which were in their store-bought, U.L.-certified condition, were not properly grounded in accordance with federal regulations.[216]

In addition to inspection-related costs, there are substantial costs associated with the imposition of sanctions. For a variety of reasons, disputes frequently arise between MSHA and mine operators about the appropriateness of enforcement. For example, the

If one assumes that the Mine Act saves a substantial number of lives each year, the estimated costs of forced compliance still exceed its benefits by more than a factor of four.

The problem with estimating the benefits of forced compliance is that there may not be any. It has never been established that forced compliance has saved one life or prevented one injury.

Federal Mine Safety and Health Review Commission received 2,335 cases in FY99.[217] One mine operator stated that its legal costs approached $1 million in one such proceeding.[218] Those costs incurred by mine operators are in addition to the substantial litigation costs incurred by MSHA, to which the agency gives little or no regard.[219] It is obvious that the human and financial resources committed to those disputes, which appear to be a necessary evil of forced compliance, are resources that will never be committed to safety or to increased production.[220]

Remarkably, there are no detailed estimates of the total costs associated with the forced compliance approach to mine safety that is required by the Mine Act. Only since 1993 has MSHA attempted to quantify the estimated costs of forced compliance with particular regulations.[221] The only available cumulative estimate of the cost of MSHA's forced compliance approach is a $7.4 billion per year figure put forth by Professor Joseph M. Johnson of George Mason University's Mercatus Center.[222] To arrive at the $7.4 billion figure, Johnson updated an earlier analysis by E. F. Denison, which measured the postregulatory productivity changes that resulted from mine safety and health regulation. Although Johnson found that "the current total costs are likely greater than $7.4 billion," he determined that "Denison's estimate is the best available."[223]

The Benefits of Forced Compliance

The initial problem with estimating the benefits of forced compliance is that there may not be any. It has never been established that forced compliance has saved one life or prevented one injury. Although there may be some anecdotal accounts from the last 25 years of instances in which MSHA's actions have been beneficial, the unfavorable change in the fatalities per million tons trend that coincides with federal intervention suggests that, at least with respect to coal mine fatalities, the overall impact of forced compliance may have been detrimental.

Another problem with estimating the benefits of forced compliance, assuming that there are some, is that the lives-saved approach emphasized by MSHA may not be a good measure of the overall safety of the workplace. First, fatal injuries are to a large extent an aberration and only a small percentage of the total number of mining injuries. For example, in 2000 there were 11,193 nonfatal mining injuries that resulted in lost workdays.[224] Second, fatal injuries can decline irrespective of improved accident prevention as advances in medical response and medical care make it less likely that a particular injury will result in death.

Even if MSHA's lives-saved approach is a fair proxy for the overall safety benefit that the Mine Act purportedly bestows on the nation's mines, it is, nonetheless, very difficult to place a monetary value on a human life.[225] MSHA, which often uses the sanctity of human life as a shield from accountability, publishes no estimates of the monetary value of a human life.[226] While it is certainly true that human life is sacred, it does not follow that it is unreasonable to assign a monetary value to it for purposes of allocating scarce public resources. Estimates of the value of a human life range from as low as $100,000 to as much as $6.8 million.[227]

Using $6.8 million as an undiscounted fair valuation of a human life, it is possible to produce a ballpark estimate of the best-case monetary benefit that the Mine Act's forced compliance program bestows upon society. Assuming, purely for the sake of argument, that as a result of forced compliance "coal miners are five times less likely to be killed on the job than they were in 1969, and metal miners twice less likely to die [than in 1977]," as former labor secretary Reich contends, MSHA saved approximately 237 lives in 2000. If MSHA is generously credited with saving all 237 lives and the value of each life is $6.8 million, then the best-case monetary benefit of the Mine Act in 2000 was $1,611,600,000 or about $1.6 billion.

The Net Loss to American Society

On the basis of the very generous benefit assumptions and conservative cost estimates

described above, it appears that the annual costs of forced compliance exceed its annual benefits by more than a factor of four. Of course, these estimates are crude. Notably, the cost estimate (presumably) includes the cost of health regulations, whereas the benefit estimate includes only lives saved through accident prevention. Nonetheless, the estimates help conceptualize the potential size of the net loss to society over the 25 years that the Mine Act has been enforced. The cumulative loss to society could be on the order of $145 billion.

Some proponents of safety regulation argue that such cost/benefit analyses are inappropriate. For example, law professors Thomas McGarity and Sidney Shapiro, who are vigorous advocates of the forced compliance approach, maintain:

> Public policy making provides us with an opportunity to express our empathy with those who are less fortunate. It is an opportunity for those of us with sufficient wealth to purchase our way out of the danger of occupational disease to choose to protect those who do not have that option. When we reject cost-benefit analysis as a guide to public policy, we not only better protect workers, we ennoble ourselves.[228]

The problem with the so-called noble or compassionate approach to social policy, which dominates present thinking about the Mine Act,[229] is that society's resources are not infinite.

While even McGarity and Shapiro "acknowledge that trade-offs must inevitably take place," they propose "an alternative way of managing such trade-offs."[230] They contend:

> Under the cost-benefit approach, significant financial burdens fall on individual undercompensated workers and their families. By comparison, the additional costs imposed by a technology-based standard [i.e. forced compliance] are passed onto consumers or absorbed by stockholders. The individual impact on any one consumer or stockholder is insignificant compared with the burden on uncompensated workers and their families.[231]

In other words, McGarity and Shapiro attempt to use the "distributional consequences of regulatory policy" to avoid the reality that society's resources are finite.[232]

Apart from the problem of unexpected distributions, discussed below, the fundamental fallacy of the professors' approach is that it fails to recognize that "the real cost of anything is still its value in alternative uses."[233] The tradeoff that arises from committing society's resources to a forced compliance approach to mine safety is not between the families of deceased miners and consumers or stockholders. The tradeoff created by forced compliance is between the families of miners and the families of other workers, such as timber cutters, fishers, and pilots, who face even greater chances that their loved ones will not return home at the end of the workday, as well as the families of truck drivers, who bear the brunt of occupational deaths in terms of absolute numbers.[234]

Ultimately, the tradeoff that arises from committing resources to forced compliance is not even among different groups of workers. The families of miners and other workers who are exposed to accidental death on the job must also compete for societal resources against the families of children who are exposed to accidental death at home. In 1998, for example, 5,848 children died from unintentional injuries.[235] The tough question is whether the $246 million spent by taxpayers and the $7.4 billion spent by consumers should be committed to the prevention of the deaths of adult miners at the workplace or the deaths of children at home.

The question is, of course, rhetorical. There are innumerable noble causes that are worthy of society's compassion. Therefore, society needs to select its beneficiaries knowingly and avoid using up any resources that could be put to alternative, possibly nobler,

Over the 25 years that the Mine Act has been enforced, the cumulative loss to society could be on the order of $145 billion.

uses. Enforcing the Mine Act, which is supposed to benefit "mostly" adult men, who are compensated (at least in part) for the hazards that they face, might not be the noblest use of society's scarce resources.[236]

The Unexpected Distributional Effects of the Mine Act

Although the public does not generally think in terms of whether a particular social policy is the best use of society's scarce resources, the public usually does concern itself with what elements of society bear the costs.[237] Identifying the elements of society that reap the benefits is equally important. In the case of the Mine Act, the distributions are somewhat surprising.

It is generally understood that mine operators bear the costs that result from attempting to improve safety through forced compliance. It is, however, tax-paying consumers who are ultimately left paying the bill for the Mine Act. Mine operators, who have "the primary responsibility to prevent . . . the existence of unsafe conditions" under the Mine Act, pay the initial costs associated with compliance and law enforcement.[238] Ultimately, however, those costs are reflected in the commodity prices of mining products.[239] As a result, consumers have to pay higher prices for electricity, groceries, automobiles, houses, communications, and everything else that can trace its origin to mining.[240] In addition, consumers who pay taxes have to pay even more since they contribute to the $246 million that Congress appropriated to MSHA in FY02.

It is generally understood that mine operators bear the costs that result from attempting to improve safety through forced compliance. It is, however, tax-paying consumers who are ultimately left paying the bill for the Mine Act.

Although common sense suggests that consumers and taxpayers bear the cost of forced compliance, it is more difficult to ascertain the beneficiaries, particularly where the expected benefits may never materialize. Perhaps the best way to identify the beneficiaries is to take note of the groups that opposed MSHA reform in 1995.

The most vigorous advocate of the Mine Act has been MSHA. Support for the Mine Act from within the agency has not been limited to the extensive lobbying efforts of political appointees such as Reich and McAteer. According to allegations made by Congress in 1995, career MSHA employees at all levels actively lobbied to save the agency from a 50 percent budget cut. Rep. Peter Hoekstra (R-Mich.) alleged that

> [district managers and mine inspectors have] actually offered, that if the mine operator were to express opposition to the [Ballenger] bill then the inspector would go easy on the operator during a mine inspection.[241]

The average salary for an MSHA inspector is $58,000 per year, higher than that of the average miner.[242] In this regard, the approximately 2,300 MSHA employees[243] who have a vested financial interest in their continued employment are no different from other employees who are keen on preserving their jobs. For example, when McAteer sought to transfer the functions of MSHA's Technical Support Unit from Colorado to West Virginia, MSHA employees in Denver were outspoken in their resentment about loosing their federal jobs and actually demanded a congressional investigation.[244]

Organized labor also adamantly opposed reform of the Mine Act.[245] For example, Richard Trumka, president of the United Mine Workers of America, testified:

> My members don't want MSHA cut and their health and safety and lives jeopardized to pay for a tax break for people who already make and receive too many tax breaks from the American government. And make no mistake about it, they [UMW members] believe that their health and safety is being used as down payment on tax breaks for the rich.[246]

Setting aside the irony of Trumka's invocation of class issues when advocating the Mine Act, which requires all other workers in the United

States to pay extra as consumers and taxpayers to provide miners with the appearance of increased workplace protections,[247] it is important to understand why the miners' unions would be willing to support a law that in all likelihood does not provide tangible protections to their members.

There are at least two possible reasons. First, it could be that the unions have not considered the possibility that forced compliance may not save the lives of their members. Second, and alternatively, it is also possible that the unions have ulterior motives. Because the Mine Act essentially grants miners a federal right to a safe workplace, the miners' unions do not have to commit as much bargaining power to safety issues, which allows the unions to bargain for other institutional benefits such as job security and the protection of bargaining unit work.[248] In addition, the Mine Act enables the unions to seek intervention from MSHA on both legitimate and illegitimate issues as a means of exercising leverage over the mine operator in both safety- and non-safety-related disputes.[249]

The insurance industry also expressed concerns about reform of the Mine Act. As one insurer explained:

> Insurance companies understand the value of MSHA's mandatory safety standards and can hardly be pleased with the prospect of mine safety becoming a discretionary option for their policy holders.[250]

The perceived value of MSHA's forced compliance approach to insurance companies is that, to the extent that it reduces any injuries, it reduces the insurance industry's exposure to liability at the expense of consumers and taxpayers. In addition, mandatory inspections by MSHA reduce the need for private insurers to perform mine inspections. As discussed above, however, the actual value of MSHA's forced compliance approach to insurers is questionable because that approach may actually impair the market for safety.

As a whole, the mining industry did not unequivocally support reform of the Mine Act. While numerous mining industry groups supported reform,[251] that support was far from unconditional.[252] The National Mining Association, which incidentally also supported Convention 176, took a fairly neutral stance on Mine Act reform.[253] While the NMA's motive for supporting Convention 176, which essentially encourages the imposition of regulatory burdens on competitive foreign mine operators, is obvious,[254] the explanation for its lukewarm support of Mine Act reform is less clear.[255] One possible explanation for such conditional and lukewarm support is that industry groups viewed the proposed OSHA-MSHA merger, which was a primary component of the 1995 budget-oriented reform proposal, as creating the prospect for even more generic regulations and even less competent inspectors.[256]

Another possible explanation is that certain association members, particularly large unionized coal operators, were specifically opposed to reform of the Mine Act.[257] The largest representative of union coal operators, the Bituminous Coal Operators' Association, did not support MSHA reform.[258] The comments of a representative of one large mining company, who spoke out publicly against MSHA reform, reveal that certain large coal mine operators may perceive the Mine Act as providing them with protection from competition with smaller nonunion coal mine operators.[259] In this regard, the Mine Act puts large mine operators, particularly unionized ones that already have to commit resources to compliance and enforcement activities under a union contract, on more equal footing with smaller operators, who do not bear that burden.[260] For example, under the Mine Act, a small mine operator has to implement a regulatory compliance program, which may not improve the bottom line, possibly even at the expense of another type of accident prevention program, which may.[261] Thus, it is possible that some large unionized mining companies consider forced compliance under the Mine Act a lesser problem than competition from small nonunion mine operators.

The National Safety Council also opposed reform of the Mine Act.[262] Because the NSC has more than 18,000 member organizations repre-

Certain large coal mine operators may perceive the Mine Act as providing them with protection from competition with smaller nonunion coal mine operators.

senting diverse political viewpoints, it is doubtful that the not-for-profit organization, whose stated mission is "protecting life and promoting health," had an ulterior motive in opposing reform.[263] To the contrary, in theory, a reduction in the federal government's role might have actually created opportunities for the NSC to expand its consultative, education, and training businesses. Thus, the NSC's motive for opposition to MSHA reform appeared to be simply an erroneous assumption regarding "the relative success of the MSHA program."[264] As set out above, MSHA's success is more mythical than factual.

