

Shareholder Value and the Transformation of the U.S. Economy, 1984–2000¹

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Using data from 62 U.S. industries for 1984–2000, this article explores the connections between shareholder value strategies, such as mergers and layoffs, and related industry-level changes, such as de-unionization, computer technology, and profitability. In line with shareholder value arguments, mergers occurred in industries with low profits, and industries where mergers were active subsequently saw an increase in layoffs. Industries with a high level of mergers increased investment in computer technology. This technology displaced workers through layoffs and was focused on reducing unionized workforces. Contrary to shareholder value arguments, there is no evidence that mergers or layoffs returned industries to profitability.

KEY WORDS: de-unionization; economy; layoffs; mergers; shareholder value; technology.

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

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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. 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 who 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; Fligstein, 2001; Useem, 1993).

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 United States (Davis, 1991; Davis and Stout, 1992; Davis *et al.*, 1994; Fligstein, 2001; Fligstein and Markowitz, 1993). 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 toward raising share prices by convincing the investment community that the firms were focused on their core businesses and on making profits (Useem, 1993; Zuckerman, 2000).

Almost all 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 article, we extend this concern by considering how these changes played out across whole industries. 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. (For studies on diffusion across industries, see Greve, 1996; Han, 1994.) Here, we analyze how shareholder value strategies operated across industries to put pressure on all firms to conform to those tactics.

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 U.S. business. There was a continued shift in the underlying economy from a goods-based to a service-based economy (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 U.S. workers who were unionized (Kochan *et al.*, 1994; Mishel *et al.*, 2003). These changes eliminated many blue-collar and union-held jobs across the U.S. economy and increased service and white-collar employment (Baumol *et al.*, 2003; Gordon, 1996).

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 investment in computer technology. These investments also appeared to cause reduction in unionized workforces 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—to increase profits. Higher profits at the industry level were most highly related to industry growth and computer investment. The data provide some support for 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 (Black and Lynch, 2001; Kelley, 1994).

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

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. For evidence on layoffs, see Blackwell *et al.* (1990), Hallock (1998), and Worrell *et al.* (1991).

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, U.S. 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 toward 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 U.S. firms had stock prices that valued them as being worth less than the value of their assets and cash (Friedman, 1985).

There was clearly an economic crisis in the U.S. 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. 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.

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 ensure 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 refocused 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 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. 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. From the point of view of these critics, the main culprits who were to blame for the problems of U.S. business in the early 1980s were managers who had failed in the 1970s to maximize shareholder value. 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.

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 reevaluate 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 (Davis *et al.*, 1994; Zuckerman, 2000). This meant they were encouraged to refocus their business on “core competences” (Hammer and Champy, 1993; Prahalad and Hamel, 1990). Third, managers were under pressure to close facilities and lay off 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 reorganized, 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.

The evidence shows that overall, the pressure of the financial community to push managers toward 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 that were targets of takeovers did have undervalued assets relative to stock prices. He shows that firms that 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 also evidence that shows how firms reduced the number of products they produced by engaging in mergers with 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).

SHAREHOLDER VALUE AND THE REORGANIZATION 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 U.S. 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 two centuries. Marx (1990) noted long ago that the main way that firms made money was by increasing the productivity of labor by substituting machines 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 to see that, in the United States, 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 capitalist 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 United States, corporate de-industrialization through downsizing was also the most active, resulting in a phenomenal shift from manufacturing to service industries (Baumol *et al.*, 2003). During the upswing of shareholder value ideas from 1978–1988, union participation rates fell from about 25% to 15% and they have continued to drift downward ever since (Mishel *et al.*, 2003). This is the period when the employers' resistance to trade unions became increasingly organized and legislatively supported (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.

