

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

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Introduction

Economic sociologists have spent a great deal of energy trying to make sense of how corporations have changed in the past 20 years (Useem, 1988; Davis and Stout, 1994; Davis, 1991; Davis, et. al., 1994; Fligstein and Markowitz, 1994; Fligstein, 2001, ch. 7; Dobbin, et. al., 2003; Zorn, et. al., forthcoming; Zuckerman, 1999; 2000). These changes are mainly indexed by the idea that corporations were increasingly being managed according to principles of "maximizing shareholder value". During the 1980s and 1990s, large American corporations were subject to hostile takeovers and the increasing use of financial analysis to evaluate their performance. As a result, their managers chose strategies that focused them on increasing their stock prices by trying to increase their profits (Zuckerman, 1999; 2000; Useem, 1990).

There were several other important processes going on during this period. First, there was a continued shift in the underlying economy from a goods based to a service based economy. Second, there was an explosion in the use of information technology, particularly after 1985 (Baumol, et. al., 2002: 7-15). These changes eliminated many blue collar and union held jobs across the American economy and increased service and white collar employment (Osterman, 2000; Baumol, et. al., 2002; Harrison, 2000; Gordon, 2001; Harrison and Bluestone, 1984). The purpose of this paper is an effort to explore how all of these processes transforming American corporations during the 1980s and 1990s actually played out across the American economy. One goal of this paper is to make arguments about how "shareholder value" strategies pushed forward these transformations.

We begin by considering the economic crisis of the 1970s and how it was interpreted by policymakers and the people who ran corporations. Then, we turn our attention to the evolution of the "shareholder value" conception of the corporation (Fligstein, 2001). We argue that the idea that corporations ought to maximize shareholder value is both an ideology and a proscription about a set of strategic behaviors that ought to follow. As an ideology, it caused managerial discourse to shift to focus on increasing profits and in doing so (for publicly held corporations), raising the stock price.

There is now a pretty solid set of results from economic sociologists concerning the spread and implementation of "shareholder value" strategies across large publicly held corporations in the U.S. (Davis, 1991; Davis, et. al., 1994; Davis and Stout, 1994; Fligstein and Markowitz, 1994; Fligstein, 2001: ch. 7; Useem, 1991; Dobbin, et. al., 2003; Zuckerman, 1999; 2000; Appelbaum and Berg, 1996). These results show that large U.S. corporations were financially reorganized and used the tactics of selling off unrelated product lines, engaging in mergers with firms in similar industries, and downsizing their labor forces. 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 (Zuckerman, 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. But, the literature has missed several key features of these changes as a result. We have almost no information on how these changes affected whole industrial sectors. If the largest firms in a particular industry underwent re-organization, then this certainly affected the

overall competition in that sector. One would presume that any such changes would have had to be adopted across the industry.

The focus on firms has not included a focus on technology (Fernandez, 2001 is an important exception). Economists believe that technological change was one of the key variables driving the reorganization of American business in the past 20 years (Baumol et. al, 2003; Krueger, 1992). Sociologists have generally been less interested in connecting the changes in technology to the drive for increased profitability. But, we argue that managers who were trying to increase shareholder value (ie. increase profits and thereby elevate the stock price), had the incentive to implement new technology and use that technology to downsize their work forces.

One of the implications of the shareholder value perspective is that it implies 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 (Osterman, 2001). One way in which this might have worked, was the replacement of both blue and white collar workers by computer technology. In the case of managers and other white collar workers, downsizing and collapsing 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. So, for example, bank tellers and phone operators decreased dramatically in numbers as computers replaced them with automatic phone systems and tellers.

The focus on shareholder value and the exclusion of employees from being considered in strategic corporate decisions had a major implication for 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. While unions were already in decline by the early 1980s, the number of unionized workers continued to decline precipitously during the 1980s.

Finally, the literature has been remarkably silent on the degree to which these changes actually increased the profitability of firms. Indeed, what evidence we have seems to suggest that mergers, for example, did little to increase the profitability of firms (for a review, see Jensen and Ruback, 1994). Given that the whole purpose of managing to maximize shareholder value was to increase profits, this is a big gap.

This paper explores empirically 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. Industry level data allows us to observe how the various forms of reorganization played out across industrial sectors. It also gives us perspective on how these changes worked across the whole of the American economy.

We provide evidence that the shareholder value strategies did spread across American industries. Mergers occurred in sectors where layoffs were occurring suggesting that economic conditions in those sectors were not good. 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 evidence that managers who engaged in mergers invested in computer technology. This technology directly displaced workers through layoffs and was focused on reducing unionized work forces. Computer technology was also being implemented more strongly in sectors where profits were and growing. Finally, the evidence that the shareholder value tactics actually increased the profitability of industrial sectors is mixed. Indeed, industries where mergers and layoffs occurred tended to have lower profits subsequent to those events. Higher profits were most highly related to industry growth and computer investment. Computer investment replaced workers and created new higher productivity production processes. This is in line with the view that the use of computer technology to reorganize work did increase productivity substantially.

The American economy faced tough times coming out of the 1970s. The rhetoric of using strategies associated with increasing shareholder value came to be touted as the dominant solution to the problems of firms and whole industries. The reality was more complex. Poorly performing industrial sectors did reorganize by engaging in mergers, layoffs, investing in computer technology, and deunionization. But the only sectoral strategy related to increasing their collective profitability was investing in computer technology. While some of this computer investment occurred as sectors were being reorganized, computer investment was mostly driven by the high and growing profit opportunities. The continued shift in the American economy from markets in goods, which were growing slowly if at all to services, which were growing more quickly, were the main source of new opportunities for new profits.

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 proscriptions 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.

The Crisis of the 1970s

The large American corporation in the early 1980s was under siege from two exogenous forces: the high inflation and slow economic growth of the 1970s, and increased foreign competition. Foreign competition, particularly with the Japanese, heated up. American firms lost market shares and, in some cases, like consumer electronics, entire markets. Slow economic growth meant that the major markets of many firms were not 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. 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).

