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Shareholder Value and the Transformation of American Industries, 1984-2001*

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Abstract

There is now a solid set of results from economic sociologists concerning the spread and implementation of "shareholder value" strategies across publicly held corporations in the United States during the 1980s. Corporations were financially reorganized and used the tactics of selling off unrelated product lines, engaging in mergers with firms in similar industries, various financial ploys such as stock buybacks, and downsizing their labor forces. Using data from 62 industries for 1984-2000, this paper explores empirically the connections between shareholder value strategies such as mergers and layoffs, and related industry-level changes such as de-unionization, computer technology, and subsequent profitability. Mergers occurred in industries where economic conditions were not good in line with shareholder value arguments. Mergers subsequently led to layoffs, consistent with the shareholder value perspective that emphasizes that firms needed to deploy their resources more efficiently as they reorganized. There is also evidence that managers who engaged in mergers invested in computer technology. This technology displaced workers through layoffs and was focused on reducing unionized work forces. There is no evidence that mergers or layoffs returned industries to profitability. This suggests that shareholder value strategies were not, successful in righting the problems of American business.

Introduction

Economic sociologists have spent a great deal of energy trying to make sense of how corporations have changed in the past 25 years. These changes are mainly indexed by the idea that corporations were increasingly being managed according to principles of "maximizing shareholder value". This idea suggested that managers needed to pay more attention to increasing the returns on the assets of the firm in order to increase the value of those assets to shareholders and less attention to other constituencies, such as employees and communities. In practical terms, since shareholders were primarily stock owners, some managers began to view their firms the same way that stock analysts did (for an account of how this worked at Enron, see McLean and Elkind, 2003). They decided that the way to maximize shareholder value was to financially engineer their balance sheets to please stock analysts and institutional investors. During the 1980s and 1990s, those managers that resisted financial analysis found that their stock price would decrease, their firms were subject to hostile takeovers, and their jobs could be in jeopardy (Davis and Stout, 1992; Useem, 1993; Zuckerman, 1999; 2000).

There is now a pretty solid set of empirical results from economic sociologists concerning the spread and implementation of "shareholder value" strategies across publicly held corporations in the U.S. (Davis, 1991; Davis and Stout, 1992; Davis, et. al., 1994; Fligstein and Markowitz, 1993; Fligstein, 2001: ch. 7; Useem, 1993; Dobbin, et. al., 2003; Zuckerman, 1999; 2000). These results show that U.S. corporations were financially reorganized and used the tactics of selling off unrelated product lines (Davis, et al., 1994; Zuckerman, 2000), engaging in mergers with firms in similar industries (Davis and Stout, 1992; Fligstein, 2001), various financial ploys such as stock buybacks (Westphal and Zajac, 2001), and downsizing their labor forces (Appelbaum

and Berg, 1996). These actions were oriented towards raising share prices by convincing the investment community that the firms were focused on their core businesses and on making profits (Useem, 1993; Zuckerman, 1999; 2000).

Almost all of this research has been focused on publicly held corporations. This has proved to be a fruitful tactic because it has focused attention on the links between firms, managers, boards of directors, financial markets, and institutional investors. In this paper, we extend this concern by considering how these changes spread across whole industries (for studies on diffusion across industries, see Han, 1994; Greve, 1996). Here, we analyze how shareholder value strategies (like mergers and layoffs) operated within industries to put pressure on all firms to conform to those tactics. There are good theoretical reasons to believe that if the largest publicly held firms in a particular industry underwent reorganization, this would certainly put pressure on the rest of the industry to respond.

There are two main mechanisms by which this might have occurred: competition and mimicry. Economic theory suggests that competitive pressures from publicly held firms would have pushed smaller, nonpublic firms into changing their tactics (for a similar argument, see Baumol, Blinder, and Wolff, 2003). Population ecology theory would also view competition in a particular niche (i.e., industry) to push firms to either be selected by or evolve towards the same tactics (Carroll and Hannan, 2001). Institutional theory would suggest that even without competitive pressures, firms would be pressured to conform to what others believed to be the most "efficient" tactics (Meyer and Rowan, 1977; DiMaggio and Powell, 1983).¹

¹ Useem (1993), for example, argues that mimetic, competitive, and coercive pressures pushed firms in the 1980s to conform to shareholder value as both an ideology and a set of strategies. Haunschild (1993) shows that interlocking directorates are important vehicle through which managers imitate acquisition activities of other firms. Westphal and Zajac (2001) find a similar diffusion process of stock repurchase programs.

Our goal is to evaluate several claims of the proponents of shareholder value. First, we try to assess whether shareholder value tactics like mergers and layoffs occurred more frequently in industries that were underperforming. Then, we try and assess if the use of these tactics affected profits. We are also interested in connecting the idea of shareholder value to some of the other important changes going on in American business. There was a continued shift in the underlying economy from a goods based to a service based economy (Bluestone and Harrison, 1982; Harrison and Bluestone, 1988). There was also an explosion in the use of information technology, particularly after 1985 (Baumol, et. al., 2003: 7-15; Kelley, 1994). Finally, there was a continued drop in the percentage of American workers who were unionized (Goldfield, 1987; Kochan, Katz, and McKersie, 1994; Mishel, Bernstein, and Boushey, 2003). These changes eliminated many blue collar and union held jobs across the American economy and increased service and white collar employment (Harrison and Bluestone, 1988; Osterman, 1999; Baumol, et. al., 2003; Gordon, 1996).

The empirical literature has shown that the shareholder value perspective on firms brought managers to be increasingly concerned with ways to deploy their assets in order to increase profits. The literature shows that they did so by strategically engaging in mergers (Stearns and Allan, 1996; Fligstein, 2001), selling off diversified product lines (Zuckerman, 2000), and laying off workers (Dial and Murphy, 1995; Cappelli, 2000). It seems plausible that managers who were trying to maximize shareholder value would also have been more likely to invest in computer technology and lessen their dependence on unionized work forces in order to maximize shareholder value. We do not claim that the shift from manufacturing to services, changes in technology, or de-unionization started in the 1980s. Nor do we claim that managers interested in increasing shareholder value were the only ones who engaged in these tactics.

Instead, we want to test a hypothesis that the heightened concern with strategies that would maximize shareholder value pushed managers to accelerate their use of tactics like reducing their dependence on unionized labor forces and using computer technology.

There are plausible reasons to believe that shareholder value seeking managers would focus on using technology and de-unionization as tactics to increase profitability. Economists believe that technological change was one of the key variables driving the reorganization of American business in the past 20 years (Rosenberg 1982; Krueger, 1993; Bresnahan, Brynjolfsson, and Hitt., 2002). Sociologists have generally been less interested in connecting the changes in technology to the drive for increased profitability (see Fernandez [2001] for an important exception). But, we want to fill in the gap in sociological literature by testing the hypothesis that managers who were trying to increase shareholder value through the use of mergers and layoffs had the incentive to implement new technology and use that technology to reorganize and downsize their work forces.

One of the implications of the shareholder value perspective is that workers in firms should not figure into firm decision making in any important way. Workers came to be viewed more and more as costs of production and reducing their number, pay, and benefits was certainly a strategy to increase profits (Appelbaum and Berg, 1996; Osterman, 1999). We examine the argument that one way in which this worked, was the replacement of both blue and white collar workers by the extensive deployment of computer technology. In the case of managers and other white collar workers, downsizing and removing levels of management could only work if higher level managers had more information about their workers at lower levels of the organization. Computer technology provided one tool by which their performance could be monitored. Computer technology could also be used to reduce the power and numbers of blue collar or

service workers.² Finally, the focus on shareholder value and the exclusion of employees from being considered in strategic corporate decisions had a major impact on how firms might behave towards their unionized workers. Managers could relocate plants either in nonunion states or overseas. They could also continue to automate production processes in order to lessen their need for blue collar skilled and unionized labor.

One of the most interesting questions is the degree to which these changes achieved their ultimate end: increasing the return on assets (i.e., profits). Indeed, what evidence we have seems to suggest that mergers did little to increase the profitability of firms (Jensen and Ruback, 1983; Caves, 1989; Ravenscraft and Scherer, 1989; Scherer and Ross, 1990; Andrade, Mitchell, and Stafford, 2001). In this paper, we show that the search for increasing shareholder value by increasing profits through mergers and layoffs appears to have failed at the industry level.

We investigate these various hypotheses by empirically exploring the connections between mergers, layoffs, de-unionization, computer technology, and subsequent profitability. We do this by putting together a novel data set that contains information on many key variables for 62 industries across 17 years. We provide evidence that the shareholder value strategies such as mergers and layoffs were occurring more frequently in industries where profits were low in line with the central claim of the proponents of shareholder value ideas. At the industry level, mergers subsequently led to more layoffs, consistent with the shareholder value perspective that emphasizes that firms needed to deploy their resources more efficiently as they reorganized.

There is also some evidence that industries where mergers were more active had higher

² Atwell (1987) and Form, Kaufman, and Wallace (1988) provides a critical review of early debates on the role of computer technology in degrading and deskilling work. For a comprehensive review of more recent literature on the effect of technology on the work organization, see Liker, Haddad, and Karlin (1999). There are also case studies from clothing (Taplin, 1995) and banking (Autor, Levy, and Murnane, 2002) industries on how introduction of new technologies affected workers and work organizations.

investment in computer technology. These investments also appeared to cause reduction in unionized work forces at the industry level.

Finally, the evidence that the shareholder value tactics actually increased the profitability of industries is mixed. Indeed, industries where mergers and layoffs occurred tended to have lower profits subsequent to those events, which is consistent with the literature.³ This suggests that shareholder value tactics to reorganize firms and industries failed in their central goal: i.e. to increase profits. Higher profits at the industry level were most highly related to industry growth and computer investment. The data provide some support to the hypothesis that at least at the industry level computer investment replaced workers and created new higher productivity production processes. This is in line with the view that the increased use of computer technology to reorganize work did enhance productivity substantially (Kelley, 1994; Black and Lynch, 2001).

