

THE IMPACT OF ASBESTOS LIABILITIES ON WORKERS IN BANKRUPT FIRMS

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ABOUT THIS STUDY

This study was commissioned by the American Insurance Association as an independent analysis of the costs borne by workers of firms filing for bankruptcies due to asbestos liabilities.

The views and opinions expressed in this study are solely those of the authors and do not necessarily reflect the views and opinions of the American Insurance Association or any of the institutions with which the authors are associated.

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Executive Summary

Asbestos claims have skyrocketed over the past decade. These claims are pushing many companies into bankruptcy or at least to the brink of filing for bankruptcy protection.

The pain and suffering of impaired asbestos claimants are palpable and undeniable. It is important to realize, however, that the current system of paying asbestos claims imposes significant costs not just on businesses, but on their individual employees. Wages, future employment prospects, and the ability to save for retirement are all affected. The purpose of this paper is not to suggest in any way that impaired claimants are unworthy of assistance, but rather to highlight the fact that payments to any claimants are not free and to illuminate some of the costs imposed on workers as a result.

We estimate that 61 companies have filed for bankruptcy protection under Chapter 11 of the U.S. Bankruptcy Code as a result of asbestos liabilities. These companies are spread across the nation, with 47 states having at least one asbestos-related bankruptcy. Many of the workers at these companies – which employed 204,868 people the year before they filed for bankruptcy – are members of unions, and they are often shareholders in the companies as well as employees.

The bankruptcies associated with asbestos liabilities have had a marked deleterious effect on workers in those firms. For example, we found:

- Bankruptcies led to a loss of an estimated 52,000 to 60,000 jobs;
- Each displaced worker at the bankrupt firms will lose, on average, an estimated \$25,000 to \$50,000 in wages over his or her career because of periods of unemployment and the likelihood of having to take a new job paying a lower salary; and
- The average worker at an asbestos-related bankrupt firm with a 401(k) plan suffered roughly \$8,300 in pension losses, which represented, on average, a roughly 25-percent reduction in the value of the 401(k) account.

The bankruptcy event itself is costly, since the legal, accounting, and other transaction costs associated with a bankruptcy can be significant. Based on the published literature on the topic, the direct costs of bankruptcy amount to between three and six percent of the firm's market capitalization. This range suggests that the direct costs associated with asbestos-related bankrupt companies total between \$325 million and \$650 million.

The pace at which these bankruptcies have been filed has accelerated in recent years: Since 1998, 35 companies have filed for bankruptcy protection because of asbestos-related claims, compared to 26 in the previous two decades. In the first ten months of 2002, 15 companies facing significant asbestos liabilities filed for bankruptcy – that represents more asbestos-related bankruptcies than in any five-year period before 1999.

This paper has focused primarily on the costs associated with firms declaring bankruptcy because of asbestos liabilities. While it is important to remember that such bankruptcies are unlikely to have substantial macroeconomic effects, it is also important to remember

that the bankruptcies do not capture the full effect of asbestos liabilities on defendants. In particular, many other firms experience financial shocks as a result of asbestos liabilities even if they do not declare bankruptcy as a result. Furthermore, perhaps only a quarter of the estimated eventual costs associated with asbestos claims have been paid to date, raising the specter of many more companies facing severe financial effects and additional asbestos-related bankruptcies in the future. Any such additional bankruptcies are not reflected in our analysis.

Our conclusion is that the current system for handling asbestos claims imposes significant costs on the workers (and shareholders) of the defendant firms. Since many of these firms were not asbestos manufacturers, the costs imposed on workers may seem unfair and inefficient from an economic perspective.

I. Introduction

Prior to the 1970s, asbestos was an important and cost-effective input in a wide variety of manufactured products, from wire insulation to building materials. Asbestos had unique and attractive features: It was cheap, strong, flexible, and resistant to heat and decay. Reflecting these advantages, it was promulgated as a “strategic material” during World War II.¹ Throughout much of the 20th century, asbestos was widely used and an estimated 100 million Americans were occupationally exposed to it.²

In the early 1970s, the United States government – through the Occupational Safety and Health Administration (OSHA) within the Department of Labor – began regulating workplace exposure to asbestos. Over time, the regulations became increasingly stringent. Asbestos use remains technically legal in the United States today, but OSHA and Environmental Protection Agency (EPA) regulations have effectively phased out most uses of asbestos.

A number of diseases have been linked to asbestos exposure. The most severe is mesothelioma, a cancer that is fatal within one to two years of diagnosis. The inhalation of asbestos also can cause lung and other cancers. A third disease arising from exposure to asbestos dust is asbestosis, which is a fibrous scarring of the lung that may or may not impair an individual. A fourth condition associated with asbestos exposure is pleural plaques, which are generally non-impairing symptomatic changes in the pleural membrane covering the lung.

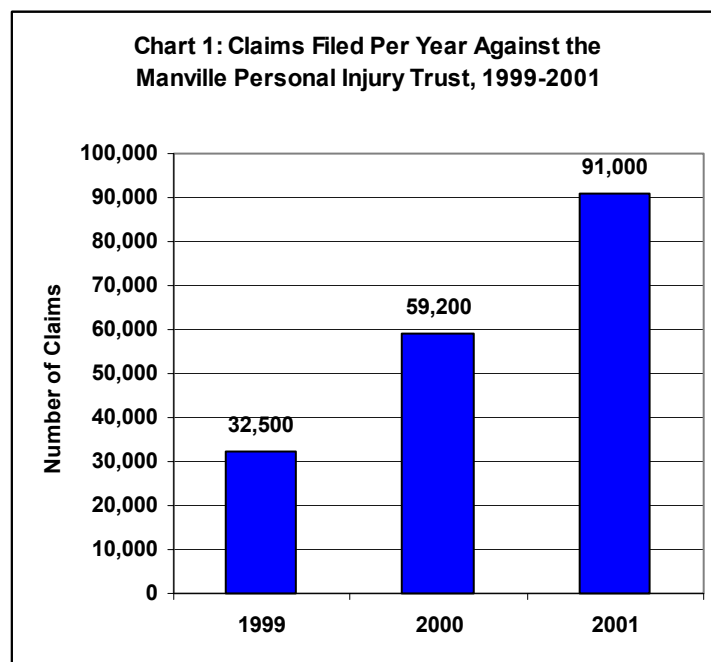
Prior to the 1970s, workers with an asbestos-related disease generally filed for relief through state worker’s compensation systems. In 1973, the U.S. Court of Appeals for the Fifth Circuit ruled in *Borel v. Fibreboard* that manufacturers were liable if they failed to warn consumers about the risks associated with asbestos exposure.³

¹ See American Academy of Actuaries (2001), page 1.

² Ibid.

³ See *Borel v. Fibreboard Corp.*, 493 F.2d 1076 (5th Cir. 1973). For a more detailed discussion of the history of asbestos litigation, see Castleman (1996).

Given the long latency period of asbestos-related diseases (up to 40 years), many experts had expected the filing of claims to peak in the 1980s or early 1990s.⁴ Asbestos claims, however, continued to skyrocket in the 1990s.⁵ A RAND Institute for Civil Justice (RAND) analysis of five major asbestos defendants suggests, for example, that each company was receiving roughly 15,000 to 20,000 claims per year in the early 1990s. By 2000, that number had increased to roughly 50,000 claims per year.⁶ Similarly, the Manville Trust – which pays asbestos claims for former asbestos producer Johns-Manville – has experienced substantial increases in claims in the past few years. In 1999, the Manville Trust had 32,500 new claims filed against it. New claims rose to approximately 59,200 in 2000 and 91,000 in 2001.⁷ (See Chart 1.)



⁴ Castleman, page 784.

⁵ There are myriad reasons why the number of claims has increased so sharply. See White (2002), Plevin and Kalish (2001), and Prudential (2002) for a discussion of the reasons.

⁶ Stephen Carroll et al. (2002), page 42.

⁷ See <http://www.mantrust.org>

The claims are also increasingly being extended to a wider array of firms. In 1983, RAND found 300 firms had been listed as defendants in asbestos cases.⁸ By 2002, RAND estimates that more than 6,000 independent entities have been named as asbestos-liability defendants.⁹ The dramatic recent expansion in defendants raises an important public policy issue. One of the objectives of product liability law is to provide financial incentives for manufacturers to ensure the safety of their products. When joint and several liability is extended well beyond the original manufacturer to include an extremely broad class of firms, however, it could impose an inefficient burden.¹⁰ As explained below, joint and several liability means that any firm in the production chain could potentially be held accountable for the entire cost of the damage associated with an input. To reduce the expected costs of such liabilities, the downstream firms may have to undertake excessive safety checks on all the inputs used in their production processes. The information costs associated with this activity may well outweigh the benefits associated with improved incentives for safety.

The incentive effects discussed above relate primarily to the expected cost of the liability facing specific firms. A distinct issue involves the distribution of any liability payments actually made to claimants. According to the RAND, at least 600,000 individuals filed asbestos-related claims between 1973 and the end of 2000, many against multiple companies.¹¹ This figure may be an underestimate of the total number of individuals filing claims since RAND's database is incomplete: it only has data on claims filed against certain companies, not every company with an asbestos claim against it. In addition, RAND notes that it only obtained data on claims submitted through the end of 2000; as shown above, however, a significant number of individuals filed claims in 2001.

⁸ Stephen Carroll et al. (2002), page 49.

⁹ Ibid.

¹⁰ The long latency period involved in cases such as asbestos raises another potential impediment to the effectiveness of the liability system in providing incentives for the safety of products. If a firm's managers and owners will have departed by the time any safety problems or illnesses manifest themselves, the incentives provided for corrective action may be weakened.

¹¹ Stephen Carroll et al. (2002), page 40.