There was a crisis of profitability during the 1970s for managers of large firms. The conditions were right for some form of change in how managers were going to govern large corporations (what Fligstein, 1990 has called a “conception of control”). There were three problems: what role would government play in sparking the new conception of the firm, who would spearhead the spread of the new conception of the firm, and what would that analysis of problems suggest both as the cause of the problem and the strategic solutions to those problems?

The slow economic growth and high inflation of the 1970s stimulated a public policy discussion over how the economy could be fixed. The Carter Administration embraced the view that one way out of the economic crisis known as “stagflation” (high inflation, low economic growth) was to deregulate product and labor markets. The theory suggested that deregulation would stimulate competition, force down wages, and end inflation. This, in turn, would produce lower prices which would stimulate consumption and economic growth. The Carter Administration began to experiment by deregulating the airlines and trucking industries. The presidential election of 1980 brought Ronald Reagan into power. Reagan embraced a pro-business, anti-government agenda to combat economic hard times. One of his first acts when he came to power was to decertify the air traffic controllers union. This sent a chill throughout organized labor in the U.S. by encouraging firms to directly attack their existing unions. While unions were already in decline, these actions accelerated the process.

Reagan's Administration did several things that directly encouraged the merger movement of the 1980s. William Baxter, Reagan's attorney general in charge of antitrust, had been an active opponent of the antitrust laws while a lawyer and academician. In 1981, he announced new merger guidelines. These guidelines committed the government to approving almost all mergers except those that led to concentration ratios within particular markets of greater than 80%. This gave the green light to all forms of mergers, large and small, vertical and horizontal. The Reagan Administration also substantially reduced corporate income taxes at the same time. Reagan encouraged firms to use this largesse to make new investments in the economy. The kind of investment that most of them made was mergers.

There was clearly an economic crisis in the American economy and a federal government friendly to business solutions to that crisis in the late 1970s and early 1980s. 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 already. 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. He documents how U.S. firms over time tried to solve big crises caused by lack of profits or growth. He shows how the depression of the 1890s produced a move towards monopolies, the merger movement of the 1920s tried to solve problems of over competition by creating oligopolies in many industries, the

depression of the 1930s stimulated marketing strategies, and the opportunities of the postwar economy produced the finance strategy which caused managers to diversify their firms in order to make them larger (1990). 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 studied extensively (Davis and Stout, 1994; Fligstein and Markowitz, 1992; Useem, 1994; Zorn, et. al., forthcoming). 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., forthcoming; Dobbin, et. al. 2003).

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 (ie. workers, communities, or customers) should matter for the decisions that managers undertake. Hirsch (1990) and Whitley (1986)

argue that the theory has its roots in agency theory, a branch of financial economics that evolved during the 1970s. Jensen (1987), 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 on their assets.

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. 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 (ie. 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. The final source of discipline for recalcitrant firms is the hostile takeover. Here, 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 proscriptions 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, 1988; Hammer and Champy, 1993; Walther, 1997; Pralahad

and Hamel, 1990). From the point of view of these critics, the main culprits who were to blame for the problems of American business were in the early 1980s were managers who had failed in the 1970s to maximize shareholder value. Put simply, the assets of firms were not earning high enough 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 (1990) 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.

Not surprisingly, the groups that proposed this analysis of the shortcomings of sitting management teams were the ones who had the most to lose and gain by this analysis. The financial community made up of financial analysts, stock brokers, institutional investors, and investment bankers proposed that firms either had to voluntarily reorganize to raise profits and stock prices or else face getting bought out. The merger movement that began in the early 1980s focused on firms that had undervalued assets relative to stock prices (Fligstein, 2001).

It is useful to consider the kinds of tactics that firms pursued in order to avoid becoming merger targets. First, firms could themselves begin to aggressively engage in mergers. They would often borrow money to pay for new companies, thereby putting

themselves into debt. This had the effect of making them both larger and less valuable as takeover targets. 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. They were also encouraged to re-focus their business on “core competences” (Zorn, et. al, forthcoming; Prahalad and Hamel, 1990; Hammer and Champy, 1993). This meant that firms sold off diversified businesses (Davis, et. al, 1993). 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.

Finally, managers began to engage in various forms of financial engineering in order to make their balance sheets look better and thereby increase the stock price (Harlan, 1986; Walther, 1997). One favorite tactic was to use cash to buy back some of the firm’s stock. This would reduce the supply of stock and raise the stock price directly. It would also have the effect of getting rid of cash. The result of this tactic was to make the firm a less attractive takeover target. Another financial ploy was the selling of assets, especially buildings but also equipment, and then purchasing them as services by leasing. This took the assets off the books and made them a cost of doing business. The return on assets would increase as a result of the shrinkage in the size of assets thereby making the financial performance of the firm look better.

Davis and Stout (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.

But, 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. 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 hostile takeover bids. He also demonstrates that having institutional investors on the boards of directors pushes managers to engage in financial reorganization.

Davis, et. al. (1994) 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. Zorn et. al (forthcoming) demonstrates that the number of mergers involving diversification drops precipitously during the 1980s. There is a steep rise in mergers in firms’ main product lines. There is also a substantial rise in vertical mergers (ie., the purchase of upstream suppliers or downstream customers).

Dobbin, et. al.(2003) show that the main beneficiary of these changes within corporations was the chief financial officer. 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.

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 . We want to argue that these changes are part of how American business solved its problems of slow economic growth and lack of profits since 1980. One way to increase shareholder value was to exit less profitable businesses and enter more profitable ones. Since manufacturing was slow growing and services were fast growing, transferring capital investment made sense. Another way to increase profits was to remove the most highly paid production workers, ie. those in unions. Finally investing in technology to increase labor productivity could also result in increased profits.

We want to argue that these three processes were harnessed by managers seeking to maximize shareholder value. Their decisions about where to invest, which workers to try and replace, and how to use technology to increase productivity and control wage bills were being motivated by their desire to please boards of directors, financial analysts, and the financial markets. In essence, we want to show that these larger secular changes in the American economy were somewhat endogenous to the spread of shareholder value.

While these changes have been the focus of sustained research in literature on the reorganization of work (Harrison and Bluestone, 1988; Osterman, 2001; Card, 1992; Card and DiNardo, 2002; Gordon, 2000; 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.

