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EXAMINING THE INCIDENCE OF DOWNSIZING AND ITS EFFECT ON ESTABLISHMENT PERFORMANCE

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ABSTRACT

The interest in examining job security and job stability has been driven in part by the phenomenon of downsizing. The distinctiveness of downsizing, as opposed to more traditional layoffs, is that the job cuts do not necessarily appear to be driven by shortfalls in demand but instead appear to be driven by the search for operating efficiencies. Despite the interest in downsizing, there has been essentially no serious investigation into its causes. I distinguish downsizing from job cuts associated with shortfalls in demand and find that employment and management practices over which employers have control, such as severance pay and profit sharing, are important predictors of subsequent downsizing and more general job losses. Surprisingly, excess operating capacity is not necessarily related to more general job losses at the establishment level. I also examine the relationship between both job losses associated with shortfalls in demand and downsizing and subsequent financial performance. The results suggest, among other things, that downsizing reduces labor costs per employee but also sales per employee. Job cuts associated with excess capacity appear to be somewhat more successful at improving sales per employee than is downsizing.

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Introduction

"Downsizing" is a term that was introduced to describe the contemporary development of permanent job cuts motivated by an effort to improve operating efficiency, not necessarily because of declines in business.[1] Downsizing has received a great deal of attention, especially in the business press, in part because it appears to represent something of an enigma. Academic research and casual observation before the early 1980s suggested that employment levels, and reductions in jobs, were derived in a straightforward way from the demand for a firm's product or services. Most layoffs were seen as driven by business cycles, they were temporary in that employees were rehired when product demand returned, and they concentrated on production workers. The exceptions were typically limited to industry-specific market changes; the long-term decline of an industry, such as coal mining, or the movement of industries overseas, such as textiles. Virtually all of the public policy attention given to unemployment centered on the view that job losses are driven by cyclical or structural declines in product demand.

After the 1980s, however, the above description no longer seemed complete. Layoffs were more likely to be permanent. And while business cycles still drove unemployment rates, they did not neatly explain corporate layoff announcements, now labeled as downsizing. As noted below, the companies having downsizings did not necessarily appear to be in financial distress. The perception that even successful companies could improve their financial performance by downsizing led to a series of studies of the financial consequences of downsizing decisions (see below).

The main empirical question about downsizing, and the focus of this paper, is to examine the factors that cause it. There have been no prior studies of the determinants of downsizing and only a handful on related topics such as plant closings. The most important empirical challenge facing such investigations is how to define and then measure downsizing. The studies of the *consequences* of downsizing either rely on firms to self-identify when they have had a downsizing or on announcements in the media. I take a different approach and define downsizing as reductions in jobs driven by the desire for operating efficiencies and distinguish it from more typical layoffs associated with shortfalls in demand. One might think of downsizing, therefore, as being driven by developments inside the firm, in its production function, as distinguished from changes in the product market and product demand. I can identify such situations indirectly by controlling for cases where establishments experienced a shortfall in demand as well as for other unrelated sources of job loss such as outsourcing. Job losses in the remaining cases are defined as downsizing. I examine the factors that explain both general job losses and downsizing across a national probability sample of establishments using hypotheses associated with management practices, most commonly as they relate to incentives to cut the use of labor. Finally, I relate job losses and downsizing to the subsequent performance of the establishments, contributing to the growing literature on the consequences of job losses for firms.

The Downsizing Construct

Downsizing represents for many the most obvious manifestation of a perceived decline in the nature of the employment relationship as it relates to job security. In particular, the perception that even profitable companies can raise the price of their

stock by making downsizing announcements seems to have stood on its head the conventional wisdom that layoffs were a sign of trouble for firms, something that happened when their businesses were failing. As Hallock (1998) observes, the belief that companies reward those CEOs who downsize their operations fed the perception that downsizing is good for companies. (Whether these perceptions are justified is another matter, as discussed below.)

Much of the concern and interest in downsizing has focused on large corporations where the perception had been until relatively recently that most employees, especially managers, could have expected lifetime jobs, subject to adequate performance (see, e.g., Kanter 1977). Finding systematic evidence of the change in practice can be difficult, however. The job security that existed in most companies was an implicit policy that was never written in employee handbooks. It is difficult, therefore, to use changes in explicit policies as a measure of the change in job security. But there are anecdotes describing changes in policies associated with employment security. The authors of the book "The 100 Best Companies to Work for in America," for example, found ten of those companies with explicit no layoff policies in the previous decade but only two of them still had such policies in 1997, one of which was privately held (Levering and Moskowitz, 1993; Mother Jones 1997). A bench marking study of leading companies conducted by the Corporate Leadership Council found an important change in their expectations about career development as compared to the previous decade. They found that companies were now planning explicitly on managerial jobs having on average a three-to-four year lifetime with the expectation that the incumbents would leave in that time period, as opposed to what had been the expectation that employees would, on average, remain until they retired (Corporate Leadership Council 1995). A recent survey of large employers conducted by the Conference Board reported that 69 percent of those companies had abandoned policies of job security for their employees; only three percent said that they still had such policies (Conference Board 1997). This result in particular seems suggestive of important change, but in the absence of a representative sample, it is difficult to interpret its significance.

The appearance of the concept of downsizing began after the recession in 1981-83. The layoffs were initially driven by sharp declines in business and were seen as traditional, temporary layoffs. Sixty-one percent of the human resource executives surveyed by The Conference Board thought that by 1984, the downsizing trend was losing its momentum (Gorlin 1985). By 1991, in contrast, a similar Conference Board survey found more than half of the executives believing that downsizing would continue to be necessary indefinitely to maintain competitive firms (Johnson and Linden 1992). That year, other surveys reported that 22 percent of the companies were planning to make cuts in their workforce. In fact, 46 percent of those companies, twice as many, ended up cutting workers (Ehrbar 1993).

The American Management Association (AMA) has surveyed approximately 1,000 of its member companies about downsizing every year since 1990. Although the AMA membership is no doubt different from the population of all employers, even from the average large employer by virtue of their membership in that organization, the trends in their experience over time may be instructive. The AMA surveys found that the incidence of downsizing increased every year until 1996 when 48.9 percent

of companies reported having at least one downsizing wave that year, only a trivial decline from 50 percent the year before. (The AMA survey essentially counts every incidence of a layoff as a downsizing and in that sense is more a measure of occurrence than of the intensity of job loss.) Downsizing therefore increased across companies even as the economy expanded following the 1991 recession. Hallock's (1998) calculations of layoff announcements (not necessarily downsizing per se) finds that they increased in the 1990s as compared to the 1980s.

And the causes of downsizing as reported in the AMA annual surveys also changed. In the early 1990s, virtually all respondents cite overall economic conditions as an important cause of downsizing. By 1996, however, most cite restructuring (66 percent) as the cause, and most of the companies reporting cuts are now profitable in the year they are cutting (American Management Association 1996). In more recent years, firms are hiring at the same time that they are downsizing. The AMA survey indicates that 31 percent of firms in their survey were adding workers at the same time as reporting job cuts in 1996 while the average firm reporting that they had a downsizing in fact was growing by 6 percent.

Evidence from Data on Individuals

The firm-level data above are suggestive of interesting and potentially new relationships with job loss. But because the surveys from which they are derived are proprietary and typically use non-representative sampling frames, it is difficult to use them as the basis for conclusions about the economy as a whole. In contrast, a considerable literature has developed on the labor market experience of individuals to examine questions related to downsizing. Although it is only suggestive of employer practices, this literature has the advantage of being based on representative samples. Many studies find increases in job losses of a kind associated with changes in the nature of employment security and in the factors shaping it. Medoff (1993) finds that the proportion of prime-age male workers (age 35-54) who were permanently (as opposed to temporarily) displaced from their jobs almost doubled between the 1970s and the early 1990s. Farber (1997; 1998) concludes that the overall rate at which workers have been permanently displaced backed down a bit during the late 1980s from the peak of the 1981-'82 recession period but then rose again -- despite the economic recovery -- and jumped sharply through 1995 (Farber 1997; but see Polivka 1998 for concerns about data problems that may have inflated more recent figures). The rate at which workers were thrown out of their jobs was almost as great in 1993-'95, a period of significant economic expansion and prosperity in the economy as a whole, as compared to 1981-'83, the worst recession since the Depression. And the cause of the job losses has shifted away from economy or company-wide reasons, such as downturns in business or plant closings, toward eliminating particular positions associated with.

The downsizing of white-collar and management employees whose jobs were traditionally the most protected is another aspect of changing practices with respect to layoffs. The data on the experience of individual workers suggests that the rate of displacement was actually higher for managers and white-collar workers in the 1980s than for other occupations, controlling for

other characteristics (Cappelli 1992; Kletzer 1997). It rose sharply through the early 1990's but appears to have declined somewhat from 1993-95 (Farber 1997). Older and more educated workers, the kind one would expect to find in "better" jobs and more buffered by the organization from market pressures, seem more likely to be displaced in the early 1990s as compared to earlier periods (Gustman et al. 1995; Farber 1996), with the reasons for the increase in job losses for these groups also attributed more to internal restructuring (e.g., "position abolished") as opposed to external economic conditions (Farber 1997).

Another body of research that may add to an understanding of changing employment relationships are the studies of changes in average employee tenure, a measure driven by the combination of voluntary and involuntary employee turnover. Turnover for the average employee seems quite stable over time (although not for all demographic groups) as estimated by data from both the Current Population Survey and the Panel Study of Income Dynamics (see, e.g., Jaeger and Stevens 1998). Neumark and Polsky (1998) find that overall turnover, while stable in the 1980s, appears to have risen somewhat in the mid-1990s, even for managerial employees who have traditionally been seen as having significant job security. The more relevant question for downsizing and job security more generally, though, is whether involuntary or employer-initiated turnover has increased. The answer appears to be yes. Polsky (1999) examines whether there has been an increase in employer-initiated job loss, such as layoffs, using the Panel Study of Income Dynamics (PSID). He compares 1976-1981 and 1986-1991 and finds that while the overall rate of employee turnover was similar, involuntary job loses were greater, especially for older employees and those with more tenure with the employer, the group traditionally associated with internal labor markets. Boisjoly, Duncan, and Smeeding (1998) find similar results with the same data. Valletta (1996) reports that the proportion of the unemployed accounted for by permanent dismissals (technically, non-layoff job losers) rose through the 1980s and early 1990s.