Nonetheless, other organizations have produced estimates that are similar to RAND's calculations.¹²

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The dramatic acceleration in claims does *not* appear to be associated with an acceleration in the number of severely affected people. Indeed, the American Academy of Actuaries has concluded that about 2,000 new mesothelioma cases are filed each year, a flow which is largely unchanged over the past decade, and that the annual number of other cancer cases at least partly related to asbestos exposure amounts to between 2,000 and 3,000.¹³ Such cases cannot come close to explaining the increase in asbestos claims being filed, which increased by almost 60,000 between 1999 and 2001.¹⁴ RAND concluded that “it is clear that the growth in the annual number of claims observed...is entirely due to increases in the numbers of nonmalignant claims entering the system.”¹⁵

The upshot is that the share of total new claimants who are unimpaired has increased sharply. In 1984, RAND estimated that fewer than four percent of claimants had no asbestos-related impairment.¹⁶ A 1992 paper asserted that non-mesothelioma (and other cancer) claims “account[ed] for sixty to seventy percent of new asbestos claims filed.”¹⁷ In a 1993 paper, Professors Christopher Edley and Paul Weiler of Harvard Law School estimated that “up to one-half of asbestos claims are now being filed by people who have little or no physical impairment.”¹⁸

More recent studies of have concluded that even a larger share of claimants is unimpaired. NERA, an economics consulting firm, found that roughly 75 percent of the

¹² For example, a 1999 National Judicial Conference report estimated that there were between 300,000 and 700,000 asbestos claimants.

¹³ American Academy of Actuaries (2001), page 3.

¹⁴ See www.mantrust.org

¹⁵ Stephen Carroll et al. (2002), page 44.

¹⁶ Kakalik et al. (1984), page 30.

¹⁷ Brickman (1992).

¹⁸ Edley and Weiler (1993).

claims brought against one defendant in 1999 and 2000 had no evidence of impairment.¹⁹ Similarly, a preliminary analysis of claims filed against Babcock and Wilcox in 2001 concluded that “two-thirds of the claims... seek to recover for benign and harmless conditions such as pleural plaques, pleural thickening with no evidence of impaired lung function, or asbestosis with no evidence of impairment.”²⁰ Data from claims against W.R. Grace produce similar results.²¹

The rapid increase in claims has, not surprisingly, been associated with an increase in total outlays. To date, RAND estimates that aggregate outlays for asbestos claims total \$54 billion, with U.S. insurance companies covering an estimated \$21.6 billion,²² non-U.S. insurance companies covering \$8 billion to \$12 billion, and the defendant companies paying \$20 billion to \$24 billion, including at least five companies which have each spent more than \$1 billion.²³

Looking to the future, most analysts believe that the number of claimants and total outlays for claims will continue to rise. Tillinghast-Towers Perrin, an actuarial consulting firm, projects that 1.1 million claims will eventually be filed, with the total cost to defendants and insurers amounting to \$200 billion.²⁴ Milliman USA, another actuarial consulting firm, also forecasts 1.1 million total cumulative claims, but it projects higher total costs (\$275 billion).²⁵ These projections imply that only roughly half of the claims and one-fifth to one-quarter of the eventual costs have been paid to date.

¹⁹ See National Economic Research Associates, Unimpaired Claims Analysis (February 26, 2001). Of all claims received by the Manville Trust in 1999 and 2000, 11 percent were malignant claims (4 percent mesothelioma, 6 percent lung cancer, and 1 percent other cancers), and 89 percent were non-malignant claims.

²⁰ See Babcox and Wilcox’s Report to the Court Regarding Asbestos Developments Generally and the Proofs of Claim Filed Here, at 32-37, and Road Map to Babcox and Wilcox’s Defenses to Asbestos Personal Injury Claims, VII-1&2, *In re The Babcock & Wilcox Co.*, Bcy No. 00-10992 (Bankr. E.D. La)(October 18, 2001).

²¹ See Debtors’ Consolidated Reply in Support of Their Motion For Entry of Case Management Order, etc., *In re W.R. Grace Co.*, Bcy No. 01-01139 (D. Del.)(November 9, 2001).

²² See A.M Best (2001).

²³ Stephen Carroll et al. (2002), pages 53-55.

²⁴ Lehman (2002), page 5.

The staggering costs of asbestos liabilities have pushed many defendant companies into bankruptcy or to the brink thereof. We estimate that 61 companies have faced significant asbestos liabilities and have filed for bankruptcy protection under Chapter 11 of the U.S. Bankruptcy Code as a result.²⁶ (Our selection methodology is described in more detail in the next section.)

The staggering costs of asbestos liabilities have pushed many defendant companies into bankruptcy or to the brink thereof

The pace at which these bankruptcies have been filed has accelerated in recent years: Since 1998, more companies have filed for bankruptcy protection (35 companies) than in the previous 20 years combined (26 companies). (See Chart 2.) In the first ten months of 2002, 15 companies facing significant asbestos liabilities filed for bankruptcy – that represents more asbestos-related bankruptcies in 10 months than in any five-year period before 1999.

Bankruptcy offers firms facing substantial asbestos liabilities a number of benefits.²⁷ First, bankruptcy includes an “automatic stay” on litigation in which the firm is the defendant. Second, the firm can often obtain an injunction, which temporarily protects the parent (as well as subsidiary firms that have not filed for bankruptcy) from asbestos liabilities. Since bankruptcy reorganization can often take more than five years, bankrupt firms often receive a relatively lengthy reprieve from paying asbestos liabilities. Moreover, as part of the reorganization plan, the bankrupt firm usually wins the right to pay claimants on much less favorable terms.

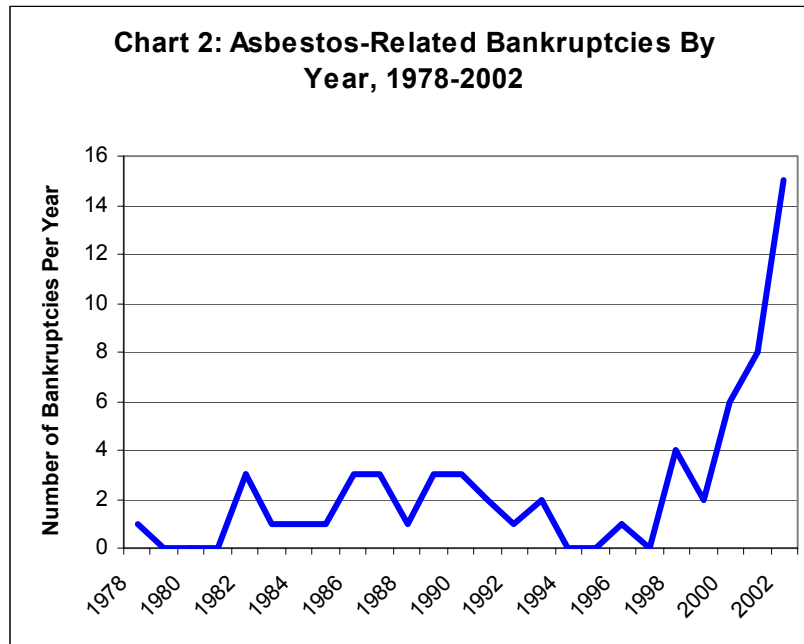
Another effect of a firm’s declaring bankruptcy is that it may cause a “domino effect” on other asbestos-related defendants. The domino effect arises from three simple

²⁵ Ibid, page 22.

²⁶ For comparison, RAND estimates in their September 2002 study that 60 companies have been pushed into bankruptcy due to asbestos liabilities. See Stephen Carroll et al. (2002), page 75.

²⁷ The *Economist* recently noted that, “Bankruptcy may not sound like an attractive option, but it is often the best alternative for firms in the throes of asbestos litigation.” *The Economist*, September 19, 2002.

facts: (1) many states have joint and several liability for damage; (2) most people sue multiple defendants,²⁸ and (3) most claimants “forum shop.”²⁹



An example may help to explain how this effect works.³⁰ Suppose that an individual (John Doe) sues two companies (Company A and Company B) because he has developed asbestosis and is physically impaired. Further suppose that John Doe proves to a jury that both Company A and Company B are jointly liable for his impaired condition and they owe him a total of \$500,000. If Company A goes bankrupt before it pays John Doe its share of the \$500,000 (say, \$250,000), Company B may be liable for Company A’s share of the damages. Thus, if Company A files for bankruptcy, the asbestos-related costs for Company B increase. Such a structure creates a number of

²⁸ According to RAND, “In the early 1980s, claimants typically named about 20 different defendants. The data we have now suggests that by the mid-1990s, the typical claimant named 60 to 70 defendants.” Stephen Carroll et al. (2002), page 41.

²⁹ A number of analysts have noted that a disproportionate percentage of the claims are filed in state courts that are considered to be “pro-plaintiff.” For example, Mississippi has only one percent of the U.S. population, but accounts for roughly 20 percent of the pending claims. See American Academy of Actuaries (2001), page 3. *Fortune* magazine notes that in July 1999, “some 9,100 asbestos plaintiffs from all over the country were suing in rural Jefferson County, Miss.—about 700 more asbestos plaintiffs than there were county residents.” See Parloff (2002). RAND has similarly found that five states account for two-thirds of recent cases filed, and 84 percent of all the claims were filed in just 10 states. See Stephen Carroll et al. (2002), pages 32 and 34.

³⁰ This example simplifies the joint and several liability rules, which vary across states.

perverse effects, including the incentive for firms to declare bankruptcy in order to shift liabilities to other firms (which in turn raises the probability that the other firms will be forced into bankruptcy) and the incentive for claimants to sue as many defendants as possible.