The main growth in the American economy in the past 40 years has been in the service sector, and we will demonstrate that this was concentrated 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. De-industrialization (Harrison and Bluestone, 1988) is the process by which manufacturing facilities were closed and firms shifted their activities from less to more profitable product lines. 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. 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 target of these actions was jobs that were unionized.

Another way to increase profits and reduce wage bills was to invest in new technology. Technology presumably increases the productivity of labor. It is also a way to reduce the power of labor (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, computers replaced hundreds of thousands of telephone operators and bank tellers. 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. 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 at the level of the industry.

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 performance, one would ideally like to have data on a large number of firms over a long period of time across industrial sectors. One would like data not just on publicly held corporations, but also small and medium size enterprises. This is because firms that found themselves competing with large publicly held corporations would presumably have to engage in tactics to maximize shareholder value as well. Moreover, such a data set would be difficult to create because it would be nearly impossible to draw a sample. 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 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 economic sectors over time. We can observe the degree to which economic sectors have embraced the various tactics associated with the shareholder value perspective and why some sectors were more likely to do so than others. We can also try and untangle how secular patterns of growth in industries do or do not affect either the use of shareholder value tactics or their outcomes. The main downside is that industry data may mask the performance of particular firms and thus reduce the correlations between variables. But, this downside is offset by the fact that using industry allows us to examine what has happened across the entire American economy over a relatively long period of time. Our data set has many observations ($N=62$) over a relatively long time period (1984-2001). 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.

Hypothesis 1: Industries with low rates of profits ought to be more likely to engage in mergers, layoffs, deunionization, and investment of computer technology.

The basic shareholder value idea is that managers are not producing enough profits relative to the size of investments. It follows that the sectors where we expect there to be the most pressure for the reorganization of industry should be those that are the least profitable. In such sectors, we ought to observe more mergers and more layoffs in order to reduce costs. Managers in highly unionized industries that are less profitable will attack their labor forces more systematically by closing down facilities with unionized workers and moving their operations to places where unions are not important. Finally, managers in low profit industries will have incentives to invest in labor saving computer technology.

Hypothesis 2: Mergers should produce layoffs as firms cut workers to make more profits. Mergers will also push firms to reorganize and increase their expenditures on computer investment.

There are several reasons for managers to engage in mergers. Firms were trying to increase their size by buying market share in order to be one of the largest in their industry. This would give them some stability either by being able to control prices or by being the most reliable producers. Second, firms were trying to attain larger size and rationalize production. One of the main arguments put forward by managers for doing mergers were cost savings to be attained by reducing redundant departments. This process of rationalization ought to be associated with increased layoffs. But in order for these gains to be attained, firms needed to be able to coordinate more disparate activities. The main way they did this was by investing in computer technology. This allowed them to eliminate layers of management and coordinate far flung activities.

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

Hypothesis 4: Mergers, layoffs, and computer investment ought to be aimed at unionized workforces.

Investments in computer technology 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. The largest and most protected group of less skilled workers in the economy circa 1980 was unionized. 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 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 5: Mergers, layoffs, and computer investments should increase the profits of industrial sectors, net of the growth prospects of any particular sector.

The entire purpose of pushing managers to maximize shareholder value was to get them to increase the profits of firms. Thus, the main tactics that managers used to reorganize their firms ought to raise the profits of firms over time. Hence, mergers, layoffs, and computer investments ought to be positively associated with changes in profits over time.

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. It is useful to describe how the data was gathered and coded.

Mergers data came from the yearly almanac of *Mergers and Acquisitions* from 1983 to 2001. From this source, the number of merger and acquisition deals in each 2-digit 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 1983 and 1991 more or less raised the threshold level anyway.

Layoffs were counted from the *Wall Street Journal* articles in ProQuest's Newspapers archive. Initially, we identified the articles from 1983 to 2001 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 and his colleagues (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 and his colleagues' (2003: 31) in Table 1. The comparison shows a substantive correspondence between the two data. The exact correspondence is not possible due to the differences in search methods and industry classification. The order of industries in terms of the frequency of layoffs (or downsizing as it is termed in Baumol et al) 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) calculation, particularly the one with Fortune 500 firms.

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 wage earners who were aged 18 to 64, civilian, working in the private sector, and we 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, corporate profits and Gross Domestic Product (GDP) came from the Bureau of Economic Analysis internet data archive. Detailed estimates for private nonresidential fixed assets by detailed industry and by detailed asset type are available on its website.¹ Among various asset types, computers and the related assets were selected to calculate the dollar amount of computer investment. Data on corporate profits and the GDP were also available from a series "Gross Domestic Product by Industry and the Components of Gross Domestic Income."² All dollar amounts are in million dollars, adjusted for inflation using the Consumer Price Index and transformed into logarithms. Table 2 summarizes the sources and definition of the variables used in the analysis.

(Table 2 about here)

The data set that we constructed has 1,054 observations which reflects the 62 industries for the 17 years (1984-2001). This constitutes a cross sectional time series design. There are two methods for panel data analysis, fixed-effects and random-effects models (Allison, 1994). We used fixed-effects models, which allow us to control for all time-constant, unobserved differences between industries without making the random-

¹ <http://www.bea.gov/bea/dn/faweb/Details/Index.html>, accessed on January 20, 2004.

² <http://www.bea.gov/bea/dn2/gpo.htm>, accessed on January 20, 2004.

effects assumption that these differences are independent of the observed regressors (Allison, 1994).

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. We suppose that changes in one element of economy rarely result in immediate consequences that are simultaneously measured in the changes in the other. To resolve the problem of reciprocal causation, we incorporated time lags into the model specification. The independent variables are lagged one year. We also included in the model a lag of the 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:

$$y_{it} = \beta_0 + \beta_1 y_{i,t-1} + \beta_2 x_{i,t-1} + \nu_i + \varepsilon_{it},$$

where i indexes the 62 industries and t denotes the 17 years from 1984 to 2001. Due to the lagged variables, the observations from 1983 contribute only through the lagged values. ν_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:

$$y_{it} = \beta_0 + \beta_1 y_{i,t-1} + \beta_2 x_{i,t-1} + \beta_3 z_{it} + \nu_i + \varepsilon_{it},$$

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

In the analysis that follows, we estimated separate 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. For each dependent variable, basic and extended models were estimated using fixed-effects model.