These changes have been the focus of sustained research in literature on the reorganization of work (Baumol *et al.*, 2003; Gordon, 1996; Osterman, 1999), but 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 U.S. economy in the past 40 years has been in the service sector, and particularly 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 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 lay off workers. That managers have disinvested in manufacturing (at least in the United States) 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 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. 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 nonunionized 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 (Edwards, 1978). During the 1980s and particularly in the 1990s, U.S. corporations made huge investments in computer technology. These investments allowed many tasks to be performed both more quickly 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.*, 2002). Computers 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. Proponents of shareholder value argue that firms

engaging in maximizing shareholder value achieve more efficient allocation of resources and higher levels of profitability, which enables them to increase investments in new technologies and innovations. Agency theory provides justification for this expectation. According to the theory, a firm's investment decision, particularly regarding introduction of new technology, often involves a high level of risk due to the sunk cost. Although managers may be reluctant to make investments that will pay off in the long term, shareholders prefer the high-risk, high-return opportunities because they are protected by diversified stock portfolios (Alchian and Demsetz, 1972; Fama and Jensen, 1983). As a result, agency theory predicts that firms that maximize shareholder value invest more in innovative strategies and new technologies (Baysinger *et al.*, 1991; Kor, 2006).⁴ The effect of technology on the overall labor employed in the economy has generally been positive (Brynjolfsson and Hitt, 2000; Kelley, 1994). Although 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 the activities in which the firm is engaged. So, for example, firms may fire a large number 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. 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 on small and medium-size enterprises. This is because firms that competed with large 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

⁴ The argument of agency theory contrasts sharply with a popular criticism that shareholders and institutional investors pursue short-term financial returns, thereby discouraging firm's long-term investments in technology and innovations (Bushee, 1998; Scherer, 1984). Research evidence is mixed on whether or not the firms that maximize shareholder value do invest more in long-term innovation (see, e.g., Baysinger *et al.*, 1991; Graves, 1988; Koskisson *et al.*, 2002).

that firms have 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 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 article. 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. 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 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. The question is: Under what conditions might individual properties be constant across groups? Economists use industry data frequently (see, e.g., Baumol *et al.*, 2003; Hatfield *et al.*, 1996; Smyth, 1986; Wolff, 2002). 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: the individual-level processes for firms are going to be equivalent to the group-level processes for the industry.

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 that have been selected by these pressures have chosen the “right” strategies to survive and prosper while those that 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 toward conformity in an industry net of competition (DiMaggio and Powell, 1983). Although 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 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 article. 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 interested in how these processes affected firms, our results can be only suggestive and exploratory. The strength of our results certainly implies that it might be worth some effort to gather firm-level data to more directly test some of our hypotheses.

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 or absence of shareholder value ideas at the industry level as in the processes of reorganization in the industry that are consistent with the use of shareholder value tactics.⁵ The basic shareholder value hypothesis is that where profits are low, managers ought to engage in reorganization, the main forms of which are mergers and layoffs.⁶

Applying this hypothesis to the industry level, it follows that the industries where we expect there to be the most pressure for 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

⁵ For an attempt to directly measure whether or not firms adopt shareholder value rhetoric, see Fiss and Zajac (2004).

⁶ Another possible measure of shareholder value strategies is divestitures, but we chose to focus on mergers for two reasons. First, divestitures are often followed by mergers and acquisitions (Porter, 1987; Ravenscharft and Schere, 1987). Capron *et al.* (2001) demonstrated that divestiture is a logical consequence of a dynamic, structural reconfiguration process caused by mergers. Second, it is often argued that mergers and acquisitions, rather than divestitures, increase combined shareholder value of the acquiring firms and the target firms (Fluck and Lynch, 1999; Jensen and Ruback, 1983; Morck *et al.*, 1990).

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 workforces. Unionized workforces tend to be high cost. By closing down plants with union workers and opening facilities in nonunionized states and countries, industries might improve their performance.

Hypothesis 1a: Industries with low profits relative to assets are associated with a high level of mergers.

Hypothesis 1b: Industries with low profits relative to assets are associated with a high level of layoffs.

Hypothesis 1c: Industries with low profits relative to assets are likely to reduce the industry's reliance on unionized workforces.

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 mergers is 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 rationalize production, coordinate far-flung activities, and create larger oligopolistic industries.

Hypothesis 2a: Mergers are likely to produce layoffs in the industry.

Hypothesis 2b: Mergers are likely to push industry investment in computers 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, 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 the 1980s 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 leads to layoffs in the industry.

Hypothesis 4a: Mergers are likely to reduce the industry's reliance on unionized workforces.

Hypothesis 4b: Layoffs are likely to reduce the industry's reliance on unionized workforces.

Hypothesis 4c: Computer investment is likely 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 5a: Mergers increase the return on assets of industries, net of the growth prospects of any particular industry.