Although bankruptcy may provide benefits to firms facing significant asbestos liabilities, it also imposes economic costs. In particular, empirical studies have shown that bankruptcy is associated with significant transaction costs (for the lawyers, accountants,

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and others involved in the proceedings). The events leading to the bankruptcy, along with the bankruptcy event itself, also tend to be associated with a loss in human capital (for the workers displaced from their jobs) and organizational capital (if the firm is scaled back or no longer exists). As we discuss below, a significant share of these costs is borne by the firm's workers. In most cases, the workers would not have been in a position – nor perhaps even employed by the firm at the time – to alter the choice of input used in the production process. Having such workers bear a substantial share of the costs attenuates any positive incentive effects from the underlying product liability approach. In the absence of any significant incentive effects, the attractiveness of the product liability approach relative to alternatives for compensating victims is therefore weaker, since the product liability approach may involve higher transaction costs and be less fair than alternatives.

The purpose of this paper is to analyze the impact of asbestos-related bankruptcies on the workers of asbestos-related companies. The paper is divided into three sections. The first section explores the characteristics (such as size, location, and industry distribution) of the companies that have filed for bankruptcy due to asbestos-related claims. The second section focuses on the effects of asbestos liabilities on workers in the bankrupted firms, including the impact on employment levels and the effects on workers

in their role as partial owners of the firm (especially through their pension plans). The final section draws conclusions from the previous sections.

II. Asbestos-Related Bankruptcies

This section provides a brief history of asbestos-related bankruptcies and examines the characteristics of the 61 bankrupt companies.³¹ We compiled our list of bankrupt companies from five different sources: (1) a paper by Mark Plevin and Paul Kalish (*Where Are They Now? A History of the Companies That Have Sought Bankruptcy Protection Due to Asbestos Claims*), (2) the June 2002 Mealey's Asbestos Bankruptcy Report, (3) a March 2002 Lehman Brothers analysis (*Thinking About Asbestos*), (4) a December 2001 report of the American Academy of Actuaries (*Overview of Asbestos Issues and Trends*), and (5) a list of companies that have sought bankruptcy protection that was provided to us by the American Insurance Association. The entire universe of companies cited by these sources exceeded 70.

After compiling this list, three filters limited our sample to U.S. firms for which asbestos liabilities played a substantial role in causing the bankruptcy. First, we sought confirmation from a variety of contemporaneous sources (e.g., press releases, bankruptcy filings, newspaper stories, other regulatory filings, etc.) that asbestos liabilities played a *significant* role in the bankruptcy. To be sure, other factors may have contributed to the company filing for bankruptcy (e.g., foreign competition, financial mismanagement, etc.), but for the companies we designate as “asbestos-related bankruptcies,” asbestos was identified as a significant contributing factor to the decision to enter into bankruptcy. Second, we excluded any non-U.S. corporations because of data limitations. Finally, to avoid double counting, we treated separate bankruptcies by subsidiaries of the same parent firm as one bankruptcy event. (For example, when UNR Industries filed for bankruptcy in 1982, ten related companies filed at the same time.)

A Brief History of Asbestos-Related Bankruptcies

Asbestos-related bankruptcies can be grouped into four waves. The “first wave” occurred between 1978 and 1985 when seven companies with significant asbestos liabilities filed for bankruptcy protection. For example, UNR Industries faced an estimated 17,000 asbestos claims and projected that it was going to face another 120,000 claims when it filed for bankruptcy in July 1982. Johns-Manville, still the largest employer to have declared bankruptcy because of asbestos claims, filed for bankruptcy the next month. The companies that comprised this “first wave” of bankruptcies were primarily large asbestos manufacturers.

The “second wave” of asbestos-related bankruptcies occurred between 1986 and 1993. During that time period, 18 companies entered into bankruptcy due to significant asbestos liabilities. Some of these companies were quite large: Todd Shipyards employed 4,400 workers in 1986, the year before it went bankrupt; and Hillsborough Holdings employed 8,935 workers in 1988, the year before it went bankrupt. None of these companies, however, approached the size of Johns-Manville, which employed 27,000 people in 1981.

From 1994 to 1997 (“the third wave”), there was a sharp downturn in asbestos-related bankruptcies. Only one company (Rock Wool Manufacturing) filed for Chapter 11 protection, although it was not a prominent asbestos-liability defendant.³²

The “fourth wave” of asbestos-related bankruptcies started after the U.S. Supreme Court struck down *Georgine v. Amchem Products*, a landmark asbestos settlement, in June 1997. It accelerated after the U.S. Supreme Court overturned a 1993 global class action settlement, *Ortiz v. Fibreboard*, in June 1999. That settlement involved approximately 186,000 asbestos personal injury claims against the Fibreboard Corp., a

³¹ Three companies in the sample filed for bankruptcy after September 2002. Since our analytical work had been completed by then, we included these companies in the overall count, but did not include them in our various analyses.

³² See Plevin and Kalish (2001).

maker of vinyl siding that is now a subsidiary of Owens Corning. As one Chief Executive Officer confided to *Fortune* in March 2002, “We should’ve filed bankruptcy on the day after the Georgine settlement was overturned by the Supreme Court... Every asbestos defendant should’ve done the same thing.”³³ In 1998, there were four asbestos-related bankruptcies. By 2001, there were eight, and in the first ten months of 2002, there were 15 asbestos-related bankruptcies. These companies employed more than 135,000 workers: for example, Owens Corning employed 20,000 and Babcox and Wilcox employed 12,264 people in 1999, the year before both firms declared bankruptcy.

Size of Asbestos-Related Bankrupt Firms

Using data from Compustat, Dun & Bradstreet’s Million Dollar Directory, Ward’s Business Directory, Moody’s, company web sites, and individual firms’ Securities and Exchange Commission (SEC) filings, we constructed an employment database for the asbestos-related bankrupt companies. Employment data were available for only 40 of the companies. The other 18 companies were small and presumably excluded from the above-mentioned data sources; as noted above, three companies were excluded because they filed for bankruptcy after our analysis was completed. For some companies – roughly 10 – we built a time series of employment data between 1960 and 2001. For the other 30 companies, employment data were available on an infrequent basis or for shorter time periods (e.g., for Kaiser Aluminum, data were available for 1986 to 2001).³⁴

Table 2 presents data on the size of the firms that have filed for bankruptcy in each of the four waves described above. Since 1978, 26 companies facing asbestos liabilities filed for bankruptcy when they had more than 1,000 employees, with seven companies having more than 10,000 workers when they filed for bankruptcy protection.

³³ See Parloff (2002).

³⁴ Since employment data were often unavailable from the same data source for the whole time period, we often had to cross data series. Such a mixing of data series may introduce some biases in the employment numbers. If the data did not appear to match – that is, switching from one data source to another was associated with a significant increase or decrease in employment – we filtered the data from the database.

The companies that have filed bankruptcy most recently appear to be the largest firms, with six out of the seven largest filing for bankruptcy since 1998.

	“First Wave”: 1978-1985	“Second Wave”: 1986-1993	“Third Wave”: 1994-1997	“Fourth Wave”: 1998-2002	Total
More than 10,000 Employees	1	0	0	6	7
Between 1,000 and 10,000 Employees	1	8	0	10	19
Fewer than 1,000 Employees	0	5	1	8	14
Data Not Available	5	5	0	8	18
Total	7	18	1	32*	58*

* Three companies were excluded because they filed for bankruptcy after September 2002, when our analysis was completed.

Table 3 offers another perspective on the size of the bankrupted firms in the past four years. In total, the 40 companies in our database employed 204,868 workers the year before they filed for bankruptcy.³⁵ Two-thirds (66.7 percent) of these employees worked at firms that went bankrupt in the past four years. That is, the companies that went bankrupt between 1998 and 2002 employed a total of 136,831 people in the year before each company filed for Chapter 11 protection.

³⁵ For some companies data were unavailable for the year prior to it filing for bankruptcy. In such cases, we used the closest year data were available, as long as it was not more than five years from the date in which the company filed for bankruptcy.

Table 3: Number of Asbestos-Related Bankruptcies and the Number of Workers Employed By the Firms, By Time Period		
Time Period	Bankrupt Companies For Which We Have Employment Data	Number of Workers Employed By Bankrupt Firms Year Before Bankruptcy Filing
“First Wave”: 1978-1985	2	30,600
“Second Wave”: 1986-1993	13	37,365
“Third Wave”: 1994-1997	1	72
“Fourth Wave”: 1998-2002	24	136,831
Total	40	204,868

Another measure of the size of the bankrupt companies is their market capitalization one year prior to filing bankruptcy. From the Center for Research in Security Prices (CRSP) market database and individual companies’ Securities and Exchange Commission (SEC) filings, we obtained market capitalization data for 17 companies. (Many of the bankrupt companies were either privately held or were subsidiaries of larger firms. For such companies, market capitalization data are not publicly available.) Since companies filed for bankruptcy in different years, we converted each firm’s market capitalization level into July 2002 dollars using the Consumer Price Index (CPI-U). As Table 4 shows, four of the 17 firms had market capitalizations of more than \$1 billion the year before they filed for bankruptcy, two firms had market capitalizations of between \$500 million and \$1 billion, six firms had market capitalizations of between \$100 million and \$500 million, and five firms had market capitalizations of less than \$100 million. All four firms with market capitalizations over \$1 billion filed for bankruptcy after 1998.