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. Figure 1 presents the change in GDP from 1984-2001. The industries in the trade and service sectors and the FIRE sector were already larger on average than manufacturing and transportation, utilities, and trade 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 the late 1980s, declined between 1990 and 1992, and increased until 2001. This corresponds to the two merger waves of the past 20 years. There is interesting variation across industries. During the merger wave of the 1980s, the FIRE sector led all sectors in the average number of mergers. But, in the 1990s merger wave, trade and services surpassed the FIRE sector. Both the FIRE and trade and services industries witnessed far more mergers than manufacturing and transportation, communications, and utilities did, on average.

(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. There were fewer discernible patterns of layoffs in the other two industrial sectors. 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 industrial sectors. This implies that a labor market regime, one based on more churning of workers even good economic times was in place (see Osterman, 2001).

(Figure 3 about here)

Figure 4 shows the decline in rates of unionization from 1984-2001. 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 2001. 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 2001. Rates of investment were highest in the FIRE sector and these rose continuously over time. Rates rose in all three other sectors, 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 directly.

(Figure 5 about here)

Figure 6 presents data on corporate profits over the period. The most profitable sector of the American economy was consistently FIRE. As time goes on, it increases its profitability steadily over the period. Profit making in the other industries remained relatively steady throughout the period.

(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 sectors grew steadily over the period. FIRE was the most spectacularly successful sector at increasing profits. Not surprisingly, the largest and fastest growing sectors 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 sectors. Patterns of layoffs differed the most across industries reflecting the relative performance of the sectors. 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 (Farber, 1997 documents this using Current Population Survey data; for a review, see Fligstein and Shin, forthcoming). The most convergence in layoffs occurred during the late 1990s when in a prosperous economy, layoffs rose dramatically. 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 number in the manufacturing and transportation, communications, and utilities sectors.

Table 3 presents descriptive statistics for the entire 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 as given year and a high of 19 announcements. Union membership averaged about 16% over the period.

(Table 3 about here)

Tables 4-6 test the various hypotheses put forward earlier. It is useful to go through these results in some detail. The first two panels of table 4 provide evidence on the determinants of mergers at the industry level. The most important result is that mergers are most likely to appear in industries where profits are lower in the previous

year as suggested in hypothesis 1. This is consistent with the idea that these industries were underperforming and were targets for financial re-organization. The only other statistically significant effect is that mergers are also occurring in industries that are growing. These results confirm what is going on in figure 2. Mergers were occurring in both fast growing industries and low profit ones.

(Table 4 about here)

The second part of table 4 produces results predicting layoffs. Column 4 contains variables that index the level of variables and their changes in the previous year. In this column, we see evidence that industries with mergers produce layoffs confirming 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 evidence that investments in computers also caused layoffs. This means that capital investments were being used by managers to reduce their work forces consistent with hypothesis 3. We earlier argued that this was part of trying to increase profitability. It is clear that computerization did increase layoffs. Finally, industries with profits increasing more in the previous year were less likely to announce layoffs than industries where profits were increasing less. 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.

(Table 5 about here)

Table 5 provides evidence for the causes of 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 less profitable industries were clearly engaging in mergers, laying off workers, and making investments in computer technology in order to raise profits. This is strong evidence for the use of shareholder value tactics. There is one other interesting effect that appears to index shareholder value tactics. Industries where there were high rates of unionization also saw high levels of computer investment. Managers in these industries were trying to reorganize work to lower their dependence on unionized work forces consistent with hypothesis 4. Finally, more profitable industries made more investments in computer technology presumably to take advantage of existing and expanding opportunities. The last columns of table 5 explore the causes of de-unionization. There is only one variable that predicts changes in the unionization rate: the implementation of computer technology. In industries with high computer investment, unionized workers decreased substantially. The results in table 5 imply that computer investment and de-unionization were related to shareholder value strategies consistent with hypothesis 4.

Table 6 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 sectors, it is not surprising, that their profits grew the most. In column 2, 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. There is one variable that does appear related to shareholder value: computer investment. Industries that invested in computers did show profits increases net of the other variables. Thus, the mergers and layoffs associated with shareholder value did not positively affect the bottom line, but investments in computer technology that accompanied those events did.

(Table 6 about here)

It is useful to return to our hypotheses. Hypothesis 1 implied that low profits should have been the source of reorganization of industries. Low profits were related to both mergers and layoffs the main tactics that were to be pursued by firms that were engaging in shareholder value strategies. Low profits did not cause de-unionization or investments in computer technology. 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 implied that industries where mergers would occur would engage in layoffs. Maximizing shareholder value implied buying up other firms and rationalizing costs to increase profits by laying off workers. 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 unions. We do not have any direct evidence that mergers or layoffs were

directed at unionized work forces. However, we did find that investment in computer technology did decrease unionization rates in line with the view that managers were trying to rid themselves of high priced labor by investing in computer technology. Finally, we were not able to demonstrate that mergers or layoffs increased profits. Indeed, they were related to fewer profits, not more. We did find evidence that computer investment did increase profits at the industry level.

There were several results which imply a kind of two sector model of industry reorganization over the period. It is clear that in industries that suffered from low profits, mergers, layoffs, and computer investment occurred. Computers were used to lessen the dependency of these industries on unionized workers as well. This implies managers in low profit industries were trying to increase their profits by engaging in mergers, layoffs, investment in computer technology, and de-unionization. But, in growing industries and industries that were profitable, there were also mergers, mergers probably to increase the size of firms. These industries also experienced increases in profits and the increased investments in computer technology also increased profits. So, for the FIRE and trade and service parts of the economy, increasing shareholder value meant mergers and investing in computer technology to rationalize production and take advantage of expanding opportunities. For manufacturing and transportation, communication, and utilities, shareholder value meant that in the face of low profits and slow economic growth, managers pursued mergers, layoffs, and the use of computers to replace unionized workforces.