A few mine safety professionals also quietly opposed the reform of the Mine Act. Those safety professionals believed that the persistent threat of MSHA enforcement gave them extra credibility and authority with mine managers who might otherwise permit expediency to interfere with sound moral and long-term economic judgments in particular circumstances.[265] The flaw in that line of support for the Mine Act is that there are numerous alternative threats of loss (for example, insurance concerns, injury-related costs, tort liability) that safety professionals can invoke to convince short-sighted mine managers to invest time and resources in accident prevention.[266] As set out above, in terms of dollars, those potential losses are much more significant than any sanctions that are likely to be imposed under the Mine Act.

The reasons cited by the miners who advocated the continuation of the forced compliance model are not any better than the reasons put forth by MSHA and Congress.

The Views of Miners on Forced Compliance

Reform of the Mine Act was also opposed by some miners. For example, a group of UMWA coal miners from different states traveled to Washington, D.C., to attend congressional hearings and oppose reform of the Mine Act in 1995.[267] The apparent motivation for those miners' opposition to any reform of the Mine Act, at least according to two op-eds written by coal miners who have worked for mining companies in eastern Kentucky, was a belief that mine safety depends on forced compliance:

> The industry has improved because MSHA has the power to fine and close mines if operators don't do what is required of them.[268]

And

> Can you imagine asking this company or any other company to simply abide by the law, but have no one there to make them comply?[269]

While it is unclear whether those views are representative of all UMWA miners, non-UMWA miners and noncoal miners, it is not altogether surprising that miners would support the Mine Act, which was enacted specifically for their benefit and gives them perceived advantages, such as regular federal inspections, that other nonmining workers do not enjoy.

However, miners' opposition to the reform of the Mine Act should not be construed as evidence that they actually benefit from forced compliance. The reasons cited by the miners who advocated the continuation of the forced compliance model are not any better than the reasons put forth by MSHA and Congress. For example, reminiscent of the 1977 Congress's reasoning in deciding to strengthen the Coal Act and McAteer's statements regarding Southmountain, miners have argued that the failures of forced compliance highlight the need for forced compliance:

> Ballenger and his followers simply believe that if we ask the coal companies to work safe, they will. But take a look at the Southmountain explosion. It was apparent that every safety and health regulation in the book was broken, and this was with the government telling them "this is the law."[270]

And

> When MSHA inspectors are not on the site, some of my employers have forced

> us to work in dangerous environments, in violation of the MSHA approved mining plan.[271]

However, the fact that forced compliance does not work in some instances does not prove that it does work in other instances. To hide the flaw in this line of argument, emotion is used as a substitute for logic:

> If Ballenger gets his legislation passed, he is guilty, along with anyone else who signed up with him, of sending some of our miners to their deaths.[272]

And

> I challenge anyone in Congress who supports Ballenger's bill to help us go through rubble and help us find enough body parts to help us piece our coal mining buddies back together.[273]

Although any loss of life resulting from a mining accident is certainly tragic, and especially difficult for the brave miners who participate in recovery operations, it does not follow that accidents are prevented by forced compliance and that the Mine Act actually benefits miners.[274]

In fact, the irony of those particular miners' opposition to reform of the Mine Act is that 25 years of federal police intervention apparently have not improved their situation. Evidently, coal miners in eastern Kentucky are still faced with a "cruel choice" between an unsafe job and the unemployment line:

> I can tell you from a coal miner's view why dangerous conditions exist and persist today—it's called job security. You can't trust some operators. You can't say to these operators "I'm not doing that" and then wake up the next morning and have a job. Simply put, miners are faced with a cruel choice between a job that can kill them and the unemployment line.[275]

And

> I won't work in unsafe conditions and the bottom line is that I have been blacklisted from the coal fields of Eastern Kentucky for simply insisting that I be allowed to work in safe conditions.[276]

There is no disputing that the predicament described by those miners is a harsh one, particularly where the "choice" to work in a "dangerous" coal mine is occasioned by other choices, such as dedication to family, which are beyond reproach. It is disputable, however, that forced compliance has made that choice any less cruel. The fact of the matter is that the Mine Act cannot remedy and has not remedied the apparent lack of viable alternative employment opportunities in eastern Kentucky.

The Risk Preferences of Miners

Although those particular miners endorsed the Mine Act's forced compliance model with their words, their actions are actually a testament to the functionality of the market approach to mine safety, which depends in large part on the choices made by individual miners. Both miners had adequate information about the hazards that they faced and determined that they did not want, or were not being paid enough, to put their personal safety at risk.

Fortunately, American society respects their choice to get out, and neither government nor creditors can force them back into the mines against their will. Scholars have debated whether the local mine may have presented the only realistic employment option in earlier times,[277] but today, when the population is mobile[278] and the national unemployment rate remains under 6 percent,[279] circumstance does not force individuals into the mines.[280]

Although there is a strong temptation to focus on the difficult choices faced by particular individuals, it is important not to lose sight

Today, when the population is mobile and the national unemployment rate remains under 6 percent, circumstance does not force individuals into the mines.

The market for safety, to the extent that it is not unduly impaired by moral hazards or inadequate information, reflects the current risk preferences of all miners and potential miners.

of the aggregate effect of those choices. For example, if enough individuals in eastern Kentucky had risk preferences similar to those of these particular miners, the mines in the area would have to pay higher wages to attract other workers, to make improvements to make the mines safer, or to close, as mines often do, when the costs of production exceed the price of minerals sold. Ultimately, the market for safety, to the extent that it is not unduly impaired by moral hazards or inadequate information, reflects the current risk preferences of all miners and potential miners.

Although this level of safety may be higher or lower than the level sought by legislators and regulators,[281] it nonetheless reflects the choices of individuals who work in mines as opposed to individuals who work in office buildings in Washington, D.C., and Arlington, Virginia.[282] Historically, miners have resented the paternalistic risk choices made by federal and state regulators and even mine operators when the choices have impacted the miner's ability to earn a higher wage or restricted his freedom. For example, coal miners initially opposed electric cap lamps, permissible explosives, hard hats, and goggles; and hard-rock miners initially opposed the introduction of permissible explosives and mechanization.[283] To some extent, similar resentment is still expressed by miners today.[284] That is especially true at mining operations where there is little or no distinction between the operator and the miner, such as family owned and operated mining operations and operations where the miners are independent contractors.[285] In this regard, the enforcement of mandatory safety standards is seen, not as an expansion of a worker's "rights," but rather as a sign of disrespect for a worker's right, as an individual, to select a job that best suits his personal risk-to-pay preferences.[286]

The imposition of Washington's risk preferences is perhaps most egregious when they are exported to less-developed nations. In addition to being outside the scope of the Mine Act's original jurisdiction and legislative mandate, initiatives such as the ILO's Convention 176 are unethical in that they seek to impose the risk preferences of wealthy Americans on the peoples of other nations. While such initiatives are undertaken under the guise of improving labor standards worldwide, the less-publicized motive is to level the international playing field for the heavily regulated mine operators in the United States.[287] Irrespective of the motivation, the ultimate effect of not trusting the risk preferences of workers in poorer countries is usually not better working conditions for those workers but the lost opportunity to raise their standard of living.[288]

The Improvement of Safety through Wealth Creation

In the final analysis, it is probably a rising standard of living, more than anything else, that reduces mining fatalities. Although the apparent correlation between rising per capita income and declining mine fatality rates (Figure 8) does not prove a cause and effect relationship, there are innumerable ways in which wealth reduces mining injuries.

Nations with accumulated wealth can substitute equipment for labor. Those nations also have better health care facilities to mend injured miners and greater resources to commit to rescue operations. Perhaps most important, nations with accumulated wealth are usually comprised of individuals who are adverse to job risk. In this regard, McAteer's observation that "[m]ost miners and mine operators alike have a commitment to safety and health that once was rare," is just another way of saying that the risk preferences of American miners have changed.[289] As a result of the change, which is almost certainly related to the nation's growing wealth, the nation's mines are safer than they were in the past.[290]

Thus, while it is certainly true that "there are more important things than the pursuit of material wealth,"[291] it is also true that "[f]ew things have saved as many lives as the simple growth of wealth."[292] The public policy impli-

cations of this observation are important: any social legislation that reduces society's wealth by committing society's scarce resources to endeavors whose costs do not exceed the benefits is counterproductive. The Mine Act, which possibly commits more than $7 billion of society's scarce resources annually to achieve no measured benefits in terms of lives saved, obviously fails this test. Congress should consider repealing the Mine Act.

The Transition to the Market Approach to Safety

For the last 25 years, MSHA has successfully used scare tactics to oppose all efforts to repeal or to reform the Mine Act. In 1995, for example, McAteer stated to Congress:

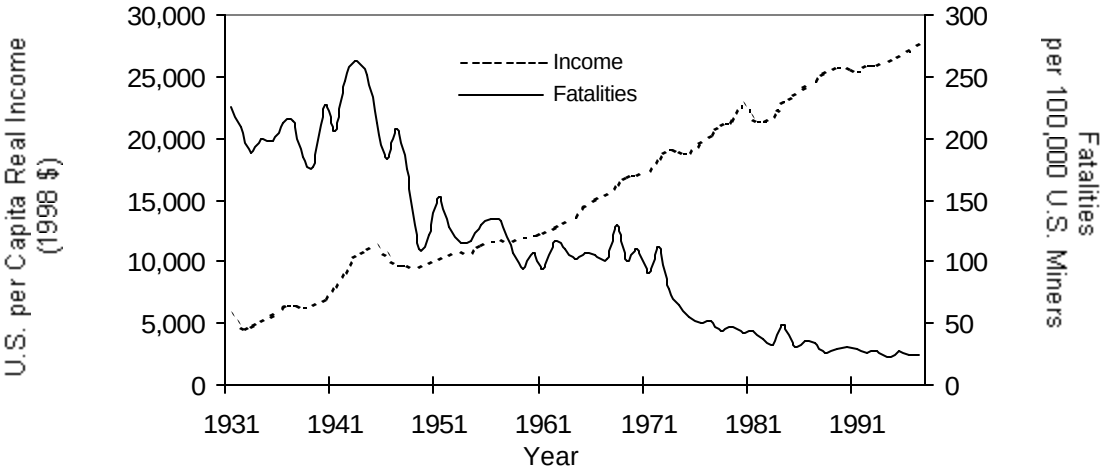
> By repealing the Federal Mine Safety and Health Act of 1977, and by substituting a much weaker enforcement scheme, H.R. 1834 would return us to an earlier era. Mining communities remember that era, even if others have forgotten. Mine explosions were common. Roof falls were routine. Miners and their families paid the price.[293]

However, given present risk preferences, advancements in technology, and liability concerns, it is virtually certain that the mining conditions that existed in the nation's "earlier era" are gone forever. Thus, in the mine safety context, "the fundamental question that we must address is whether we should continue to sacrifice additional lives in an effort to preserve this popular mythology."[294]

That is not to say that the transition from forced compliance to a market-based approach is guaranteed to be flawless. It may take time for the regulatory status quo to unwind. For example, because labor prices are often locked in by long-term contracts, it could take as long as a decade for higher labor costs to accurately reflect the risk-pay preferences of miners.

In the final analysis, it is probably a rising standard of living, more than anything else, that reduces mining fatalities.

Figure 8
Increasing Wealth and Mine Fatality Rates



Sources: For mine fatality rates, author's calculation ([coal fatalities + metal fatalities] ÷ [number of coal miners + number of metal miners]) based on data from U.S. Department of Labor, MSHA Internet, Metal/Nonmetal Fatalities 1900 [1931] through 2001, www.msha.gov/centurystats/mnmstats.htm; and U.S. Department of Labor, MSHA Internet, Coal Fatalities for 1900 through 2001, www.msha.gov/centurystats/coalstats.htm. U.S. per capita income from Bureau of Economic Analysis, Regional Accounts Data, Annual State Personal Income (United States), www.bea.doc.gov/bea/regional/spi/drill.cfm?table=SA05H&lc=30&years=1957,1956,1955,1954,1953,1952,1951,1950,1949,1948,1947,1946,1945,1944,1943,1942,1941,1940,1939,1938,1937,1936,1935,1934,1933,1932,1931,1930,1929&format=htm (converted to 1998 dollars using conversion factor from Consumer Price Index Conversion Factors to Convert to Dollars of the Year 1998, www.orst.edu/dept/pol_sci/fac/sahr/sahr.htm).

In the unlikely event that mining injuries or fatalities on a production-rated basis increased during the transitional period (or even thereafter), Congress might again be pressured by special interest groups to intervene in the market for mine safety. In the event that Congress succumbs to that pressure, it should resist a return to the forced compliance model embodied in the Mine Act for all of the reasons discussed above.[295] To the extent that intervention may be politically expedient and necessary, Congress should narrowly tailor its actions to whatever specifically contributed to the rising accident rates.