Together, both the limited descriptive data on employer layoff decisions and the more representative studies of employee job loss and turnover suggest that the factors driving contemporary job loss may be different than in the past. They appear to relate less to downturns in product demand and more to internal factors associated with management decisions.

Research on Downsizing

Despite the popular attention given to downsizing and the continuing stream of studies about job security for individual workers, there has been essentially no research directed at the causes of downsizing. A growing body of research on the consequences of downsizing developed to address the perception that firms could improve their financial performance by downsizing. Although these studies do not relate to the central question here – what explains employer downsizing – they may shed light on how to conceptualize and measure downsizing. These studies include Abowd et al. (1990), Caves and Krepps (1993), and Worrell, Davidson, and Sharma (1991), all of which find that, on average, financial performance as measured by stock prices seems to decline following downsizing (for similar results see also DeMeuse et al. 1994 and Iqbal and Shetty 1995, and Gunderson, Verma, and Verma 1997 for Canadian firms). At least some part of the negative performance of the firms can be traced to a wide range of adverse effects on the workforce (see, e.g., Brockner 1992 and Cameron 1995 for surveys).

But some studies also find that performance improves after downsizing for firms with certain characteristics. Worrell et al. (1991) find that firms with restructuring plans as part of their downsizing effort show an improvement in stock prices following downsizings. Cascio, Young, and Morris (1997) take a longer time horizon, examine several different model specifications, and find some positive relationships between reductions in employment and financial performance although the relationship was generally negative. A study of the positive effects on performance associated with downsizing at General Dynamics suggests that the restructuring of firm operations and management that presumably drove much of that company's improved performance both led to and was facilitated by downsizing (Dial and Murphy 1995).

The central analytic problem facing studies of downsizing is to define it and differentiate situations where employers are cutting jobs because they already have financial problems from those where they are cutting jobs in order to seek new efficiencies. The data outlined below make it possible to address this issue and to contribute to the literature on the relationship between downsizing and performance effects.

There is also a body of research on plant closing decisions and firm financial performance, decisions not identical to downsizing but perhaps similar enough to shed some light on how to conceptualize downsizing. Blackwell, Marr, and Spivey (1990) observed early on that negative relationships between plant closings and firm financial performance may be spurious because such decisions are associated with and difficult to untangle from the overall competitiveness of firms. Gombola and Tsetsekos (1992) find that while plant closing decisions in general hurt share prices, they do not do so for firms that are financially secure. These results appear to be consistent with the view in the downsizing studies that cuts in struggling firms help identify those firms that are already declining while cuts in more successful firms may proxy efforts to restructure and reposition their operations. Kalra, Henderson, and Walker (1994) find a similar result, that plant closings may be associated with improved performance when firms are restructuring.

One of the drawbacks with the above studies is that, because they use stock prices as a dependent variable, they are limited to publicly-held companies. And the unit of analysis must be the entire corporate entity, often far-removed from where employment decisions are made; a massive company like General Electric with hundreds of divisions and facilities is counted as a single observation because it has a single stock price. Baily, Bartelsman, and Haltiwanger (1996) take a different approach and examine the effects of job reductions on plant productivity using plant-level data from the U.S. Bureau of the Census. They find a range of results, concluding that downsizing plants had only slightly more productivity growth than did plants that were increasing employment.

The more fundamental complication illustrated by all of these studies is the problem of defining and then measuring what counts as a downsizing. The studies of downsizing announcements rely on firms to self-identify through their public announcements that they are having a downsizing and to define it consistently.[2] Not all reductions in employment merit public announcements, exactly what type of job cuts get labeled as downsizing will differ across firms, and, as noted above, actual cuts

do not seem closely related to planned cuts. In that sense, studies of downsizing announcements appear to be measuring something that may differ systematically from actual job losses, perhaps in part something about the effects of public statements or about unobserved characteristics associated with the type of changes that merit such announcements. To illustrate, Hallock's (1998) study of layoff announcements finds that the initial positive relationship between layoffs and CEO pay (presumably motivated by the perception that layoffs improve firm performance) in fact appears to be driven by firm characteristics that are associated both with CEO pay and with the layoff decision. When one controls for those characteristics, the relationship between layoff announcements and pay disappears.

The Baily et al. (1996) study takes the simpler approach of examining actual employment changes while the Cascio et al. (1997) study defines "employment downsizers" as companies that cut employment more than they cut plant and equipment. The Cascio study is an attempt to differentiate job cuts associated with declines in business activity from what might be thought of as "true" downsizing, job cuts designed to increase efficiency by operating with proportionately fewer employees.

Modeling the Downsizing Decision

The research above suggests the importance first of defining downsizing clearly and consistently. I define downsizing as job cuts driven by pressures for increased efficiency in the use of labor, as opposed to declines in demand. The way to begin conceptualizing downsizing, therefore, is to think about the factors that drive reductions in jobs – essentially reductions in labor demand – and then to differentiate which of those factors are consistent with the drive for improved efficiency. The demand for labor is typically seen as derived from the demand for the final product or service produced by the firm through a production function that represents how labor and capital are combined to produce final products (see, e.g., Hamermesh 1993). Reductions in the level of demand for that product or service lead to reductions in the demand for labor of the kind traditionally associated with layoffs: Especially if the firm is a price taker in its factor markets and cannot cut wages and other factor prices, then it will respond to a decline in product demand by attempting to reduce inputs and lay off employees. There are a wide range of forces and developments that might cause the demand for a firm's final products to decline, such as general business cycle conditions, changes in import penetration, or other industry and firm-specific effects. For the purposes of estimation, they operate by reducing effective product demand and creating excess capacity.

Factor Prices: Changes in the input mix within a given production function represent the other main cause of reductions in the demand for labor, the kind associated with the concept of downsizing as I define it. Changes in the input mix, within a given production function, represent perhaps the best-known conceptual illustration of developments within a given production functions that would lead to reductions in the demand for labor: employers substitute other, cheaper factors for labor and reduce their use of labor in the process. Wage rates and changes in the price of various factors that substitute for labor such

as technology or even management practices that might economize on the use of labor are examples of these factor prices. (Of course, changes in factor prices may also affect product prices and, in turn, product demand and the derived demand for labor.)

Employment practices may affect the ability to substitute other factors for labor by changing the costs of laying off employees. Severance payments and employer pension obligations may be the clearest examples. The presence of unions and collective bargaining agreements can also restrict management's ability to adjust employment. The use of part-time and temporary employees, in contrast, may provide a substitute for downsizing by making it easier to adjust the total hours of work by reducing contract work without cutting employees.

Efficiency Parameter: The other explanation for downsizing relates to the general efficiency parameters in production function models. They represent the technology, broadly defined, for combining labor and other factors into final products. The typical assumption is that efficiency parameters are fixed in a given production function, although no doubt employers have some choice of practices within a given production function (see below). Firms may have choices *among* production functions, however, and essentially among different efficiency parameters.

One basic choice firms have that no doubt affects their basic operation and their production function is business strategy. The traditional concept of business strategy is competitive strategy, how a firm positions itself against competitors in a given product market. The notion behind competitive strategy is that firms have choices and discretion in selecting niches within markets. Porter's (1985) framework describing the competitive strategy choices that firms have is the best-known. He argues that each strategy choice has implications for the internal structure of the firm, including employment practices. These practices, in turn, have implications for job security and downsizing.

Practices and Incentives: The distinction between substitution of other factors for labor within a given production functions and the shift to different production functions that use less labor is easier to establish in theory than in practice. For example, whether the automation of a production operation represents only substitution of capital for labor within a production function or a move to a new production function altogether may be difficult to distinguish empirically. Doing so would require, among other things, estimates of the firm's production frontier.

It is possible to identify some changes in practices that are directly associated with shifts within or between production functions. It may be easier to identify the different incentives that managers have to pursue more efficient operations that reduce the use of labor and relate them to downsizing. The classic argument about the operation of modern, publicly held firms is that managers pursue their own interests and do not necessarily maximize efficiency because their interests are not aligned with those of the shareholders (Berle and Means 1932). Arrangements that align the interests of the managers who operate the companies with those of the shareholders are thought to change the operation of firms in fundamental ways, such as reducing excess jobs (Lichtenberg and Siegel 1992; Matsusaka 1993). Programs like stock options for managers are perhaps the most obvious

attempts to create these incentives for managers to act like stockholders in their execution of managerial responsibilities, changing the way firms operate.

In a typical production function like the well-know Cobb-Douglas form where $\mathbf{Y = AK^{\delta}L^{1-\delta}}$, then the arguments above about the practices that may affect overall efficiency of the function relate to the general efficiency parameter **A**. Changes in the distribution parameter δ reflect general technological changes, as well as changes in employment practices that affect the ability to substitute other factors for labor. The general cost of labor, and the employment practices that influence these costs, relate directly to the incentives to substitute capital (as well as other factors) for labor. The cost of labor relates directly to the incentives to substitute capital and other factors for labor. Changes in the demand for the output **Y** are the basis of the derived demand for labor. Reductions in that demand are behind traditional capacity-related layoffs. Changes in factor prices, the distribution parameter, and the efficiency parameter, in contrast, are associated with the more contemporary phenomenon of downsizing as defined above.

The analyses that follow examine the extent to which variables associated with the potential substitution of other factors for labor and with the shift to more efficient production regimes explain the incidence of more general job reductions and then the specific case of downsizing.

Data And Analyses

The EQW National Employer Survey: In order to examine the causes of downsizing, we need data about changes in employment, about product demand and related firm characteristics, and about management practices at the establishment level where downsizing decisions take place, a combination that has been difficult to find in the same data set. A recent establishment-level survey of employment practices conducted by the Bureau of the Census for the National Center on the Educational Quality of the Workforce (EQW) contains such data and allows us to address some of the above questions.

The EQW National Employers Survey was administered by the U.S. Bureau of the Census as a telephone survey in August and September 1994 to a nationally representative sample of private establishments with more than 20 employees. It is structured to provide information on all categories of incumbent workers, not just new hires or those in core occupations.