Conclusions

The American economy was heavily transformed by the logic of shareholder value during the 1980s and 1990s. Managers had pressure placed on them to increase profits and stock prices (if they were publicly held). In order to do this, they had to engage in mergers and making computer investments which caused them to increase layoffs and decrease their unionized workers. In industries that were making lower profits, these reorganizations only affected the bottom line by increasing productivity through computer investments. Mergers and layoffs per se did not help profitability. In industries that were growing, their growth was a major cause of their increased profits and of course, they also gained from their computer investments.

The most novel implication of our results is that the use of computer technology was not an exogenous change in American business but part and parcel of "maximizing shareholder value". Computer technology was clearly being used strategically by managers who engaged in mergers to reorganize their work forces. They deployed it to decrease their dependence on all workers as computer technology caused both decreases in unionized workers and increases in layoff announcements. The admonition of proponents of "maximizing shareholder value" was that neither communities nor workers should matter in the strategies of managers, but only shareholders and their profits. It is clear that American managers took this charge seriously and used mergers and computer technology strategically to reorganize their firms and reduce their dependence on their work forces.

The most counterintuitive result, is that mergers and layoffs did not work to return ailing industries to profit. 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, 1994) that shows that the buyers of firms rarely make money while the sellers do so. Our results are consistent with the literature. This suggests that buyers are frequently optimistic about their abilities to make enlarged businesses work. Our evidence shows that at the industry level, mergers and layoffs actually decrease profit net of other factors. There might be a couple of explanations for this. First, industries might have been even worse off financially if they had not merged and laid workers off. This, of course, is difficult to prove. Second, our measure of profits may be too short run. Since mergers and layoffs frequently result in charges against profits, it may be that with a sufficiently long time horizon, mergers might pay off. We did try several different lag structures in our data with almost no change in result. This is an issue worth exploring further.

Another useful avenue to explore is to try and explicitly link the changes in industries that reflect reorganization to changes in how workers were treated. If shareholder value tactics are really reorganizing work and making workers more insecure (as many have argued, Osterman, 2001; Gordon, 2000; Harrison, 2000), then we ought to be able to link things like mergers and layoffs to changes in health insurance and pension coverage at the industry level. We also ought to be able to observe higher rates of labor turnover and perhaps changes in hours of work at the industry level as well. We think this is potentially a very fruitful avenue of research.

Finally, it may be the case that "shareholder value conception of control" has run its course as a way to make money in the American economy. The stock market crash in 2001, the corporate scandals at Enron and other companies, and the general slowdown of

the economy imply that the current set of financial tactics of corporations have lost favor with investors and voters. It is probably also the case that many of the gains from mergers and layoffs and generally making workers more insecure have been attained. One could speculate that there are gains coming from continued outsourcing of activities (particular offshore) and from productivity increases due to computers (which of course, also make it easier to send activities offshore). The search for new strategies of growth and profit is endemic to capitalism. In the current economic context, it remains to be seen what new tactics will emerge.

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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 data with Baumol, Blinder, and Wolff (2003).

Industry	Wall Street Journal		Baumol et al (2003)	
	Count	Percent	Count	Percent
Insurance and finance	39	7.6	48	16.4
Telecom	20	3.9	15	5.1
Airlines	9	1.8	9	3.1
Oil and gas	8	1.6	10	3.4
Utilities	13	2.5	5	1.7
Manufacturing	184	35.8	179	61.3
Metals manufacturing & mining	8	1.6	7	2.4
Aerospace & auto	36	7.0	41	14.0
Foods, beverages, tobacco	15	2.9	26	8.9
Computers, electronics	23	4.5	28	9.6
Pharmaceuticals	12	2.3	13	4.5
Misc manufacturing	90	17.5	64	21.9
Railroads	2	0.4	5	1.7
Retail and misc services	44	8.6	21	7.2
Others	9	1.8	0	0.0
Total	512	100.0	292	100.0

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	.00	1974.00
Layoff (lag) ^b	Number of layoffs of more than 50 employees, lagged one year.	1.08	2.39	.00	19.00
Union (lag) ^c	Percent union members, lagged one year.	15.80	16.16	.00	100.00
Computer (lag) ^d	Logged million dollar amount of investment in computers, lagged one year.	6.54	1.66	.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.	.04	2.05	-14.00	14.00
Δ Union ^c	Change in unionization rates between year t and t-1.	-.55	9.26	-83.90	100.00
Δ Computer ^d	Change in computer investment between year t and t-1.	.08	.24	-1.81	2.79
Δ Profit/Asset ^e	Change in profit/asset between year t and t-1.	.09	5.73	-59.68	73.15
Δ GDP ^e	Change in GDP between year t and t-1.	.02	.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. Regression of Merger, Layoff, Computer Investment, Unionization Rate, and Profits, 1984-2000: Fixed Effects Models.

	Dependent Variable											
	Merger		Layoff		Computer		Unionization		Profits			
Merger (lag)	1.123	(.014) **	.003	(.001) **	.0002	(.000) *	-.001	(.003)	-.006	(.002) **		
Layoff (lag)	1.789	(.843) *	.084	(.033) *	-.006	(.006)	-.117	(.210)	-.239	(.132) #		
Computer (lag)	-2.501	(1.902)	.177	(.091) *	.880	(.012) **	-2.546	(.416) **	.044	(.268)		
Union (lag)	.025	(.190)	-.005	(.009)	.004	(.001) **	.168	(.032) **	-.043	(.027)		
Profit/Asset (lag)	.147	(.255)	-.013	(.012)	.004	(.002) **	-.131	(.057) *	.404	(.030) **		
GDP (lag)	-8.487	(7.300)	.079	(.348)	.138	(.048) **	3.209	(1.624) *	4.674	(1.015) **		
ΔMerger	—	—	.003	(.002) *	-.0001	(.000)	-.002	(.007)	-.005	(.005)		
ΔLayoff	1.174	(.591) *	—	—	.003	(.005)	-.026	(.154)	-.203	(.097) *		
ΔComputer	-2.739	(4.948)	.160	(.236)	—	—	.949	(1.102)	1.702	(.693) *		
ΔUnion	-.032	(.148)	-.001	(.007)	.001	(.001)	—	—	-.043	(.021) *		
ΔProfit/Asset	-.263	(.235)	-.023	(.011) *	.004	(.002) *	-.107	(.052) *	—	—		
ΔGDP	13.317	(12.371)	-1.231	(.589) *	.138	(.082) #	4.308	(2.753)	22.231	(1.577) **		
Constant	101.636	(77.324)	-1.023	(3.689)	-.766	(.515)	-4.996	(17.238)	-46.205	(10.769) **		
sigma_u	14.016		1.571		.136		10.822		6.766			
sigma_e	32.646		1.556		.218		7.271		4.587			
N	992		992		992		992		992			

Standard errors in parentheses.