For example, if it was established that miners were not demanding adequate hazard premiums, a system could be put in place to provide miners with greater information about the relative risks that they face at the workplace.[296] One information-based approach that the federal government could take is to make a national registry of injury statistics available.[297] Such a registry could contain the injury statistics of particular mines and mine operators, as well as necessary ownership and control information. A miner seeking employment or to change jobs would access the registry over the Internet and use it to make a better-informed decision about possible employment opportunities. For example, he might choose to accept a lower rate of pay, a longer commute, or a complete relocation in order to work at a mine or for a company with better injury rates. Such government encouragement of safety-based competition would put less-safe mines and less-safe mine operators at a disadvantage; eventually they would be put out of business as compensating wage differentials made their continued operation unprofitable.

To the extent it focuses on accident rates, MSHA's present Data Retrieval System is a step in the right direction in this regard, given that it provides miners with fatal and nonfatal injury rates at different mining operations.[298] However, substantial refinement would be required to create a system that provides reliable and understandable information to miners about the relative risks faced at competing mining and even nonmining operations.[299] Moreover, the information collection system would need to be refined to ensure that the direct and indirect costs associated with the collection and dissemination of information did not outweigh the benefits of such a system.[300] Ideally, such a registry might even be maintained by a nongovernmental entity such as the National Safety Council.

As another example, Congress might consider offering preferential treatment to mine operators that meet certain injury thresholds as a means of encouraging additional investment in safety if it was established that labor, injury, insurance, and workers' compensation costs did not create sufficient incentives. MSHA already uses injury thresholds in the issuance of its annual safety awards to mine operators.[301] However, instead of getting a piece of paper, the mine operator would get a tangible monetary benefit for meeting the thresholds. The benefits could range from lower federal tax rates to lower royalty rates on resources extracted from federal lands.[302] Lost tax revenues or royalties would pale in comparison with the societal resources lost to forced compliance. Tax breaks would be preferable to an injury tax because a tax diverts resources from the private sector, which can prevent accidents, to government, which cannot prevent accidents.[303]

The Role of Local Law Enforcement

Regardless of whether or not the federal government intervenes in the market for mine safety, there will be operators who will choose to expose individual miners to hidden risks despite the economic incentives to prevent accidents; and even at mines where the operator has removed the barriers to safe behavior, there may be individuals who will choose to put themselves and others at risk. Those operators and individuals, to the extent that their deliberate or reckless choices endanger others, may be appropriate candidates for law enforcement. However, to the extent that law enforcement is necessary and appropriate, it should be carried out by state

To the extent that law enforcement is necessary and appropriate, it should be carried out by state and local governments, not by the federal government.

and local governments, not by the federal government.

At present the Mine Act provides two law enforcement mechanisms by which the federal government can deal with bad actors in the nation's mines: civil penalties and criminal sanctions. Under the Mine Act, MSHA can levy civil penalties and criminal sanctions not only against mine operators but also against "corporate directors, officers and agents," including mine foremen, who "knowingly authorized or carried out such violation."[304] Because of an oddity in the Mine Act, the criminal and civil penalties are not available against directors, officers, and agents of noncorporate operators such as sole proprietorships, partnerships, and limited liability companies.[305] As indicated above, miners are also largely exempt from federal law enforcement.

The problem with the present federal approach, apart from the fact that only a select minority of the individuals who work in the nation's mines are subject to punishment, is that it usurps local law enforcement. The Mine Act does not expressly preempt state or local enforcement.[306] Moreover, most state governments have laws on the books that enable the successful prosecution of workplace crimes, such as negligent homicide, reckless endangerment, and the like.[307] Furthermore, most governments of mining states have mine inspectors who are available to assist local prosecutors with technical mining issues. Nonetheless, the reality is that active participation by federal mine inspectors usually diminishes the role of state and local authorities to the point where local law enforcement officials generally do not meaningfully participate in mine accident investigations.[308] As a result, decisions about whether to prosecute an entity or an individual are made by federal mine inspectors and federal attorneys, and sentencing decisions are made by federal judges, none of whom have any relationship with or accountability to the affected community.

The result of the lack of accountability to the local populace is incoherent law enforcement, in that actors who should not be penalized are penalized and actors who should be punished are not punished severely enough. For example, MSHA has used the Mine Act to civilly prosecute supervisors for noncriminal violations of its regulations, even where they did not intend to violate the law and had only constructive knowledge of the violative conditions.[309] On the other hand, the federal government has been accused of being lax in punishing the serious malefactors.[310] Those are mistakes that local officials who are accountable and more in touch with the local mining community may be less likely to make.[311] Therefore, law enforcement, where necessary, should be reserved to the states under their existing criminal codes.

The End of a Legacy

A common misperception is that "the Federal Mine Safety and Health Act is a sibling of the of the OSH Act that applies only to the mining industry."[312] In fact, the OSH Act is a sibling of the Coal Act, which followed the Farmington mine disaster. As McAteer has correctly pointed out, "[T]oday, thousands upon thousands of workers beyond the coal industry indirectly owe federal safety and health protection upon which they rely to the Farmington disaster."[313]

The legacy of Farmington is that the federal government now attempts to improve workplace safety and health for all workers in the United States through forced compliance, whereas prior to Farmington it tried to improve workplace safety and health with information empowerment. The legalistic approach is now so firmly embedded in our safety psyche that it does not even raise eyebrows when the head of the federal mine safety agency states that "it ought to be the purpose of the lawyers and of the mine inspectors [i.e., police] to improve health and safety."[314]

The simple fact of the matter is that lawyers and police cannot effectively or efficiently improve mine safety. Safety has to start and finish with the individuals who make up the mining industry. For that to happen, the federal government will have to repeal the forced compliance provisions of the Mine Act.

Safety has to start and finish with the individuals who make up the mining industry. For that to happen, the federal government will have to repeal the forced compliance provisions of the Mine Act.

Notes

1. Federal Mine Safety and Health Act (1977), 30 U.S.C. 802(c) et seq.

2. Robert Reich, quoted in U.S. Department of Labor, Mine Safety and Health Administration, "MSHA Commemorates 25th Anniversary of Coal Act," News release, March 30, 1995, www.dol.gov/opa/media/press/msha/msh95110.htm.

3. J. Davitt McAteer, quoted in ibid.

4. Cass Ballenger, Opening Statement, Hearing on the Federal Mine Safety and Health Act before the Subcommittee on Workforce Protections of the House Committee on Education and the Workforce, July 30, 1998, http://edworkforce.house.gov/hearings/105th/wp/msha73098/ballenger.hm.

5. Colleen M. O'Neill, "OHSA Plan 'Should Be Called Die Act,'" *AFL-CIO News*, July 3, 1995, www.aflcio.org/publ/newsonline/95jul3/osha.html.

6. "But the true toll cannot be calculated in dollars and cents, for behind every number is a neighbor. On June 9, a worker was . . . killed at a Montana Copper mine, when he fell from the 170-ton haul truck he was repairing." Robert B. Reich, Remarks before Subcommittee on Workforce Protections of the House Committee on Economic and Educational Opportunities, June 28, 1995, www.dol.gov/asp/programs/history/reich/congress/062895rr.htm.

7. Thomas Sowell, *Basic Economics: A Citizens Guide to the Economy* (New York: Basic Books, 2000), p. 306.

8. Given that there are human lives and billions of dollars at stake, no one individual is qualified to make such a determination. The determination needs to be made by economists, accountants, actuaries, statisticians, sociologists, and safety professionals, preferably ones who have no or limited vested interest in the Mine Act's future.

9. See, for example, *Contractor's Sand & Gravel Inc. v. FMSHRC*, 199 F.3d 1335 (D.C. Cir. 2000) (award of $100,000 in attorney's fees and expenses against MSHA in a case involving a vacated citation that carried a $7,000 civil penalty assessment).

10. The focus of this paper is on the provisions of the Mine Act that deal with safety regulation, inspection, and enforcement. The provisions dealing with health regulation, inspection, and enforcement; black lung benefits; mandatory training; and whistleblowers are beyond the scope of this paper but are worthy of equal scrutiny.

11. Davitt McAteer, "Farmington Victims Left Legacy to Nation's Miners," *MSHN [Mine Safety and Health News]* 5 (November 27, 1998): 532.

12. U.S. Department of Labor, "Injury Trends in Mining," Fact sheet, MSHA Internet, www.msha.gov/MSHAINFO/FACTSHET/MSHAFCT2.HTM.

13. "Explosions never accounted for as much as a quarter of the miners' mortality." Mark Aldrich, "Preventing 'the Needless Peril of the Coal Mine': The Bureau of Mines and the Campaign against Coal Mine Explosions, 1910–1940," *Technology and Culture* 36, no. 3 (1995): 518.

14. Chris Stirewalt, "Loss of Life Leads to Change," *Charleston Daily Mail*, February 9, 1999, www.dailymail.com/static/specialsections/lookingback/lb0209.htm.

15. Ibid. See also H.R. 91-563, Federal Coal Mine Safety and Health Act, 91st Cong., 1st sess., October 13, 1969, www.msha.gov/SOLICITOR/COALACT/69hous.htm ("General Subcommittee on Labor conducted 10 days of public hearings on coal mine health and safety proposals. Included in the hearing record are the views of representatives of operators of large coal mines; operators of small coal mines; the coal miners' union; individual mine workers; interested parties; and Administration personnel.").

16. "Only in 1969 was federal legislation dealing comprehensively with coal mine safety enacted." National Research Council, Committee on Underground Coal Mine Safety, Commission on Engineering and Research Systems, *Towards Safer Underground Mines* (Washington: National Academy Press, 1982), p. 54.

17. Sowell, p. 308.

18. For an analysis of compensating wage differentials in bituminous coal mining from 1890 to 1930, see Price V. Fishback, *Soft Coal, Hard Choices* (New York: Oxford University Press, 1992), pp. 79–98. But see Hal Sider, "Safety and Productivity in Underground Coal Mining," *Review of Economics and Statistics*, May 1983, pp. 225, 231. Sider suggests, but does not conclude, that at union coal mining operations where wages are not determined competitively, a mine operator's wage costs might be insensitive to risk.

19. "I will insist on following the rules if I think that I am going to get hurt or killed or that I may get someone else hurt or killed [and] I won't work in unsafe conditions." Danny Sheperd, "A Miner's

Perspective of the Ballenger Bill and the Proposed MSHA/OSHA Cuts," *MSHN* 2 (June 30, 1995): 362.

20. For an econometric analysis of compensating wage differentials, see Kip A. Viscusi, *Employment Hazards: An Investigation of Market Performance* (Cambridge, Mass.: Harvard University Press, 1979).

21. For a summary of the literature discussing risk premiums, see Thomas O. McGarity and Sidney A. Shapiro, *Workers at Risk: The Failed Promise of the Occupational Safety and Health Administration* (Westport, Conn.: Praeger, 1993), pp. 18-20.

22. It is important to note that this is only an observation and that a calculation of actual risk premiums is much more complex. See Viscusi, *Employment Hazards*, pp. 42–45.

23. U.S. Department of Labor, Bureau of Labor Statistics, *Career Guide to Industries, 2002–03*, www.bls.gov/oco/cg/cgs004.htm.

24. National Mining Association, *Mining Facts/Fast Facts*, www.nma.org/fastfacts.html.

25. David Lauriski, Remarks to 62nd Annual Meeting of the Kentucky Mineral Law Institute, reprinted in *MSHN* 7 (August 31, 2001): 387.

26. "Indirect costs, though hidden, are real and are estimated to be at least four times the insured costs." Dave Carlson, Michigan State Grants Program, "Barriers to Safe Employee Behavior," *MSHN* 6 (January 22, 1999): 50. "A commonly accepted figure is that for every dollar that the insurance carrier pays out on a workers' compensation claim, the company may have an indirect expense of around six dollars." Rob Brooks, Chubb Group of Insurance Companies, "Rethinking Mine Safety Management," *MSHN* 2 (August 25, 1995): 457.

27. "[R]ising injury costs were the spur that goaded the large metal mines to begin organized safety work." Mark Aldrich, *Safety First: Technology, Labor and Business in the Building of Work Safety, 1870–1939* (Baltimore: Johns Hopkins University Press, 1997), p. 247.

28. "Companies Can Expect Higher Compensation Insurance," *MSHN* 7 (September 1, 2000): 381.

29. Western Mine Engineering, Inc., "U.S. Metal and Industrial Mineral Mine Salaries, Wages, and Benefits & U.S. Coal Mine Salaries, Wages, and Benefits 2000 Survey Results," 2000.

30. For a summary of changes in employer tort liability, see McGarity and Shapiro, pp. 18–20.

31. "Widow, Son Sue Baylor Mining for $10 Million in Mine Death," *MSHN* 9 (January 21, 2002): 41; "N.M. Supreme Court Allows Employers to Be Sued for Misconduct in Accidents," *MSHN* 8 (October 29, 2001): 480; "Families File First Lawsuits in Jim Walter Mine Disaster," *MSHN* 8 (October 15, 2001): 456; "Lawmakers Want to Change Wyoming Constitution to Allow Worker Lawsuits," *MSHN* 8 (August 3, 2001): 364; "Worker Injured in Fall Awarded $6.7 Million by Alabama Jury," *MSHN* 8 (May 25, 2001): 247; "Missouri Court Reinstates Widow's Lawsuit against Lone Star," *MSHN* 8 (April 13, 2001): 177; and "Widow Sues Kentucky Coal Company over Husband's Death," *MSHN* 8 (January 19, 2001): 46.