The survey over sampled establishments in the manufacturing sector and establishments with more than 100 employees. Public sector employees, non-profit institutions, and corporate headquarters were excluded from the sample. Although the survey excluded establishments with less than 20 employees (which represent approximately 85 percent of all establishments in the U.S.) the sampling frame represents establishments that employ approximately 75 percent of all workers. This is because while most establishments are small (fewer than five employees), most workers are employed in larger establishments. The survey concentrates on those establishments with the most employees. The target respondent in the manufacturing sector was the plant manager and, in the non-manufacturing sector, the local business site manager.

The sampling frame for the survey was the Bureau of the Census SSEL file, one of the most comprehensive and up to date listings of establishments in the United States. Of the 4,633 eligible establishments who were contacted by Census, 1,275 refused to participate in the survey. This represents a 72 percent response rate, which is substantially higher than similar establishment surveys.[3] The usual reason given by employers about why they would not participate in the survey was that they did not participate in voluntary surveys or were too busy to participate. Probit analysis conducted by Lynch and Black (1995) of the characteristics of nonrespondents indicates that there was no significant pattern at the two digit industry level in the likelihood of participating in the survey. The only differentiating characteristic of establishments less likely to participate was that manufacturing establishments with more than 1000 employees, 0.1 percent of the sample, were less likely to do so. Of the 3,358 establishments who participated in the survey, not all respondents completed all parts of the survey by the interview cutoff date of October 1, 1994. The final number of surveys in which all parts of the survey were completed was 1,621 establishments in the manufacturing sector and 1,324 establishments in the non-manufacturing sector. This represents a 64 percent overall 'completed' survey response rate. For the analyses below, we restricted the sample to establishments reporting useable data for all questions used in any of the regressions to ensure that differences across specifications or across different dependent variables do not reflect changes in the sample.

The questionnaire was designed to allow for multiple respondents. Establishments that kept financial information in a separate office, such as corporate headquarters for multi-establishment enterprises, could have that information reported directly. Computer Assisted Telephone Interviewing (CATI) was used to administer each survey, which took approximately 28 minutes to complete.

The survey was repeated again in August of 1997 (NES II) and administered by the U.S. Bureau of the Census via CATI. The sampling frame was again drawn from the SSEL, targeting business establishments throughout the United States and excluding those with fewer than 20 employees. The survey over-sampled the nation's largest establishments and those in the manufacturing sector. The sample for the NES II has three components including; an over sampling of states involved in particular educational reform efforts (2,000 completed interviews in California, Kentucky, Michigan, Maryland, and Pennsylvania); approximately 2,500 completed interviews that comprise a representative sample of the rest of the United States (45 states plus the District of Columbia); and a longitudinal component of about 900 completed interviews with business establishments that had participated in the initial National Employer Survey, the component of interest for this paper. A total of 5,465 establishments responded to NES II for a response rate of 78 percent. Nine hundred and fifteen responded to the longitudinal component for a response rate of 88 percent. Excluding partial responses brought the sample down to 766 and a completed response rate of 74 percent. The data became available for use at the Bureau of the Census in January 1998.

Variables and Specific Hypotheses

In contrast to prior studies that used the corporate entity as the unit of analysis, this study examines the establishment where actual job reductions can more reliably be tallied and linked to practices. The NES survey measures downsizing with a variable that reports the change in employment at each establishment from 1991 to 1994, from 1994 to 1997 in the NES II, and if so, by what percentage. The Table 1-A presents first the average employment change by establishment (reported as well only for establishments that were decreasing and then increasing employment) for two digit industry and size category and according to their level of operating capacity for the period 1991-1994 for the full sample of observations. Table 1-B presents similar statistics for those establishments that were operating at or above capacity in 1991-1994. Table 1-D repeats the descriptions presented in 1-A using data for the period 1994-1997, and Table 1-E repeats the descriptions offered in Table 1-B for establishments operating at or below capacity in 1994 using employment change data for 1994-1997, again for the full sample.

[Table 1 Here]

Job loss and Downsizing Variables: The creation of the downsizing variable begins with the more general measure of employment change over time, from 1991-1994 in the NES and from 1994-1997 in the NES II. This measure is then converted into a measure of job reduction: 0= if employment was unchanged or increased; the percentage change if it decreased. The variable that results contains more information than would a simple dummy variable for whether jobs declined. But the variable is truncated at zero, suggesting the need for estimation techniques associated with limited variables such as Tobit procedures.

The measure of downsizing needs to differentiate reductions in employment that are associated with declines in business -- more traditional layoffs -- from those associated with production function changes that correspond to the notion of downsizing. The NES 1994 includes a question that captures whether the establishment is experiencing a shortfall in demand. It asks whether the establishment is operating below capacity (=1 if operating below capacity; 0 if at or above capacity). Establishments operating below capacity may not have enough business to keep the current workforce employed and might be expected to have layoffs of the traditional kind. Establishments that cut jobs even when they are at or above their normal operating capacity, in contrast, fit the notion of downsizing defined as job cuts driven by the changes in the production function in pursuit of improved efficiency.

The most straightforward way to incorporate this measure of excess capacity into a measure of downsizing is to include in the analysis of downsizing only those establishments that are operating at or above capacity. The middle column in Tables 1-B (for 1991-1994) and 1-D (for 1994-1997) present statistics for those establishments that meet the definition set out here for downsizing -- operating at or above capacity and have decreased employment during the period. Establishments that fit the downsizing definition tend to be somewhat larger and less concentrated in manufacturing than the average establishment for the 1991-1994. These differences are less pronounced for the 1994-1997 period.

It is also important to distinguish job reductions associated with outsourcing from downsizing. For example, an employer who contracts out some function such as janitorial service to an outside vendor would experience a reduction in their

total "employment" even though the total number of workers performing tasks for the enterprise has not changed. The variable measuring the total value of goods and services other than labor used in production includes contracts for materials and services that have been outsourced and should help control for these situations.[4]

The decision to examine employment declines per se, as opposed to looking more generally at all changes in employment, may seem obvious given the interest in understanding the factors driving downsizing and not job change more generally. But to do so requires the assumption that the factors driving reductions in employment are different from those that drive employment increases, that downsizing is more than just a special case of job change. If one thought that increases in jobs were explained by the same factors as decreases, then it could be difficult to argue that downsizing merited examination on its own. If, on the other hand, one believes that the factors driving downsizing are different from those behind job growth, then a separate examination of downsizing is warranted. The suggestion that management practices, such as those that increase fixed labor costs, have distinctive effects on downsizing suggests that the causes are different. There is also empirical evidence for that view. Studies like Davis and Haltiwanger (1992), for example, find that the factors driving job loss in their sample are different from those driving job creation. The analyses that follow test whether reductions in employment should be examined separately from increases in jobs.

Independent Variables

The independent variables used in the analyses are described in Table 2. The basic model predicting job loss and downsizing includes control variables describing important aspects of establishments such as their size, age, and capital structure. Including controls for industry presumably helps control for some of the industry-specific product market conditions that drive demand-related job reductions, but excluding industry controls makes it possible to identify the effects of sources of downsizing associated with variation across industries. Additional analyses, available on request, indicate that industry control variables are jointly insignificant predictors of both employment losses and downsizing as defined here. In virtually all cases, they are individually insignificant as well and have little substantive effect on any of the results examined by the hypotheses. They are therefore not included in the analyses presented here.

[Table 2 Here]

The analysis begins with variables that might capture factor price changes that create incentives to reduce the use of labor. The first of these is compensation levels. An important issue with wages is the extent to which they are above market levels, a calculation that requires standardizing for job requirements, worker characteristics, and local labor markets. The alternative used in these data is simply to ask respondents whether they believe that their establishment's *compensation* for each of five different occupational groups is high or low (with on level the omitted category) compared to their competitors. The associated share of the workforce accounted for by each occupation is included to differentiate the effect of having higher compensated employees from greater use of more expensive employees such as managers.

The next set of variables examining possible substitution effects includes the presence of a union, associated with wage premiums and work rule restrictions that raise labor costs. Union contracts may contain restrictions on layoffs that raise the costs of downsizing (e.g., Allen 1986; Rees 1989) that may mitigate the incentive to cut jobs that the higher costs create. Severance pay obviously raises the costs of downsizing (Lazear 1990) as do pensions on the assumption that at least some pensions are defined benefit plans where the employer's obligations to vested employees do not end when employment is terminated. (Even if the pension plan is fully funded for vested employees, the employer nevertheless loses in this scenario by having to pay out the pension benefits for the former employee while not having their productive work and at some point possibly replacing them with a new hire whose pension must be funded. The data unfortunately do not provide information on the type of pension plan.) The presence of temporary help may also reduce the extent of downsizing by providing a substitute for it: Employers can easily reduce hours of work by cutting back on temps without having to downsize. Part-time workers may also be easier to cut than other workers as they may have a more casual relationship with the employer and fewer severance-related benefits. But because they count as part of the workforce in calculating downsizing in these data, they should be associated with increased use of downsizing.

The final set of variables relates more directly to changes in the efficiency of production functions or shifts to new production functions that use less labor. Some management practices may reduce the need for employees. The variables measuring efforts to restructure the firm include whether the number of levels in the organizational hierarchy or chart have changed in the past three years. Flattening the organizational chart does not automatically imply a reduction in jobs, as positions are typically retitled in the process. But they may well go together, and reducing the organizational chart may also proxy other changes that eliminate jobs such as decentralizing authority. The percentage of employees in self-managed teams, for example, reduces the need for supervisors and associated management support. Ideally, we would want to know when this practice was introduced (information that is not available) because potential reductions in employment presumably occur as a result of their introduction. There is some evidence that these practices are a relatively recent innovation, not likely to be in place before the 1990s, however (see Osterman 1994, e.g.). And it may take some time for their effects to play out even well after they are originally introduced.