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

Table 4. Regression of Merger, Layoff, Computer Investment, Unionization Rate, and Profits, 1984-2000, "High Road" Sector: Fixed Effects Models.

	Dependent Variable											
	Merger		Layoff		Computer		Unionization		Profits			
Merger (lag)	1.155	(.021) **	.004	(.001) **	.0002	(.000) *	.0001	(.001)	-.007	(.003) *		
Layoff (lag)	-1.520	(2.523)	.089	(.053) #	-.001	(.010)	.069	(.132)	-.216	(.319)		
Computer (lag)	-14.606	(6.853) *	.359	(.188) #	.836	(.027) **	-1.218	(.356) **	.518	(.871)		
Union (lag)	-.695	(1.253)	.016	(.034)	-.010	(.005) #	.107	(.049) *	-.011	(.158)		
Profit/Asset (lag)	.183	(.478)	-.015	(.013)	.005	(.002) *	-.0001	(.025)	.264	(.048) **		
GDP (lag)	-1.036	(13.535)	-.102	(.372)	.184	(.055) **	-.224	(.709)	5.437	(1.690) **		
ΔMerger	—	—	.001	(.001)	-.0002	(.000)	-.003	(.003)	-.005	(.006)		
ΔLayoff	.712	(1.800)	—	—	.002	(.007)	.053	(.094)	-.326	(.227)		
ΔComputer	-10.456	(12.044)	.076	(.331)	—	—	-.589	(.631)	5.013	(1.504) **		
ΔUnion	-.958	(.942)	.015	(.026)	-.004	(.004) **	—	—	-.113	(.119)		
ΔProfit/Asset	-.339	(.391)	-.015	(.011)	.005	(.002)	-.019	(.020)	—	—		
ΔGDP	12.795	(20.237)	-.692	(.555)	.072	(.083)	.171	(1.061) *	21.771	(2.322) **		
Constant	114.687	(136.167)	-1.113	(3.743)	-.833	(.557)	16.232	(7.099)	-60.188	(16.968) **		
sigma_u	18.708		.768		.164		4.516		6.873			
sigma_e	42.749		1.174		.175		2.241		5.404			
N	448		448		448		448		448			

Standard errors in parentheses.

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

Table 5. Regression of Merger, Layoff, Computer Investment, Unionization Rate, and Profits, 1984-2000, "Low Road" Sector: Fixed Effects Models.

	Dependent Variable														
	Merger		Layoff		Computer		Unionization		Profits						
Merger (lag)	.716	(.033)	**	-.002	(.004)	.0002	(.000)	.001	(.019)	-.008	(.007)				
Layoff (lag)	2.458	(.603)	**	.072	(.045)	-.007	(.008)	-.246	(.325)	-.211	(.121) #				
Computer (lag)	1.380	(1.148)		.166	(.114)	.885	(.015)	**	-2.715	(.599)	**	-.142	(.227)		
Union (lag)	.079	(.109)		-.006	(.011)	.005	(.001)	**	.160	(.044)	**	-.019	(.022)		
Profit/Asset (lag)	.200	(.199)		-.015	(.020)	.004	(.003)		-.248	(.105)	*	.592	(.035)	**	
GDP (lag)	-4.535	(6.892)		.265	(.688)	.083	(.094)		6.102	(3.656)	#	4.178	(1.353)	**	
ΔMerger	—	—		.008	(.004)	#	.0001	(.001)	.011	(.024)		-.0002	(.009)		
ΔLayoff	.843	(.447)	#	—	—		.004	(.006)	-.075	(.239)		-.148	(.089)	#	
ΔComputer	.361	(3.280)		.213	(.327)	—	—		1.483	(1.743)		-.026	(.649)		
ΔUnion	.039	(.084)		-.003	(.008)	.001	(.001)		—	—		-.032	(.017)	#	
ΔProfit/Asset	-.005	(.226)		-.038	(.022)	#	-.0001	(.003)	*	-.231	(.120)	#	—	—	
ΔGDP	21.900	(13.234)	#	-2.448	(1.319)	#	.392	(.180)		9.452	(7.043)		28.438	(2.299)	**
Constant	47.586	(72.498)		-2.103	(7.234)		-.259	(.990)		-27.619	(38.544)		-39.621	(14.252)	**
sigma_u	14.632			1.943			.137			11.075			5.356		
sigma_e	18.061			1.802			.247			9.603			3.576		
N	544			544			544			544			544		

Standard errors in parentheses.

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

Table A. Regression of Merger Deals, 1984-1992 and 1993-2000: Fixed Effects Models.

	1984-1992		1993-2000	
Merger (lag)	.273	(.049) **	1.078	(.021) **
Layoff (lag)	-.144	(1.107)	1.382	(1.375)
Computer (lag)	-4.024	(2.683)	-14.191	(7.412) #
Union (lag)	.134	(.242)	.167	(.295)
Profit/Asset (lag)	-.648	(.321) *	-.070	(.398)
GDP (lag)	24.893	(9.799) *	-26.703	(18.147)
Δ Layoff	-.357	(.784)	1.414	(.984)
Δ Computer	-4.137	(4.864)	-13.637	(8.930)
Δ Union	.003	(.159)	.117	(.242)
Δ Profit/Asset	-.376	(.331)	-.334	(.300)
Δ GDP	17.971	(13.932)	4.002	(18.361)
Constant	-210.115	(104.717) *	391.286	(172.642) *
sigma_u	41.794		55.539	
sigma_e	24.644		30.624	
N	496		496	

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.