32. John D. Worrall says that the incentive for employers to maintain safe workplaces to avoid premium increases will be offset to some extent by the moral hazard created by the compensation for injured miners. John D. Worrall, *Safety and the Work Force* (Ithaca, N.Y.: IRL Press, 1983), p. 154. According to Price V. Fishback and Shawn E. Kantor, the limited empirical studies have indicated that in most industries, except notably coal mining, the incentives for operators to invest in safety outweighed the moral hazards, resulting in fewer injuries. Price V. Fishback and Shawn E. Kantor, *A Prelude to the Welfare State* (Chicago: University of Chicago Press, 2000), pp. 77–83.

33. "An experience modification factor (EMF) takes into account . . . [a mine operator's] past [insurance] claims. . . . The EMF is a direct multiplier to your premium cost so your costs for insurance would be 75% or 150% of the initial cost depending on your claims experience." Carlson, p. 51.

34. With respect to coal mine explosions, "economic incentives were probably more important than legal changes in encouraging the spread of rock dusting, [the practice of covering all surface areas in the mine with incombustible material, because, in part] explosions could be extremely expensive, for they often destroyed the mine." Aldrich, "Preventing 'the Needless Peril of the Coal Mine,'" p. 513.

35. For example, Larry Lankton found that "major fires were very expensive in terms of lost revenues and large recovery rates." Larry Lankton, *Cradle to Grave: Life, Work and Death at the Lake Superior Copper Mines* (New York: Oxford University Press, 1991), p. 120.

36. U.S. Department of Labor, MSHA Internet Site, History of Mine Safety and Health Legislation, www.msha.gov/MSHAINFO/MSHAINF2.HTM.

37. Fishback, p. 113. "The Bureau had no power of inspection or supervision, but was to cooperate with mining interests, providing them the tech-

nological support needed to reduce the 'needless perils' and other wastes of the mining." Aldrich, "Preventing 'the Needless Peril of the Coal Mine,'" p. 491.

38. "[T]he bureau gradually mastered the art of prodding operators into implementing the new technologies that resulted from its scientific investigations." Ibid., p. 495.

39. John Mendeloff, *Regulating Safety: An Economic and Political Analysis of Occupational Safety and Health Policy* (Cambridge, Mass.: MIT Press, 1979), p. 25.

40. Ibid.

41. "Even though miners are afraid of someone getting killed—rarely do they believe that it could be them." Sheperd, p. 363.

42. Viscusi, *Employment Hazards*, pp. 133, 143. See also W. Kip Viscusi, *Risk by Choice: Regulating Health and Safety in the Workplace* Cambridge, Mass.: Harvard University Press, 1983), pp. 73–75.

43. Rhea Graham, "Goodbye to an 85 Year Old Agency; Farewell to Bureau of Mines," *MSHN* 2 (November 17, 1995): 623.

44. "These findings demonstrated that virtually all American bituminous coal dust, if sufficiently fine and mixed with gas, was highly explosive and required large amounts of inert material [i.e., pulverized rock dust] to neutralize it." Aldrich, "Preventing 'the Needless Peril of the Coal Mine,'" p. 501.

45. Viscusi, *Employment Hazards*, pp. 133, 143.

46. Fishback, p. 113.

47. See generally Aldrich, *Safety First*; and Aldrich, "Preventing 'the Needless Peril of the Coal Mine.'"

48. For a detailed history of "the federal takeover" of mining regulation, see James Whiteside, *Regulating Danger* (Lincoln: University of Nebraska Press, 1990), pp. 175–201.

49. For a summary of the history of mine safety legislation, see ibid and U.S. Department of Labor, *History of Mine Safety and Health Legislation*.

50. See Whiteside, pp. 175–201.

51. Walter J. Hickel, secretary of the interior, quoted in H.R. 91-563.

52. "Official figures claim there are fewer than 10,000 mining deaths a year. The real figure is more likely to be closer to 20,000." "Coal Mining in China, Introduction," *China Labour Bulletin*, January–February 2000, http://iso.chinalabour.org.hk/-iso/article.adp?article_id=1086. "[R]ecent government moves to match production levels to slowing consumer demand could see production in the year 2000 at a level closer to 1,100 to 1,200 million tonnes [run-of-mine]." International Energy Agency, *Coal in the Energy Supply of China*, www.iea.org/pubs/studies/files/coachi/coachi.htm#chart.

53. Number of fatally injured coal miners in 2000 from U.S. Department of Labor, MSHA Internet, Coal Fatalities for 1900 through 2001, www.msha.gov/centurystats/coalstats.htm. U.S. coal production in 2000 from Energy Information Administration, Coal Industry Annuals, 1994–2000, http://tonto.eia.doe.gov/FTPROOT/coal/coalpubs.htm.

54. U.S. coal production for 1969 and 1934 from Energy Information Administration, U.S. Bituminous and Lignite Coal Production 1900–1993, 1995, Table 18, pp. 65–66, http://tonto.eia.doe.gov/FTPROOT/coal/006493.pdf. U.S. anthracite coal production 1900–1993 from Pennsylvania Department of Environmental Protection 2000 Annual Report on Mining Activities, Table 1, www.dep.state.pa.us/dep/deputate/minres/bmr/annualreport/2000/table01.htm. Fatalities from U.S. Department of Labor, MSHA Internet, Coal Fatalities for 1900–2001, www.msha.gov/centurystats/coalstats.htm.

55. The 91st Congress received technically correct, but otherwise inaccurate, information regarding the trend in mine fatality rates from former department of the interior secretary Walter J. Hickel, who testified that "there has been no improvement in the overall fatality rate since 1947." H.R. 91-563. Although the fatality per employee rates per 100,000 miners in 1947 (236) and in 1968 (231) were similar, the 1968 rate, which reflected the Farmington disaster, was an aberration. Fatalities in absolute numbers had been steadily declining since the late 1950s after rising somewhat in the mid-1950s. U.S. Department of Labor, MSHA Internet, Coal Fatalities for 1900 through 2001. See also National Research Council, p. 15. Moreover, Secretary Hickel neglected to tell Congress that the fatality per million ton rate had improved by more than a factor of three between 1947 (1.7) and 1968 (.56). Number of U.S. coal mine fatalities from U.S. Department of Labor, MSHA Internet, Coal Fatalities for 1900 through 2001, www.msha.gov/centurystats/coalstats.htm, divided by U.S. total coal production (thousand short tons) 1900 to 1993 from Energy Information Administration, U.S. Bituminous and Lignite Coal Production 1900 to 2000, Coal Products Publications, Coal Data: A Reference, Table 18, U.S. Production Trends in Bituminous

Coal and Lignite, 1900–1993 (total production, thousand short tons), 1995, pp. 65–66, http://tonto.eia.doe.gov/FTPROOT/coal/006493.pdf, plus U.S. anthracite coal production 1900 to 1993 from Pennsylvania Department of Environ-mental Protection, Mining and Reclamation, 2000 Annual Report on Mining Activities, Table 1, Anthracite Statistical Summaries 1870 to 2000 (production, net tons), www.dep.state.pa.us/dep/deputate/minres/bmr/annualreport/2000/table01.htm, and U.S. total coal production 1994 to 2000 from Energy Information Administration, Coal Products Publications, Coal Industry Annals 1994–2000 (thousand short tons), http://tonto.eia.doe.gov/FTPROOT/coal/coalpubs.htm, times 1,000.

56. H.R. 91-563.

57. "[T]he legal background of most congressmen . . . inclines them to make the reallocation of legal rights and duties rather than economic incentives the usual tool for effecting changes in behavior." Mendeloff, p. 26. Compare 30 U.S.C. 801(e) ("operators of such mines . . . have the primary responsibility to prevent [accidents]") and 801(a) ("the first priority and concern of all in the coal or other mining industry must be the health and safety of its most precious resource—the miner"); see also 30 U.S.C. 814(a), 821.

58. U.S. Department of Labor, *History of Mine Safety and Health Legislation.*

59. See generally Federal Coal Mine Safety and Health Act of 1977, Pub. L. 91-73 (1977); and U.S. Department of Labor, *History of Mine Safety and Health Legislation.*

60. "[The Coal Act] allowed 'first-instance' penalties, that is, employers could be cited merely for having a violation, not just for failing to correct violations cited earlier." Mendeloff, p. 19.

61. S.R. 95-181, 95th Cong., 1st sess., reprinted in Subcommittee on Labor of the Senate Committee on Human Resources, *Legislative History of the Federal Mine Safety and Health Act of 1977*, July 1978, p. 592, www.msha.gov/SOLICITOR/COALACT/leghist2.htm.

62. Ibid., p. 595.

63. Ibid., p. 592.

64. H.R. 91-563.

65. The UMWA claims that it "convinced Congress to enact the landmark Federal Coal Mine Health and Safety Act" in 1969. UMWA Internet, A Brief History of the UMWA, www.umwa.org/history/hist1.shtml.

66. Frederic Bastiat, *The Law* (Irvington-on-Hudson, N.Y.: Foundation for Economic Education, 1998), pp. 7–8.

67. H.R. 95-312, reprinted in Subcommittee on Labor of the Senate Committee on Human Resources, p. 364.

68. Ibid.

69. Occupational injury incidence rates per 100,000 miners by industry in United States in 1975 and 1976 were anthracite coal 229.2, bituminous and lignite coal 133.9, metal mining 76.9, private-sector average 57.8, nonmetallic mining 49.8. U.S. Department of Labor, Bureau of Labor Statistics, "Occupational Injuries and Illness in the United States Industry, 1978," *Bulletin* 2019 (1979): Table 8, p. 79.

70. H.R. 95-312, reprint, p. 364 (citing at length Frank McGee, treasurer-elect of the United States Steel Workers of America).

71. "[The UMWA] provided little support for the bureau [of Mines'] efforts to introduce permissible explosives and electric cap lamps." Aldrich, "Preventing 'the Needless Peril of the Coal Mine,'" p. 493.

72. "The appeal of federal action to union leaders was that it offered a way to bypass the union's weak position on these issues in collective bargaining." Mendeloff, p. 16.

73. H.R. 95-312, reprint, p. 358.

74. U.S. Department of Labor, Bureau of Labor Statistics, "Occupational Injuries and Illness in the United States Industry, 1978," p. 24. Chart 14 ranks the 10 three-digit SIC industries with the highest injury incidence rate of lost workdays in 1976: water transportation, 452.6; sanitary services, 274.6; loggers, 284.5; anthracite coal, 229.2; private-sector average, 57.8.

75. "The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people." U.S. Constitution, Amendment Ten.

76. "To regulate Commerce with foreign Nationals, and among the several States, and with the Indian Tribes. . . ." U.S. Constitution, Art. 1, sec. 8.

77. Pub. L. 91-173, sec. 2(f).

78. S.R. 95-181, reprint, p. 590 (discussing federal takeover).

79. H.R. 91-563 ("Coal is our most abundant fuel resource. Right now, it supplies nearly a fourth of our total energy demand and every forecast, whether by Government or the private sector, indicates that coal must continue to play a significant role if this country's future energy requirements are to be satisfied.").

80. 30 U.S.C. 801(b).

81. 30 U.S.C. 801(c); see also H.R. 91-563 ("it has also frequently saddened our Nation with news of crippled men, grieving widows, and fatherless children.") (quoting President Nixon).

82. 30 U.S.C. 801(a).

83. Mendeloff, pp. 25–31.

84. Former labor secretary Alexis Herman commented that "Americans workers have a fundamental right to a safe and healthful workplace." Quoted in "Kaiser, MSHA Agree to $513,000 Settlement with New Safety Measures," MSHA News release 2000-1214, December 14, 2000, www.msha.gov/MEDIA/PRESS/2000/NR001214.HTM. Reich stated, "If Congress enacts this legislation, it will be reneging on the promise it made twenty-five years ago to America's workers: the right to a safe and healthy workplace." Quoted in "Labor Dept. Denounces Attempt to Gut Safety Agencies," MSHA News release 95-021, June 14, 1995, www.msha.gov/MEDIA/PRESS/1995/NR950614.HTM. See also 30 U.S.C. 801(a); and H.R. 95-312, reprint, p. 379.

85. "The organized labor movement is the Department of Labor's (and OSHA's [and MSHA's]) chief client, and the department is expected to show at least some partiality to the interests of organized labor." Mendeloff, pp. 73–74.

86. 30 U.S.C. 811(a).

87. 30 U.S.C. 813(a).

88. 30 U.S.C. 814(a); 820(a), (c), (d). See also 30 U.S.C. 814(b), (d); 817(a); 821 (authorizing MSHA to issue orders closing all or part of the mine operator's operation and to require the mine operator to compensate certain miners idled by such orders in cases involving unwarrantable noncompliance, failure to correct or imminent danger).

89. S.R. 95-181, reprint, p. 596 ("The Committee believes that there is great need to encourage young people to go into the occupation of mining as the need of our nation for the minerals and energy sources extracted from the earth continues to increase. It is the Committee's feeling that the duty of the Congress, if it is to encourage such employment, is to make that employment as safe as possible.").

90. Ibid., p. 593 ("Over the long run, improved health and safety promotes greater productivity through reduction of 'downtime.'").

91. Ibid. ("Lowered workers' compensation premiums which should result from improved safety and health, can be expected to lower production costs.").

92. 30 U.S.C. 801(d). Emphasis added.