Other variables help capture both the incentives and opportunities to shift toward more efficient operations using less labor. Competitive strategy is measured by four questions representing Porter's (1985) generic strategies: "competing on price," "competing on innovation," and "competing by tailoring products to customer needs" with "competing on quality" as the omitted variable. Each strategy choice, as noted above, has been associated with distinctive employment policies. Miles and Snow (1978), among others, have articulated how different employment practices are associated with different business strategies, how those strategies create continuing incentives to change employment levels. In particular, the "competing on quality" dimension (the omitted category) is thought to require long-term, stable employment relationships first because secure, committed workers

are more likely to care about quality and second because long tenure may be required to understand jobs and products well enough to improve quality continuously. The "competing on price" dimension requires low cost, creating incentives to cut jobs and costs where possible. "Competing on innovative products" and "tailoring products to specific customer needs, " the other two dimensions, are somewhat more ambiguous in their relationship with downsizing. They may demand flexibility that requires firms to restructure, possibly shedding workers in the process. Innovative firms in particular may find better methods that use less labor.

Total quality management programs (TQM) involve employees and the entire organization in problem solving exercises that are designed to reveal opportunities for improvements in quality and efficiency. Most of the formal TQM programs require that employees be protected from any layoffs that new efficiencies might produce (see, e.g., Walton 1986) even though the process may well reveal opportunities for cutting jobs. Whether the establishment has a research and development (R&D) function and, if so, how important it is to the organization may indicate something about the level of continuing technological innovation in the establishment. Innovation may suggest a greater use of new methods and efficiencies. But establishments with important R&D priorities may also be ones where seeking cost efficiencies in production are less important than other goals. The use of computers may proxy the extent to which the establishment is involved in substituting capital for labor. Again, it would be useful to know about the introduction of computers as well as the level of use. As with the self-managed team variable above, it may also reduce the need for labor not only after it was introduced but sometime thereafter.

Variables measuring the compensation structure for managers and employees help capture the incentives for the employers to secure improvements in efficiency that might lead to reductions in employment. Stock options, for example, creates incentives for managers to act like stockholders, cutting costs -- including excess employees -- in order to increase the value of their shares. Profit sharing may do something similar, especially for managers who have the ability to make decisions about the use of labor. Profit sharing for other employee groups may be associated with participative programs that empower employees, creating both the incentive and the ability to reduce jobs (possibly through attrition) in order to increase profits. Variables measure whether or not the establishment offers stock options and profit sharing, the latter measured for each of the five occupational categories. Here again, it would be interesting to have data on the introduction of these practices, information that is unfortunately not available. But these practices clearly create incentives to seek efficiencies in the use of labor that continue as long as they are in place.

It may be helpful to outline the source and time period of the data that will be used in the analyses to help understand both its strengths and its limitations:

VARIABLES	**1994 NES – Year Measured**	**1997 NES II – Year Measured**
Job Loss	1991-1994	1994-1997

Operating Capacity	1994	Not available
Independent Variables and Performance Measures	1993-'94	1996-'97

Job losses are measured over a period of time while the other variables, especially operating capacity, are measured only at a point in time.[5] It is arguably better to have the measure of operating capacity at the beginning of the period over which job loss is measured rather than at the end. It is certainly possible that the characteristics measured by the independent variables were the same at the end of the period measuring employment changes as at the beginning. But the causal relationship is obviously easier to establish if the independent variables precede the dependent variables in time.[6] Particularly with the capacity measure, the ideal situation might be to have measures of capacity throughout the period and also to have measures of job reductions in each period as well. Similar arguments could be made about relationships with the other independent variables in that they should be measured at the beginning of the period, not the end, in order to assess their effects on subsequent job loss. These arguments suggest that the best design is to relate 1994 practices as measured by the NES to reductions in employment and downsizing from 1994-1997. Again, the downsizing variable is created by measuring job loss over that period and operating capacity at the beginning of the period, in 1994. For comparison purposes and robustness, I also present the results of an analysis using the 1994 independent variables to predict employment losses and downsizing from 1991-1994, recognizing the conceptual limitations of that design.

To summarize, I examine the factors associated with substitution within and shifts in the efficiency of production functions for job losses and for downsizing where the latter is defined as job cuts not driven by shortfalls in product demand. Because both job losses and downsizing are measured as reductions in employment, negative coefficients suggest direct relationships with the dependent variables (increased job losses and downsizing) and positive coefficients suggest inverse relationships. That is, negative coefficients imply that increases in the independent variables are associated with larger downsizing or employment losses. Relationships indicated with $\pm$ are ambiguous with respect to the predictions:

Job Losses and Downsizing = a + bi(Controls) - bj(Compensation and Occupational Shares) - b1(Union) + b2(Severance) - b3(Pensions) + b4(Percent Temp) - b5(Percent Part-time) - b6(Management Levels Down) +b7(Management Levels Up) – b8(Compete on Price) $\pm$ b9(Compete on Innovation) $\pm$ b10(Compete on Needs) -b11(TQM) $\pm$ b12(R&D) – b13(Stock Options) – b14(Profit Sharing) + e

There are many variables in the estimating equation because several proxy the same concept. Fourteen of the variables, for example, proxy different aspects of the same concept, the relative price of labor.

Downsizing and Performance: These data are also ideal for examining the relationship between downsizing and establishment performance. The ability to differentiate downsizing from layoffs associated with shortfalls in demand provides

the opportunity to address the selection bias issue that nags all of the prior research on downsizing; are the firms that are laying off workers doing so because they are experiencing shortfalls in demand that would eventually lead to financial declines?

The conceptual issue behind studies of layoffs/downsizing and performance is straight-forward. First, are any reductions in associated labor costs offset by increases in other costs? Second, are any net cost reductions offset by declines in business and sales that might be caused by the cuts? If the answers are both "no, " then performance improves. If they are both "yes," then performance declines. If they are mixed, then it is an empirical question. Profit data are useful for addressing this issue but are not available here because these data come from establishments that are often a part of larger firms and not accountable for profit and loss themselves. Total sales per employee and labor costs per employee may offer something equivalent, especially after controlling for industry and establishment size. Labor costs per employee help answer whether labor costs fall as a result of downsizing (controlling for other material costs), and sales per employee answer whether business suffers. Job cuts when establishments are experiencing excess capacity should improve sales per employee because employers can easily cut employees – and capacity – without affecting existing sales. The relationship with downsizing, where the establishment is operating at or above capacity, is less obvious because these cuts must be designed very carefully to avoid affecting production and sales. Labor costs per employee may fall with job losses and downsizing if more expensive labor is cut. But if less senior/less expensive labor is cut first, as in seniority-based arrangements, then labor costs per employee may rise (if wages = productivity, of course, then cost per unit of output do not necessarily rise even if costs per worker rise).[7]

The relationships examined below include job loss and downsizing from 1994 to 1997 and financial performance in 1997. For comparison purposes, job loss and downsizing are also measured from 1991-1994 and related to performance in 1994 with the caveat noted above that the downsizing measure in this period will be flawed because the capacity measure used to define it is available only at the end of the period (1994) and not the beginning.

Results

Table 3 reports the results of Tobit estimation techniques for explaining job loss and downsizing. It uses the log value of the dependent variables to address outliers in the values: Change in employment is expressed in percentage terms (I take the log of the absolute value of the percentage change and then add the sign), and small establishments in particular sometimes have big percentage increases in jobs. The log form of the variable results in better overall fit, including larger t-statistics, although the qualitative findings are the same as compared to using the non-log form (results available on request). Again, because the downsizing variable is measured as a reduction in employment, negative coefficients suggest direct relationships with job loss and downsizing.

Table 3 begins with the panel results comparing the relationship between 1994 variables and 1994-1997 job losses and downsizing. The results are presented first for the variables associated with factor substitution and then adding the variables

associated with changes in the efficiency parameter. The panel data begin with a sample of 900 and declines sharply as establishments are deleted because of missing information (in order to keep the sample being used consistent across estimates) and because the downsizing restriction removes establishments operating below capacity. Given that the initial survey was skewed to manufacturing/ away from non-manufacturing, the remaining sample of non-manufacturing establishments is too small to estimate the model outlined above separately for them (also for two of the compensation variables for manufacturing). Analyses with subsets of the model indicate that the relationships are significantly different for the manufacturing and non-manufacturing sample, making it inappropriate to pool them. The results for the 1994-1997 panel, therefore, are presented only for manufacturing.

[Table 3 Here]

In general, the results suggest that management practices broadly defined do help explain job loss and downsizing but not always in the directions anticipated. Among the factor price variables, unionization serves to increase downsizing but severance pay seems to as well, perhaps suggesting that companies introduce severance pay in anticipation of job cuts, possibly under pressure from employees. The compensation and occupational share variables suggest no simple relationship with downsizing: Establishments with higher paid technicians and clerical employees actually downsize less than do those with lower paid production workers. Those with a higher proportion of managers downsize more and those with a higher proportion of production workers downsize less, consistent with the effort to move toward a "flatter" organizational structure. The compensation variables are jointly significant (F=2.15 Prob>F=.04) as are the occupational share variables (F=2.75 Prob>F=.02). More use of temporary help does seem to provide something of a substitute for downsizing of permanent employees while greater use of part-time workers has the opposite effect, as expected, because they count as part of the establishment's workforce in calculating job loss and downsizing numbers.

In terms of the variables associated with shifts in efficiency parameters, reductions in management levels are associated with increased downsizing. The strategy variables are jointly significant (F=2.25 P>F=.08), but the results are not as expected. The strongest hypothesis is that companies competing on price would have a greater incentive to cut costs as compared to those competing on quality. The results suggest a significant relationship in the opposite direction, that companies competing on price actually downsize less than those competing on quality. Perhaps the former have already done their downsizing and restructuring before the period measured here, but the result is otherwise a puzzle. Both TQM and the R&D variables were associated with reduced downsizing. The profit sharing variables tend to be among the most statistically significant set of variables although the signs on their relationships are not always consistent. Profit sharing for managers and technicians is associated with increased downsizing, as expected, but profit sharing for supervisors is associated with *reduced* downsizing. One of the choices that firms have is how far down the organization to extend profit sharing arrangements, and those that extend them

to various groups may have unique circumstances driving them. Perhaps profit sharing is introduced to supervisors after restructuring efforts take place. The profit sharing and stock option variables are jointly significant (F=2.43 Prob>F=.03).