Table 4: Market Capitalization of Bankrupt Firms One Year Prior to Filing for Bankruptcy, in July 2002 Dollars	
Market Capitalization (in July 2002 Dollars)	Number of Firms
More than \$1 billion	4
\$500 million to \$1 billion	2
\$100 million to \$500 million	6
Less than \$100 million	5
Total	17

Industry Distribution of Asbestos-Related Bankrupt Firms

A number of analysts have noted that the companies facing asbestos liabilities are not concentrated in a particular industry. For example, RAND has found that “The firms on our current list of defendants fall into 75 different SIC categories at the 2-digit level. The SIC system divides the entire U. S. economy into 82 industries at this level. In other words, this litigation has spread to touch firms in industries engaged in almost every form of economic activity that takes place in the American economy.”³⁶

Companies outside asbestos manufacturing appear to be paying a larger share of the asbestos liabilities today. Specifically, according to a confidential study of asbestos costs cited by RAND, nontraditional defendants accounted for about 60 percent of asbestos expenditures by the late 1990s. By comparison, in the early 1980s, the report cites evidence that nontraditional defendants accounted for only about one-quarter of asbestos-liability costs.³⁷ A different analysis by Prudential Financial draws a similar conclusion. Prudential Financial notes that as traditional defendants – those involved in the mining, manufacturing, and distribution of products that included large amounts of asbestos – declared bankruptcy, claimants cited other organizations as responsible parties. The study notes, “Defendants are increasingly ‘peripheral.’ This generally means that: They did not manufacture, sell, or install asbestos-containing insulation or materials; [a]sbestos was more or less ‘incidental’ in their products or facilities; [i]f it was in their products, it was enclosed [and] therefore, only a minimal number of fibers were released into the air; and [t]heir current outstanding claims count is in the hundreds or low thousands... opposed to the more than one hundred thousand recorded by the traditional defendants.”³⁸

Companies outside asbestos manufacturing appear to be paying a larger share of the asbestos liabilities today

³⁶ See Stephen Carroll et al. (2002), page 50.

³⁷ Ibid.

³⁸ Prudential Financial (2002), page 3.

The Prudential Financial report provides a list of nearly 1,000 organizations that are current defendants in asbestos litigation, along with an industry classification for each defendant. As noted above, RAND estimates that there are more than 6,000 defendants. The Prudential Financial list is thus a subset of all defendants and only 39 bankrupt companies are included. We have divided this incomplete list into bankrupt and non-bankrupt companies. (See Table 5.) The table shows clearly that defendants – and, to a lesser degree, bankrupt companies – are spread across different industry groups.

Table 5: Distribution of Defendants and Bankrupt Companies, By Industry Group, As Presented in Prudential Financial’s <i>Asbestos Litigation—A Problem Without A Solution</i>		
<u>Industry</u>	<u>Defendants</u>	<u>Bankrupt Companies</u>
Aluminum & Metal Plants ³⁹	30	1
Asbestos Industry ⁴⁰	128	16
Automotive	5	
Brake Product Manufacturers	11	
Cement Manufacturer ⁴¹	23	1
Chemical Plant	28	
Commercial Industry Jobsites	19	4
Commercial Industry West Coast	8	1
Construction	3	
Contractor	16	
Distributor	14	
Diversified	1	
Financial Services	3	
Fireproofing Manufacturers	6	2
Floor Tile Manufacturers	1	1
Food	1	
Gasket & Packing Manufacturers	1	
Hotels	2	
Imaging	1	
Industrial Boiler Companies	2	1
Lumber Industry Mills	3	
Lumber, Plywood, Veneer/Particleboard	24	
Manufacturing	47	2
Marine	3	
Media	1	
Mills – Plants	3	
Miscellaneous	1	
Oil Refinery	91	

³⁹ Includes defendants categorized as “Aluminum Plant.”

⁴⁰ Includes defendants categorized as “Sold, Made, Designed Asbestos Products.”

⁴¹ Includes “Insulating Cement Manufacturer” and “Refractory Cement Manufacturer.”

Paper/Pulp Mills	27	
Pharmaceuticals	3	
Power Plants ⁴²	230	
Real Estate	1	
Refineries/Chemical Plants	35	
Shipyards ⁴³	116	2
Steel Mill	58	1
Supplier	2	
Technology	1	
Telecommunications	3	
Thermal Insulation Manufacturers	7	3
Transite Pipe Manufacturers	4	1
Transportation	9	1
Turbine Companies	1	
Utility	2	
Wallboard, Plaster & Joint Compound Manufacturers	17	2
Total	992	39

Location of Asbestos-Related Bankrupt Firms

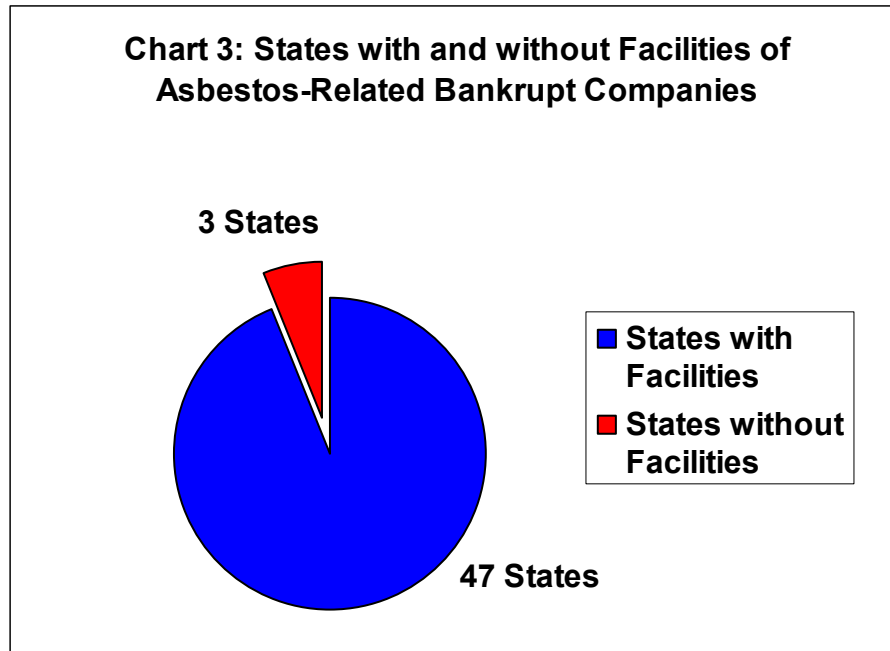
Using the same sources described above to build our employment database, we also constructed a database on the locations within the United States of the companies that have sought bankruptcy protection due to asbestos liabilities. For 50 of the companies that have filed for bankruptcy before September 2002, we have data on the location of their headquarters. These companies are currently headquartered in 19 different states; Pennsylvania – which contains heavy concentrations of manufacturing firms -- accounts for almost a quarter of the bankrupted firms. See Table 6.

⁴² Includes defendants categorized as “Industrial Sites – Power Plants,” “West Coast Power Plant,” “Power Plant,” and “State & Electric Power Plants.”

⁴³ Includes defendants categorized as “Shipyard.”

Table 6: Distribution by State of Current Headquarters of Companies That Have Sought Bankruptcy Protection	
State	Number of Companies Currently Headquartered in State
Pennsylvania	12
Illinois	5
New Jersey	5
California	4
Maryland	3
New York	3
Alabama	2
Colorado	2
Florida	2
Michigan	2
Washington	2
Connecticut	1
Delaware	1
Idaho	1
Missouri	1
North Carolina	1
Ohio	1
Texas	1
Vermont	1

Our database also includes information on the location of company facilities. Many firms do not report the locations of all of their facilities, so this information is incomplete. In addition, our database does not include any information on the number of workers at a given facility. Despite these shortcomings, it is interesting that these 50 companies have facilities in 47 states. (See Chart 3.) The only states without a facility appear to be Hawaii, North Dakota, and Rhode Island.



Unionization of Asbestos-Related Bankrupt Firms

Although the bankrupt firms span a wide variety of industries, they are concentrated in manufacturing, which has a relatively high unionization rate. Many of the firms declaring bankruptcy report particularly high unionization rates in their SEC filings. For example, Johns-Manville reported that 42 percent of its workers were unionized in 1981, the year before it declared bankruptcy.⁴⁴ Other bankrupt firms report similarly high unionization rates for the year before they filed for bankruptcy: Eagle-Picher reported a unionization rate of 33 percent;⁴⁵ Federal Mogul reported 33 percent;⁴⁶ Armstrong reported 57 percent;⁴⁷ and Todd Shipyards reported 75 percent.⁴⁸

⁴⁴ See Manville Corporation Annual Report (10-K) for the fiscal year ended December 31, 1981, page 11.

⁴⁵ According to Eagle-Picher, as of November 30, 1990, “approximately 33% of the Company’s hourly employees were represented by eight labor organizations under 13 separate contracts.” See Eagle-Picher Industries, Inc. Annual Report (10-K) for the fiscal year ended November 30, 1990, page 3.

⁴⁶ According to Federal Mogul, as of December 31, 2000, “Various unions represent[ed] approximately 33% of the Company’s United States hourly employees.” See Federal-Mogul Corporation Annual Report (10-K) for the fiscal year ended December 31, 2000, page 3.

⁴⁷ According to Armstrong, “About 57% of our approximately 12,400 hourly or salaried production and maintenance employees in the United States are represented by labor unions.” See Armstrong World Industries Annual Report (10-K) for the fiscal year ended December 31, 1999, page 7.

⁴⁸ Todd Shipyards Annual Report (10-K) for the fiscal year ended March 30, 1986, page 9.

III. Economic Implications of Asbestos Liabilities and Bankruptcy

The previous section described the characteristics of the bankrupt companies that filed for bankruptcy prior to September 2002. This section explores the effect of asbestos-related liabilities and bankruptcies on employment, retirement security, government finances, and other economic factors. There is a large theoretical literature in economics, and a somewhat smaller empirical literature, on the effects of bankruptcies on firm financial policies and behavior.⁴⁹ Our focus here is more applied, and focuses specifically on asbestos-related bankruptcies.