Our paper has the following structure. First, we consider the crisis of the 1970s. Then we consider the "shareholder value" idea and how it was conceptualized both as a critique of management practices and a set of prescriptions about what managers ought to do. We briefly review the empirical literature that documents which actors pioneered the ideology of shareholder value and spread these practices across U.S. firms. Next, we generate some hypotheses about how shareholder value, investments in computer technology, and industry growth affect important firm outcomes. We then turn to a discussion of our data, methods, and results.

³ For evidence on mergers, see Scherer (1988) and Andrade, et al. (2001) for the summary of findings. Shleifer and Summers (1988) argue that shareholder gains from takeovers come largely from extracting rents from stakeholders.

The Profitability Crisis of the 1970s and the Emergence of Shareholder Value

The purpose of this section is to consider the economic crisis of the 1970s and the emergence of the "shareholder value conception of control" as the solution to that crisis. The literature has documented quite clearly how this happened. Our intention is to use the literature in order to frame hypotheses about how firms used shareholder value tactics to push forward the reorganization of their industries.

During the 1970s, American corporations were under siege from two forces: the slow economic growth and high inflation of the 1970s, and increased foreign competition (Friedman, 1985). Slow economic growth meant that the major markets of many firms stopped expanding, causing their profits to stagnate. The inflation of the 1970s had a set of negative effects on corporations. Interest rates were quite high over the period. These high rates pushed investors towards fixed income securities like government bonds and away from stocks, causing stock prices to drift downward over the decade. Inflation caused firms to have assets on their books that were increasing in value, but from which they were not earning higher profits. Since many measures of firm performance were based on returns to assets or investments, this meant that firms looked even less profitable. Foreign competition, particularly with the Japanese, heated up. American firms lost market shares and, in some cases, like consumer electronics, entire markets. Taken together, profit margins were squeezed by inflation, competition, and slow economic growth. By the late 1970s, with low stock prices, undervalued assets, and slow growth in sales and profits, many large American firms had stock prices that valued them as being worth less than the value of their assets and cash (Friedman, 1985).

For evidence on layoffs, see Blackwell, Marr, and Spivey (1990), Worrell, Davidson, and Sharma (1991), and

There was clearly an economic crisis in the American economy. But, the existing managerial elite who ran large corporations were an entrenched economic interest that had much at stake in their control over the largest corporations. Their firms were already relatively unprofitable. Their inclination was to blame the troubles of the overall economy for their troubles. This made them unlikely candidates to produce a sweeping new order. Fligstein (1990) has argued that historically, when existing conceptions of control fail to produce economic growth or earn profits, new economic actors often emerge with a new view on how to make money. Once some firms demonstrated the efficacy of these tactics in solving a particular crisis, the tactics frequently spread across the population of the largest firms. The actors who pioneered these tactics often came from outside the mainstream of business to challenge the existing order. These pioneers had to have a critique of the existing order and a set of strategies they would impose on firms to solve the problems.

The question of who came up with the shareholder value conception of the firm and how they related to those who were already running the largest corporations has been extensively studied (Davis and Stout, 1992; Fligstein and Markowitz, 1993; Useem, 1993; Zorn, et. al., 2005). Not surprisingly, the groups that proposed this analysis of the shortcomings of sitting management teams were the ones who had the least to lose and the most to gain by this analysis. There appear to have been a number of important actors including financial analysts in brokerage houses, institutional investors like mutual fund companies and retirement funds, investment bankers, insurance companies, and the newly formed executive position of chief financial officer (Zorn, et. al., 2005; Dobbin, et. al. 2003; Zorn, 2004). The financial community proposed that

Hallock (1998).

firms either had to voluntarily reorganize to raise profits and stock prices or else face getting bought out (Davis and Thompson, 1994; Zuckerman, 2000).

It is useful to explicate the idea of “maximizing shareholder value”, both as an ideology and as a set of strategies. Then, one can connect it more directly to the various actors who promoted it. . The main idea in what Fligstein (2001) has called “the shareholder value conception of the firm” is that the job of top managers is to insure that the assets of the firm were returning the highest possible profits for their shareholders. This implies that no other constituency (i.e. workers, communities, or customers) should matter for the decisions that managers undertake. Hirsch (1986) and Whitley (1986) argue that the theory has its roots in agency theory, a branch of financial economics that evolved during the 1970s. Jensen (1989), one of the originators of agency theory, argues that the changes that occurred during the 1980s in the market for corporate control were efficiency enhancing. By forcing managers to pay more attention to shareholder interests, firms re-focused their businesses in order to produce higher returns.

The theory underlying the shareholder value conception of control is that the relationship between managers, boards of directors and equities markets involves monitoring, rewarding, and sanctioning managers in order to get them to maximize the returns on assets and in doing so raise the price of the stock (Jensen and Meckling, 1976; Jensen and Ruback, 1983). Boards of directors are supposed to monitor managers by tying their pay to performance. If boards find that these incentives do not sufficiently produce high enough profits, then boards would be forced to change management teams. If boards of directors failed to monitor managers closely enough, the equity markets would punish firms when owners begin to sell stock and the share price of the firm drops. This would cause the overall value of the firm (i.e., the stock price multiplied by the

number of outstanding shares) to drop. If it dropped low enough, the assets and cash the firm held would become worth more than the cost of taking the firm over. This condition produced the final source of discipline for recalcitrant firms: the hostile takeover. Theoretically, a new team of owners and managers will take over the assets by buying them at the depressed price and use them more fruitfully in the pursuit of maximizing shareholder value.

The shareholder value conception of control offered both a criticism of what managers were doing circa 1980 and a set of prescriptions about what ought to be done about it (for versions of what managers "should" do that appeared in the popular business press, see Baker and Smith, 1998; Hammer and Champy, 1993; Walther, 1997; Prahalad and Hamel, 1990). From the point of view of these critics, the main culprits who were to blame for the problems of American business in the early 1980s were managers who had failed in the 1970s to maximize shareholder value (Jensen, 1989). Put simply, these managers were not deploying the assets of firms in such a way as to earn the highest possible rates of return. Managers were sitting on undervalued assets that were earning low profits and not surprisingly, their stock prices reflected the judgment of the market as to how well they were doing. These sitting management teams were also accused of controlling their boards of directors. The proof that they had failed to maximize shareholder value was their low stock price relative to the value of their assets and cash on hand. If the firm was worth liquidated rather than continue in operation, then clearly managers were to blame. The rhetoric of shareholder value began to seep into management practices. Useem (1993) describes how managers either responded to demands to increase shareholder value by engaging in activities that the financial markets valued or alternatively, they risked becoming takeover targets.

Maximizing shareholder value implied a balance sheet where return on assets was high and growing over time. This encouraged managers to try and financially engineer their balance sheets in order to increase the attractiveness of the firm and raise its share price. The kind of tactics managers pursued evolved over the 20 year period. It is useful to review some of what we know about those tactics. At the beginning of the 1980s, firms with lots of cash, little debt, and low stock prices found that they were likely to be merger targets. By borrowing money to pay for new companies, they became both larger, more in debt, and less valuable as takeover targets (Davis and Stout, 1992; Stearns and Allan, 1996). Second, managers were being told to re-evaluate their product lines and sell off certain assets. They needed to make sure that they were in businesses that were profitable and if some lines of business were unprofitable, they were encouraged to divest themselves of those businesses. This meant they were encouraged to re-focus their business on “core competences” (Zorn, et. al, 2005; Prahalad and Hamel, 1990; Hammer and Champy, 1993). Firms, as a result, sold off diversified businesses (Davis, et. al, 1994; Zuckerman, 2000). Third, managers were under pressures to close facilities and layoff workers in order to reduce costs. Mergers were frequently justified in cost savings terms. Workers who were redundant were laid off, product lines that were not profitable would be divested, and the newly re-organized more “focused” firm would presumably make more money (Cappelli, 2000; Hallock, 1998). Eventually, managers figured out they could give a momentary boost to their stock price by announcing layoffs. This was because a firm's short term costs would decrease and this might spike the bottom line, thereby increasing returns on assets.

Davis and Thompson (1994) argue that the financial community and managers who embraced the “maximizing shareholder value” rhetoric formed a kind of social movement. They used the frame of “maximize shareholder value” to push existing firms towards financial

reorganization and where managers resisted, members of the financial community would aid others in doing hostile takeovers. Some managers did try and resist the arguments put forward by proponents of maximizing shareholder value. Davis (1991) shows how managers tried to resist hostile takeovers by creating financial devices (including so-called “poison pills”) to prevent such takeovers. These devices would flood the market with the stock of a firm in the event of a hostile takeover bid, thereby diluting the stock of the firm and forcing the people who wanted to do the takeover of making a higher offer.

However, the evidence shows that overall the pressure of the financial community to push managers towards trying to maximize shareholder value did result in firms engaging in precisely the forms of financial reorganization recommended by the financial community (Useem, 1993). Fligstein (2001) provides evidence that firms who were targets of takeovers did have undervalued assets relative to stock prices. He shows that firms who did engage in mergers, divestitures, and stock buybacks were less likely to be targets of takeover bids. He also demonstrates that having institutional investors on the boards of directors pushes managers to engage in financial reorganization.

There is evidence that show how firms reduced the number of products they produced by engaging in mergers of firms producing similar products and divestitures of unrelated product lines (Davis, et al., 1994). Zorn et. al (2005) demonstrate that the number of mergers involving diversification drops precipitously during the 1980s. There was a steep rise in mergers in firms’ main product lines. There is also a substantial rise in vertical mergers (i.e., the purchase of upstream suppliers or downstream customers).

Studies show that the main beneficiary of these changes within corporations was the chief financial officer (Dobbin, et al., 2003; Zorn, 2004). This job title was almost nonexistent during

the 1970s. But beginning in the early 1980s, managers with this title began to proliferate. Their main job was to manage the relationships between the firm, institutional investors, and stock analysts by paying attention to factors associated with helping to increase the stock price. Zuckerman (2000) shows how financial analysts convinced firms that their stocks would be easier to value if they concentrated on fewer products. Chief financial officers obliged such analysts by selling off businesses that were unrelated to a firm's main business. As a result, by the 1990s, the "shareholder value" conception of control came to dominate the rhetoric about firms and the strategic behavior of managers. Financialization tactics that focused on convincing stock analysts that the balance sheet was getting better became the focus of much attention in the 1990s.