A comparison with the set of equations examining job losses, of which downsizing is a subset, finds some important differences. Severance has the same relationship as with increased downsizing, but many of the other variables that predict downsizing – Unions, TQM, R&D – are not significant. And the strategy results are also different: Competing on the basis of customer needs is associated with greater downsizing than competing based on quality. Competing on price has the expected sign but is insignificant. Together, the strategy variables are jointly significant (F=2.53 P>.06) as are the occupational employment shares (F=2.94 P>.02). The compensation variables are not. Although it is difficult to draw conclusions from insignificant variables, one of the most surprising findings in this equation is that the two variables measuring operating capacity, included as control variables, are neither individually nor jointly significant predictors of overall job loss in the presence of these other management practice variables.[8] Excess operating capacity has been the traditional explanation for job cuts, and the fact that it adds little to our understanding of job loss in this period is interesting.

Despite the fact that the relationships with several of the independent variables appear to be different in the job loss and the downsizing equations, the two equations overall are not significantly different.[9] The factors that explain why establishments operating at or above capacity cut jobs appear similar to those that drive establishments with excess capacity to cut jobs. It may be tempting to conclude that downsizing as defined here is in fact no different than more traditional layoffs driven by excess demand. But it is important to remember the surprising finding that excess capacity does not predict reductions in jobs in this period 1994-1997. Another way to think about these results, then, is that, at least in this period, all job reductions are like downsizings in that they are better explained by management practices than excess operating capacity.

The models estimating job loss are significantly different than models estimating increases in employment (F=24.65 P>F=.0000 for the full model and F=25.48 P>F=.0000 for the factor price model using the manufacturing sample on 1994-1997 data; F=12.33 P>F=.0000 and F=9.8 P>F=.0000 for the full and factor price models, respectively, and the non-manufacturing sample). [10] Job losses do seem to be explained by different characteristics than job increases, suggesting that it is appropriate to examine them separately.

A comparison of the results for downsizing from 1991-1994 presented in Table 2 suggests roughly similar results to those using the 1994-1997 data, despite the caveats about a temporal mismatch between the independent and dependent variables. The larger sample size these data offer makes it possible to examine relationships for manufacturing and non-manufacturing establishments separately. They suggest for manufacturing, less downsizing where supervisors are higher paid and where production workers are low paid, more downsizing where technicians and clerical workers are higher paid and where there are proportionately more managers. Unions increase downsizing as do reductions in management levels while the presence of an R&D operation reduces it. In this sample, the strategy variable competing on innovation is associated with greater

downsizing than competing on quality. The relationships in non-manufacturing are not as strong but are broadly consistent. Two that are now significant are pensions, which are associated with reduced downsizing in non-manufacturing, and stock ownership, which is associated with increased downsizing. As with the 1994-1997 results, the equations estimating relationships with job losses are significantly different from those estimating relationships with increases in employment (F=13.03 P>F=.0000 for manufacturing and F=11.15 P>F=.0000 for non-manufacturing using the full model). But, again, the overall relationships between the models estimating job loss and downsizing are not significantly different.

Job Losses, Downsizing and Performance: Equations designed to examine the effects of downsizing on firm performance should look much like other production function equations: Controls for industry, for capital structure, for the quality of labor in the establishment (education levels, average compensation, occupational mixes). The model used includes further controls -- union status, computer use, part-time and temporary help measures described above, and the capacity variables to control further for the initial financial condition of the establishments.

Table 4 summarizes the relevant results for both job loss and downsizing for 1991-1994 on performance in 1994 and 1994-1997 on performance in 1997. (The complete results are available on request.) The 1994 survey asked about labor costs as a percentage of total costs, which were then converted into a measure of labor costs per employee.[11] Results for 1994 are therefore presented both for labor costs as a percentage of total costs, the original variable, and for the labor cost per worker calculation. The small sample size in the panel noted above made it impossible to examine the relationship with sales per employee with the 1997 data for non-manufacturing establishments. Median regression was used to address the issue of outliers with the dependent variables, some of which is driven by the employment data that forms their denominators.

Table 4 Here

The model includes the job loss and downsize variables and the operating capacity variable, which is used to generate the downsize variable, in the same equation. The way to interpret the downsizing variable, therefore, is the *marginal* effect of downsizing given job loss. Estimating the *average* effects for both job loss and downsizing requires including the coefficient for operating capacity because all the job loss observations, controlling for downsizing, by definition are operating below capacity while all the downsizing observations, controlling for job loss, are operating at or above capacity. Again, job loss and downsizing are expressed in percentage terms (i.e., larger job losses and downsizing equal more negative values on the dependent variables). Positive coefficients, therefore, imply that bigger job losses and downsizing are associated with decreased sales per employee and decreased labor costs per worker.

The most reliable data are for the 1994-1997 changes on 1997 performance. Those results indicate that job loss is associated with increased sales per worker, as one might expect where establishments have excess capacity that can be cut and still meet current demand. The marginal effect of downsizing given those cuts, however, is to reduce sales per employee. No doubt it is difficult to cut employees when there is no slack capacity and not suffer shortfalls in operations. The 1991-1994

changes on 1994 performance suggest similar pattern for sales per employee and are stronger for non-manufacturing, perhaps because labor is more directly tied to performance outcomes in the service sector where labor is the dominant factor. The results for the labor cost measures raise labor costs for job losses but lower them for downsizing. The 1994-1997 non-manufacturing results for labor costs per employee are the important exception in that they reverse the pattern – positive relations with job loss and negative with downsizing. (Note that raising sales per employee is a good outcome while raising labor costs per employee is a bad outcome.)

I examined other relationships between job losses, downsizing, and performance as well. The relationship between 1991-1994 job loss and downsizing and performance measures in 1997 explores whether the effects persist after a three-year lag. While the signs of the coefficients are in the same direction as those reported above -- negative relationships between sales per worker and job loss (increasing performance) and positive between sales per worker and downsizing (decreasing performance); negative between labor costs per worker and job loss (decreasing performance) and positive between labor costs and downsizing (increasing performance), none of the relationships are significant. (The relationships could not be estimated for non-manufacturing because of small sample sizes and missing observations.) Job losses and downsizing between 1991 and 1994 can also be related to the change in performance measures between 1994 and 1997. These results, again only for manufacturing, come closer to acceptable significance levels, especially for the downsizing variable. They suggest negative relationships between job loss and change in sales (-.03 t=1.23) and positive between downsizing and change in sales (.005 t=1.24). The relationship with change in labor costs per employee is similar, negative for job loss (-.002 t=.82) and positive for downsizing (.007 t=1.45). The full results are available on request.[12]

What is more difficult to tell from these results is the combined, net effect of the sales per employee and labor cost per employee measures. Any calculations using these results are ambiguous at best because no single equation has significant coefficients for both of the dependent variables. Assuming that problem away for the moment, the signs of the coefficients alone could suggest clear conclusions even when the actual coefficients are in doubt. For example, if one assumes that the signs on the coefficients are correct, then the results for downsizing in 1997 and job loss for non-manufacturing in 1994 are unambiguous: Sales per employee are falling while labor costs per employee are rising, leading to a clear reduction in performance. The other results are more ambiguous. One conclusion from these overall results is sales per worker and labor costs per employee tend to move in opposite directions. Another is that estimating the effects of practices like downsizing depends very much on the measures one chooses. An accurate picture may require multiple measures.

Conclusions

The analyses above examine issues associated with job loss and downsizing of an establishment's workforce. Excess operating capacity associated with shortfalls in demand has been seen as the main cause of layoffs. What is different about downsizing is the perception that companies are cutting jobs even when they are not experiencing shortfalls in product demand.

While a few studies explore the growth and decline of firms and many examine the financial effects of job reductions, none have examined the causes of downsizing.

A brief summary of the results suggests that management practices that are within the control of the establishment have important relationships with both job losses and downsizing. Variables associated with factor prices, such as compensation levels, unions, and severance pay, were associated with downsizing as were other variables that proxied incentives to pursue more efficient production functions, such as business strategy and profit sharing. Management and employment practices seem predictive of both overall job loss and downsizing. Several of the results were the reverse of the expected relationship, however. One explanation for this is the possibility of reverse causation, that firms adjust some practices such as severance pay in anticipation of forthcoming job cuts.

Among the most interesting observation are those that stem from the "non-results," that the factors explaining downsizing are not as a group significantly different from those that explain overall job losses and that having excess operating capacity at the establishment is not related to job losses in the presence of these management practice variables. At least in the mid-1990s when these data were collected, job reduction decisions seem not to be dominated by factors associated with shortfalls in demand. Whether this situation represents something distinct about that period, one of economic expansion when perhaps the level of excess capacity in establishments was too small to drive job cuts, or something more fundamental is an question for further research.

In terms of the effects of downsizing on establishment performance, the analyses here are distinct from prior studies in their focus on establishments and particularly in their ability to distinguish establishments that were in trouble before their job cuts. The results are broadly consistent with the common-sense view that job cuts make more sense when establishments experience excess capacity than when they do not. Even in such situations, however, the benefits of improvements in sales per employee must overcome increases in labor costs per employee. Downsizing, defined as job cuts when operating at or above capacity, appears to hurt sales per employee. In the context of this model, it is clearer why downsizing may hurt performance, because it is difficult to cut without doing damage to organizational capabilities when there is no slack to cut. In most cases, labor costs per employee move in the opposite direction from changes in sales per employee: When job cuts make sales per employee rise, so do labor costs per employee, and when the former fall, so do the latter. This relationship may mitigate some of the gains from cutting employees as well as the losses and lead to an overall moderating effect in relations with performance outcomes.

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Footnotes

[1] For discussion of the downsizing phenomenon, see, e.g., Cascio (1993) and Cappelli et al. (1997).

[2]To illustrate ways in which definitions may not be applied consistently, reductions in jobs that are achieved through attrition may count as downsizing in one firm while in another downsizing may count only terminations. Some firms may count as downsizing jobs that have been eliminated even if the affected workers were redeployed in other, growing operations while others may define it as reductions in total employment.

[3] For example, among the best-known employer surveys, Mark Huselid's (Huselid and Becker 1996) achieved about a one-third response rate while Osterman's (1994) survey and the National Organizational Survey (Kalleberg et al. 1996) both had about 60 percent response rates.