Bankruptcies and the events that lead to them impose various forms of (potentially related) economic costs. First, the events leading to bankruptcy cause job displacement, which reduces the human capital of workers at the firm. These costs are borne primarily by the workers themselves (with some of the costs subsidized through the unemployment insurance system) but largely represent a loss to society as a whole. Second, bankruptcies can destroy the organizational capital associated with the firm; these costs are borne by both the workers and owners of the firm and also largely represent a loss to society as a whole. Third, the liability payments that caused the bankruptcy represent transfers from stockowners of the firm to victims; these transfers impose costs on the owners of the firm but produce benefits for the recipients. Only the net cost of the transfer – that is, any inefficiency associated with the transfer from one party to the other – represents a loss to society as a whole. Finally, the bankruptcy event itself involves direct transaction costs: the legal, accounting, and other costs associated with a bankruptcy can be significant. Our focus is primarily on the costs borne by workers at the bankrupt firms, through the loss of their human capital and the potential reduction in their retirement wealth (if they own shares of the firm through their retirement accounts), although we also discuss briefly the overall economic issues.

It is important to emphasize that some decline in the size, stock value, and employment of asbestos manufacturing firms is appropriate, given the discovery of the

health risks associated with asbestos and the importance of the incentives provided by the liability system for improved safety. The purpose of this paper is not to separate the “appropriate” from the “inappropriate” costs associated with asbestos liabilities. Nonetheless, the mechanism used to transfer funds to victims is worthy of further examination. As discussed elsewhere in the paper, the increasingly extensive number of tangentially related defendants raises questions about the economic costs and benefits of the liability approach in this context.

Impact of Asbestos-Related Bankruptcy on Workers

As asbestos-related claims increase, firms may find it difficult to obtain new financing and retain clients. They may therefore seek to reduce costs, including labor costs, well before they actually declare bankruptcy.⁵⁰ In particular, as a firm approaches bankruptcy, it faces the challenge of maintaining its customer base and continuing production, which may make it difficult to maintain previous employment levels even before the bankruptcy occurs. Indeed, a common finding in the bankruptcy literature is that the threat of bankruptcy has real effects several years ahead of the bankruptcy event.⁵¹

The media have reported a large number of layoffs by firms declaring bankruptcy due to asbestos liabilities. For example, Federal-Mogul announced in January 2001 that it would close up to 50 of its 150 production units.⁵² The following month (February 2001) it announced it was firing 1,100 workers.⁵³ This layoff followed an April 1998

⁴⁹ See, for example, Stiglitz (1972).

⁵⁰ The forgone profits and investment opportunities associated with this reduction in firm-level activity before and during the bankruptcy form the primary component of the indirect costs associated with bankruptcy. As discussed in the text below, these indirect costs are in addition to the direct costs – for lawyers, accountants, and others – required in the bankruptcy event itself.

⁵¹ See, for example, Altman (1984).

⁵² Jamie Butters, “Credit Gives Big Supplier A Life: Federal-Mogul Says Added \$550 Million Assures Its Survival,” *Detroit Free Press*, January 4, 2001.

⁵³ See Federal-Mogul Press Release, “Federal-Mogul Adjusts Salaried Workforce Levels to Reflect Business Conditions,” February 26, 2001.

announcement by Federal-Mogul of 4,200 job cuts.⁵⁴ In 1998 and 1999, the years before it filed for bankruptcy, Owens Corning reported 1,500 layoffs.⁵⁵ And U.S. Gypsum announced in January 2001 that it would eliminate 500 salaried jobs as part of a restructuring plan.⁵⁶

We conducted a more systematic and rigorous analysis of employment among asbestos-related bankrupt companies. We have time-series employment data for 31 of the companies that filed for bankruptcy prior to September 2002. The 31 firms for which we have time-series employment data represent the vast majority, and likely roughly 90 percent, of total employment for the bankrupt firms as a whole.⁵⁷ For these firms, we compared the change in employment of each firm in the five years prior to bankruptcy to the change in employment for other firms in the same four-digit Standard Industrial Classification (SIC) code.⁵⁸ The five-year period was chosen as a rough proxy for the time between the first material revelation of asbestos liabilities and the bankruptcy event. A longer-time period, such as ten years, produces an even larger employment effect than the estimate presented below.

Data for each four-digit SIC code were obtained from the Bureau of Labor Statistics; for each four-digit SIC code, we obtained an estimate for employment at the non-bankrupt firms by subtracting the employment at companies that declared

⁵⁴ See Federal-Mogul Press Release, “Federal-Mogul Announces First Quarter Results and Special Charges Related to Acquisitions and Restructuring,” April 23, 1998.

⁵⁵ See Owens Corning 2000 SEC 10-K filing.

⁵⁶ James Miller, “USG’s Asbestos Woes Bring \$904 Million Charge,” *Chicago Tribune*, January 12, 2001.

⁵⁷ We have some employment data for 40 firms and a fuller set of time-series data for 31 firms. The sample of 31 firms represents roughly 91 percent of employment at the 40 firms as a whole one year prior to bankruptcy. The 18 firms for which we have no employment data are extremely small, and are extremely likely to have had less than a total of 10,000 employees. The 31 firms in our sample would then represent 87 percent of total employment for the bankrupt firms as a whole.

⁵⁸ For 11 of the 31 companies, we did not have employment data for the precise year the firm declared bankruptcy or five years prior to the bankruptcy filing. For example, eight of these 11 companies filed for bankruptcy in 2001 or 2002, but employment data were available only through 2000 or 2001. For such companies, we analyzed the 1995-2000 or 1996-2001 time periods. The SIC system has recently been replaced by the North American Industry Classification System (NAICS).

bankruptcy due to asbestos liabilities from the overall SIC employment level.⁵⁹ The results of this analysis are summarized in Table 7.

After adjusting for the changes in industry employment, the 31 firms lost 51,970 jobs in the five years prior to bankruptcy. (The raw change in employment – that is, the change without adjusting for employment changes at the industry level – was a loss of 60,636 jobs.) Nine firms showed gains in employment in the five years prior to bankruptcy, while 22 firms experienced declines in employment. The change in employment represents an average 22-percent decline – relative to changes in industry employment – for the 31 bankrupt companies. And, as the table shows, roughly half (53 percent) of the change in employment has occurred in firms that have filed for bankruptcy since January 1998.

The 31 firms for which we have data likely represented 87 percent of total employment at the bankrupted firms as a whole. Assuming that employment losses at the firms for which we lack data were proportionate to those for which we have data, the implied total employment loss for the bankrupted firms as a whole would be roughly 60,000.

Table 7: Change in Employment in Five Years Prior To Bankruptcy After Controlling for Changes in Industry Employment	
	<u>Number of Lost Jobs</u>
Firms Filing for Bankruptcy Before January 1998	24,551
Firms Filing for Bankruptcy After January 1998	27,419
Total for Firms With Data	51,970
Estimated Scaled Total for All Bankrupt Firms	~60,000

⁵⁹ If employment data were unavailable for the four-digit SIC code, we used the three-digit SIC code. If data for the three-digit SIC code were unavailable, we used data for the two-digit SIC code. In cases in which the firm’s employment level represented a significant portion (more than one-third) of the total employment in the industry code, we also used more disaggregated data.

This methodology effectively assumes that, in the absence of the bankruptcy, the bankrupted firm would have maintained a constant share of the industry's employment. An alternative methodology, which has been applied to revenue calculations in other bankruptcy studies, most notably Altman (1984), uses regression analysis to examine the relationship between the firm's employment and industry employment for some period before the bankruptcy. It then applies that relationship to industry employment immediately surrounding the firm's bankruptcy to obtain a predicted level of employment. The difference between the predicted level of employment for the firm and the actual level is then attributed to bankruptcy-related events. We also conducted this type of analysis. The overall results were not qualitatively different from those summarized above when the requisite data were available, although the results for individual firms did vary in some cases. Because of data limitations, we prefer the principal approach adopted above rather than this regression-based approach.

RAND has also estimated job losses associated with asbestos-related bankruptcies or liabilities. Specifically, it bases its calculations for changes in employment levels on the amount defendant firms have paid out (\$23 billion). RAND estimates that a reduction of \$23 billion in retained earnings would result in a reduction in investment levels by the defendant firms of up to \$10 billion. RAND then estimates the employment effect of this reduced investment. The study concludes that, "If, on average, one less job is created each time a firm reduces its investment levels by \$78,000, the number of jobs not created because asbestos defendants spent \$10 billion less on investment up to the year 2000 would be approximately 128,000."⁶⁰ RAND notes that these figures represent upper-bound estimates, since non-defendant firms will likely "make up" for the reduction in investment by defendant firms. Note that we focus only on bankrupt companies; RAND examined all defendant firms regardless of whether they declared bankruptcy.

Regardless of the precise estimate attached to employment losses associated with asbestos, it is important to emphasize that the aggregate level of employment in the nation as a whole will be primarily determined by factors other than asbestos liabilities

⁶⁰ Stephen Carroll et al. (2002), page 74.

and the bankruptcies that have resulted. That is, while the firms that have declared bankruptcy due to asbestos liabilities have reduced employment by between 52,000 and 60,000, the effects on total employment are likely to be smaller.