Shareholder Value and the Re-Organization of Industries

The empirical literature focusing on publicly held corporations has provided evidence that tells a compelling and coherent story about what has changed for publicly held American corporations. There are three key features of the past 20 years that are relevant to making sense of the changes in the way that firms are organized that have so far not figured into this story: the shift from manufacturing to services, de-unionization, and the increased use of computer technology to change the way firms work . Of course, all three processes have been part and parcel of the dynamics of capitalism for the past 200 years. Marx (1990) noted long ago that the main way that firms made money was by increasing the productivity of labor by substituting technology for human labor power. He also argued that the struggle between owners, managers, and workers was at the core of capitalist social relations. He would not have been surprised that

in America, owners and managers would work hard during the 1980s and 1990s to destroy unions.

Even though these secular trends have been part of the way that capitalists firms functioned, we want to argue that during the 1980s and 1990s these trends were pushed forward even more systematically by managers seeking to maximize shareholder value. During the period when shareholder value conception of the firm was dominant in the U.S., corporate deindustrialization through downsizing was also the most active. Research shows that during the last two decades downsizing was concentrated in manufacturing, while upsizing was a predominant pattern in the major retail and service industries (Baumol, et al., 2003). This resulted in a phenomenal shift from manufacturing to service industries. During the upswing of shareholder value ideas from 1978-88, union participation rates fell from about 25% to 15% and they have continued to drift downward ever since (Freeman, 1993; Mishel, et al., 2003). This is the period when the employers' resistance to trade unions became increasingly organized and legislatively supported. During this period, employers' assault on unions intensified and union bargaining power has weakened (Bronfenbrenner and Juravich, 1998; Clawson and Clawson, 1999). On the other hand, microcomputer usage begins to take off during the early 1980s as well and accelerates dramatically in the late 1980s just as shareholder value ideas take hold in large firms. In 1984, about 24.5% of the labor force used computers and by 1994, this rose to almost 50% (Card and DiNardo, 2002: 742). We think the timing of these dramatic changes is at least consistent with the emergence of shareholder value tactics. It is an empirical question as to the degree to which these changes were driven by the reorganization of industries undertaken by managers interested in maximizing shareholder value.

While these changes have been the focus of sustained research in literature on the reorganization of work (Osterman, 1999; Card, 1996; Card and DiNardo, 2002; Gordon, 1996; Baumol, et. al, 2003), they have not been the focus of the empirical work that has been interested in shareholder value. We want to argue that focusing on shareholder value pushed managers to pay more attention to profits and less attention to employees and communities. As a result, they made strategic decisions on facilities, employment, and technology using financial criteria that emphasized making their balance sheets more attractive to financial analysts. What are the plausible mechanisms that link shareholder value tactics to the acceleration of these changes?

The main growth in the American economy in the past 40 years has been in the service sector, and as we shall demonstrate, in the finance, real estate, and insurance parts of the economy. It follows that the continued secular change from manufacturing to services is one of the underlying stories that have driven managers and the financial community to make particular kinds of investments. In general, scholars have viewed these changes as “secular” and outside of the rubric of shareholder value. But, arguably, this process is also part of maximizing shareholder value. If managers were in lines of business with poor futures, then they would divest themselves of those businesses. They would close down plants that were not profitable enough and layoff workers. That managers have disinvested in manufacturing (at least in the U.S.) is consistent with their managing to maximize shareholder value.

A second tactic that is also consistent with shareholder value maximization is the attempt to get rid of jobs dominated by labor unions. Labor unions raise wage costs by making firms pay more into wages and benefits. They also reduce the flexibility of management to deploy labor across existing jobs (Edwards, 1978). Part of the shareholder value critique of managers in the 1970s was that they paid too much attention to the interests of employees and not enough to

those of shareholders. It is straightforward to argue that undertaking actions to remove unions by closing facilities with union workers and moving to places with lower wages and benefits, is consistent with maximizing shareholder value as well. During the 1980s, it is clear that the federal government wanted to reduce so-called labor market rigidities. The main targets of these actions were jobs that were unionized. Despite the evidence that the layoffs tend to result in negative, not positive, reaction in the stock prices (Blackwell, et. al., 1990; Worrell, et., al., 1991), unionized firms continued to lay off more workers than non-unionized firms (Medoff, 1979; Montgomery, 1991). There is empirical evidence that more unionized industries tended to downsize more than those that were less unionized (Baumol, et al., 2003).

Another way to increase profits and reduce wage bills is to invest in new technology. Technology presumably increases the productivity of labor. It is also a way to reduce the power of labor (Braverman, 1974; Edwards, 1978). During the 1980s and particularly in the 1990s, American corporations made huge investments in computer technology. These investments allowed many tasks to be performed both quicker and with fewer people. So, for example, bank tellers and phone operators decreased dramatically in numbers as firms replaced them with automatic phone systems and tellers (Autor, et al., 2001). They also made it easier for firms to track inventories and sales and thereby allowed them to keep inventories lean and make adjustments to production more quickly. The effect of technology on the overall labor employed in the economy has generally been positive (Kelley, 1994; Brynjolfsson and Hitt, 2000). While new technologies have destroyed old jobs, they also create new opportunities (Baumol, et. al, 2003). At the firm level, however, this has played out in complex ways, depending on what activities in which the firm is engaged. So, for example, firms may fire large numbers of lower

skilled workers and replace them with far fewer higher skilled workers. It is an empirical question as to how this played out across industries.

Hypotheses

It is useful to begin by describing the data set we use. In order to evaluate whether or not firms came to use the tactics proscribed by the proponents of the “shareholder value” conception of control and the effects of these tactics on firm investment and performance, one would ideally like to have data on a large number of firms over a long period of time across industries. One would like data not just on publicly held corporations, but also small and medium size enterprises. This is because firms that competed with large publicly held corporations would have to engage in tactics to maximize shareholder value as well. There are a number of problems in doing this. Such a data set would be difficult to create because it would be nearly impossible to draw a sample. It is also difficult to get small and medium sized enterprises to release data. This would be compounded by the fact that firms have been come into existence and disappeared in the past 20 years and many smaller ones have done so without a trace. Suffice it to say that a data set with these characteristics would be prohibitively difficult and expensive to collect.

We have decided to pursue an alternative tactic. Instead of using firms, we use industries. Industries as a unit of observation allow us to compare the relative performance of industries over time. Our data set spans the whole of the economy (62 industries) over a relatively long time period (1984-2000). We will describe this data set more thoroughly in the next section of the paper. The hypotheses we propose are thus stated at the level of the industry.

Using industry data for testing hypotheses about firm-level process can raise a concern of ecological fallacy. Since Robinson (1950) brought it to the attention of social scientists, it is well known that relationships at one level of analysis are not necessarily the same as those on another level. To assume that they must be the same is what Robinson called “ecological fallacy.” Mathematically, this occurs because the individual level relationships are a function of group level relationships, within-group level relationships, and correlation ratio of the variance between groups (Robinson, 1950; Hannan, 1971). For this reason, aggregate industry-level relationships may be different from firm-level processes. Although we acknowledge that it is generally inappropriate to use aggregate data to make inference about firm level processes, industry data can still be useful in exploring differences between industries in the degree of association between shareholder value strategies across industries.

One can make two arguments in this regard. First, Goodman (1953, 1959) suggested that if individual properties of interest are assumed to be constant within the group, or at least have within-group variation that is absorbed into a disturbance term, standard methods of linear regression can be used to estimate individual-level parameters (Goodman, 1953; 1959). The question is, under what conditions might individual properties be constant across groups? Economists use industry data frequently (see, for example, Wolff, 2002; Baumol, et al., 2003; Smyth, 1986; Feldman, et al., 1987; Hatfield, et al., 1996; Liebeskind, et al., 1996). They justify the use of such data by making the theoretical argument that competitive pressures that exist in a particular industry are felt equally by all firms. Thus, they assume what Goodman suggests: i.e. that the individual level processes for firms are going to be the same as the group level processes for the industry. For example, Baumol, et. al. (2003) study downsizing at the industry level

suggesting that the average firm size in an industry reflects the current competitive conditions in that industry and that changes in average firm size reflect downsizing.

There are also sociological theories of market processes that suggest that the processes for firms in an industry will be the same regardless of the structure of firms. Population ecology suggests that isomorphism in industries is a result of selection pressures in particular niches (Carroll and Hannan, 2001). Firms who have been selected by these pressures have chosen the "right" strategies to survive and prosper while those who do not, disappear. Hence the industry pressure is isomorphic with the structuring of firms. Institutional theory also posits that there could be mimetic and coercive pressures towards conformity in an industry net of competition (DiMaggio and Powell, 1983). While these are theoretical justifications for using industries as proxies for firm level processes, they are of course, untested when one uses industry level data. So, even if one accepts them as plausible arguments, one would want to be cautious about assuming that what is going on at the industry level applies to firms.

A second way to justify firms as the units of analysis is to argue that studying industries in their own right can tell us about how larger industries of the economy are changing over time. One can frame one's hypotheses at the level of the industry and therefore, the results are thought to characterize what is going on in the industry and apply only to the performance of the industry. We follow this strategy in the paper. We will frame our hypotheses and offer plausible reasons why we might expect industry level process of reorganization to occur under pressure of the use of shareholder value tactics such as mergers and layoffs.

We are careful to distinguish between our results at the industry level and what this might imply for firms. The degree to which our results actually apply to firms is an open question. For scholars only interested in how these processes affected firms, our results can only be suggestive

and exploratory. The strength of our results certainly implies that it might be worth some effort to gathering firm level data to more directly test some of our hypotheses. We return to that issue in the conclusion of the paper.