[4] One of the difficulties with this measure is knowing whether employers include all contracts in this measure, especially temporary help and leased workers. The Bureau of the Census is undertaking separate surveys to estimate the use of such workers.

[5]A related concern is whether the time period measured here is adequate to capture the true relationship with downsizing. As noted above, it would be ideal to know when practices were introduced and then measure the downsizing immediately after. It might be, for example, that some of these practices led to downsizing immediately after they were introduced so that by the time the NES II survey measures job reductions, most have already occurred. Such effects would cause an underestimate of the true relationship between practices and downsizing. On the other hand, as noted above, most of the practices being examined create incentives for efficiency-based job reductions that continue as long as the practices are in effect, even though diminishing returns may eventually reduce the opportunities for continuing reductions.

[6] It is certainly possible that the causation with these employment practices might be reversed. For example, firms that believe that they will be laying off employees might be less inclined to introduce severance plans because such plans would end up costing them a great deal. Even in this example, however, it is the employers' anticipation of the

fact that severance payments will restrict the ability to lay off employees that drives firms to adjust their use of such plans.

[7] I am indebted to David Neumark for suggesting the importance of the unit cost measure.

[8] These capacity variables help control for the establishment's situation when the period begins – 1994. They are not included as controls in the 1991-1994 analysis because in that context they would be representing the situation at the end of the period after the job cuts had occurred, not at the beginning.

[9] The job loss equations were fully interacted with a variable measuring whether the establishment is at or above operating capacity, and the F-tests of the resulting interaction terms were insignificant for the full model, the factor price variables alone, and for alternative specifications as well.

[10] There are several ways to test whether equations are significantly different. The one used here is to interact the at and above capacity measure with the other variables in the model and test whether that variable and its interactions are jointly significant.

[11] The calculation is done by taking the percentage of labor in total operating costs, applying it to total operating costs other than labor (materials and capital investment), and then dividing by one minus the percentage of labor in total operating costs. This process no doubt compounds a series of measurement errors, and the variable that results should be examined with caution.

[12] The other potential relationship to examine is with changes in practices between 1994 and 1997 and downsizing between 1994 and 1997. Such an analysis offers the possibility of examining changes in practices, but it also poses considerable problems. Specifically, not all of the independent variables are available in both periods, some (such as strategy) are not easily expressed as changes, and the number of establishments in the panel that changed practices is relatively small.

Table 1-A: Employment Changes for All Plants, 1991-94

	All Plants						Plants with Decreasing Employment						Plants with Increasing Employment					
			Percent Change in Employment						Percent Change in Employment						Percent Change in Employment			
	N	Share, as % of Worker Pop.	Un-weighted Mean	(S.d.)	Worker-Pop. Weight-ed Mean	(S.d.)	N	Share, as % of Worker Pop.	Un-weighted Mean	(S.d.)	Worker-Pop. Weight-ed Mean	(S.d.)	N	Share, as % of Worker Pop.	Un-weighted Mean	(S.d.)	Worker-Pop. Weight-ed Mean	(S.d.)
Total	2689	100.0	4.9	(35.7)	5.3	(37.4)	787	34.8	-18.3	(15.7)	-18.0	(16.7)	1146	39.4	24.0	(45.5)	29.4	(47.3)
By Operating Level Versus Capacity in 1994:																		
Below	901	30.1	-1.2	(32.3)	0.7	(25.4)	358	28.4	-21.5	(17.1)	-17.5	(15.5)	270	23.1	24.6	(43.3)	21.3	(32.9)
At	1523	60.6	6.7	(33.3)	1.5	(31.1)	380	68.4	-15.9	(14.3)	-18.5	(17.4)	720	60.9	22.5	(41.1)	22.1	(36.4)
Above	265	9.3	15.3	(52.6)	45.2	(70.2)	49	3.2	-13.1	(10.3)	-12.5	(8.2)	156	16.0	30.1	(64.1)	68.9	(74.2)
By Plant Size:																		
< 50	458	10.3	1.5	(23.7)	5.6	(20.6)	113	4.0	-23.4	(18.8)	-21.6	(15.9)	164	10.7	20.4	(23.1)	21.0	(21.0)
50-99	405	10.7	9.5	(50.9)	7.1	(43.0)	93	7.2	-20.8	(16.7)	-18.9	(13.8)	178	11.9	32.5	(68.4)	26.3	(57.8)
100-249	522	14.0	4.8	(31.1)	4.9	(26.3)	143	9.5	-18.6	(15.6)	-15.5	(12.6)	226	14.0	22.8	(37.3)	21.6	(33.4)
250-499	453	10.7	6.8	(40.5)	3.7	(57.1)	134	10.9	-17.4	(15.1)	-32.9	(19.2)	227	13.5	23.9	(49.9)	30.8	(68.0)
500-999	286	10.3	7.0	(38.6)	8.1	(33.7)	90	10.6	-15.3	(13.3)	-13.5	(10.2)	123	13.5	27.4	(50.3)	25.1	(38.8)
1000+	565	44.0	1.8	(27.5)	4.7	(36.8)	214	58.0	-16.0	(14.1)	-16.1	(16.6)	228	36.5	19.5	(32.7)	36.8	(45.8)
By Industry:																		
All Manufacturing	1510	25.5	4.4	(36.6)	7.6	(46.5)	460	22.4	-19.1	(16.8)	-18.3	(15.8)	654	28.2	23.5	(46.2)	30.4	(61.4)
Food, Tobacc.	123	2.1	10.6	(60.8)	16.9	(85.7)	26	1.4	-16.9	(15.0)	-15.4	(11.3)	62	2.8	28.1	(81.2)	39.2	(112.8)
Textile, Apparel	115	1.8	10.6	(61.8)	11.9	(72.0)	25	1.4	-19.8	(18.3)	-21.5	(16.3)	56	2.0	30.7	(82.9)	39.3	(99.5)
Lumber, Paper	171	2.8	4.1	(28.8)	4.6	(27.7)	58	1.4	-12.4	(12.1)	-15.5	(13.0)	53	1.5	26.9	(41.2)	33.4	(44.9)
Printing, Publ.	139	1.9	2.3	(16.4)	3.1	(15.5)	41	2.0	-13.8	(15.0)	-11.0	(9.7)	61	2.3	14.6	(11.5)	15.4	(12.1)
Chem., Petro.	148	2.2	-0.1	(17.7)	1.6	(14.2)	57	2.0	-14.7	(15.0)	-13.2	(11.9)	61	3.0	13.6	(12.9)	10.8	(9.4)
Primary Metals	169	1.0	3.3	(31.8)	4.2	(29.0)	55	1.1	-19.4	(15.2)	-15.7	(11.6)	75	1.0	21.8	(37.2)	23.4	(34.9)
Fabricated Metals	140	1.5	0.5	(22.9)	4.6	(22.8)	42	1.1	-23.1	(19.2)	-18.1	(16.6)	57	1.8	18.3	(16.9)	21.6	(19.9)
Machin., Instr.	171	7.0	3.9	(41.6)	12.7	(52.1)	59	6.9	-25.9	(19.5)	-18.7	(16.8)	68	7.9	32.2	(49.5)	43.9	(64.3)
Transportation Eqp.	161	1.9	6.6	(44.0)	1.4	(52.5)	53	2.6	-27.5	(17.3)	-31.8	(17.0)	78	2.0	32.3	(48.3)	39.0	(61.5)
Misc. Mfg	173	3.2	3.8	(16.8)	4.1	(17.1)	44	2.3	-15.8	(13.6)	-16.0	(13.6)	83	4.1	16.3	(11.0)	16.1	(11.8)
All Non-Mfg	1179	74.5	5.6	(34.4)	4.5	(33.8)	327	77.6	-17.1	(14.0)	-17.9	(17.0)	492	71.8	24.8	(44.5)	29.0	(40.4)
Construction	132	3.3	1.3	(26.2)	21.3	(57.4)	39	2.0	-22.4	(13.5)	-16.9	(11.9)	51	4.8	20.4	(29.1)	42.8	(67.4)
Transport. Svc	107	5.1	8.7	(43.2)	4.6	(26.9)	25	2.3	-18.1	(12.8)	-12.2	(8.8)	58	4.6	23.9	(53.0)	18.4	(41.4)
Communications	64	8.0	1.8	(22.9)	-8.5	(11.0)	22	21.6	-17.0	(15.8)	-10.5	(3.0)	24	1.0	20.2	(22.9)	28.2	(29.9)
Utilities	112	2.5	-3.5	(12.4)	-3.2	(8.0)	57	5.5	-11.9	(9.5)	-5.8	(6.3)	27	0.8	10.4	(9.8)	10.7	(6.3)
Wholesale Trade	131	13.7	4.1	(26.6)	-4.1	(28.1)	39	17.0	-18.7	(16.7)	-27.3	(22.0)	50	12.4	25.3	(27.8)	21.3	(18.0)
Retail Trade	100	17.1	2.5	(13.5)	-4.3	(19.2)	21	14.9	-14.9	(11.0)	-25.4	(20.0)	38	10.2	14.8	(9.4)	14.7	(8.7)
Finance	107	3.9	17.7	(61.2)	16.5	(48.0)	25	2.0	-20.2	(16.9)	-24.3	(20.9)	55	5.8	43.5	(75.7)	35.2	(53.1)
Insurance, R.E.	99	2.3	4.6	(30.7)	2.9	(20.1)	30	1.7	-20.8	(16.4)	-21.7	(15.1)	48	3.3	22.5	(32.5)	14.6	(14.6)
Hotels	134	1.6	2.0	(15.5)	2.1	(14.8)	33	1.1	-11.3	(6.4)	-11.4	(6.5)	40	1.5	15.9	(20.9)	13.7	(18.1)
Business Svc	103	8.2	19.7	(59.1)	38.9	(55.1)	16	4.0	-25.8	(18.0)	-14.8	(13.4)	56	14.5	43.6	(70.6)	59.0	(53.8)
Health Svc	90	8.8	3.9	(14.6)	6.3	(14.8)	20	6.0	-13.7	(12.1)	-13.0	(10.8)	45	13.2	13.8	(11.0)	15.9	(8.2)

Notes

Worker-population weights are calculated as sampling probability weights times total employment in 1994.