The workers displaced from the bankrupted firms may ultimately find employment elsewhere, but the transition could be costly and lengthy. For example, regional imbalances in employment may make it difficult for workers to find a new job that

The workers displaced from the bankrupted firms may ultimately find employment elsewhere, but the transition could be costly and lengthy

matches their existing skills within driving distance of their existing home. And it is costly for workers to move or learn new skills. Research by Henry Farber, an economist at Princeton University, has shown that “the costs of job loss are substantial. Employment probabilities are reduced substantially. There is an increased probability of working part-time, yielding lower earnings both through shorter hours and lower wage rates. These costs are larger for those workers with less education. And even those re-employed full-time suffer substantial earnings losses on average, regardless of education level.”⁶¹

The economic costs resulting from the dislocation involve two components:

- First, the structural and frictional unemployment associated with the bankruptcies represents a lost opportunity. That is, to the extent that the movement of the displaced workers to new jobs produces a temporary increase in the unemployment rate that would not have otherwise occurred, the production of goods and services lost during the transition represents a true economic cost. Data from the Bureau of Labor Statistics suggest that the median displaced worker who had been previously employed for at least three years and who finds a new job went approximately six weeks between jobs.⁶² Furthermore, only about four-fifths of displaced workers were re-employed within a few years of being

⁶¹ Farber (2001), page 31.

⁶² BLS (2001).

displaced.⁶³ To give a conservative estimate of the magnitude of costs involved, we can adopt a variety of simplifying, but nonetheless reasonable, assumptions. If we assume an average displacement lasts for one month, that the displaced workers had earned an average of \$40,000 per year (which we also assume to be equal to the value of goods and services they produced), and that a total of 52,000 to 60,000 workers were displaced due to the asbestos-related bankruptcies, the unemployment spells associated with the displacements would represent an economic cost of about \$175 million to \$200 million.

- Second, displaced workers tend to earn lower wages at their new jobs, reflecting the loss of human capital associated with the displacement. Farber (2001) estimates that the loss in earnings from displacement amounts to between 5 and 10 percent of previous wages. Under the same assumptions as above, and assuming that the average displaced worker is 45, and has 20 years to retirement, the present value of the losses in wage income would amount to between \$1.2 billion and \$2.8 billion at a five percent real discount rate.

The total economic costs associated with the displacements under these assumptions would then amount to between \$1.4 billion and \$3.0 billion.

In addition to these earnings-related costs imposed on workers, bankruptcy also imposes costs on workers as shareholders. Many workers hold shares of the firm in their pension plans, so that workers suffer two forms of losses: a loss in their human capital (from their displaced employment) and a loss in their financial capital (from the decline in their retirement assets). In the next sub-section, we turn to estimates of the retirement asset losses experienced by workers in the bankrupt firms.

⁶³ Helwig (2001).

Impact of Asbestos-Related Bankruptcy on Retirement Security

Layoffs may not be the only costs to workers from asbestos-related bankruptcies. Indeed, current (and former) workers may experience significant deteriorations in retirement savings if their pension account is invested in company stock. As Michael Kavanagh, the president of a local union that represents 400 W.R. Grace employees in Baltimore, recently told the *Baltimore Sun*, he is “worried about retirees and those about to retire who were counting on the Grace stock they’d built up over the years to help supplement their post-paycheck years.”⁶⁴

This concern arises because as asbestos liabilities increase, the market value of the firm usually declines. Such stock market declines manifest themselves in decreased values of employee defined contribution (DC) pension plans, such as 401(k)s. In 1998, 40 percent of families had a 401(k) or other similar DC pension plan through their employer.⁶⁵ And as various policy-makers have emphasized in recent months, a significant portion of these DC pension plans are invested in the company’s stock: According to the Employee Benefit Research Institute, roughly one-fifth (19 percent) of 401(k) assets are in company stock.⁶⁶ In total, the National Center for Employee Ownership estimates that approximately 25 to 30 million U.S. employees own stock in their companies through employee stock ownership plans (ESOPs), broad-based stock option plans, and DC plans.⁶⁷

To estimate the impact of asbestos-related bankruptcies on employee retirement assets, we undertook two different approaches.

⁶⁴ Kristine Henry, “Old W.R. Grace v. New,” *The Baltimore Sun*, July 1, 2001.

⁶⁵ Sunden and Surette (2000), Table 1, Page 2.

⁶⁶ Dallas Salisbury, Testimony Before the Senate Committee on Health, Education, Labor, and Pensions, February 7, 2002. Also see Munnell and Sunden (2002).

⁶⁷ See www.nceo.org

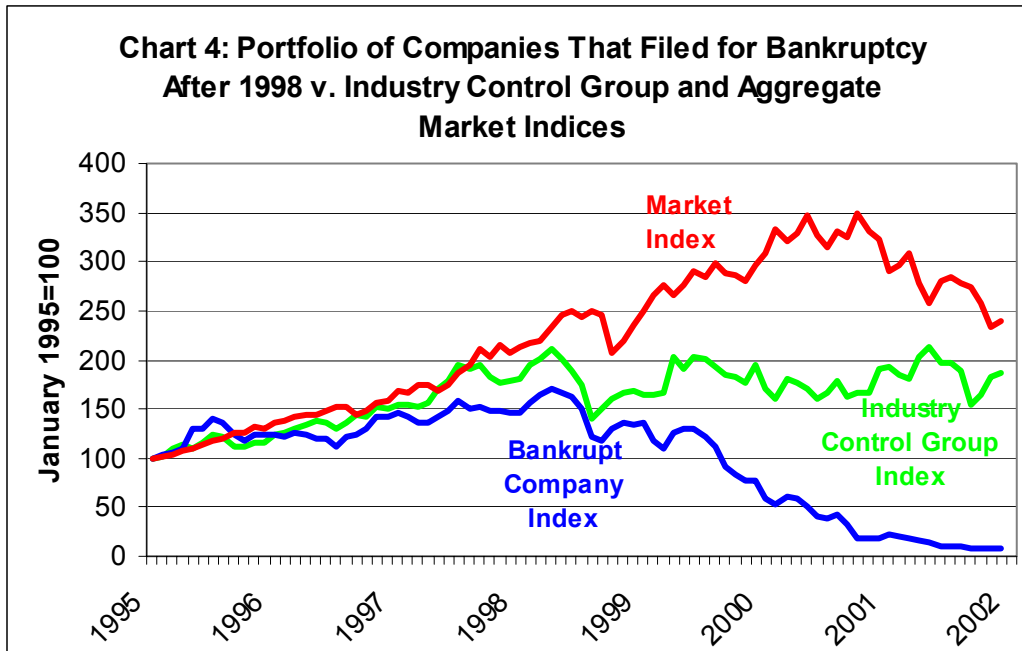
Changes in Stock Prices

The first method uses an estimate of the change in the stock price due to asbestos liabilities to calculate the change in retirement assets for each worker.

Of the companies that went bankrupt due to asbestos liabilities prior to September 2002, we have consistent time-series stock market data for 13 of them. As with the analyses of changes in employment, we compare stock market performance to a control group. In particular, we track the stock market price of each company for the five years before and, if possible, five years after bankruptcy to the performance of a control group of companies, weighted by market capitalization, that produce similar products and face similar economic and market circumstances. (Control group companies are those in the same three-digit SIC code as the bankrupt company, but have not filed for Chapter 11 protection for asbestos-related reasons.) Data on stock prices were obtained from the CRSP database; stock price data were adjusted to take into account dividend payments.

We limit the analysis to a ten-year period that begins five years prior to Chapter 11 filing and extends up to five years after the filing; the comparison stops before five years if the company liquidated, was acquired, or if the bankruptcy took place within the last five years. As before, we compare a market capitalization index for each bankrupt firm to a value-weighted market capitalization index for a control group of companies drawn from the same SIC. The index is normalized to 100 in January 1995 – the first period of comparison.

The results of this exercise for firms declaring bankruptcy after 1997 are shown in Chart 4. To simplify the presentation, aggregate indexes of the bankrupt firms and non-bankrupt firms within the same industries were constructed. As the graph shows, the bankrupt firms experienced significant stock market declines relative to their industry groups: while the industry control group increased 87 percent between 1995 and 2002, the bankrupt firm index fell 92 percent.



An analysis of the firm-by-firm results for all 13 companies for which we have full data shows that *all* these bankrupt firms underperform relative to their industry control group. This type of stock market underperformance is perhaps not surprising and has been found in other broader studies of bankruptcies.⁶⁸ The next step involves converting these results into an estimate of the impact on pension assets. Of the 13 companies analyzed, six report information on what share of employee pension assets are invested in common stock. We used information from the firm's SEC filings to estimate the per plan participant assets held in company stock.⁶⁹ Among the six firms, the average plan participant had 401(k) assets of \$35,891, with \$9,098 invested in company stock five

⁶⁸ See, for example, Altman (1984).

⁶⁹ We obtained SEC filings for 16 of the bankrupt companies. We first excluded three companies with ownership changes. Of the remaining 13 companies, eight reported defined contribution plans. Two of these companies were excluded because data were not available for the period within two years of bankruptcy. Of the remaining six companies, we computed the net common stock fund value per plan participant. In cases in which the companies offered multiple plans to various classes of employees, we consolidated the funds and participant figures. For one company (Federal Mogul), data on the number of plan participants were unavailable; we assumed that two-thirds of the employees were participants in the DC plan. Where a common stock fund's asset and liability breakdowns were not given, we used the fair market value of the common stocks held by the plan. For two companies, we were unable to obtain data for five years prior to bankruptcy. For both companies (Federal Mogul and Eagle Picher), we used data from three years prior to bankruptcy.

years before the company filed for bankruptcy.⁷⁰ Common stock thus represented 25 percent of the pension assets five years before the firms filed for bankruptcy; by comparison – as noted above – the national average is 19 percent.

If the investment in company stock had followed the industry control group index for these firms, the employee's pension assets would have dropped from \$9,098 to \$8,662. Instead, they declined by 96 percent. That is, on average, instead of the value of company stock falling to \$8,662, it fell to \$401 – a loss of \$8,261 in pension wealth per affected worker relative to the level that would have obtained if the stock performed in line with the rest of the relevant industry control group. The total defined contribution pension losses amounted to more than \$350 million.