Shareholder value is not just an ideology, but a set of concrete strategic behaviors. We do not directly measure whether or not managers in the industry espoused shareholder value as either an ideology or a set of tactics. This is because we are not so much interested in the presence of absence of shareholder value ideas at the industry level as if the kind of processes of reorganization are going on in the industry that are consistent with the use of shareholder value tactics.⁴ The basic shareholder value hypothesis is that where profits are low, managers ought to engage in forms of financial reorganization, the main forms of which are mergers and layoffs.

Applying this hypothesis to the industry level, it follows that the industries where we expect there to be the most pressure for the reorganization should be those that are the least profitable. In such industries, we ought to observe more mergers and more layoffs in order to reduce costs and increase profits. In essence, we suggest that if there is an empirical linkage between low profits and mergers and layoffs, then this supports the argument that industries have embraced the strategies associated with the shareholder value perspective. Low profits will also pressure managers in industries to find ways to lessen their dependence on unionized work forces. Unionized workforces tend to be high cost and by closing down plants where union workers are and opening facilities in non-unionized states and countries, industries might improve their performance.

⁴ For an attempt to directly measure whether or not firms adopt shareholder value rhetoric, see Fiss and Zajac (2004).

Hypothesis 1: Industries with low profits relative to assets ought to be more likely to engage in mergers, layoffs, and deunionization.

Reorganizing industries through mergers reflects two sorts of logic that work out at the industry level. First, if production is concentrated, this would produce oligopolies at the industry level. These larger producers with high levels of market share may attain more profits by setting higher prices for goods because they can more easily control competition. This means that the industry's profits would increase throughout the industry for all firms. Second, the larger the scale of production, the more likely that firms can layoff staff. One of the main arguments put forward by managers for doing mergers are cost savings to be attained by reducing redundant departments. This means, that at the industry level, mergers ought to induce layoffs. But if one creates oligopolies and reduces staff, one still must control larger organizations. This sets off a kind of contradiction: one reduces staff and increases the size of organizations, but this means that the activities in the industry will be more difficult to control. The main way that industries were reorganized in the wake of mergers and layoffs was by investing in computer technology. This allowed industries to eliminate layers of management, coordinate far flung activities, and create larger oligopolistic industries.

Hypothesis 2: Mergers should produce layoffs. As the industry sector creates larger oligopolistic firms, mergers will also push industry investment in computer investment in order to coordinate more disparate, far flung oligopolies.

Investments in computer technology in industries do not just make firms able to integrate their activities, but they also allow them to replace workers with machines. We expect that investments in computer technology will lead to layoffs in industries where workers are being replaced by computers. The largest and most protected group of lower skilled workers in the economy in 1980 were unionized workers. One of the purposes of pushing managers to maximize shareholder value was to get them to pay less attention to employees and more to the bottom line. It follows that the tactics managers used across firms in industries to maximize shareholder value, mergers, layoffs, and investments in computer technology, should have been aimed at reducing the cost and presence of unionized workers.

Hypothesis 3: Investment in computer technology in the industry ought to result in layoffs in the industry.

Hypothesis 4: Mergers, layoffs, and computer investment in the industry ought to reduce the industry's reliance on unionized workforces.

The entire purpose of pushing managers to maximize shareholder value was to get them to increase profits of firms relative to assets. In the industry as a whole, we would expect that if engaged in mergers, layoffs, and computer investments, they should have positively changed the profit situation across the industry.

Hypothesis 5: Mergers, layoffs, and computer investments should increase the return on assets of industries, net of the growth prospects of any particular industry.

Data and Methods

The data was collected from multiple sources. Several of the variables had to be constructed from original documents. These variables have potential problems that we describe below. Other variables were available from government sources. Merger data came from the yearly Almanac of Mergers and Acquisitions from 1984 to 2000. From this source, the number of merger and acquisition deals in each 2-digit 1987 SIC industry was acquired. We counted the number of the deals where a U.S. firm merged with or acquired another U.S. firm, or a U.S. firm merged with or acquired a foreign firm. The industry of the target firm was coded using a modified version of the two-digit SIC (see the Appendix for the list of industry titles used in the analysis).

A potential weakness of the data is that the collection of the merger and acquisition deals in the Mergers and Acquisition has lower-bound values, which had been \$1 million before 1991 and were changed to \$5 million in 1991. The change might have caused the reported numbers of mergers before 1991 to be higher than the number of mergers after 1991. In order to see if this made a difference in the prediction of the change in mergers in a given year, we included a dummy variable for the observations made after the change in the cutoff value. The dummy variable was not significant at the 5% level and we concluded that the coding change did not make much of a difference. This is probably because of the fact that inflation between 1984 and 1991 raised the threshold level for mergers.⁵

⁵ Another potential weakness of the measure is that it seriously undercounts mergers that are very small. Since there are no available datasets that give us a complete count of mergers, it is difficult to evaluate the degree to which this is a problem.

Layoffs were counted from the Wall Street Journal articles in ProQuest's Newspapers archive (ProQuest, various years). Initially, we identified the articles from 1984 to 2000 that included either the word "layoff" in the abstract or "layoff" or "restructuring" in the title. This procedure yielded anywhere from 100 to 400 articles each year. Since we suspected that a single event of layoff could be covered by more than one article and that the list could include some highly speculative forecasts based on rumors, we carefully examined each article's contents for redundancy and certainty. We also suspected that the newspaper report is a selected source of the real occurrence of layoffs. Smaller scale layoffs do not always attract the media's attention. In other words, we suspect that the records on the small scale layoffs are selected based on the media's discretion. Therefore we only counted the layoffs of more than 50 employees, assuming that the layoffs of more than 50 employees are more frequently reported. When the corporation has overseas locations, only the layoffs that directly affected the U.S. workers are counted. The timing of the layoffs refers to the execution of the layoffs, rather than the announcement of them. We assigned 2-digit SIC to each layoff incidence, and counted the number of layoffs in each industry for each year.

To check the quality of the data, we compared our count with Baumol, Blinder, and Wolff's (2003), who conducted a search for the word "downsizing" in the archives of the New York Times and the Wall Street Journal for the years 1993 through 1997. Since Baumol et. al. (2003) reported their count in an aggregated industry classification, we reorganized our counts to make our data comparable to theirs. Our counts are compared to Baumol et. al. (2003: 31) in Table 1. The comparison shows a substantive correspondence between the two data sets. The exact correspondence is not possible due to the differences in search methods and industry classification. The rank order of industries in terms of the frequency of layoffs (or downsizing as

it is termed in Baumol et al [2003]) roughly matches between the two counts. Manufacturing accounts for the greatest part of the layoffs, followed by insurance and finance and retail and miscellaneous services.

(Table 1 about here)

We also compared our data with Farber and Hallock's (1999) count. They counted the number of articles in the Wall Street Journal that included the words "layoff," "laid off," "downsize," "plant closing," or "downsizing," without any reference to a specific firm. In a separate count, they limited the sample to the Fortune 500 firms that existed for the entire period of 1970 to 1997, and matched the firm names to the announcements published in the newspaper. The pattern in our data corresponds roughly to Farber and Hallock's (1999, p.34, Figure 1) calculation.

There are several potential problems with all of the measures of layoffs. Since they are based on newspaper accounts, we do not know if firms ever followed through on their announcements. We also do not know the exact timing of the layoffs. So, if an announcement was made in November of a particular year, for example, the layoffs might not have taken place until April of the next year. Finally, while firms frequently announced their intention to lay off workers, they rarely announce their intention to hire new ones. So, for instance, it is quite possible for firms to announce a layoff of 1,000 workers in one division and then quietly hire 1,500 in another. So while the measure we use appears to correlate highly with other scholars' attempts to do this, all of the measures may have significant measurement error in them. Nevertheless, we measure and analyze the public announcement of layoffs, rather than the actual

occurrence, because we posit that layoff announcements reflect the prevalence of shareholder value ideology and symbolic management that address shareholder interests (Westphal and Zajac, 1998). Coverage in business media has an essential role in diffusion of specific management practices and culture.⁶

Unionization rates were calculated from the weighted samples of the March Current Population Surveys from 1984 to 2000. From each year's sample, we selected the civilian wage earners who were aged 18 to 64 employed in the private sector, and excluded non-incorporated self-employed respondents. In each year, a question on the respondents' union membership was asked. The proportion of union members in each industry was multiplied by 100 to obtain percentages.

Data on computer investment and corporate profits came from the Bureau of Economic Analysis (BEA) data archive. Detailed estimates for private nonresidential fixed assets by detailed industry and by detailed asset type are available on its website.⁷ Among various asset types, computers and the related assets were selected to calculate the dollar amount of computer investment. Data on corporate profits and GDP were also available from a BEA series "Gross Domestic Product by Industry and the Components of Gross Domestic Income."⁸ These estimates are based on data supplied by firms directly to the BEA. While there are undoubtedly biases in the data, we know of no other estimates that span so many industries over our time period. Measures of profit are fraught with difficulty. For an interesting discussion of the social construction of profits, see Hatherly, et. al. 2005.

⁶ Another possible measure of shareholder value strategies is divestitures. We did not collect data on divestitures because we were unable to find any consistent data sources that reported these activities over time.

⁷ <http://www.bea.gov/bea/dn/faweb/Details/Index.html>, accessed on September 5, 2006.

⁸ http://www.bea.gov/bea/dn2/gdpbyind_data.htm, accessed on September 5, 2006.

We use the ratio of industry profits to industry assets as a measure of the relative profitability of industries. This measure captures the overall profitability of the sector relative to its use of assets. We think this is a defensible measure as it gets at the core financial criteria by which shareholder value is judged. It measures how well the total assets of a sector are being deployed. We expect that industries that have high or rising ratios will be less likely to engage in financial reorganization, while we expect industries with low or declining ratios to be the target of mergers and layoffs.

Another potential measure of shareholder value is to calculate an aggregate value of a sector based on stock prices. There are a few practical reasons why we chose to use this measure rather than stock prices. Stock prices are limited to publicly held companies. Since this study looks at industries, stock prices do not capture the performance of all of the firms in any particular sector. There is also the fact that industries will be heterogeneous with respect to how many of the firms in the sector are publicly listed. Thus, an aggregate measure of stock price will not accurately capture the profitability of the industry relative to its assets. This will also be affected by the fact that those firms who are not publicly listed will not pay attention to stock prices compared to firms that are. The industry wide measure of profits divided by assets, on the other hand, is a clearer measure of the relative performance of all of the firms in the sector.