93. J. Davitt McAteer, Testimony before the Subcommittee on Workforce Protections of the House Committee on Education and the Workforce, September 14, 2000, http://edworkforce.house.gov/hearings/106th/wp/msha91400/mcateer.htm. Emphasis added.

94. Metzgar has pointed out that "[t]he agency never published analysis of why the fatality rate declined because it didn't know." Carl Metzgar, "The Map and the Territory: Why the Scientific Method Is Vital in the Injury Prevention Effort," *MSHN* 3 (May 31, 1996): 296. But see J. Davitt McAteer, Statement submitted to the Subcommittee on Workforce Protections of the House Committee on Economic and Educational Opportunities on H.R. 1834, the Safety and Health Improvement and Regulatory Reform Act of 1995, August 9, 1995, p. 11 n. 2 (citing John Braithwaite, *To Punish or Persuade: Enforcement of Coal Mine Safety* (Albany: State University of New York Press, 1985); on prior occasions McAteer cited Braithworth in support of forced compliance even though Braithwaith does not support the model.

95 McAteer, Testimony of September 14, 2000.

96. U.S. Department of Labor, MSHA, "Reich Testifies on Proposed Legislation Affecting OSHA, MSHA Agency Heads Defend Programs," Press release, June 28, 1995, www.dol.gov/opa/media/press/msha/msh95246.htm. Emphasis added.

97. "Congressman's Proposal to End MSHA, OSHA As We Know It," *MSHN* 2 (May 5, 1995): 264.

98. McAteer, Statemeent of August 9, 1995, p. 7. Emphasis added.

99. "Unions Denounce Ballenger Bill in 'Seven Days for Safe Jobs' Protests," *MSHN* 2 (November 17, 1995): 621.

100. "Ballenger Says MSHA/OSHA Merger Bill Is Dead—At Least for 1996," *MSHN* 3 (March 8, 1996):118.

101. Graham, p. 623.

102. "Blasting Formally Studied and Funded at University of Utah College of Mines," *MSHN* 8 (August 3, 2001): 353; and "Nev. Mining School Gets $100,000 Grant," *MSHN* 6 (January 22, 1999): 46.

103. "Present consultive activities of MSHA should be expanded. . . . However this technical assistance should be furnished by a part of the agency outside the normal inspection and enforcement operations of MSHA." National Research Council, p. 20.

104. "UMW Launching Get-Out-to-Vote Drive in Support of Clinton," *MSHN* 3 (March 22, 1996): 144; and "Clinton Promises to Support Unions, Fight for MSHA/OSHA Budgets," *MSHN* 2 (October 6, 1995): 535.

105. U.S. Department of Labor, MSHA, "Reich Testifies on Proposed Legislation Affecting OSHA, MSHA," Press release, June 25, 1995, www.dol.gov/opa/media/press/msha/msh95246.htm. "All workers should enjoy the gains in safety and health achieved for miners by MSHA and the Mine Act." McAteer, Statement of August 9, 1995.

106 See, for example, *Alcoa Alumina & Chemicals, L.L.C.*, 23 FMSHRC 911(September 14, 2001) (alumina plant); *Kinder Morgan Operating LTD "C,"* 23 FMSHRC 73 (January 26, 2001) (marine terminal); *Jim Walter Resources Inc.*, 22 FMSHRC 21 (January 31, 2000) (supply warehouse); *Cox Transportation Corp.*, 22 FMSHRC 568 (April 5, 2000) (public road); and *Herman v. Associated Electric Cooperative Inc.*, No. 98-1876 (8th Cir. April 20, 1999) (coal-fired electric generating facility).

107. U.S. Department of Labor, MSHA, "President Clinton Signs International Convention to Raise Mine Safety and Health Standards Worldwide," News release 2001-0110, January 10, 2001; see also "Clinton Signs ILO Mine Safety Convention," *MSHN* 8 (January 19, 2001): 44.

108. Ibid.

109. McAteer, Testimony of September 14, 2001.

110. This paper, which is designed to bring the Mine Act under scrutiny, focuses on MSHA's data on the number of miners and fatalities. It is important to keep in mind, however, that MSHA's data, which presumably focus on miners under its jurisdiction, differ somewhat from the Standard Industrial Classification and Occupational Classification Systems used by the Bureau of Labor Statistics. In addition, because of changes in the manner in which state mining agencies, the Bureau of Mines, MESA, and MSHA collected and classified such data throughout the 20th century, precise historical comparisons, while desirable, are not always possible.

111. See, for example, McAteer, Statement of August 9, 1995. The chart attached to the statement depicts a decline in fatalities per work hour from 1968 forward without showing a decline prior to 1968.

112. "The questions of causation are subtle in the extreme and can only be answered by a rigorous application of the scientific method." Metzgar, "The Map and the Territory," p. 295.

113. Michael Lewis-Beck and John R. Alford, "Can Government Regulate Safety? The Coal Mine Example," *American Political Science Review* 74 (1980): 745. See also Braithwaite, pp. 81–82, indicating the existence of two unpublished manuscripts that are "totally supportive" of the 1980 study; and McAteer, Statement of August 9, 1995, p. 11 n. 2, citing Braithwaite as proof for the proposition that "mine inspections save lives."

114. Lewis-Beck and Alford, p. 749.

115. Ibid., p. 751.

116. Ibid., p. 752.

117. Ibid., p. 751.

118. U.S. Department of Energy, Energy Information Administration, *A Chronology and Overview of the U.S. Coal Market*, www.eia.doe.gov/cneaf/coal/chron/chronc.html(mining timeline). "By 1960, 546 U.S. coal mines were using bolts for support of mine roof and 57 percent of the underground coal product came from under roof supported in this manner." Seth D. Woodruff, *Methods of Working Coal and Metal Mines* (New York: Pergamon, 1966), vol. 2, p. 169.

119. "Since this test and others fail to disaggregate the overall injury rate, they lose a great deal of the power they might have had." Mendeloff, p. 165. See also Carl Metzgar, who says, "The tiles of the injury picture have to be looked at as individuals as well as parts of the whole." Carl Metzgar, "Politics and the MSHA Statistics," *MSHN* 3 (June 14, 1996): 330.

120 Lewis-Beck and Alford, p. 752.

121. Ibid., p. 750.

122. See Whiteside, p. 212; Fishback, p. 122; and Aldrich, *Safety First*, p. 251.

123. Lewis-Beck and Alford, p. 750.

124. "This strong association between fatality rate and mine size could not be explained by any other mine characteristics that we examined." National Research Council, p. 91. "Technological change [especially the shift from underground to surface mining] had as much or more to do with declining death rates as did regulation." Whiteside, p. 199.

125. MSHA's data on the number of miners go back to 1900, whereas the Bureau of Mines' man-hour data go back only to 1932. See U.S. Department of Labor, MSHA Internet, Coal Fatalities for 1900 through 2001. See also Lewis-Beck and Alford, p. 748.

126. The trends for fatalities per man-hour and fatalities per miner are not identical but closely approximate each other. See, for example, National Research Council, Figure 6, p. 39.

127. "As an old American folk song notes, an underground coal miner once shoveled 'sixteen tons' a day. In 1993, underground 'longwall' coal miners in the Western United States produced an average of 5.7 tons of coal per worker-hour." J. Davitt McAteer, "Don't Undermine Mine Safety," *Multinational Monitor* 16, no. 10 (October 1995), www.essential.org/monitor/hyper/mm1090.05.html.

128. H.R. 95-312, reprint, p. 358 ("Studies have shown that accelerated emphasis on production tends to push up both fatality and injury rates among miners."). "Mechanization has frequently been held responsible for heightening the risk of death in the mines." Lewis-Beck and Alford, p. 750. Lankton notes the importance of evaluating fatalities in terms of number of miners and amount of production. Lankton, p. 124.

129. While this is true for coal, it may not hold for metal and nonmetal mining. For example, with respect to gold, from a safety perspective, tons of earth moved might be a better denominator than ounces of gold produced because it would more accurately estimate the exposure to hazards. On the other hand, fatalities per ounce produced may be a better social measure since it would indicate which mines have the highest cost in terms of human lives. Appropriate measures would have to be devised for each of the metal and nonmetal groups.

130. "Essentially, the industry is right that the number of people who have to be killed and maimed to produce a million tons of coal is the more important statistic for public policy." Braithwaite, p. 176.

131. "Thus if workers near the face are at a substantially greater risk than those away from the face, large mines would tend to have smaller fatality rates simply because their workforces include a greater proportion of low-risk miner than do those small mines." National Research Council, p. 91.

132. Sider presents an analysis of productivity and job safety, measured by injuries per million man-hours in underground coal mining in Illinois between 1962 and 1976, using estimation of an extended Cobb-Douglas production model that incorporates work-related accidents as a joint output. Sider, p. 225.

133. "The results indicate that movements along the product transformation curve relating accidents and marketable output do not account for the decline in measured productivity. This decline instead reflects a downward shift of this frontier—a real decline in potential production of marketable output. The non-linear pattern in technological change parameters and differences in these parameters across technologies indicate that a variety of factors have influenced productivity trends including CMHSA [the Coal Act] and the 1974 contract between union and management." Ibid., p. 232.

134. National Research Council, pp. 38–39 and Figure 7, p. 59. Figure 7 shows that "productivity (measured as output per employee-hour) dropped substantially between 1970 and 1980."

135. "The beginning of the downturn in measured productivity coincides with the implementation in 1970 of the Coal Mine Health and Safety Act of 1969." Ibid., p. 228.

136. In 1996 the rates were 7.29 for China, 0.66 for Russia, 0.47 for India, 0.23 for South Africa, 0.23 for Poland, and 0.04 for the United States. "Dangerous Coal Mines Take Human Toll in China," *New York Times*, June 19, 2000.

137. "During a period in 1992, from May 27 to July 14, the coal mining industry did not experience any fatal accidents while producing many million tons of coal—a period of rare length in mining history." U.S. Department of Labor, MSHA Internet, "Injury Trends in Mining."

138. Sider notes that trends in injuries per ton of coal mined fell during the 1960s but rose quite rapidly during the 1970s. Sider, p. 227.

139. "There is no discounting the fact that the Mine Act and MSHA's administration of the Act, coupled with heightened operator awareness of safety and health considerations, have served to decrease the incidence of major mine disasters that once plagued the American mining industry." Bruce Watemen, National Mining Association, Testimony before the House Oversight Hearing on the Federal Mine Safety

and Health Act of 1977, September 14, 2000, http://edworkforce.house.gov/hearings/106th/wp/msha91400/watzman.htm. The National Mining Association "does not dispute the contributions that the Mine Act has made to improved miner health and safety." "Regulatory Overhaul and Cooperation Necessary for Industry, Says NMA," *MSHN* 2 (November 17, 1995): 618. But according to Metzgar, "The combination of the bias of the Act against operators and unenlightened enforcement have potholed the road to progress." Metzgar, "The Map and the Territory," p. 295.

140. Senate Record Vote Analysis, Vote no. 307, 104th Cong., 1st sess., *Regulatory Reform/OSHA and MSHA Exemption*, S-99970 Temp. Record, July 14, 1995, www.senate.gov/~rpc/rva/1041/1041307.pdf.

141. "There are good reasons to believe that OSHA has had only a limited effect on the number of industrial accidents and illnesses. Several economists have suggested that OSHA may not be responsible for even the decrease in accidents that has occurred. Worse, there are some indications that workplaces are actually less safe today than they were a few years ago." McGarity and Shapiro, pp. 10–11. But Braithwaite says that "it is beyond dispute that, if there were 100 percent compliance with mine safety laws, the majority of miners who die in coal mines would be saved." Braithwaite, p. 75. And the National Research Council asserts that "enforcement of safety regulations and continuing improvement of safety regulations are a necessary part of the overall foundation of a national commitment to improved underground coal mine safety." National Research Council, p. 18.

142. Sider found "a small and statistically insignificant negative decline in accidents during 1970–1976" following passage of the Coal Act. Sider, p. 231 n. 16.

143. Mendeloff, p. 154.

144. "ALJ Dismisses MSHA Charges in Fatal Rail Accident Case," *MSHN* 8 (February 2, 2001): 66.

145. "Reflective Clothing Might Have Saved Prep Plant Worker's Life," *MSHN* 7 (April 28, 2000): 197; and "Barrick Goldstrike Not Charged in Employee Fatality from Fire," *MSHN* 1 (September 23, 1994): 483.

146. See 30 C.F.R. 56/57.11001 ("A safe means of access shall be provided and maintained to all working places."); 30 C.F.R. 56/57.3200 ("Ground conditions that create a hazard shall be taken down or supported before other work or travel is permitted in the affected area."); 30 C.F.R. 56/57.12030 ("When a potentially dangerous condition is found it shall be corrected before equipment or wiring is energized."); and 30 C.F.R. 56/57.14100 ("Defects on any equipment, machinery, and tools that affect safety shall be corrected in a timely manner to prevent the creation of a hazard to persons.").

147. See, for example, *Alabama by Products*, 4 FMSHRC 2128, 2130 (December 1982) ("Broadness is not always a fatal defect in a safety and health standard. Many standards must be 'simple and brief in order to be broadly adaptable to myriad circumstances.'").