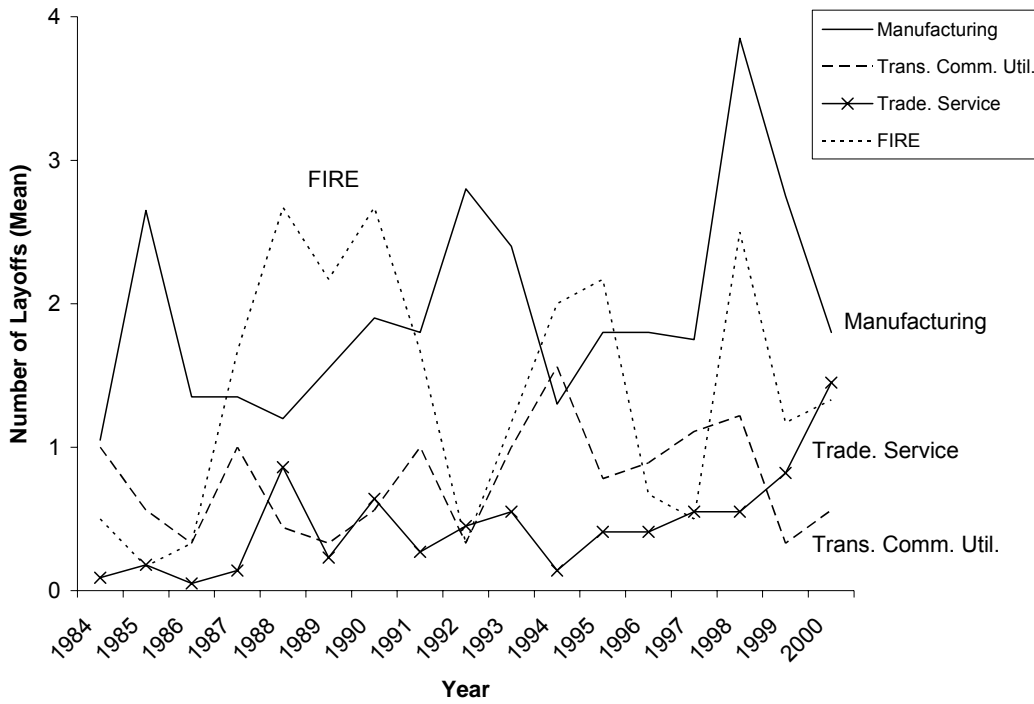


Figure 3. Mean Number of Layoffs by Industry Groups.

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

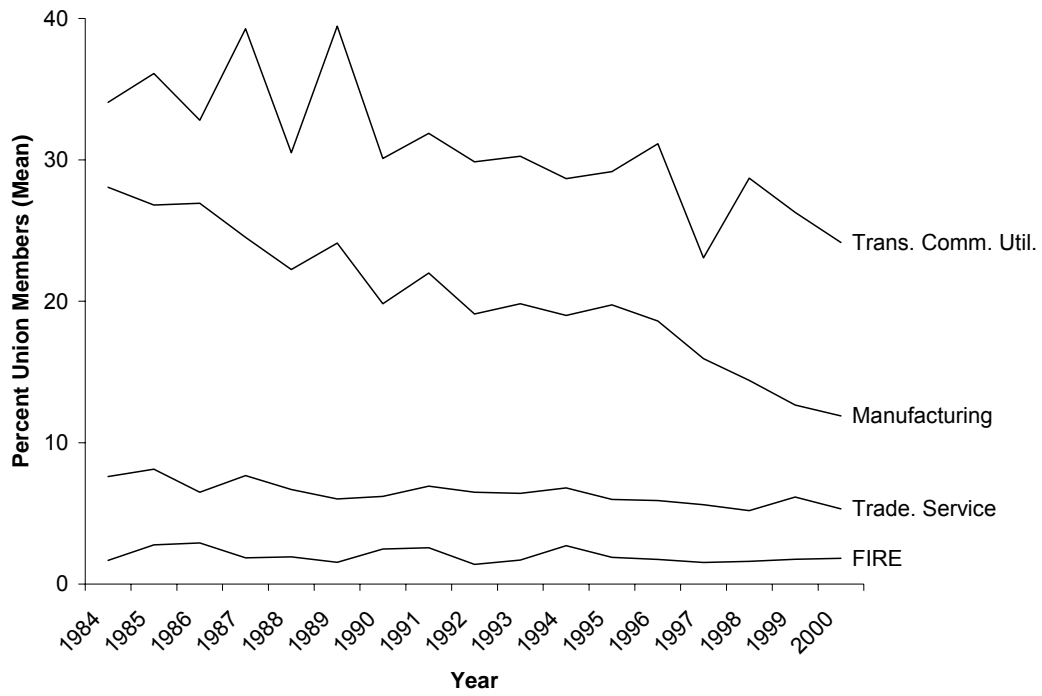


Figure 4. Mean Percent Union Members by Industry Groups.

Source: March Current Population Survey, 1984-2000.