Since the unit of analysis for this study is industry, one needs to control for the different sizes of industries. We included a measure on Gross Domestic Product (GDP) by industry as a control variable, which was available from the same source as corporate profits. The GDP measure and the computer investment variable are in million dollars, adjusted for inflation using the Consumer Price Index and transformed into logarithms. Table 2 summarizes descriptive statistic for the variables used in the analysis.

(Table 2 about here)

The data set that we constructed has 1,054 observations which reflect the 62 industries for the 17 years (1984-2000). This constitutes a cross sectional time series design. Depending on how one specifies the individual-and time-specific error terms in the model, there are two main methods for panel data analysis, fixed-effects and random-effects models. We used fixed-effects models, which allow us to control for all time-constant, unobserved differences between industries without making the random-effects assumption that these differences are independent of the observed regressors (Allison, 1994; Greene, 1996).

An important advantage of cross sectional time series analysis is that it allows the researchers to investigate the causal relationships in nonexperimental studies. With repeated observations for each industry, we are able to discern the sequence of the various events in time, which is impossible with cross-sectional data. We suppose that changes in one element of economy rarely result in immediate consequences that are simultaneously measured in the changes in the other. We note that the dependent variable in one equation is an independent variable in another equation. This creates the problem of reciprocal causation. This issue concerns the question of if a parameter estimate reflects causality or simply that both variables cause each other. The standard method used to correct for this problem is to use lag variables in the model specification. The independent variables are lagged one year. We also included in the model a lagged dependent variable. This specification allows us to check the changes in the dependent variable's values from year $t-1$ to t , rather than the absolute values for each year. We begin by estimating the basic model in the following form:

$$y_{it} = \beta_0 + \beta_1 y_{i,t-1} + \beta_2 x_{i,t-1} + v_i + \varepsilon_{it}, \quad (1)$$

where i indexes the 62 industries and t denotes the 16 years from 1985 to 2000. Due to the inclusion of the lagged variables, the observations from 1984 contribute only through the lagged values. Estimation of the regression models was performed on 992 observations. v_i is the industry-specific time-constant error, while ε_{it} is the industry-specific and time-varying error.

We extend the basic model to estimate the effects of change scores:

$$y_{it} = \beta_0 + \beta_1 y_{i,t-1} + \beta_2 x_{i,t-1} + \beta_3 z_{it} + v_i + \varepsilon_{it}, \quad (2)$$

where $z_{it} = x_t - x_{t-1}$. The estimates of the coefficient β_3 indicate how much the dependent variable changes when industries change from one value to the other in an independent variable.

There is another potential problem with the data analysis. We estimated five equations to test each of the different hypotheses. Five dependent variables were used in the separate equations: merger and acquisition, layoff announcement, computer investment, unionization rate, and corporate profits. These five regression equations are estimated from data on the same observational entities: 62 industries. This means the errors may be correlated across the equations. Ordinary least squares estimation of these equations may result in unbiased and consistent but inefficient β s (Felmlee and Hargens, 1988). For this reason, we estimated Seemingly Unrelated Regression (SUR) models, as proposed by Zellner (1962), with fixed-effects. The Breusch and Pagan (1980) test rejected the null hypothesis that the residuals among

the five regressions are not correlated. This means that there appears to have been correlation in the errors across the equations. The estimation is based on an asymptotically efficient, feasible generalized least-squares algorithm (Greene, 1996).

Results

It is useful to look at some disaggregated figures in order to understand the general patterns of change for the variables used in the analysis. We have broken our major variables down by major industry groups. The groups aggregate data across industries and the four groups are manufacturing, trade and services, finance insurance, and real estate (hereafter FIRE), and transportation, communication and utilities. These are the conventional categories used by industrial organization economists when they look at aggregate statistics. Figure 1 presents the change in GDP from 1984-2000. The industries in the trade and service industries and the FIRE sector were already larger on average than manufacturing and transportation, communication, and utilities by 1984. This figure shows the continued transformation of the American economy from a manufacturing to a service and financial basis. Industries in trade and services and FIRE grow continuously in average size over the entire period. Particularly impressive was the large growth in FIRE.

(Figure 1 about here)

Figure 2 presents the average number of mergers within industry groups over time. The general pattern is that mergers peaked in 1986, declined to a low in 1991, and increased until

2000. This pattern corresponds to the two merger waves of the past 20 years (Sterns and Allan, 1996; Andrade, et al., 2001). There is interesting variation across industries. During the merger wave of the 1980s, the FIRE sector led all industries in the average number of mergers. But, in the 1990s merger wave, trade and services surpassed the FIRE sector. We note the computer software industry is included in the trade and service sector and it experienced a huge consolidation during the late 1990s. The FIRE services industries witnessed far more mergers than manufacturing and transportation, communications, and utilities did, on average. The trade and service industries surpassed the other two industries during the 1990s.

(Figure 2 about here)

Figure 3 presents data on layoff announcements over time. Here, we have the greatest divergence in trends across industries. Manufacturing layoffs show three peaks: circa 1985 during the deindustrialization phase, circa 1991 during the recession, and in 1998 during the last merger movement. FIRE layoffs peaked during the recession from 1988-1991 following the crash of the stock market in 1987. Generally, manufacturing led the way in layoffs over the whole period. There were fewer discernible patterns of layoffs in the other two industries. One of the most interesting features of the figure is that during the great economic expansion from 1995-2000, there were relatively high levels of layoffs in three of the industries (the exception being the transportation, communications, and utilities industries). This implies that a labor market regime, one based on more churning of workers even good economic times was in place (see Osterman, 1999).

(Figure 3 about here)

Figure 4 shows the decline in rates of unionization from 1984-2000. The greatest declines in unionization occurred in the manufacturing sector where unions as a percentage of the labor force fell from about 28% in 1984 to 14% in 2000. The rate of unionization dropped steadily throughout the period. There was also a large drop in unionization rates in the transportation, communication, and utilities sector. We think this probably reflects the replacement of communication workers by computers over the period. Here, rates of unionization fell from about 35% to 28% over the period. As one might expect, there were very low rates of unionization in trade and services and FIRE and these remained low throughout the period.

(Figure 4 about here)

Figure 5 shows investment in computer technology from 1984 until 2000. Rates of investment were highest in the FIRE sector and rose over time. Rates rose in all three other industries, albeit from lower levels. The largest percentage increase in rates occurred in the transportation, communications, and utilities sector. Here, the effects of computers on the telecommunications industry can be observed.

(Figure 5 about here)

Figure 6 presents data on corporate profits over the period. The measure is the ratio of profits in the sector over the assets in the sector. The FIRE sector has the most volatile profits.

The crash of the stock market in 1987 dramatically decreased profits in the sector. But the merger movement and the booming real estate markets of the late 1990s propelled profit rates to the highest level of all of the industries. The other industries had less volatile changes in their profits over time. Manufacturing had relatively high and steady rates of profits over the entire period. The transportation, communication, and utilities sector had the lowest rate of profits.

(Figure 6 about here)

Taken together, these figures tell a coherent story about what happened in the American economy during the 1980s and 1990s. The FIRE and trade and service industries grew steadily over the period. FIRE was the most spectacularly successful sector at increasing profits. Not surprisingly, the largest and fastest growing industries also made the largest investment in computer technology. There is also evidence of the spread of shareholder value tactics across industries. The merger movements of the 1980s and 1990s affected all American industries. Thus, the rationalization of production occurred in both fast growing and slow growing industries. Patterns of layoffs differs the most across industries reflecting the relative performance of the industries. Manufacturing layoffs followed deindustrialization and the turn down in the economy in the early 1990s. FIRE layoffs corresponded to the white collar downsizings of the late 1980s and early 1990s which were related to the crash of the stock market in 1987 (Farber, 1997 documents this using Current Population Survey data). The most convergence in layoffs occurred during the late 1990s when in a prosperous economy, layoffs

rose dramatically.⁹ This could have been because of the growing securitization of the work force due to shareholder value strategies. It also could have reflected the high level of mergers which could have produced layoffs. We will investigate these phenomena in the regression analysis. Finally, unionized workers fared badly over the entire period. They decreased in proportion in the manufacturing and transportation, communications, and utilities industries.

Table 2 presents descriptive statistics for the data set over the entire period. It shows that mergers averaged 63 across industries over time. There were on average one layoff announcement per industry, although this variable had a low of zero in a given year and a high of 19 announcements. Union membership averaged about 15.8% over the period. Returns on assets averaged 7.9%. This measure showed lots of variability and ranged from a low of -40.1% to 60.9%.

(Table 3 about here)

Table 3 tests the various hypotheses put forward earlier, using seemingly unrelated regression with fixed-effects. It is useful to go through these results in some detail. The first panel of table 3 provides evidence on the determinants of changes in mergers at the industry level. The result supports Hypothesis 1 that decline in profits relative to assets in industrial industries predict mergers as suggested by the shareholder value perspective. The coefficient for the change in profit/asset is negative and significant at the 5% level; the coefficient for the lagged level of profit/asset has a positive sign, but is not statistically significant. This is consistent with

⁹ Cappelli (2000) shows that since the 1980s the companies engaged in downsizing were not necessarily in financial distress. He argued that this is evidence of downsizing driven by the desire to improve operating efficiencies as opposed to more traditional downsizing driven by business cycles. Farber and Hallock (1999) show similar findings.

the argument that mergers are occurring in industries that were being consolidated because of their falling profitability. There is also evidence in the model for the idea that mergers are occurring in industries going through hard times. The level and change in the number of layoff announcements are positively associated with mergers in the industry. Here, layoffs, which are generally caused by poor economic conditions, are precursors to subsequent mergers. This is consistent with Hypothesis 2.