148. The advantage of safety performance standards is that they permit the operator to select the least costly means of compliance. Viscusi, *Risk by Choice*, p. 131. "While some MSHA regulations are prescriptive, the majority are performance-oriented, which gives mine operators necessary and desired compliance discretion." National Stone Sand & Gravel Association, Policy Papers, *MSHA Enforcement*, www.nssga.org/publicpolicy/policypapers.htm.

149. The 1977 Congress specifically rejected a general duty clause because it "did not want such a vague and general duty clause to possibly become an inspector's vehicle for harassing and unjustifiably intimidating well-intentioned coal operators." *Congressional Record*, October 27, 1977, pp. 11662–68.

150. See, for example, 30 C.F.R. 75.312, 75.332, 75.342, 75.350, 75.360, 75.364, 75.380, 75.503, 75.701, 75.804, 75.900, 75.901, 75.1002, 75.1100-2, 75.1700, 75.1710-1, 75.1711-1, 75.1726, 75.1905, 77.214(a).

151. See 30 U.S.C. 811(c). "Leer criticized MSHA for not approving new technologies that the industry wished to introduce into the mines. 'In the case of proven technologies, such as continuous methane monitoring and enclosed helmets which provide purer air in intermittently dusty conditions, there is no justification for retaining current procedural hurdles to their use.'" "Mine Act, MSHA Changes Are Needed, Arch Mineral's President Tells Institute," *MSHN* 2 (September 8, 1995): 485.

152. See generally 30 C.F.R. part 44, subpart B.

153. See, for example, *Mettiki Coal*, 1999-MSA-6 (ALJ April 7, 2000) (two years); *Freeman United Coal Mining Co.*, 1998-MSA-10 (ALJ December 15, 1998) (more than a year); and *Consolidation Coal Company*, 1993-MSA-4 (ALJ April 22, 1994) (two years).

154. See, for example, *International Uranium Corporation*, 1999-MSA-0003, -0004, -0009 (ALJ March 2, 2000) (appeals of petition denials by

MSHA withdrawn due to mine closure); *LEECO, Inc.*, 1999-MSA-7 (ALJ December 1, 1999) (appeal of petition denied by MSHA withdrawn); and *Rochester and Pittsburgh Coal Company*, 91-MSA-1 (ALJ August 12, 1994) (appeal of petition denied by MSHA withdrawn due to mine ceasing production).

155. McGarity and Shapiro concede that "technology-based standards are not likely to induce highly innovative changes in health and safety technologies." McGarity and Shapiro, p. 296. But McAteer claims, "Technological advances—*driven in part, by the law*—have reduced miners' exposure to some risks" McAteer, Statement of August 9, 1995, p. 7. Emphasis added.

156. See, for example, "Miner Was Warned Twice in One Month about Going under Unsupported Roof," *MSHN* 1 (October 21, 1994): 532.

157. For a discussion of behavior-based safety theory, see Steve Minshall, "An Opportunity to Get Ahead of the Accident Curve," *MSHN* 4 (May 2, 1997): 268.

158. "Current MSHA thinking would have you believe that the worker has no role in the fatality problem but that regulated training of the worker is the complete solution to the fatality problem. What a delicious bit of sophistry for seizing the opportunity to inflict further enforcement where there has not been a demonstrated success." Metzgar, "The Map and the Territory," pp. 296–97.

159. "The safety program at a small mine is often geared heavily towards regulatory compliance." Brooks, p. 454.

160. S.R. 95-181, reprint, p. 606 ("If the purposes of this legislation are to be achieved, the effort must be a joint one, involving the miner and his representative as well as the operator.").

161. Ibid.

162. 30 U.S.C. 801(e) ("The operators of such mines with the assistance of the miners have the primary responsibility to prevent the existence of such conditions and practices in such mines.").

163 Mine Safety and Health Administration, Office of Assessments, Average Special Assessments, www.msha.gov/PROGRAMS/ASSESS/Outreach2001_files/frame.htm.

164. It should be noted that, among other things, sec. 105(c) of the Mine Act protects employees who report hazardous conditions to MSHA from adverse actions, such as loss of job, and sec. 103(g) of the act specifically authorizes miners to request inspections. 30 U.S.C. 815(c), 813(g). MSHA has a toll-free number and encourages miners to report hazards. See U.S. Department of Labor, MSHA Internet, MSHA's Code-A-Phone, www.msha.gov/codeaphone/codeaphone.htm. Although a discussion of the merits of the Mine Act's whistleblower provisions is beyond the scope of this paper, it is worth noting that even though the employee initiates the process, he is still relying on the federal government to address his safety concerns. The obvious problems with this approach are that (1) it can be ineffectual, (2) it can be abused, and (3) it can be detrimental to the resolution of safety issues by miners and mine operators.

165. 30 U.S.C. 813(a).

166. "Proposed Bill Would Endanger Miners, Mine Safety Chief Says," MSHA News release 95-022, June 19, 1995.

167. *Cyprus Cumberland Resources v. Secretary of Labor*, 20 FMSHRC 285, 288 (March 19, 1998) ("These inspectors spend between 3 and 5 days a week at the Cumberland Mine and normally take the full quarter to complete the inspection. Thus, in essence, there is a continuous presence at the Cyprus' Cumberland facility of at least two MSHA inspectors who are performing quarterly inspections. These two inspectors are assisted by other inspectors from the Waynesburg field office, which has two supervisors and approximately 15 inspectors. In addition, MSHA District 2 Office personnel may also inspect the mine site during a given quarter. Therefore, there may be as many as 6 or 7 inspectors at the site on any particular day.").

168. McAteer, Statement of August 9, 1995, p. 12.

169. "Obviously, around-the-clock inspector presence is neither possible nor desirable." Ibid.

170. "Former MSHA Inspector to Be Sentenced May 14," *MSHN* 3 (March 22, 1996)(bribery): "Former Inspector Gets 18 Months," *MSHN* 3 (May 31, 1996): 290(bribery); "Guilty Plea Replaces Bribery Trial for Former MSHA Employee," *MSHN* 2 (August 25, 1995): 448; "Conspiracy Charge Nets Six Month Prison Term for Former MSHA Inspector," *MSHN* 2 (June 16, 1995): 324 (bribery); "Mine Superintendent Says Bribing Inspectors Is a Long-Time Practice," *MSHN* 2 (June 2, 1995): 301; "Trial Date Set for MSHA Inspector," *MSHN* 2 (May 19, 1995): 281 (bribery); and "Fourth MSHA Inspector Enters Guilty Plea," *MSHN* 2 (March 24, 1995): 159 (bribery).

171. "After the accident, MSHA transferred Kirk to its Denver office where his salary was raised $2,659 per year to $78,179." Craig Harris, "Mining Official Concedes Errors, Safety Complaints Had Been Ignored," *Arizona Republic*, August 9, 2000.

172. See, for example, "Inspector General's Office Targets MSHA, OSHA in Second Asbestos Probe," *MSHN* 7 (September 1, 2000): 364; "Former MSHA Inspector Admits Falsifying Reports; Other Charges Dropped," *MSHN* 2 (June 1, 1995): 324; and "Another Special Investigator Fired, But One Gets Job Back," *MSHN* 3 (October 4, 1996): 538.

173. "One example of these difficulties stems from the assignment to precious metals operations of MSHA inspectors who have little or no experience with the new technology developed in recent years by the gold mining industry. In other cases, MSHA has sent inspectors to Western gold mining operations from coal mining areas in the eastern part of the country. These MSHA inspectors often lack even the most basic familiarity with and training in modern gold extraction techniques." William G. Miles, director of loss control, Newmont Gold Company, Elko, Nevada, Testimony at Hearing on the Federal Mine Safety and Health Act of 1977 before the Subcommittee on Workforce Protections of the House Committee on Education and the Workforce, July 30, 1998, http://edworkforce.house.gov/hearings/105th/wp/msha73098/miles.htm. See also "Coal 'Loans' Inspectors for FY 1998," *MSHN* 5 (March 20, 1998): 137.

174. *Rawl Sales & Processing Co.*, 23 FMSHRC 463, 466 (May 2001) ("Since I cannot discern what mining danger threatens miners at home in their beds, I will not support the Secretary's gratuitous demand that Rawl order miners underground for several hours, who would otherwise be at home, to conduct an 'on-shift' examination to protect nobody from anything.") (Commissioner Riley, writing separately).

175. "He was just like hundreds of thousands of other blue-collar workers. He never considered himself exceptional. He was 'just one of the boys.' Charlie had more than 15 years experience on the job, and he knew it well. He knew all the rules. He knew all the safety regulations . . . and he knew all the shortcuts around them too." Phoenix Safety Management Inc., *Charlie's [Morecraft] Story*, www.charlieonsafety.com/index.html.

176 Venita Branham, coal miner, "Mine Health and Safety Protection: A Miner's Views of Dying Industry," *MSHN* (February 9, 1996): 73.

177. Sheperd, p. 363.

178. See, for example, *Fleming v. United States*, No. 2:98-00215 (WV 1999); *Ferguson v. United States*, No. 4:91-CV-83-M (KY 1996); *Deel v. United States*, No. 94-0166-A (WV 1996); *Estate of Denny Bernaldes v. United States*, No. 95-1905 (4th Cir. 1996); *Lanny Belcher v. United States*, No. 94-0240-B (VA 1993); and *Meyers v. United States*, No. 95-5812 (6th Cir. 1994).

179. "Elkins, Brooks Sentencing Wraps Up Government Case in Southmountain," *MSHN* 2 (September 22, 1995): 506; "Smoking Materials, Not Equipment Caused Day Branch Explosion," *MSHN* 2 (July 14, 1995): 388; and "Butane Lighter and Lack of Stoppings Led to A.A. & W. Explosion," *MSHN* 2 (January 13, 1995): 16.

180. 30 U.S.C. 815(b)(1)(B), 820(i).

181. Mine Safety and Health Administration, Office of Assessments, Average Regular Assessments, www.msha.gov/PROGRAMS/ASSESS/Outreach2001_files/frame.htm.

182. 30 C.F.R. 100.4 (establishing mandatory minimum of $55 for non-significant-and-substantial violations that are abated in good faith).

183. "The ineffectiveness of fines as sanctions against coal mining companies in the United States is clear." Braithwaite, p. 89. See also Lee Ann Benson, "The Most Precious Product of A Mine," *Southeast Ohio Magazine*, Fall 1982, www.ohiou.edu/southeastohio/marchives/archivef1.html. "Many observers, however, have expressed skepticism about OSHA's deterrent force." Mendeloff, p. 87.

184. February 21, 2001, facsimile response from MSHA to Freedom of Information Act request.

185. Viscusi estimated that compensating wage differentials for all industries were near $70 billion in 1983. Viscusi, *Risk by Choice*, p. 3.

186. Mendeloff notes that the small size of the deterrent may nevertheless generate substantial compliance activity. Mendeloff, p. 93. But Viscusi points out that an agency's impact on safety and health is a separate question from an agency's impact on an industry. Viscusi, *Risk by Choice*, p. 33.

187. After an explosion at Kaiser's alumina facility that injured 29 employees, Kaiser paid $513,000 to MSHA in fines but had to spend $275 million to rebuild the plant. John Stucke, "Kaiser Powers Up Gramercy Facility," United Steelworkers of America Local 329 Internet, December 2000, www.uswa329.org/December_2000/dec15b.htm.

188. See, for example, U.S. Department of Labor, MSHA, "Magma Copper Co., Contractor Fined over $2 Million in Mine Deaths," MSHA press release 94.387, August 5, 1994.

189. Mine Safety and Health Administration, Office of Assessments, Average Special Assessments,

www.msha.gov/PROGRAMS/ASSESS/Outreach2001_files/frame.htm.

190. For a discussion of injury taxes, see Mendeloff, pp. 25–31.

191. *Sunny Ridge Mining Company Inc.*, 19 FMSHRC 254, 276 (February, 1997) ("I am troubled by the indecipherable criteria used to calculate the appropriate sanction. The judge's penalty assessment is not based on any discernable mathematical formula nor supported by any comprehensible legal rationale and is therefore unreviewable.") (Commissioner Riley dissenting).

192. "There were no violations found in a recent haulage accident." "Reflective Clothing Might Have Saved Prep Plant Worker's Life," p. 197; see also "Barrick Goldstrike Not Charged in Employee Fatality from Fire," *MSHN* 1 (September 23, 1994): 483.

193. "The [administrative law judge] declined to use the agency's special assessment as a 'guideline,' because MSHA refused to explain its special penalty assessment process. However, in its petition, the agency said it was improper for the ALJ 'to coerce an inquiry into [MSHA's] decision-making process' and added that an ALJ 'has no need to inquire into how, why, or by whom [MSHA's] penalty decision was made.'" "Trucking Company Penalty before FMSHRC for Third Time," *MSHN* 9 (February 18, 2002): 75.

194. "The agency had initially proposed penalties totaling $700,000 against Dynatec arising from a fatal accident and has ended up accepting a $20,000 penalty for a violation of the safe access rule resulting from 'moderate negligence.'" "Dynatec, MSHA Settle Litigation Arising from Fatal Chute Collapse," *MSHN* 8 (December 10, 2001): 532.

195. "Interview of Davitt McAteer by Mine Safety and Health News," *MSHN* 1 (February 11, 1994): 62.