Changes in Per Plan Participant Assets

The second methodology utilizes information supplied to the SEC by the companies in annual filings. Specifically, in 11-K filings, publicly traded companies report the share of the firm's pension fund assets that are held in company stock. We can thus calculate the assets that each plan participant holds in company stock by dividing that amount by the total number of plan participants.

We examine the per plan participant assets invested in company stock for five years before (or the closest time period to five years before) the company filed for bankruptcy and for the year the company filed for bankruptcy.⁷¹

This approach does not directly rely on an estimated change in the stock price, as the first approach does. But like the first approach, it implicitly assumes that the decline in plan assets is due to the bankruptcy itself rather than other factors. In addition, this approach has three shortcomings not relevant to the first approach. First, it likely obscures the underlying trend in per plan participant assets, since participants continue to contribute to the pension plan in the intervening period. Second, it does not control for

⁷⁰ These figures represent the average of the six firms, weighted by the number of plan participants.

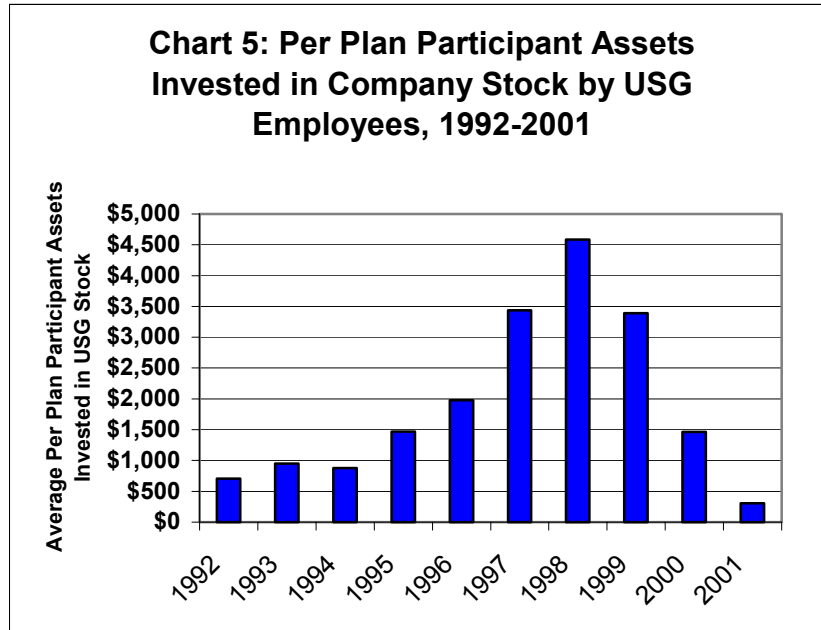
changes at the industry level. In other words, it does not make even a crude adjustment for the change in per plan participant assets that would have occurred in the absence of the asbestos liabilities (e.g., the industry may have suffered a severe downturn that would have affected the per plan participant assets regardless of the asbestos liabilities). Finally, the per plan participant metric can be affected by hiring decisions and pension participation rates, since the addition of new plan participants with below-average balances would cause a decline in the per plan participant measure.

As noted above, we have data on pension fund investments in company stock for six firms. As Table 8 indicates, the weighted average per plan participant assets in the six companies for which we have data fell by \$8,307 from the five years prior to bankruptcy to the year of bankruptcy.

Table 8: Change in Average Per Plan Participant Assets in Company Stock for Six Asbestos-Related Bankrupt Firms	
	<u>Average Per Plan Participant Assets</u>
Five Years Before Bankruptcy	\$9,098
Year of Bankruptcy	\$791
Change	\$8,307

As one example, Chart 5 shows the change in the per plan participant assets invested in company stock for USG employees. Between December 1996 and December 2001, per plan participant assets fell by \$1,670, from \$1,976 in December 1996 to \$305 in December 2001. In December 1996, the pension fund held nearly \$20 million in company stock; by December 2001, it held just \$3.7 million. After accounting for inflows of pension savings, the USG pension fund lost more than \$40 million between December 1998 and December 2001 due to the drop in USG's stock.

⁷¹ For two of the six companies, data were only available for three years before bankruptcy.



Changes in Retirement Security

We can apply the results from the two methodologies above to estimate the impact on workers (and their families) from the loss of pension wealth. Such a reduction in pension wealth imposes a cost that could manifest itself in one of three ways: a reduction in consumption during retirement; an increase in savings (and thus a decrease in consumption) before retirement;⁷² or a delay in retirement. To provide insight into the potential magnitude of these adjustments, we built a model of retirement saving.

The model takes a given level of current pension wealth, projects it forward to an assumed retirement age, and then annuitizes it (that is, converts the accumulated pension account into a monthly payment that is paid as long as the annuitant or his or her spouse is alive). The model takes into account the current age of the worker, the marital status of the worker, the worker's marginal tax rate in retirement (to examine after-tax retirement income), the worker's current 401(k) balance; the worker's current earnings; the worker's anticipated retirement age; an assumed real return on the 401(k) assets; an

⁷² It could also manifest itself as a reduction in the worker's bequests to his or her children. For simplicity, we ignore this possibility.

assumed rate of aggregate real wage growth, combined with the age-wage profile constructed by the Office of the Chief Actuary at the Social Security Administration; and marital-specific annuitization rates. By comparing the results before and after the decline in pension wealth, the model can then be used to examine the effects of the decline on after-tax retirement income if no changes are made to saving or the worker's retirement age; required saving prior to retirement to maintain the previous level of after-tax retirement income; and the delay in the retirement age necessary to maintain a given level of after-tax retirement income without an increase in saving.

The projections shown in the table below assume actuarially fair annuities; a 5 percent real pre-tax return on assets; 1.5 percent aggregate real wage growth; a 25 percent marginal tax rate in retirement; that the worker is currently earning an age-adjusted lifetime equivalent of \$45,000 per year; that the worker is married; and the worker intends to retire at age 65. We examine three workers: a 35-year-old, 45-year-old, and 55-year-old. Unfortunately, we do not have data on plan assets by age of worker. Therefore, for each worker, we assume 401(k) balances were initially equal to mean per plan assets for the affected companies (\$35,891) multiplied by an age-related scaling factor. The age-related scaling factor was derived by comparing median financial assets by age groups from the Federal Reserve's Survey of Consumer Finances, and assuming that the median worker was 45 years old. The result was an assumed initial 401(k) balance of \$14,795 for the 35-year-old worker; \$35,891 for the 45-year-old worker; and \$43,898 for the 55-year-old worker. In each case, we assumed a decline due to the bankruptcy of 25 percent, which is roughly consistent with the observed declines in plan assets (as discussed above).

As Table 9 shows, the losses imposed by bankruptcy cause substantial, albeit perhaps not devastating, costs on workers. For example, if a 45-year-old worker lost 25 percent of his assumed 401(k) balance, he could either allow his retirement income to fall by \$1,250 per year or he could raise his annual 401(k) saving before retirement by \$720 per year. For older workers, several offsetting forces affect the results. The first factor is that the accumulated 401(k) balances prior to the decline are assumed to be larger for the

55-year-old than for the 45-year-old, meaning that a given percentage decline represents a larger absolute loss at the time for the older worker. On the other hand, the power of compound interest means that a loss of \$1 to a 45-year-old corresponds to a larger loss in retirement income than the loss of \$1 to a 55-year-old. For example, \$1 today would accumulate to \$2.65 over the twenty years that a 45-year-old has until retirement; \$1 today would accumulate only to \$1.63 over the ten years that a 55-year-old has until retirement. Therefore, although the 55-year-old may lose more dollars today, the 45-year-old suffers more from the lost power of compound interest. Finally, the 55-year-old has fewer working years over which to make up the loss through additional contributions to the 401(k) plan.

Table 9: Impact of Loss of Pension Wealth on Measures of Retirement Security			
	<u>35-year old worker</u>	<u>45-year old worker</u>	<u>55-year old worker</u>
<i>Assuming 25 percent decline in 401(k)</i>			
Increase in required 401(k) saving per year to maintain pre-reduction retirement income (\$2002)	\$241	\$720	\$1,421
Reduction in retirement assets (\$2002)	\$15,986	\$23,807	\$17,876
Reduction in annual after-tax retirement income (\$2002)	\$839	\$1,250	\$939
Delay in retirement age to maintain pre-reduction retirement income per year (years)	0.48	0.83	0.72

Note: See text for assumptions.

Other Pension Losses Due to Asbestos-Related Bankruptcies

Bankruptcies can also impose large costs on defined benefit (DB) pension plans in addition to defined contribution plans. The Federal Government plays a significant role in protecting employees and retirees who participate in traditional (defined benefit) pension plans. A key element of that protection is the benefit guarantee for underfunded, terminating defined benefit plans that is administered by the Pension Benefit Guaranty

Corporation (PBGC), a government corporation established within the Department of Labor.⁷³ (Since the PBGC is required to be self-financing, it does not impose any direct cost on the Federal Government or on the taxpayers when it assumes trusteeship of a particular plan and thereby takes on additional liabilities to pay claims.) One example of a defined benefit plan that the government “took over” was the Atlas Corporation’s 1978 Retirement Plan, which covered 148 workers. Atlas filed for bankruptcy in September 1998. On October 27, 1999, Atlas’ DB plan was terminated and the PBGC became the trustee on November 18, 1999.⁷⁴ PBGC also took action against Raymark Industries. (Raymark created Raytech Corporation, which filed for bankruptcy in 1989.) In 1999, PBGC won a decision against Raymark. In the case, PBGC sought to ensure that Raymark covered the \$19 million in pension liabilities owed to 1,500 former workers based in Connecticut, Pennsylvania, Indiana, South Carolina, and North Carolina.⁷⁵

Losses associated with the declines in firm values (embodied in both stock value drops and corporate debt restructurings) are not, of course, concentrated solely among the employees and pension plans of the bankrupted firm. Instead, all shareholders and creditors bear some of the burden. For example, soon after USG Corporation entered into bankruptcy, the New York State Teachers Retirement Board ranked as the twelfth largest institutional investor in USG Corporation with nearly 400,000 shares.⁷⁶ The California Public Employees Retirement System (CALPERS) is currently the eighth largest institutional investor in W.R. Grace, which filed for bankruptcy in April of 2001.⁷⁷ And CALPERS and TIAA-CREF are two of the top ten institutional investors in Kaiser Aluminum.⁷⁸

The sharp declines in the stock market value of asbestos-related bankrupt companies would thus likely have broader effects. One example of such a loss is the

⁷³ See, for example, Title IV of the Employee Retirement Income Security Act of 1974, as amended (ERISA), 29 USC section 1301 et seq.