Hypothesis 5b: Layoffs increase the return on assets of industries, net of the growth prospects of any particular industry.

Hypothesis 5c: Computer investments increase the return on assets of industries, net of the growth prospects of any particular industry.

DATA AND METHODS

The data were collected from multiple 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 two-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.

Layoffs were counted from the *Wall Street Journal* articles in ProQuest's Newspapers Archive. 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, 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 counted only 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 were counted. We assigned two-digit SIC codes to each layoff incidence and counted the number of layoffs in each industry for each year.

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 nonincorporated self-employed respondents.

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 gross domestic product (GDP) were also available from a BEA series, "Gross Domestic Product by Industry and the Components of Gross Domestic Income."⁸

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

⁸ Retrieved on September 5, 2006 (http://www.bea.gov/bea/dn2/gdpyind_data.htm).

These estimates are based on data supplied by firms directly to the BEA. Although 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 Hatherley *et al.* (2005).

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 industry 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 an industry 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 an industry based on stock prices. Combining share price appreciation and dividends paid to shareholders, one can calculate total shareholder return (TSR), a popular measure used by financial analysts and proponents of shareholder value. There are a few practical reasons why we chose to use the profits/assets ratio 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 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. This will also be affected by the fact that those firms that 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 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 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 I summarizes descriptive statistic for the variables used in the analysis.

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 (Greene, 1996). To minimize the problem of reciprocal causation, the independent variables are lagged 1 year. We also included

Table I. 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	1,974.00
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

^aSource: *Mergers and Acquisitions*, yearly almanac.

^bSource: *Wall Street Journal* articles, ProQuest Electronic Database.

^cSource: March Supplement to the Current Population Survey.

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

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

in the model a lagged dependent variable. 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, t denotes the 16 years from 1985 to 2000, v_i is the industry-specific time-constant error, and 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.

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). This may be problematic as we aim to test several hypotheses that are causally intertwined. For this reason, we estimated seemingly unrelated regression (SUR) models with fixed effects. As proposed by Zellner (1962), a seemingly unrelated regression system refers to a set of linear regression equations that has contemporaneous cross-equation error correlation. Accounting for the correlated errors, seemingly unrelated regression model corrects the estimates. 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). We estimate our five equations simultaneously. Each equation has fixed effects to control for unobserved differences between industries.

RESULTS

Table II tests the various hypotheses put forward earlier, using seemingly unrelated regression with fixed effects. The first panel of Table II provides evidence on the determinants of changes in mergers at the industry level. The result supports Hypothesis 1a that decline in profits relative to assets in industries predicts 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 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.

Table II. 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 (0.014)**	0.003 (0.001)**	0.0002 (0.000)*	-0.002 (0.003)	-0.005 (0.002)**
Layoff (lag)	2.733 (0.916)**	0.082 (0.032)*	-0.002 (0.006)	-0.156 (0.203)	-0.403 (0.128)**
Computer (lag)	-3.035 (1.850)	0.199 (0.087)*	0.882 (0.012)**	-2.413 (0.401)**	0.154 (0.258)
Union (lag)	-0.002 (0.185)	-0.007 (0.009)	0.005 (0.001)**	0.164 (0.031)**	-0.084 (0.026)**
Profit/Asset (lag)	0.013 (0.248)	-0.028 (0.012)*	0.007 (0.002)**	-0.196 (0.055)**	0.399 (0.029)**
GDP (lag)	-6.912 (7.099)	0.187 (0.336)	0.115 (0.048)*	3.527 (1.567)*	4.478 (0.980)**
ΔMerger	-	0.005 (0.002)**	-0.0002 (0.000)	-0.004 (0.007)	-0.010 (0.004)*
ΔLayoff	2.249 (0.671)**	-	0.007 (0.005)	-0.074 (0.149)	-0.398 (0.093)**
ΔComputer	-4.659 (4.811)	0.367 (0.227)	-	2.078 (1.063)#	3.350 (0.667)**
ΔUnion	-0.075 (0.144)	-0.003 (0.007)	0.002 (0.001)#	-	-0.085 (0.020)**
ΔProfit/Asset	-0.488 (0.228)*	-0.046 (0.011)**	0.008 (0.002)**	-0.214 (0.050)**	-
ΔGDP	20.816 (12.028) #	-0.769 (0.567)	0.054 (0.081)	6.430 (2.656)*	21.640 (1.522)**
Constant	1.310 (1.008)	0.029 (0.048)	0.042 (0.007)**	-0.240 (0.223)	0.094 (0.141)
N	992	992	992	992	992

Note: Standard errors in parentheses. ** $p < .01$, * $p < .05$ (two-tailed tests), # $p < .05$ (one-tailed tests)

Here, layoffs, which are generally caused by poor economic conditions, are precursors to subsequent mergers.