196. Jerry Davidson, "Prince of Pork Grabs Colorado Jobs," *MSHN* 3 (August 9, 1996): 453; and "GAO Asked to Investigate Denver Move: Reich Told to Put Move on Hold," *MSHN* 3 (September 20, 1996): 511.

197. "This technical assistance should be furnished by a part of the agency outside the normal inspection and enforcement operations of MSHA." National Research Council, p. 19. Cf. "MSHA has little or no interest in injury prevention. It is interested in enforcement and punishing operators. . . . The statistical branch has to be separated from the enforcement scheme." Metzgar, "Politics and the MSHA Statistics," p. 328.

198. J. Davitt McAteer, "Remarks before the Eastern Mine Law Foundation Special Institute, Washington, D.C.," *MSHN* 1 (March 25, 1994): 145.

199. Attorneys warned mine operators about MSHA's police powers. See, for example, Michael Heenan, Heenan, Althen & Roles, "Document Requests by MSHA: Pitfalls for Operators," *MSHN* 3 (March 8, 1996): 119; Greg Ruffennach, "Mine Accident Investigations: What Every Operator Should Know," *MSHN* 3 (June 1996): 356; and "What You Say Can and Will Be Used against You, Attorney Warns Supervisors," *MSHN* 2 (September 22, 1995): 510.

200. "Continued endorsement of the misguided policies . . ., combined with selected zealous enforcement indicates a continuance of an unreasonably confrontational atmosphere." Bobby Jackson, "McAteer's MSHA at the Mid-Term," *MSHN* 1 (September 9, 1994): 456. The Mine Act "begs adversarial relationships between affected parties." Ford B. Ford, "Differences Can Be Resolved at Mine; Leave Big Issues for the Court," *MSHN* 1 (April 8, 1994): 169.

201. "The threat of punishment can have a chilling effect on the information-gathering process." Braithwaite, p. 99. "The insensitive, invective enforcement of the laws and the creative development of a legal theory to sustain a citation and punish at all costs has dried up the very information that would help prevent injuries." Metzgar, "Politics and the MSHA Statistics," p. 331. See also "Industry Calls for Cooperation at Congressional Hearing," *MSHN* 7 (September 15, 2000): 391.

202. "When there is a willingness to do the right thing, across-the-board punishment is simply not the best strategy for maximizing compliance . . . this is the very mistake that the U.S. Mine Safety and Health Act perpetuates." Braithwaite, p. 99. "An inappropriate focus on blame forces people to be apprehensive and defensive." Lauriski, p. 387.

203. "McAteer Says MSHA, Industry Can't Rest until Accidents Are Brought Down," *MSHN* 3 (May 31, 1996): 296.

204. "Lauriski Open to New Ideas to Decrease Fatalities and Accidents," *MSHN* 8 (July 6, 2001): 307.

205. Number of U.S. coal fatalities plus number of U.S. metal/nonmetal fatalities. Coal fatalities from U.S. Department of Labor, MSHA Internet, Coal Fatalities for 1900 through 2001, www.msha.gov/centurystats/coalstats.htm; metal/nonmetal fatalities from U.S. Department of Labor, MSHA Internet, Metal/Nonmetal Fatalities 1900 [1911] through 2001, www.msha.gov/centurystats/mnmstats.htm.

206. “I do not believe the maxim that says all injuries are preventable.” Minshall, p. 269. But see “Mining Deaths Drop Overall in 2000,” MSHA News release. 2001-0104, January 4, 2001.

207. U.S. Department of Labor, Department of Labor Budget Overview 2002, www.dol.gov/_sec/Budget2002/budgetfy2002.htm#msha.

208. Ibid.; compare *Contractor’s Sand & Gravel Inc. v. FMSHRC*, 199 F.3d 1335 (D.C. Cir. 2000) (January 2000) (MSHA technical support personnel used as expert witnesses to support MSHA’s enforcement position); *Dynatec Mining Corporation*, 20 FMSHRC 1058 (September 1998) aff’d in part rev’d in part 23 FMSHRC (January 2001) (same).

209. Federal Mine Safety and Health Review Commission, *Fiscal Year 2001 GPRA Annual Performance Plan and Fiscal Year 1999 Annual Program Report*, www.fmshrc.gov/plans/2002gpra.html.

210. In FY 2000, $246 million was budgeted; there were 20,000 inspections. U.S. Department of Labor, MSHA, MSHA’s Statutory Functions, www.msha.gov/MSHAINFO/MSHAINF1.HTM.

211. In FY01, $246 million was budgeted and there were 132,000 assessed violations. U.S. Department of Labor, Department of Labor Budget Overview 2002

212. Ibid; U.S. Department of Labor, MSHA Internet, Metal/Nonmetal Fatalities 1900 to 2001; and U.S. Department of Labor, MSHA Internet, Coal Fatalities 1900 to 2001 ($246 million budget, 350,413 miners in FY01).

213. Mendeloff notes, “The budget of the public safety agency constitutes a small part of the resources used in the effort to prevent injuries. The largest component of these social costs is the compliance costs incurred by employers.” Mendeloff, p. 123. “MSHA estimates that the yearly compliance costs (annualized costs plus annual costs) resulting from the final rules will be approximately $17.94 million, of which about $16.55 million will be borne by the affected nonmetal mine operators.” Final Regulatory Economic Analysis and Regulatory Flexibility Analysis for the Final Rule on Training and Retraining of Miners Engaged in Shell Dredging or Employed at Sand, Gravel, Surface Stone, Surface Clay, Colloidal Phosphate, or Surface Limestone Mines, September, 1999, www.msha.gov/ REGS/FLEX/99-25273.pdf.

214. Melinda Pon, chairman, NMA’s Occupational Health Subcommittee, quoted in “Regulatory Overhaul and Cooperation Necessary for Industry, Says NMA,” *MSHN* 2 (November 17, 1995): 619.

215. “The impact of this sort of presence cannot be ignored because it also means that hourly employees and management employees are taken away from their normal duties every day to accompany the inspectors. . . . Present inspection procedures are disruptive and time-consuming.” Wateman.

216. 30 C.F.R. 77.701; and *San Juan Coal Company*, 13 FMSHRC 1688, 1692-1700 (October 21, 1991) (citations vacated after trial).

217. Federal Mine Safety and Health Review Commission.

218. “[A]fter three years and nearly a million dollars in legal defense fees, MSHA’s unjustified policy change remains pending before the MSHA Review Commission.” Miles.

219. S.R. 95-181, reprint, pp. 632–33 (“the need to save litigation and collection expenses should play no role in determining settlement amounts”); see, for example, *Contractor’s Sand & Gravel Inc. v. FMSHRC*, 199 F.3d 1335 (D.C. Cir. 2000) (January 2000)(MSHA paid more than $100,000 to cover the mine operator’s attorney fees pursuant to the Equal Access to Justice Act.).

220. “The net result is an enormous drain on the resources of the agency for the imposition of what are puny fines.” Braithwaite, p. 111.

221. Executive Order no. 12866, 58 FR 51735, 1993 WL 388305 (President Clinton) (requiring a Regulatory Economic Analysis for any rule having major economic consequences); see, for example, Final Regulatory Economic Analysis and Regulatory Flexibility Analysis for the Final Rule on Training and Retraining of Miners Engaged in Shell Dredging or Employed at Sand, Gravel, Surface Stone, Surface Clay, Colloidal Phosphate, or Surface Limestone Mines.

222. Joseph M. Johnson, “A Review and Synthesis of the Cost of Workplace Regulation,” George Mason University, Mercatus Center, August 30, 2001, p. 21, www.mercatus.org/ Workplace.pdf.

223. Ibid. Compare S.R. 195-181, reprint, p. 645 (the 1977 Congress operated under the assumption that it would cost the mining industry $69.15 million per year [1977 dollars] to comply with the Mine Act). But see also Senator Schmitt stating that there was not agreement regarding the “accuracy” of the estimate. “Floor Debate on Federal Mine Safety and Health Act of 1977,” *Congressional Record*, June 20, 1977, pp. 10203-38.

224. For total contractor and operator NFDL injuries for both coal and metal/nonmetal, see U.S. Department of Labor, MSHA Internet, Mining

Industry, Accident, Injury and Employment Statistics, www.msha.gov/ACCINJ/accinj.htm.

225. "Each time I approve a major fine against a company—for safety violations that were discovered after an accident that cost the life of an employee—I can't help but feel a twinge that if we had just worked harder on prevention, we wouldn't be in the impossible position of trying to calculate the value of a lost human life." Elaine L. Chao, secretary of labor, Remarks at Welcoming Ceremony, U.S. Department of Labor Francis Perkins Building, March 6, 2001, www.dol.gov/_sec/media/speeches/000306chao.htm.

226. For example, "The Agency does not have much experience in quantifying benefits in the case of a proposed health standard. . . ." Department of Labor, MSHA, Proposed Rule, Preliminary Regulatory Economic Analysis Health Standards for Diesel Particulate Concerning: 30 CFR, parts 70 and 75, Underground Coal Mines, March 1998, www.msha.gov/REGS/FLEX/PARTIC.HTM#03.

227. For a discussion of various valuation methods, see McGarity and Shapiro, pp. 270–72.

228. McGarity and Shapiro specifically refer to health regulations. Ibid., p. 297.

229. "What worries me is that we are becoming an uncaring nation. We are making lack of compassion acceptable in this country. I just cannot sit up there and diminish safety of the workplace." Rep. Frank Mascara (D-Pa.), quoted in "Ballenger Unclear on Some of His Own Bill's Regulatory Provisions," *MSHN* 2 (July 28, 1995): 415.

230. McGarity and Shapiro, p. 278.

231. Ibid., p. 295.

232. "There are good reasons why OSHA should not be restricted by a cost-benefit test, the most important of which may be that cost-benefit analysis ignores the distributional consequences of regulatory policy." Ibid., p. 294.

233. Sowell, p. 10.

234. "Truck drivers have more work-related fatalities than any other occupation, accounting for 14% of all job-related fatalities in 1988." Peggy Suarez, "The Unforgiving Road: Trucker Fatali-ties, Compensation and Working Conditions," Bureau of Labor Statistics, Winter 1999, www.bls.gov/opub/cwc/1999/Winter/art4full.pdf. Fatali-ties per 100,000 workers (based on Occupational Classification System) in 1998 were as follows: timber cutters, 141.6; fishers, 137.3; structural metal workers, 82.5; aircraft pilots, 80.5; extractive occupations, 48.0; truck drivers, 29.2.

235. For unintentional injuries to persons aged 1–14 years, see Centers for Disease Control, National Center for Injury Prevention and Control Home Page, www.webapp.cdc.gov/ sasweb/ncipc/mortrate.html.

236. "The simplest accurate statement about the beneficiaries of OSHA's programs is that they are overwhelmingly blue collar workers, mostly unionized, and mostly men. Support for OSHA based on a concern with income distribution and improving the lot of the least fortunate does not seem well grounded." Mendeloff, p. 35.

237. "Few people think about using up society's resources; they ask who will pay." Ibid., p. 31.

238. 30 U.S.C. 801(e), (d).

239. Mendeloff notes "the strong likelihood that least some and perhaps all of the added costs will be passed on to consumers." Mendeloff, p. 57. "We have seen that in the United States, fines are . . . generally passed on in higher energy costs to the community as a de facto royalty on the cost of each ton of coal." Braithwaite, p. 165.

240. National Mining Association, "Facts about Mining," www.nma.org/fastfacts.html.

241. "MSHA Questioned about Possible Lobbying Efforts by Career Employees," *MSHN* 2 (June 30, 1995): 359; but see "Hugler, Other MSHA Employees Cleared of Charges of Illegal Lobbying," *MSHN* 2 (December 1, 1995): 647.

242. "The average grade and salary of a mine inspector is GS 12/5, at $58,031 per annum or $28 ($27.90) per hour." U.S. Department of Labor, MSHA Internet, 1219-0103 Supporting Statement, www.msha.gov/regs/fedreg/paperwork/2000/00-8243.htm.

243. MSHS employees represent 2,310 full-time equivalents. U.S. Department of Labor, Department of Labor Budget Overview 2002.

244. Davidson, p. 453; and "GAO Asked to Investigate Denver Move."

245. "Unions Denounce Ballenger Bill in 'Seven Days for Safe Jobs' Protests." A UMTA leader has stated that "without it [i.e., the Mine Act] there's no reason to believe that the mining industry won't revert back to the bad old days when it was common for miners to pay for their jobs with their lives." "Assaults on MSHA Play Fast and Loose with Miners' Lives," *MSHN* 2 (May 19, 1995): 286

246. Richard Trumka, quoted in "Ballenger Unclear on Some of His Own Bill's Regulatory Provisions."

247. Bastiat, p. 8.

248. "[T]he appeal of federal action to union leaders was that it offered a way to bypass the union's weak position on these issues in collective bargaining." Mendeloff, p. 16.

249. Compare "UMWA Call for MSHA Investigation into Massey Energy's Health and Safety Record," *MSHN* 8 (July 20, 2001): 334, with "UMWA Miners Renew Campaign against Massey Energy," *MSHN* 8 (May 25, 2001): 244.