Below the first row, worker pop.-weighted shares have been renormalized to sum to 100 by vs capacity, size or industry, as appropriate.

Table 1-B: Employment Changes of Plants At or Above Capacity in 1994, 1991-1994.

	All Plants						Plants with Decreasing Employment						Plants with Increasing Employment					
			Percent Change in Employment						Percent Change in Employment						Percent Change in Employment			
	N	Share, as % of Worker Pop.	Un-weighted Mean	(S.d.)	Worker-Pop. Weight-ed Mean	(S.d.)	N	Share, as % of Worker Pop.	Un-weighted Mean	(S.d.)	Worker-Pop. Weight-ed Mean	(S.d.)	N	Share, as % of Worker Pop.	Un-weighted Mean	(S.d.)	Worker-Pop. Weight-ed Mean	(S.d.)
Total	1788	69.9 of All	8.0	(36.9)	7.3	(41.4)	429	35.6 of At/Abv Cap.	-15.5	(13.9)	-18.2	(17.2)	876	43.3 of At/Abv Cap.	23.8	(46.1)	31.8	(50.6)
By Plant Size:																		
< 50	266	8.7	5.0	(21.1)	8.4	(17.7)	48	2.0	-19.4	(17.4)	-15.6	(12.7)	112	9.2	20.2	(20.5)	21.2	(17.9)
50-99	247	9.2	13.3	(56.6)	11.4	(49.0)	47	5.6	-17.7	(16.5)	-13.7	(12.2)	127	9.9	32.3	(73.0)	30.5	(65.5)
100-249	354	13.3	8.1	(33.1)	7.6	(27.8)	72	5.6	-16.9	(14.5)	-15.1	(11.3)	177	14.9	23.1	(40.0)	20.4	(34.3)
250-499	307	11.3	10.3	(44.4)	3.9	(64.5)	71	11.2	-16.6	(13.8)	-38.6	(17.7)	178	13.2	24.4	(52.9)	34.7	(75.8)
500-999	201	10.6	8.1	(31.7)	5.8	(28.6)	55	11.2	-11.4	(11.0)	-11.2	(8.2)	94	11.9	23.9	(39.7)	20.4	(34.2)
1000+	413	46.9	4.8	(27.9)	7.4	(41.4)	136	64.3	-13.8	(11.7)	-16.6	(16.6)	188	40.6	20.5	(33.4)	41.2	(48.0)
By Industry:																		
All Manufacturing	997	24.6	8.2	(38.9)	11.7	(50.5)	231	15.7	-15.9	(15.0)	-14.7	(13.1)	510	28.7	23.3	(48.3)	29.9	(65.4)
Food, Tobacc.	85	2.1	16.5	(71.6)	24.2	(99.2)	12	1.2	-15.8	(14.8)	-16.5	(11.8)	49	3.0	32.5	(90.9)	45.3	(123.5)
Textile, Apparel	91	2.0	10.9	(65.7)	13.0	(78.1)	19	1.6	-19.9	(20.9)	-22.1	(17.9)	48	2.3	28.5	(85.6)	38.9	(104.5)
Lumber, Paper	122	3.1	3.6	(24.5)	2.5	(22.9)	45	1.6	-11.1	(8.9)	-16.2	(12.2)	42	1.3	22.2	(33.0)	28.7	(37.4)
Printing, Publ.	97	1.7	3.7	(16.8)	6.3	(15.8)	22	0.8	-14.8	(18.8)	-12.9	(14.7)	47	2.0	14.5	(11.6)	15.6	(11.9)
Chem., Petro.	102	2.4	1.8	(14.9)	3.5	(12.0)	32	1.6	-12.7	(9.5)	-12.2	(7.7)	46	3.3	12.7	(12.7)	10.2	(9.2)
Primary Metals	114	1.0	6.6	(34.3)	7.3	(30.8)	31	0.8	-17.3	(15.6)	-12.6	(10.3)	60	1.0	21.4	(39.8)	23.8	(37.0)
Fabricated Metals	70	1.1	7.9	(19.1)	11.9	(21.9)	11	0.4	-13.9	(12.7)	-10.7	(12.0)	35	1.3	20.1	(18.5)	23.7	(21.8)
Machin., Instr.	98	6.4	12.6	(43.7)	17.9	(55.5)	22	5.2	-22.0	(19.6)	-13.0	(13.3)	52	7.3	33.0	(49.5)	43.0	(68.7)
Transportation Eqp.	95	1.4	16.3	(42.6)	20.0	(50.4)	12	0.4	-29.1	(16.4)	-23.8	(14.4)	62	2.3	30.6	(45.2)	34.5	(55.1)
Misc. Mfg	123	3.3	6.2	(15.4)	6.1	(15.3)	25	2.0	-14.1	(11.4)	-13.3	(8.6)	69	4.3	16.1	(10.6)	16.1	(11.7)
All Non-Mfg	791	75.4	7.6	(34.2)	5.8	(37.8)	198	84.3	-15.1	(12.4)	-18.8	(17.7)	366	71.3	24.6	(42.9)	32.6	(43.2)
Construction	81	3.0	6.0	(27.1)	33.4	(67.9)	16	1.2	-21.8	(11.9)	-15.6	(12.0)	40	4.3	20.9	(29.8)	57.2	(76.5)
Transport. Svc	76	3.0	11.5	(49.7)	10.7	(40.6)	16	1.6	-18.8	(9.8)	-16.1	(6.6)	46	5.0	25.5	(59.2)	19.3	(45.4)
Communications	49	11.3	3.6	(24.0)	-8.5	(10.8)	16	29.7	-15.6	(15.9)	-10.5	(2.6)	21	1.3	20.2	(24.5)	28.9	(30.9)
Utilities	75	3.0	-4.0	(10.9)	-3.8	(6.2)	39	6.8	-11.2	(9.3)	-5.2	(5.4)	16	0.3	8.6	(6.4)	8.1	(5.3)
Wholesale Trade	90	16.9	7.9	(26.3)	-4.1	(29.0)	23	20.1	-15.1	(14.2)	-28.6	(22.9)	42	14.9	25.3	(27.4)	21.5	(16.9)
Retail Trade	60	12.3	2.8	(14.6)	-8.8	(24.4)	13	12.4	-15.4	(13.0)	-35.4	(18.9)	22	7.3	16.8	(9.3)	16.1	(8.5)
Finance	83	4.4	16.3	(60.1)	16.8	(47.0)	21	2.4	-17.6	(16.2)	-22.5	(20.7)	40	5.9	43.2	(77.2)	37.2	(51.4)
Insurance, R.E.	74	2.6	5.4	(23.3)	4.8	(19.1)	21	1.6	-17.1	(14.4)	-18.2	(11.9)	38	3.3	19.9	(21.0)	16.2	(14.9)
Hotels	72	1.4	2.6	(15.7)	3.4	(15.5)	18	0.8	-10.9	(6.0)	-10.7	(6.1)	23	1.3	16.8	(19.9)	15.4	(18.4)
Business Svc	60	7.0	25.8	(52.2)	60.0	(56.3)	NA	NA	NA	NA	NA	NA	38	13.9	41.6	(60.3)	71.3	(54.2)
Health Svc	71	10.4	5.7	(13.8)	7.2	(13.8)	13	6.8	-12.1	(7.7)	-11.5	(4.8)	40	14.5	14.1	(11.5)	16.4	(8.8)

Notes

Worker-population weights are calculated as sampling probability weights times total employment in 1994.

Below the first row, worker pop.-weighted shares have been renormalized to sum to 100 by size or industry, as appropriate.