The second part of Table II 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 2a. 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. This means that capital investments were being used by managers to reduce their workforces, 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 1b. The result implies that industries with firms that were not performing well felt compelled to lay off workers either to raise their stock price or to adjust to their business conditions.

The third column of Table II 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 Hypotheses 2a and 2b. 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. As predicted in Hypothesis 2b, 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 workforces.

One of the causes of computer investment was certainly the spread of shareholder value strategies to revive declining industries; however, 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 II 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 workforces in the subsequent year, which is contrary to the prediction in Hypothesis 1c. 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 aimed at reducing the number of unionized workers, as in Hypothesis 4c, is mixed. The level of unionization has a negative and significant coefficient, while the change in unionization has a positive and marginally significant ($0.05 < p < 0.10$) coefficient. In industries with a high level of computer investment, unionized workers decreased in the subsequent period. In industries where investment in computers increased, however, unionization rates were likely to increase, too. There is little support for Hypotheses 4a and 4b. Mergers or layoffs are not significantly associated with changes in unionization rates at the industry level.

The last column of Table II considers whether any of these changes produced growth in profits. Here, 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 finance, trade, and service industries, it is not surprising that their profits grew the most. Contrary to Hypotheses 5a and 5b, 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 (Andrade *et al.*, 2001; Caves, 1989) and layoff announcements (Blackwell *et al.*, 1990; Worrell *et al.*, 1991) had a negative impact on market values. 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. Hypotheses 1a, 1b, and 1c tested the basic shareholder value assertion that industries with low profits should have reorganized. Low profits were related to subsequent mergers and layoffs. Hypotheses 2a and 2b suggested that industries where mergers are active would engage in layoffs and computer investment. Maximizing shareholder value implied buying up other firms and rationalizing costs to increase profits by downsizing the 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, 4a, 4b, and 4c suggested that such efforts should be particularly aimed at downsizing the workforce, particularly at reducing the number of unionized workers. We found that a high level of investment in computer technology did increase layoff announcements, and that computer investment was associated with a low level of unionization rates at the subsequent period. This is consistent with the view that firms were trying to rid themselves of high-priced labor by investing in computer technology. Finally, contrary to Hypotheses 5a and 5b, 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, which supported Hypothesis 5c.

CONCLUSIONS

The U.S. 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. 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 finance, trade, and services, and the increased use of computer investments, which led to 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 U.S. business but was part and parcel of “maximizing shareholder value.” Although de-unionization and computerization were going on in the U.S. economy well before the 1980s, the implementation of shareholder value tactics pushed these processes forward. Computer technology was being used strategically by managers who engaged in mergers to reorganize the workforce. They deployed it to decrease their dependence on labor 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 (Andrade *et al.*, 2001; Caves, 1989; Ravenscraft and Scherer, 1987; Scherer and Ross, 1990). 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 (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 postmerger 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 DiMaggio and Powell, 1983; Meyer and Rowan, 1977).

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. Relationships that are found among the industry-level measures may not be the same as actual relationships between firms. Nevertheless, we hope that our study demonstrates significant variations between industries that we suggest are the consequences of firm-level changes. We did reproduce one of the main results in the literature at the firm level at the industry level: industries that had mergers and layoffs did not attain higher profits. 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. Future work should try to construct such data sets. One strategy might be to gather data on variables like we used here on all publicly held corporations over the era.

A useful avenue to explore is to try to explicitly link the changes in industries that reflect reorganization to changes in how workers were treated. One can take a neo-Marxist 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 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 neo-Marxist view of the reorganization of production whereby technology is used to de-skill 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 how it makes workers more insecure (Gordon, 1996; Osterman, 1999; 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.

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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