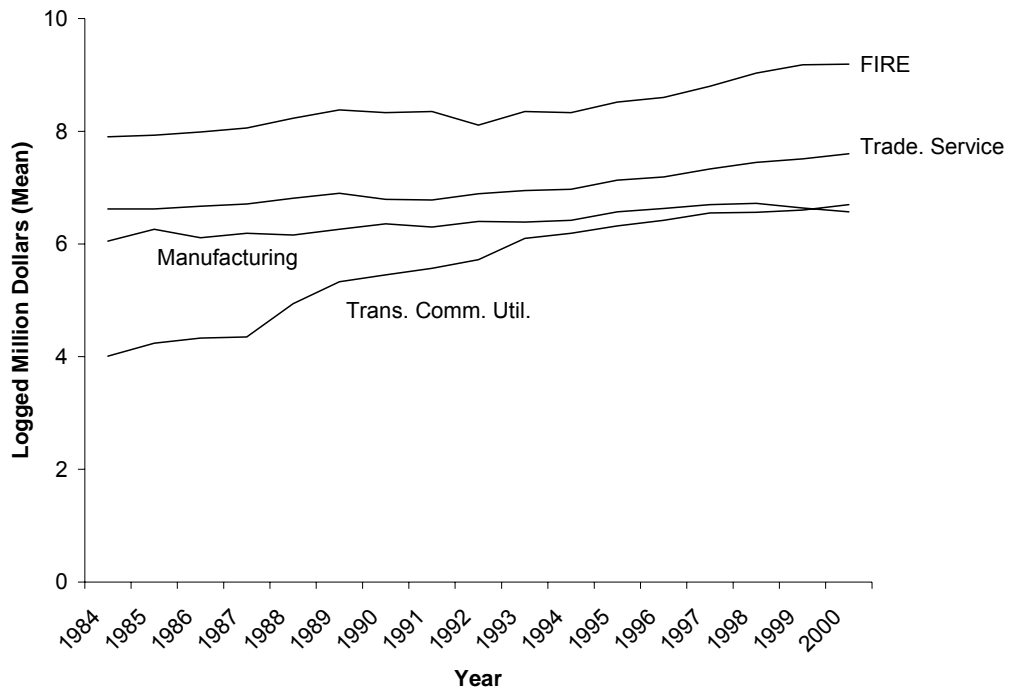


Figure 5. Mean Dollar Amount of Computer Investment divided by GDP, by Industry Groups.

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.

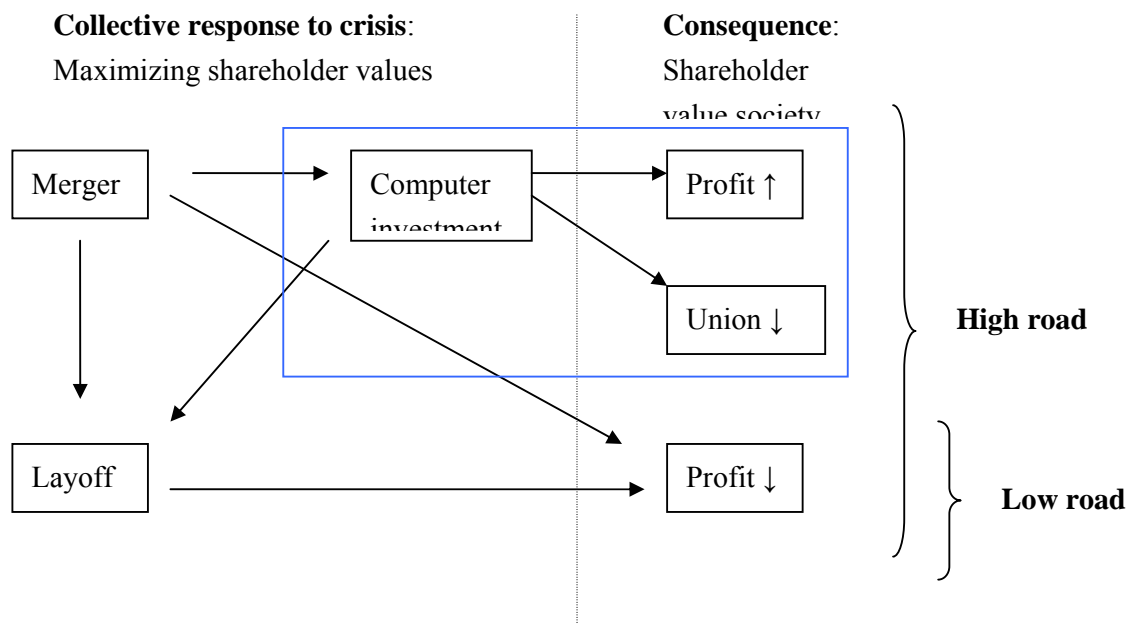


Figure 7. Process of the Transformation in American Economy.

Note: Based on the results from Table 3.

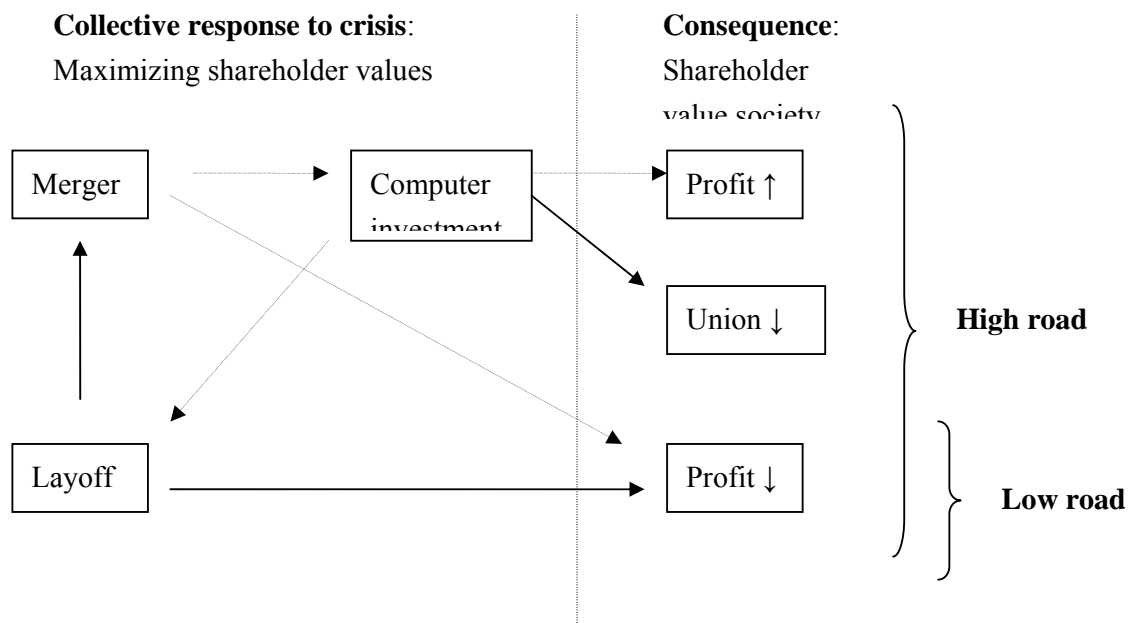


Figure 8. “Low Road” Sector’s Process of the Transformation in American Economy.

Note: Based on the results from Table 5. Solid lines are the links with significant effects; dashed lines are the links without significant effects.