250. Brooks, p. 454.

251. "The Kentucky Coal Assn., Coal Operators and Associates (Ky.), Lignite Energy Council (N.D.), Pennsylvania Coal Assn., Texas Mining & Reclamation Assn., West Virginia Mining and Reclamation Assn., West Virginia Coal Assn., Alabama Coal Assn., Indiana Coal Council, Coal Producers Committee of Assn. of Oklahoma General Contractors and the Ohio Mining and Reclamation Assn . . . stated that the 'federal government has gotten too large and too intrusive in our day-to-day affairs' and that MSHA 'is a clear case in point.'" "Support for Ballenger Bill Keeps Growing As Groups Rally for MSHA Overhaul," *MSHN* 2 (November 17, 1995): 620.

252. "The American Iron Ore Assn., American Portland Cement Alliance, Institute of Makers of Explosives, National Aggregates Assn., National Industrial Sand Assn., National Mining Assn., National Stone Assn., and the Sorptive Mineral Institute . . . state that they support making MSHA and OSHA 'more helpful and effective and less punitive.'" "BCOA Silent on H.R. 1834 Position; Other Groups Go on Record," *MSHN* 2 (October 20, 1995): 554. "The National Stone Assn. said while it endorses the Ballinger bill, it wants to see its own provisions included, and the group said it will follow the bill through the mark-up process to determine whether continued support of the legislation is appropriate. The NSA has recommended 13 changes to the bill." "Support for Ballenger Bill Keeps Growing As Groups Rally for MSHA Overhaul," p. 620.

253. "While staff of the National Mining Assn. have been meeting with members of the Heritage Foundation and discussing the possibility of merging MSHA and OSHA, NMA President Richard Lawson said the association does not support any merger of the two agencies at this time." "Mining Association Not Supporting MSHA/OSHA Merger at This Time," *MSHN* 2 (February 24, 1995): 111.

254. "The U.S. mining industry is subject to one of the most burdensome mine safety laws in the world. As a consequence, our mining is at a competitive disadvantage with foreign operators that are not subject to command and control health and safety standards." Melinda Pon, quoted in "Regulatory Overhaul and Cooperation Necessary for Industry, Says NMA," *MSHN* 2 (November 17, 1995): 618.

255. "One NMA staffer said that the association's position never changed. That the Ballenger bill is a start for reform but a repeal of the Mine Act is not appropriate." "NMA Swings into Action for MSHA Reform; Some Members Unhappy with Campaign," *MSHN* 2 (September 22, 1995): 511.

256. "The seven groups do not oppose an MSHA/OSHA merger and should a merger take place, they want mining regulations separate from general industry OSHA regulations. They would like to see a separate office for mine safety and health in OSHA with employees having significant mine-related experience and training." "BCOA Silent on H.R. 1834 Position; Other Groups Go on Record." "Like the coal industry groups, NSA supports a separate mine division of OSHA, but also wants language whereby there will be a separate coal division and metal/nonmetal mining division." "Support for Ballenger Bill Keeps Growing As Groups Rally for MSHA Overhaul."

257. "A third NMA member said 'the system works.'" "NMA Swings into Action for MSHA Reform," p. 511.

258. "On its face the [BCOA] 'position paper' seems to take a position, without taking a position." "UMW Vice President for Health and Safety Joe Main said . . . the BCOA position that was represented to us was one of non-support for the Ballenger legislation and one of addressing reforms through the administrative versus legislative process." "BCOA Silent on H.R. 1834 Position," p. 555.

259. "Responsible, health and safety conscious operators will be forced out of business by price competition from undercapitalized, irresponsible operators who will sacrifice the health and safety of their workers in order to cut their production costs. . . . Substantial penalties should be applied regardless of the mine capitalization choices made by that operator." Representative of Westmoreland Coal Company, quoted in "Westmoreland, American Electric Power Support MSHA in Letters to Congress," *MSHN* 2 (June 30, 1995): 360. "National Mining Assn. President Richard Lawson . . . said that NMA worries that merging the two agencies could reduce inspection and enforcement activities, allowing for the proliferation of fly-by-night operators who don't invest in worker safety and health." "Ballenger Unclear on Some of His Own Bill's Regulatory Provisions," p. 415.

260. Brooks, p. 454.

261. Because work-related accidents are an economic bad, reallocating inputs from output-producing to accident-reducing activity does not necessarily decrease and may actually increase total marketable output. Sider, pp. 225–27. "The bottom line is that to remain competitive, safety and health must be a company value." Carlson, p. 51.

262. "NMA Accuses National Safety Council of Not Reaching Consensus on H.R. 1834," *MSHN* 2 (December 1, 1995): 646.

263. Ibid.

264. Ibid.

265. "The safety director felt that 'in a direct way OSHA hasn't done anything to improve our safety record—we already had a first-rate program—but it helped me . . . if the expenditure is necessary to comply with OSHA, I don't need to show what the benefits will be. If it's just something that I think we ought to have, then I have to review past accidents and show how it will prevent reoccurrences.'" Mendeloff, p. 91.

266. Carlson, p. 51.

267. Branham, p. 73.

268. Sheperd, p. 362.

269. Branham, p. 74.

270. Ibid.

271. Sheperd, p. 361.

272. Ibid., p. 262.

273. Branham, p. 74.

274. "The scientific method and the rigor and integrity it demands is terribly embarrassing and inconvenient to the politician, regulator and demagogue." Metzgar, "The Map and the Territory," p. 294.

275. Branham, p. 73.

276. Sheperd, p. 363.

277. See generally Fishback; and Lankton.

278. Jason Schachter, "Current Population Reports," *Geographical Mobility: Population Characteristics, March 1999 to March 2000*, U.S. Bureau of the Census, May 2001, www.census.gov/prod/ 2001pubs/p20-538.pdf.

279. Federal Reserve System, "The Exceptional 1990s," *National Economic Trends*, March 2000, www.stls.frb.org/docs/publications/net/2000/cover3.pdf.

280. "A Shortage of Trained Miners May Make Bust of Possible Boom," *MSHN* 8 (April 13, 2001): 176; and "Company Looking for Coal Market Could Employ Up to 300," *MSHN* 7 (September 15, 2000): 399.

281. "Since risky jobs become unattractive the higher one's income class, we should expect that many of those who are most outspoken on policy issues will consider the jobs of workers in hazardous industries abhorrent." Viscusi, *Risk by Choice*, p. 80. "Without being easily able to rely on their own personal appraisal of the risk, they are placed in a more paternalistic position." Mendeloff, p. 160.

282. "There are no mines inside the Washington, D.C. Beltway." McAteer, "Don't Undermine Mine Safety."

283. See generally Aldrich, *Safety First*, pp. 224–29, 237, 251–55; Whiteside, p. 204; and Lankton, pp. 93–125.

284. "It is common to hear employees at all levels of an organization talk about their safety rules and procedures as MSHA or OSHA mandates or regulations. Their language implies that the 'stuff' that they do for safety is more for MSHA or OSHA than for themselves." E. Scott Geller, "Behavior Change Tools to Achieve a Total Safety Culture," *MSHN* 2 (March 24, 1995): 164.

285. "The owners, management and miners of this mine speak as one. Miners and management feel MSHA has kept them off guard, that MSHA is an agency which is actually bringing about poor safety at the Sixteen to One because of its behavior." Original Sixteen to One Mine, Inc, *International California Mining Journal: Original Sixteen to One Goes to Court-Challenges MSHA Citations*, May 13, 2002, www.origsix.com/mag.asp?id=50.

286. "Efforts to promote present risk regulations on the basis that they enhance worker rights are certainly misguided." Viscusi, *Risk by Choice*, p. 80. "Other losers are workers who prefer facing job hazards . . . [and] workers who have to surrender risk premiums." Mendeloff, pp. 32–33.

287. "Convention 176 enhances the ability of the U.S. mining industry to compete on a more level playing field in the global economy." "President Clinton Signs International Convention to Raise Mine Safety and Health Standards Worldwide," MSHA News release 2001-0110, January 10, 2001.

288. Viscusi concludes, "Penalizing workers in less-developed countries by not buying their products will not boost their welfare." Viscusi, *Risk by Choice*, p. 52.

289. McAteer, Statement of August 9, 1995, p. 7.

290. "As Americans become wealthier, risk levels of all kinds have declined." Viscusi, *Risk by Choice*, p. 28.

291. McGarity and Shapiro, p. 296.

292. Sowell, p. 307.

293. McAteer, Statement of August 9, 1995, pp. 3–4; see also Richard L. Trumka, president, United Mine Workers of America, "Assaults on MSHA Play Fast and Loose with Miner's Lives," *MSHN* 2 (May 19, 1995): 286.

294. Viscusi, *Risk by Choice*, p. 168.

295. In contrast, Braithwaite contends, "The best approach . . . would be to have a reverse sunset clause for all deregulatory initiatives. That is, a set of regulations would be placed in abeyance for, say, five years. If during that five years, industry demonstrated good faith in making self-regulation work, the regulatory agency would permanently repeal the regulations; if not, they would automatically come back into force after the trial period." Braithwaite, p. 124.

296. "Providing job risk information to workers to enable them to select jobs that are appropriate for their own risk preferences is a promising strategy for augmenting market forces and promoting outcomes that are responsive to the diversity of attitudes towards risk." Viscusi, *Risk by Choice*, p. 4.

297. The National Research Council suggests that the government "encourage publication of annual rankings of companies by injury rates." National Research Council, p. 15.

298. MSHA Internet, Data Retrieval System, www.msha.gov/drs/drshome.htm.

299. "Individual facts are as important as the accumulated numbers which make up the statistical abstraction." Metzgar, "Politics and the MSHA Statistics," p. 329; see also Viscusi, *Risk by Choice*, p. 158.

300. At present, mine operators report injuries under existing MSHA regulations. 30 C.F.R. part 50. Moreover, there are already strong federal laws in place that prohibit false reporting. See, for example, 30 U.S.C. 820(f). To avoid reporting controversies altogether, the federal government might collect such injury information directly from the various states' workers' compensation programs. Under such a scheme, no injury would count against a mine operator's safety record unless an award of medical or death benefits had been made by the state agency. Although state workers' compensation programs are far from perfect and vary considerably among the states, they do provide forums in which mine operators can challenge the veracity and workplace relatedness of injury claims made by employees. Placing additional significance on the findings of the state workers' compensation programs may create incentives to reform and improve those programs as well.

301. "Mining Operations Recognized for Outstanding Safety Records in 2000," *MSHN* 8 (August 31, 2001): 374.

302. "Granting companies a tax credit for approved safety expenditures might be an additional inducement for them to make the investments needed to improve safety." National Research Council, p. 120; for an example of a successful incentive, see Aldrich, "Preventing 'the Needless Peril of the Coal Mine,'" pp. 513–14.

303. See Mendeloff, pp. 28–31.

304. 30 U.S.C. 820(c), (d).

305. *Secretary of Labor v. Shirel*, No. 94-1030, (D.C. Cir. March 29, 1995), unpublished disposition reported at 52 F.3d 1123, 1995 U.S. App. LEXIS 41129.

306. 30 U.S.C. 955(a).

307. See, for example, "Raymond Granite Co. Settles Civil Case; D.A. Drops Criminal Charges," *MSHN* 7 (June 23, 2000): 274.

308. See, for example, "MSHA Inspectors Bar Arizona Inspectors, Sheriff from Accident Scene at BHP," *MSHN* 2 (May 2, 1997): 265.

309. 30 U.S.C. 820(c); see *Roy Glen*, 6 FMSHRC 1583 (July, 1984)("Accordingly, we hold that a corporate agent in a position to protect employee safety and health has acted 'knowingly' in violation of Section 110(c) when, based on the facts available to him, he either knew or had reason to know that a violative condition or conduct would occur, but he failed to take appropriate preventative steps.").

310. David Hawpe, "What about a Miner's Expectation of Living?" *MSHN* 8 (February 16, 2001): 88. See also "Mine Foreman Gets Light Sentence for Smoking, Ventilation Violations," *MSHN* 3 (October 18, 1996): 562; and Braithwaite, p. 152.

311. "A federal judge ordered prison time for two brothers who operated a Wyoming County, W.Va.,

coal mine in violation of mine safety laws, leading to the death of an employee in 1992. . . . The courtroom was half-filled May 14 with family and friends of the Addairs, may of whom wrote letters to the court asking for leniency and citing the brothers' involvement in their respective communities." "Judge Criticizes 'Cavalier Attitude' of Brothers She Sentenced to Jail," *MSHN* 4 (May 31, 1997): 285. "In small mining communities it is hard for city dwellers to imagine the stigma that attaches to those perceived as responsible for disasters." Braithwaite, p. 140.

312. Johnson, p. 21.

313. McAteer, "Farmington Victims Left Legacy to Nation's Miners."

314. "McAteer Says MSHA, Industry Can't Rest until Accidents Are Brought Down," p. 295.

Published by the Cato Institute, Policy Analysis is a regular series evaluating government policies and offering proposals for reform. Nothing in Policy Analysis should be construed as necessarily reflecting the views of the Cato Institute or as an attempt to aid or hinder the passage of any bill before congress. Contact the Cato Institute for reprint permission. Additional copies of Policy Analysis are $6.00 each ($3.00 each for five or more). To order, or for a complete listing of available studies, write the Cato Institute, 1000 Massachusetts Ave., N.W., Washington, D.C. 20001, call toll free 1-800-767-1241 (noon - 9 p.m. eastern time), fax (202) 842-3490, or visit our website at www.cato.org.