The second part of Table 3 presents results predicting changes in layoffs at the industry level. We see evidence that industries with a high level of mergers and increase in mergers produce layoffs, supporting Hypothesis 2. This is quite consistent with ideas about shareholder value. Mergers were supposed to be carried out to rationalize production and remove layers of workers. That in the year following mergers, such announcements appeared suggests that shareholder value strategies were being practiced across industries. There is also some evidence that investments in computers also caused layoffs at the industry level, consistent with Hypothesis 3. The level of computer investment in a previous year significantly increases current number of layoff announcements, although the change variable is not statistically significant. At the mean level of investment in computer technology, there are about 1.3 additional layoff announcements in the following year. Given that the average number of layoffs in a given year was only about 1 and that one layoff could involve hundreds, or sometimes thousands, workers losing jobs, this is a huge effect. This means that capital investments were being used by managers to reduce their work forces, consistent with Hypothesis 3.

We earlier argued that layoffs were part of efforts to increase profitability. There is a statistically significant effect of changes in the profit/asset ratio on the likelihood of changes in layoffs at the industry level. Here more profitable firms were less likely to lay people off,

providing support for Hypothesis 1. The result implies that industries with firms who were not performing well felt compelled to lay off workers either to raise their stock price or to adjust to their business conditions, consistent with Hypothesis 1.

The third column of Table 3 provides analysis of changes in computer investment. Industries where mergers were high were more likely to invest in computers. This provides a link between shareholder value, mergers, layoffs, and computer investment as suggested in Hypothesis 2. Managers in industries that were doing less well laid off workers and they then often engaged in mergers. This caused them to subsequently lay off more workers. Finally, investments in computer technology were endogenous to this process. Firms that engaged in mergers were more likely to invest in computers to further rationalize production. The coefficient for the level of mergers in a previous year is positive and significant, although the change variable is not statistically significant. There is one other interesting effect in the model that predicts changes in computer investment that appears to index shareholder value tactics. Industries where there were high rates of unionization also saw growth in computer investment. This is consistent with the idea that managers in these industries were trying to reorganize work to lower their dependence on unionized work forces.

While one of the causes of computer investment was certainly the spread of shareholder value strategies to revive declining industries, there is evidence that computer investment was also favored by profitable industries. Firms in the industries that had high and growing profit/asset ratios were more likely to invest in computer technology. This presumably reflected their ability to increase investment in new technology, as well as their belief that they could grow their profits even more by investing them in computer technology.

The fourth column of Table 3 explores the causes of de-unionization. There are three key variables that predict changes in the unionization rate. High profit industries and industries with increases in profits see decline in their unionized work forces in the subsequent year. This suggests that managers who are making money are also realizing that one way to continue to do that is to decrease the size of their unionized labor. Large and growing industries as measured by GDP are actually more likely to see increases in their unionization rates in the subsequent year. Finally, evidence of computer technology aiming at unionized workers is mixed. The level of unionization has a negative and significant coefficient, while the change of unionization rate has a positive and marginally significant ($.05 < p < .10$) coefficient. In industries with a high level of computer investment, unionized workers decreased in the subsequent period. In industries where investment in computer increased, however, unionization rates were likely to increase too. There is little support for Hypothesis 4. Mergers or layoffs are not significantly associated with changes in unionization rates at the industry level.

The last column of Table 3 considers whether any of these changes produced growth in profits. Here, the support for the success of shareholder value tactics is more mixed. First, the strongest predictors of profit growth were the size of the industry and the growth in the industry. Big and growing industries produced more profits. Given the increase in the size of FIRE and trade and service industries, it is not surprising, that their profits grew the most. We see that levels and changes in mergers and layoffs negatively affect profits. Thus, in industries where financial reorganization was occurring, the reorganizations did not produce more profits subsequently. This suggests that in spite of the rhetoric of maximizing shareholder value, these tactics failed to produce returns to the bottom line. The result is consistent with findings of other studies using stock prices, where mergers (Caves, 1989; Andrade, et al., 2001) and layoff

announcements (Blackwell, et. al., 1990; Worrell, et. al., 1991) had a negative impact on market values. Firms who engage in mergers and layoffs clearly do not see subsequent success. There is one variable that does appear related to shareholder value: changes in computer investment. Industries that increased investment in computers did show profit increases net of the other variables.

It is useful to return to our hypotheses. Hypothesis 1 tested the basic shareholder value assertion that industries with low profits should have reorganized. Low profits were related to mergers and layoffs. Mergers in a previous year (which were presumably caused by low profits) were a harbinger of changes in downsizing activity. Low profits caused de-unionization. However, industries where there were mergers did make larger computer investments, suggesting that when managers were trying to put together firms through mergers, they rationalized work processes by investing in computer technology.

Hypothesis 2 suggested that industries where mergers would occur would engage in layoffs and computer investment. Maximizing shareholder value implied buying up other firms and rationalizing costs to increase profits by downsizing workforce. It also argued that mergers should produce investment in computer technology in order to reorganize production. This appears to be what was done. Hypotheses 3 and 4 suggested that such efforts should be particularly aimed at reducing unionized workers. We do not have any direct evidence that mergers or layoffs were directed at unionized work forces. However, we did find that a high level of investment in computer technology did increase layoff announcements and decrease unionization rates at the industry level, in line with the view that managers were trying to rid themselves of high priced labor by investing in computer technology. Finally, contrary to Hypothesis 5, we were not able to demonstrate that mergers or layoffs increased profits. Indeed,

they were related to fewer profits, not more. We found evidence that computer investment did increase profits at the industry level.

Conclusions

The American economy was transformed by the logic of shareholder value during the 1980s and 1990s. Managers had pressure placed on them to increase returns to assets. In order to do this, they engaged in mergers and made computer investments which subsequently increased layoffs and decreased unionized workforces. Mergers and layoffs per se did not help profitability at the industry level. The major causes of increased profits were the good fortune to be located in growing as opposed to declining industries such as FIRE, trade and services and the increased use of computer investments which created layoffs, decreased unionized labor forces, and increased profits.

The most novel implication of our results is that the use of computer technology was not an entirely exogenous change in American business but was part and parcel of "maximizing shareholder value". While de-unionization and computerization were going on in the American economy before 1980, the implementation of shareholder value tactics like mergers pushed these processes forward. Computer technology was being used strategically by managers who engaged in mergers to reorganize the work force. They deployed it to decrease their dependence on all workers as computer technology caused both decreases in unionized workers and increases in layoff announcements.

Another important result is that mergers and layoffs did not work to return ailing industries to profit, a result that is consistent with the literature on firms (Caves, 1989);

Ravenscraft and Scherer, 1987; Scherer and Ross, 1990; Andrade, et al., 2001). One interesting question is, why do firms pursue mergers and layoffs if they do not subsequently help profits? There is a literature in financial economics (for a review, see Jensen and Ruback, 1983) that shows that the buyers of firms rarely make money while the sellers do so. Literature that compares the pre and post merger performance of firms comes to the conclusion that the merged entities are not more profitable than the entities that existed before the merger (Scherer and Ross, 1990). Our results are consistent with the literature. This suggests that mergers and layoffs may be ritualistic and imitative and do not produce efficient outcomes (for theoretical arguments, see Meyer and Rowan, 1977, DiMaggio and Powell, 1983).

We note that the results from the data analysis need to be interpreted with caution. As we aimed to explore the big picture of the entire economy for a long period of time, we took a practical approach and used industry-level aggregate data, rather than observations from individual firms. The results from the industry data are suggestive of process that were working out at the firm sector. We did reproduce one of the main results in the literature at the firm level at the industry level ie. that industries that had mergers and layoffs did not attain higher profits. Relationships that are found among the industry-level measures may not be the same as actual relationships between firms. Without a nested, multilevel data set containing both industry- and firm-level information, we do not know the exact degree of potential bias from the cross-level inference. Nevertheless, we hope that our study demonstrates significant variations between industries that we suggest are the consequences of firm-level changes. Future work should try to construct such datasets. One strategy might be to gather data on variables like we used here on all publicly held corporations over the era. This sort of data set could be used to clarify if the relationships we posit here occur at the firm level. Such a data set, of course, would not be able

to model how shareholder value affected the actions of managers in non-publicly held corporations.

A useful avenue to explore is to try and explicitly link the changes in industries that reflect reorganization to changes in how workers were treated. One can take a neomarxist view (e.g., Edwards, 1978) of what occurred in the U.S. economy over the period. Firms were under pressure to make more profits. Maximizing shareholder value and minimizing the importance of employees is a not so veiled way to try and increase profits by reducing the power of workers. Our results show that the efforts to make more profits were focused on using mergers, layoffs, and computer technology to reorganize and remove unionized labor forces. The data suggest that workers were certainly being treated less like stakeholders and more like factors of production. The use of computer technology to reduce the number and power of unionized workers is quite consistent with a neomarxist view of the reorganization of production whereby technology is used to deskill and reduce the number of organized workers.

There is quite a bit of speculation about how shareholder value tactics translate into the reorganization of work more generally and making workers more insecure (Osterman, 1999; Gordon, 1996; for a review see Fligstein and Shin, 2004). Our analysis can link mergers and layoffs to changes in various other aspects of working conditions at the industry level such as aggregate fear of layoffs, and changes in health insurance and pension coverage. We think this kind of linkage would provide a "smoking gun" for why labor markets became more insecure and less lucrative for workers.

It would be useful to consider how these processes played out in different societies. The shift from manufacturing to services, changes in rates of unionization, and increases in the use of technology certainly effected corporations in other societies. It is well known that in the

advanced industrial societies that the relationships between owners, managers, financial markets, and workers are quite different and the push to "maximize shareholder value" generally did not occur (for example, see the papers in Hall and Soskice, 2001; for a review see La Porta, et. al., 1999). Many of the most negative effects of industrial reorganization are mediated through laws that protect workers and force firms to absorb much of the cost of reorganization. An interesting question is to ask if and how European and Asian firms undertook these same kinds of reorganizations.