⁷⁴ See <http://www.pbgc.gov/plans/Planlookup.cfm?plan=2814>

⁷⁵ See http://www.pbgc.gov/news/press_releases/1999/pr00010.htm

⁷⁶ In December 2001, the New York State Teachers Retirement Board owned 0.91 percent of USG Corporation. See <http://www.marketguide.com>

⁷⁷ See <http://biz.yahoo.com/hd/g/gra.html>

⁷⁸ See <http://biz.yahoo.com/hd/k/klucq.ob.html>

New York State Teachers Retirement Board's experience with Owens Corning. On March 31, 1999, the Board owned 449,200 shares of Owens Corning. While these shares represented a very small share – roughly 0.03 percent – of the entire pension fund, the value of the stock declined by roughly one third between March 31, 1999 and September 30, 1999. Owens Corning stock price continued to slide as it approached bankruptcy: It fell from 21.69 on September 30, 1999 to 1.19 on October 20, 2000 – a 95 percent decline in 13 months. If the New York Teachers Retirement Board had not sold any shares before Owens Corning filed for bankruptcy in October 2000, the pension fund would have lost nearly \$14 million.

It is possible that the stock prices for other, non-defendant firms are indirectly bolstered by the asbestos liabilities – for example, successful claimants likely spend at least part of their awards on something, and the firms selling those goods and services could experience increases in their stock prices. But any such effects are almost impossible to quantify precisely – and given the transaction costs associated with the process, the overall effect on share values is very likely to be negative.

The Direct Costs of Asbestos-Related Bankruptcies

The estimates above are proxies for what are called the “indirect costs” of bankruptcy (Altman 1984). But the bankruptcy event itself involves direct transaction costs: the legal, accounting, and other costs associated with a bankruptcy can be significant.

Altman (1984) finds that the direct bankruptcy costs amount to 6.2 percent of a firm's value during the year of bankruptcy. RAND cites evidence that the cost of bankruptcy reorganization is equal to about three percent of a firm's value, based on Franks and Touros (1989); Weiss (1990); and White (1996). The RAND figure, however, values the firm's debt at book value rather than market value; Altman, where possible, uses market value instead.

To date, no one has studied the direct costs of asbestos bankruptcy reorganization. The bankruptcies that have been studied in the literature involved large publicly traded corporations comparable in size to large asbestos defendant corporations. But reorganization costs for asbestos defendants may be higher than figures reported in these earlier studies because none of the studied bankruptcies included massive numbers of tort creditors.

Based on the earlier literature, a conservative estimate is that the direct costs of bankruptcy amount to between 3 and 6 percent of the firm's market capitalization. Since the aggregate market capitalization one year prior to bankruptcy (in July 2002 dollars) for the 12 companies for which we have data was \$7.2 billion, the direct costs associated with these asbestos-related bankrupt companies will total between \$225 million and \$425 million. These 12 firms represented about two-thirds of employment at the bankrupted firms as a whole; if the ratio of market capitalization to employment were the same for the other bankrupted firms as for these 12 firms, the total direct costs would amount to between \$325 million and \$650 million.

The previous studies had included some measure of corporate debt in computing the relative direct costs of bankruptcy; by excluding the debt altogether while nonetheless adopting the range of relative cost estimates from the previous studies, we obtain a conservative estimate for the dollar value of the direct costs. If we include the book value of the debt (nearly \$12 billion) for the 12 companies for which we have data, the direct costs would range from \$575 million to \$1.1 billion. If we assume that the debt-worker ratio were the same at the firms for which we lack financial data, the total direct costs would amount to between \$850 million and \$1.7 billion.

Impact of Asbestos-Related Bankruptcy on Government Finances

The layoffs and stock market price declines associated with asbestos liabilities may have a variety of effects on government finances. For example, workers laid off from the firms facing asbestos claims may qualify for unemployment insurance and

retraining programs. They may also become eligible for other means-tested benefits (including Food Stamps and Medicaid), depending on their family status, assets, and income while unemployed. In addition, the loss in wage income among the laid-off workers reduces both payroll taxes and income taxes, and the decline in stock prices for the bankrupted firms reduces capital gains if the stocks are held in taxable accounts (and ultimately reduces income taxes if the stocks are held in traditional retirement accounts). The loss in corporate profits at the firms involved reduces corporate profits tax revenue. But just as the employment losses at the affected firms will eventually be balanced by employment gains elsewhere in the economy as employment shifts to new jobs, the aggregate effect on government expenditures and revenue is less deleterious than this partial equilibrium picture may suggest.

Costs Imposed on Firms That Do Not Declare Bankruptcy

This section has focused primarily on the costs associated with firms declaring bankruptcy because of asbestos liabilities. While it is important to remember that such bankruptcies are unlikely to have substantial macroeconomic effects, it is also important to remember that the bankruptcies do not capture the full effect of asbestos liabilities on defendants to date, nor do they reflect the future costs imposed from ongoing litigation. As noted above, roughly a quarter of estimated total costs to defendants and insurers have been paid to date.

The companies facing significant asbestos liabilities and that have not declared bankruptcy are spread throughout the economy, representing nearly every industry group.⁷⁹ Among the companies facing such claims are a major paper and forest products company, a major media conglomerate, and leading transportation firms. For example, the major media conglomerate reported 118,000 asbestos claims outstanding against it as of June 30, 2002 – and during the second quarter of 2002 alone, it received 9,700 new claims. One major industrial firm, which never produced or sold asbestos, faces as many as 74,700 claims because its “dust masks” did not adequately protect against asbestos.

As *Fortune* magazine recently noted, “The filings by workers in so-called nontraditional industries -- industries in which employees seldom come anywhere near asbestos dust -- have skyrocketed. Filings in the textile industry, for instance, jumped more than 721% in the past two years, according to one defendant’s records; in the pulp and paper industries, 296%; in the food and beverage industries, 284%. Companies like Chiquita Brands, General Electric, and Sears Roebuck have all been hit with asbestos suits.”⁸⁰

The uncertainty surrounding such claims raises borrowing costs and reduces equity values for the firms, thereby impeding their activities. It may also discourage firms from merging, even when such mergers would make economic sense. We have not attempted to quantify the economic effects of asbestos claims against firms that have not (or not yet) declared bankruptcy.

IV. Conclusions

A large component of the payments made to asbestos claimants involves transfers from workers at the defendant firms. The pain and suffering of the impaired claimants is palpable; the costs imposed on the workers in the defendant firms is often less clear. The purpose of this paper is not to suggest that impaired claimants are unworthy of assistance, but rather to highlight the fact that payments to any claimants are not free. They impose significant costs on the workers and shareholders of the defendant firms. Since many of these firms were not asbestos manufacturers, the costs imposed on workers may seem unfair and inefficient from an economic perspective.

As we describe above, bankruptcies associated with asbestos liabilities have had a marked deleterious effect on workers in those firms. Employment declines at these firms have amounted to between 52,000 and 60,000 jobs. The displaced workers typically

⁷⁹ See Stephen Carroll et al. (2002).

⁸⁰ See Parloff (2002).

suffer periods of unemployment before finding a new job, and then often must accept a reduction in wages in order to become re-employed. The costs imposed on these displaced workers amount to between \$1.4 billion and \$3.0 billion in present value, or roughly \$25,000 to \$50,000 per displaced worker.

These costs are not the only ones imposed on workers at the bankrupted firms. For example, workers at many firms are also shareholders in the firm, since they hold company stock in their defined contribution pensions. The average worker at a bankrupted firm with a 401(k) plan suffered roughly \$8,300 in losses. For a 45-year-old worker with an average 401(k) balance, such a loss would mean his retirement income would fall by \$1,250 per year. To prevent such a decline, he would have to raise his annual 401(k) saving before retirement by \$720 per year.

In light of these costs, re-examining the system used to compensate those with illnesses associated with asbestos exposure seems worthwhile. In the context of asbestos, the beneficial incentive effects often associated with a product liability system are attenuated because claims are increasingly being extended to a wider array of firms. The liability approach also involves significant transaction costs. Finally, the liability approach raises basic questions of fairness. Citizens who have suffered from asbestos-related illnesses deserve appropriate compensation. The crucial issue, however, is how we as a society decide to meet those costs.⁸¹ The current system does not appear to an optimal mechanism for doing so.

⁸¹ Supreme Court Justice David Souter wrote that “The elephantine mass of asbestos cases... defies customary judicial administration and calls for national legislation.” See *Ortiz et al. v. Fibreboard Corp et al.*, Docket 97-1704, (decided June 23, 1999). Similarly, Senator Patrick Leahy, the Chairman of the Senate Judiciary Committee, recently stated that “Congress can provide a secure, fair, and efficient means of compensating victims.” See Senator Patrick Leahy, Statement before the Senate Judiciary Committee, September 25, 2002.

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