Finally, an agency theorist might look at our results and generally conclude that the tactics to "maximize shareholder value" worked. They pushed managers in poorly performing industries to rationalize their production, lay off redundant workers, make technology investments, and thereby take advantage of whatever opportunities their industry had. An agency theorist would also argue that mergers resulted in removing assets from an industry. This occurs when the sellers of stock take their money and invest in other industries that are growing and where the returns are more lucrative. A more critical view (perhaps, a more Marxist one) would look at this and decide that shareholder value is a form of renewed class struggle. The owners and managers of capital decided to systematically break unions and invest in computer technology in order to increase profits. Both views might be right.

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Appendix

Industry Titles used in the Analysis

<u>1987 SIC</u>	<u>Industry Titles</u>
10	Metal Mining
11, 12	Coal Mining
13	Oil and Gas Extraction
14	Nonmetallic Minerals Mining
15, 16, 17	Construction
20	Food and Allied Products
21	Tobacco Products
22	Textile Mill Products
23	Apparel and Finished Fabrics
24	Lumber and Wood Products
25	Furniture and Fixtures
26	Paper and Allied Products
27	Printing and Publishing
28	Chemicals and Allied Products
29	Petroleum Refining
30	Rubber and Plastic Products
31	Leather and Leather Products
32	Stone, Clay, Glass & Concrete
33	Primary Metals Industries
34	Fabricated Metal Products
35	Machinery, Except Electrical
36	Electrical and Electronic Machinery
37	Transportation Equipment
38	Photo, Medical and Optical Instruments
39	Miscellaneous Manufacturing
40	Railroad Transportation
41	Local and Intercity Transit
42	Motor Freight Transportation
44	Water Transportation
45	Air Transportation
46	Pipelines, Except Natural Gas
47	Transportation Services
48	Communication
49	Electric, Gas and Water Services
50, 51	Distribution and wholesale trade
52	Building Materials
53	General Merchandise Stores
54	Food Stores
55	Auto Dealers and Service Stations

56	Apparel and Accessory Stores
57	Furniture and Home Furnishing Stores
58	Eating and Drinking Places
59	Miscellaneous Retail
60	Banking
61	Credit Agencies
62	Security and Commodity Brokers
63, 64	Insurance
65	Real Estate
67	Holding and Investment Companies
70	Hotels and Lodging Places
72	Personal Services
73	Business Services
75	Automotive Services
76	Miscellaneous Repair Services
78	Motion Pictures and Video
79	Amusement and Recreation Services
80	Health Services
81	Legal Services
82	Educational Services
83	Social Services
86	Membership Organizations
87, 89	Engineering and Management Services, Miscellaneous Services

Table 1. A Comparison of the Layoff Counts with Baumol, Blinder, and Wolff (2003).

Industry	Wall Street Journal		Baumol et al (2003)	
	Count	Percent	Count	Percent
Insurance and finance	39	11.9	48	16.4
Telecom	20	6.1	15	5.1
Airlines	9	2.7	9	3.1
Oil and gas	8	2.4	10	3.4
Utilities	13	4	5	1.7
Manufacturing	184	56.1	179	61.3
Metals manufacturing & mining	8	2.4	7	2.4
Aerospace & auto	36	11	41	14
Foods, beverages, tobacco	15	4.8	26	8.9
Computers, electronics	23	7	28	9.6
Pharmaceuticals	12	3.7	13	4.5
Misc manufacturing	90	27.4	64	21.9
Railroads	2	0.6	5	1.7
Retail and misc services	44	13.4	21	7.2
Others	9	2.7	0	0
Total	328	100	292	100

Source: Authors' compilation and Baumol et al (2003: 31).

Table 2. Descriptive Statistics for Variables Used in the Analysis.

Label	Description	Mean	SD	Min	Max
Merger (lag) ^a	Number of mergers and acquisition deals, lagged one year.	63.02	125.45	0.00	1974.00
Layoff (lag) ^b	Number of layoffs of more than 50 employees, lagged one year.	1.08	2.39	0.00	19.00
Union (lag) ^c	Percent union members, lagged one year.	15.80	16.16	0.00	100.00
Computer (lag) ^d	Logged million dollar amount of investment in computers, lagged one year.	6.54	1.66	0.42	10.75
Profit/Asset (lag) ^e	Corporate profits before tax as percentage of fixed assets, lagged one year.	7.90	9.38	-40.18	60.90
GDP (lag) ^e	Logged million dollar GDP, lagged one year.	11.01	1.08	8.17	13.90
Δ Merger ^a	Change in merger between year t and t-1.	3.15	37.28	-239.00	452.00
Δ Layoff ^b	Change in layoff between year t and t-1.	0.04	2.05	-14.00	14.00
Δ Union ^c	Change in unionization rates between year t and t-1.	-0.55	9.26	-83.90	100.00
Δ Computer ^d	Change in computer investment between year t and t-1.	0.08	0.24	-1.81	2.79
Δ Profit/Asset ^e	Change in profit/asset between year t and t-1.	0.09	5.73	-59.68	73.15
Δ GDP ^e	Change in GDP between year t and t-1.	0.02	0.10	-1.16	1.09

^a Source: Mergers and Acquisitions, yearly almanac.

^b Source: Wall Street Journal articles, ProQuest Electronic Database.

^c Source: March Supplement to the Current Population Survey.

^d Source: Bureau of Economic Analysis, Private Nonresidential Fixed Assets.

^e Source: Bureau of Economic Analysis, Gross Domestic Product by Industry.

Table 3. Seemingly Unrelated Regression of Merger, Layoff, Computer Investment, Unionization Rate, and Profits, 1984-2000: Fixed Effects Models.

	Dependent Variable									
	Merger		Layoff		Computer		Unionization		Profits	
Merger (lag)	1.117	(.014) **	.003	(.001) **	.0002	(.000) *	-.002	(.003)	-.005	(.002) **
Layoff (lag)	2.733	(.916) **	.082	(.032) *	-.002	(.006)	-.156	(.203)	-.403	(.128) **
Computer (lag)	-3.035	(1.850)	.199	(.087) *	.882	(.012) **	-2.413	(.401) **	.154	(.258)
Union (lag)	-.002	(.185)	-.007	(.009)	.005	(.001) **	.164	(.031) **	-.084	(.026) **
Profit/Asset (lag)	.013	(.248)	-.028	(.012) *	.007	(.002) **	-.196	(.055) **	.399	(.029) **
GDP (lag)	-6.912	(7.099)	.187	(.336)	.115	(.048) *	3.527	(1.567) *	4.478	(.980) **
ΔMerger	—	—	.005	(.002) **	-.0002	(.000)	-.004	(.007)	-.010	(.004) *
ΔLayoff	2.249	(.671) **	—	—	.007	(.005)	-.074	(.149)	-.398	(.093) **
ΔComputer	-4.659	(4.811)	.367	(.227)	—	—	2.078	(1.063) #	3.350	(.667) **
ΔUnion	-.075	(.144)	-.003	(.007)	.002	(.001) #	—	—	-.085	(.020) **
ΔProfit/Asset	-.488	(.228) *	-.046	(.011) **	.008	(.002) **	-.214	(.050) **	—	—
ΔGDP	20.816	(12.028) #	-.769	(.567)	.054	(.081)	6.430	(2.656) *	21.640	(1.522) **
Constant	1.310	(1.008)	.029	(.048)	.042	(.007) **	-.240	(.223)	.094	(.141)
N	992		992		992		992		992	

Standard errors in parentheses.

** p<.01, * p<.05 (two-tailed tests), # p<.05 (one-tailed tests)

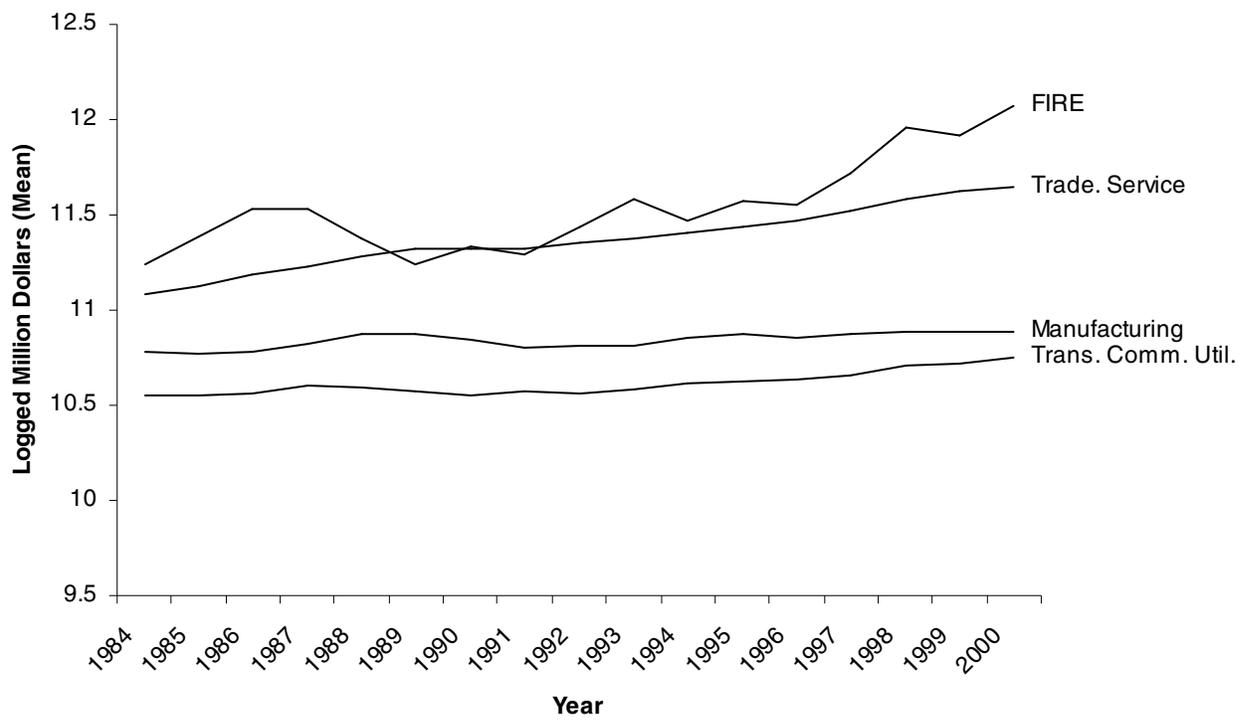


Figure 1. Mean Dollar Amount of Gross Domestic Product by Industry Groups.
 Source: Bureau of Economic Analysis, Gross Domestic Product by Industry Data.



Figure 2. Mean Number of Merger Deals by Industry Groups.

Source: Mergers and Acquisitions, 1984-2000.

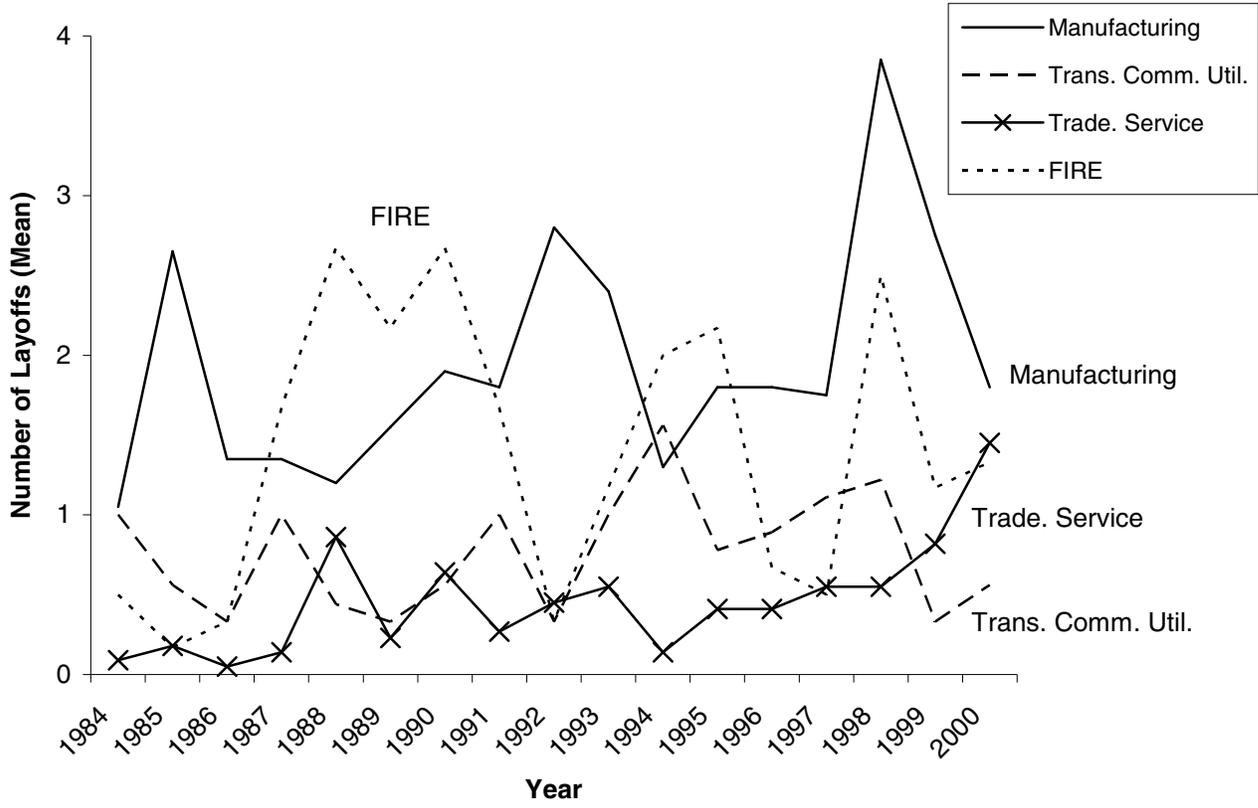


Figure 3. Mean Number of Layoffs by Industry Groups.

Source: Author's compilation from the Wall Street Journal articles, ProQuest electronic database.

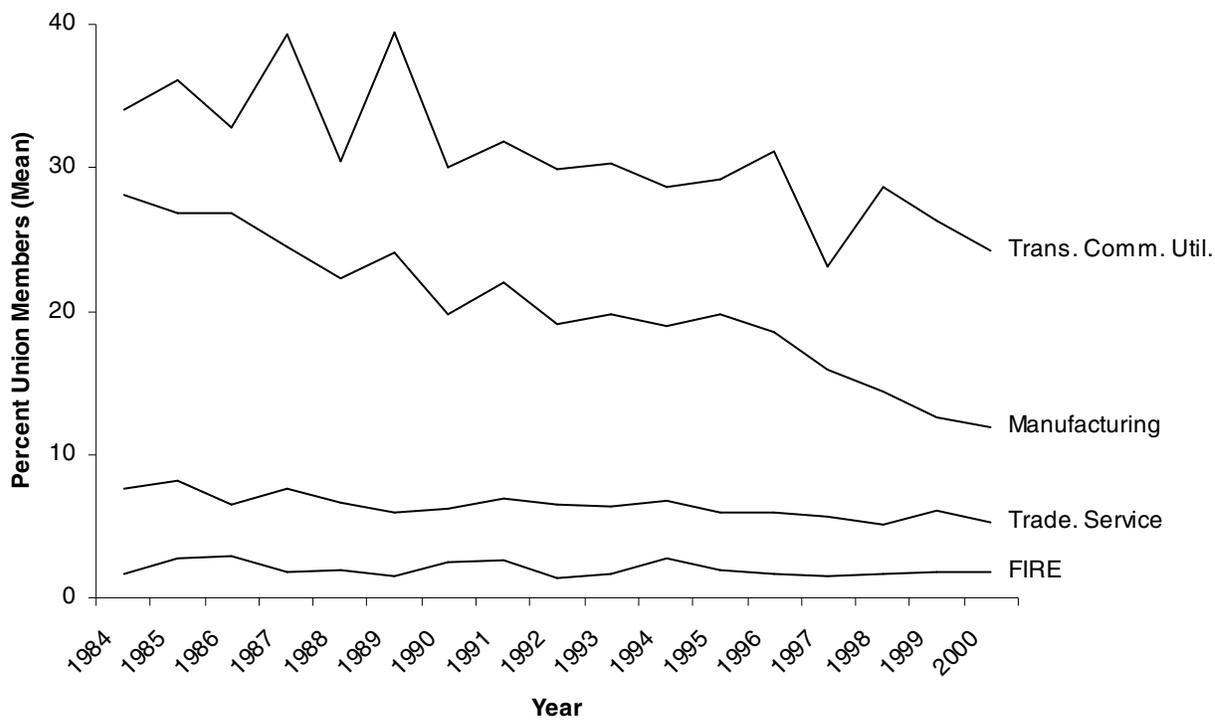


Figure 4. Mean Percent Union Members by Industry Groups.

Source: March Current Population Survey, 1984-2000.

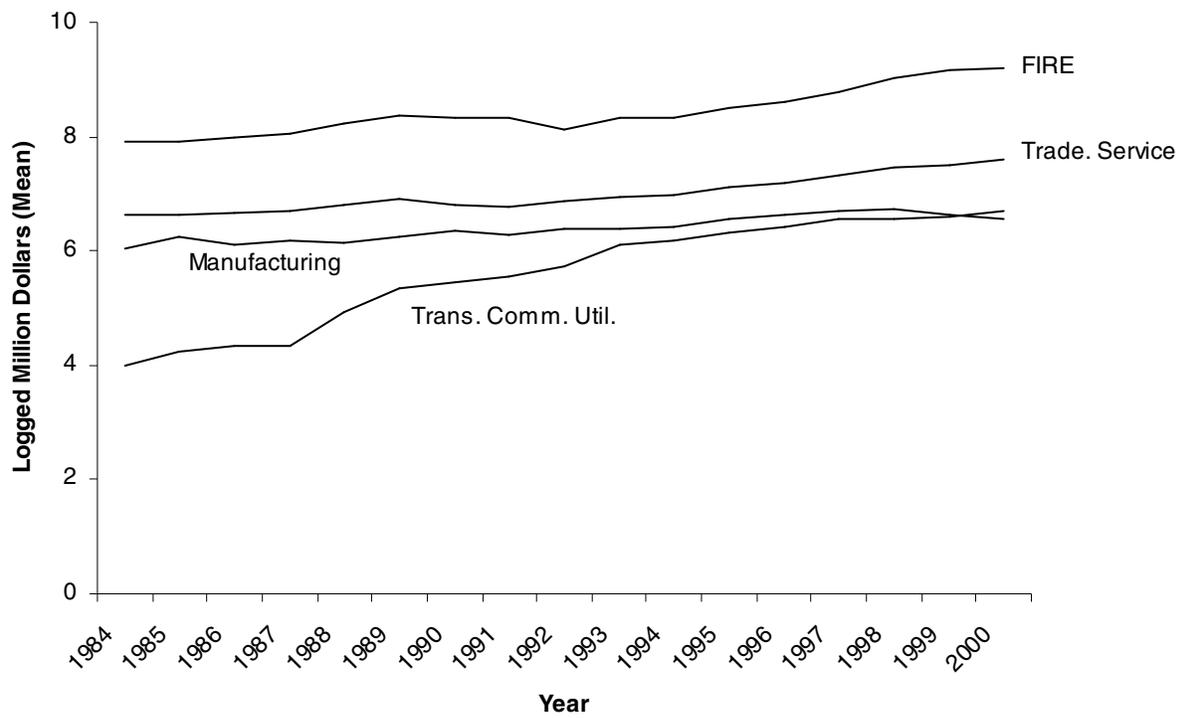


Figure 5. Mean Dollar Amount of Computer Investment divided by GDP, by Industry Groups.

Source: Bureau of Economic Analysis, Private Nonresidential Fixed Assets by Detailed Industry by Detailed Asset Type.



Figure 6. Corporate Profits Before Tax as Percentage of Fixed Assets, by Industry Groups.

Source: Bureau of Economic Analysis, Gross Domestic Product by Industry Data and Private Nonresidential Fixed Assets by Detailed Industry by Detailed Asset Type.