Table 1-C: Employment Changes for All Plants, 1994-97

	All Plants						Plants with Decreasing Employment						Plants with Increasing Employment					
			Percent Change in Employment						Percent Change in Employment						Percent Change in Employment			
	N	Share, as % of Worker Pop.	Un-weighted Mean	(S.d.)	Worker-Pop. Weight-ed Mean	(S.d.)	N	Share, as % of Worker Pop.	Un-weighted Mean	(S.d.)	Worker-Pop. Weight-ed Mean	(S.d.)	N	Share, as % of Worker Pop.	Un-weighted Mean	(S.d.)	Worker-Pop. Weight-ed Mean	(S.d.)
Total	4125	100.0	7.0	(41.1)	13.5	(50.8)	903	15.1	-20.2	(17.3)	-19.0	(15.3)	1782	53.2	26.4	(54.5)	30.7	(63.9)
By Plant Size:																		
< 50	786	15.6	4.2	(34.8)	5.9	(22.6)	157	13.2	-29.4	(23.3)	-25.0	(16.9)	269	11.5	29.3	(43.7)	23.1	(23.5)
50-99	618	13.1	6.6	(41.4)	8.4	(51.2)	130	12.6	-21.0	(17.8)	-21.6	(18.7)	262	10.2	26.1	(55.7)	27.8	(73.8)
100-249	881	19.0	9.4	(61.6)	9.2	(72.8)	170	20.5	-21.7	(16.8)	-23.3	(16.2)	415	16.5	28.8	(84.3)	28.4	(103.0)
250-499	793	13.6	7.0	(29.5)	19.5	(61.1)	182	13.9	-16.9	(13.4)	-15.1	(11.5)	359	13.2	24.0	(34.9)	42.2	(77.8)
500-999	481	12.2	10.0	(28.5)	30.7	(57.5)	104	10.6	-15.0	(13.1)	-15.3	(12.9)	239	14.8	26.6	(30.9)	50.2	(62.7)
1000+	566	26.5	5.2	(30.6)	12.4	(26.3)	160	29.1	-15.8	(12.8)	-15.4	(12.5)	238	33.8	22.9	(38.6)	22.1	(25.8)
By Industry:																		
All Manufacturing	2396	27.4	5.9	(42.7)	8.8	(62.4)	565	35.8	-20.2	(17.1)	-19.5	(14.6)	1014	24.8	25.1	(58.1)	26.3	(85.6)
Food, Tobacc.	241	2.9	4.0	(18.2)	5.0	(17.2)	51	4.0	-14.1	(14.2)	-12.8	(10.9)	101	2.6	16.7	(18.8)	15.6	(17.3)
Textile, Apparel	190	2.1	-0.2	(28.8)	1.1	(24.9)	60	3.3	-27.2	(20.8)	-27.6	(17.8)	60	1.3	26.6	(27.6)	23.5	(21.1)
Lumber, Paper	244	2.1	2.3	(17.6)	5.5	(17.6)	58	2.0	-17.0	(12.5)	-17.2	(12.2)	86	1.7	17.9	(16.6)	19.3	(15.8)
Printing, Publ.	212	2.0	2.2	(15.3)	-0.1	(17.6)	52	4.0	-14.5	(12.2)	-19.4	(15.4)	85	1.5	14.3	(13.2)	14.4	(12.4)
Chem., Petro.	216	1.7	4.9	(46.2)	6.5	(35.5)	73	2.6	-15.6	(12.6)	-14.5	(11.3)	75	1.3	29.2	(70.8)	23.9	(47.8)
Primary Metals	255	1.0	8.3	(30.9)	9.2	(29.9)	49	1.3	-17.6	(14.3)	-14.8	(11.3)	115	0.9	26.0	(37.1)	26.4	(35.9)
Fabricated Metals	256	2.2	6.3	(29.3)	12.6	(28.9)	50	1.3	-28.2	(21.2)	-27.3	(17.3)	118	2.3	25.6	(27.7)	28.1	(28.1)
Machin., Instr.	278	6.0	11.9	(92.5)	17.1	(123.6)	62	7.9	-19.2	(13.6)	-19.5	(12.6)	136	5.6	33.1	#####	41.3	(168.9)
Transportation Eqp.	223	2.3	11.9	(48.6)	6.4	(45.1)	48	5.3	-27.5	(21.4)	-23.1	(14.5)	114	2.1	34.8	(56.4)	30.3	(55.6)
Misc. Mfg	281	5.1	4.9	(23.9)	9.5	(18.7)	62	3.3	-22.4	(18.7)	-18.0	(14.9)	124	5.3	22.3	(20.8)	20.2	(16.8)
All Non-Mfg	1729	72.6	8.6	(38.7)	15.2	(45.6)	338	64.2	-20.1	(17.7)	-18.7	(15.6)	768	75.4	28.2	(49.3)	32.1	(54.8)
Construction	229	4.5	7.8	(25.6)	11.1	(25.1)	37	3.3	-24.7	(20.4)	-19.6	(11.2)	111	3.9	24.3	(23.4)	28.7	(25.7)
Transport. Svc	156	2.8	11.2	(34.2)	14.8	(29.5)	25	2.6	-24.1	(18.0)	-20.0	(13.2)	87	3.4	27.0	(36.5)	26.9	(29.3)
Communications	72	1.4	7.5	(25.8)	16.5	(28.4)	16	1.3	-20.8	(19.1)	-16.8	(12.4)	33	1.5	26.4	(22.3)	31.7	(26.4)
Utilities	145	1.3	-2.9	(21.5)	-3.0	(20.8)	64	4.6	-15.4	(13.1)	-14.1	(9.6)	30	0.6	18.6	(32.9)	22.9	(30.9)
Wholesale Trade	176	9.6	6.9	(24.5)	16.4	(21.5)	34	6.6	-21.9	(19.2)	-16.9	(14.3)	83	12.2	23.7	(21.8)	26.9	(16.6)
Retail Trade	144	17.9	7.2	(47.2)	7.8	(26.6)	28	15.2	-22.1	(22.4)	-23.1	(17.4)	50	12.4	33.0	(70.7)	29.3	(30.5)
Finance	122	4.7	11.1	(44.8)	24.3	(54.8)	19	3.3	-27.2	(25.4)	-19.6	(12.2)	54	5.5	34.7	(56.2)	42.9	(62.1)
Insurance, R.E.	130	2.6	3.5	(23.0)	2.7	(22.8)	40	4.0	-18.6	(14.7)	-27.2	(18.3)	58	2.4	20.6	(20.0)	18.8	(13.9)
Hotels	172	2.0	8.3	(36.1)	7.1	(17.3)	14	1.3	-9.6	(5.1)	-8.5	(4.0)	62	1.5	25.1	(56.4)	20.1	(20.9)
Business Svc	173	12.3	24.5	(50.4)	37.3	(75.3)	19	5.3	-29.1	(17.1)	-15.1	(16.4)	107	17.1	44.8	(53.6)	51.8	(82.7)
Health Svc	210	13.4	7.1	(57.1)	7.5	(48.3)	42	15.2	-15.4	(13.7)	-16.1	(15.5)	93	14.7	22.9	(82.4)	17.7	(60.3)

Notes

Worker-population weights are calculated as sampling probability weights times total employment in 1997.

Below the first row, worker pop.-weighted shares have been renormalized to sum to 100 by vs capacity, size or industry, as appropriate.

In contrast to 1994, the 1997 NES survey asked for the 1994-1997 percentage change in employment of *permanent* workers.

TABLE 2: Variable Definitions

Variable	Year(s) Available	Definition
Operating level versus Capacity:		
Above Capacity	1994	Dummy variable: = 1 if operating above capacity in 1994, else = 0.
At Capacity	1994	Dummy variable: = 1 if operating "at or near" capacity in 1994, else 0.
Below Capacity	1994	Dummy variable: = 1 if operating below capacity in 1994, else 0.
At+Above Cap	1994	Dummy variable: = 1 if operating at or above capacity in 1994, else 0.
Three-year, retrospective percentage changes in employment:		
Emp Chg Index, 97	1997	= -1 if "permanent employment at [the] establishment" decreased, 0 if unchanged, and +1 if increased; 1994-to-1997
Emp Chg Index, 94	1994	= -1 if "employment at [the] establishment" decreased, 0 if unchanged, and +1 if increased; 1991-1994
Emp Dn Dum, [yr]	1994, '97	Dummy variable: = 1 if Emp Chg Index, [yr] = -1, else = 0
% Emp Chg, 97	1997	The "percentage or amount [converted to percentage of implied, total, 1994 permanent employment] by which employment increased [>0], decreased [<0] over the last 3 years," or = 0 if estab. reported employment "unchanged;" 1994 to 1997
% Emp Chg, 94	1994	The "percentage by which employment increased [>0], decreased [<0] over the last 3 years," or = 0 if estab. reported employment "unchanged;" 1991 to 1994
% Job Loss, [yr]	1994, '97	Censored % change in employment: = Emp Dn Dum, [yr] * % Emp Chg, [yr] (Note that the potential range of this variable is thus -100 to zero.)
% Downsize, [yr]	1994, '97	Downsizing (as defined here): = At+Above Cap [94] * % Job Loss, [yr]
Establishment Characteristics:		
Manufact	1994, '97	Dummy variable: = 1 if primary product SIC is in manufacturing category, else = 0
Multi Estab	1994, '97	Dummy variable: =1 if establishment is part of a multi-establishment firm, = 0 if single-estab. firm
Estab Age (ln)	1994	log [1995 - "Year [estab.] began operation at this location" (from 1994 survey)]
R&D_center	1994	Dummy variable: = 1 if "at this or any other location in your company there is a research and development center for new products or processes in your line of business," else = 0
R&D_priority	1994	Dummy variable: = 1 if "in house research and development" is "Very important" "for your location's business;" = 0 if "Somewhat important" or "Not at all"

Table 2: Variable Definitions (continued).

Variable	Year(s) Available	Definition
TOTEMP	1994	*Maximum of (i) "total workers on [estab.'s] payroll," and (ii) the sum of the responses to the following, 3-part, follow-up question "of those workers, how many are full-time,...part-time,...temporary or contract"*
TOTEMP	1997	Sum of reported quantities of "permanent full-time," "permanent part-time," "estab.'s [own] temporary" and on-site but off-payroll "leased, temporary agency or contract" workers.
SALES	1994,'97	Previous year's total sales or value of shipments, in thousands of dollars
MATER	1994,'97	"Total cost of goods and services used in the production of your [last year's] sales," in thousands
CAPINV	1994,'97	Responses to "In [last year], how much did your establishment spend on new equipment?" in thousands of dollars
BKCAP	1994,'97	Responses to "At the end of calendar year [last year], what was the total book value of the fixed capital stock in your establishment (For example, buildings, equipment, furniture, vehicles, etc.)?" in thousands
Tot Empl (ln)	1994,'97	log [TOTEMP]
Bkcap/Wkr (ln)	1994,'97	log [(BKCAP/TOTEMP) + .1]
Mater/Wkr (ln)	1994,'97	log [(MATER/TOTEMP) + .01]
CapInv/Wkr (ln)	1994,'97	log [(CAPINV/TOTEMP) + .01]
ADD_VAL/WKR	1994,'97	(SALES - MATER)/TOTEMP
AddVal/Wkr (ln)	1994,'97	sign(ADD_VAL/WKR) * log[abs(ADD_VAL/WKR) + 1]
% Capital<1yr	1994,'97	Percent of BKCAP less than 1 year old.
% Capital_1-4yr	1994,'97	Percent of BKCAP aged 1 to 4 years.
% Capital_5-10yr	1994,'97	Percent of BKCAP aged 5 to 10 years.
Establishment Performance:		
Sales/Wkr (ln)	1994,'97	log [(SALES/TOTEMP) + .1]
% Labor Cost	1994	Response to "What were your total labor costs in 1993 as a percentage of the total cost of producing your 1993 sales?" (1994 survey)
EST_LAB_COST	1994	Calculated estimate of 1993 $ labor costs (in thousands): = (% Labor Cost/100) * {(MATER + CAPINV)/[1 - (% Labor Cost/100)]}
Unit Lab Cost, 94	1994	EST_LAB_COST / SALES_94

Table 2: Variable Definitions (continued).

Variable	Year(s) Available	Definition
Establishment Performance (continued):		
TOT_LAB_COST	1997	"total labor cost used in the production of 1996 sales," in thousands of dollars
Labor Cost (ln)	1997	log [TOT_LAB_COST + .01]
Unit Lab Cost, 97	1997	TOT_LAB_COST / SALES_97
Compensation Levels Controls:		
% Mgt	1994, '97	Percentage of employees (1997: of "permanent employees") that are managers or professionals
% Sup	1994, '97	As above, for supervisors
% Tech	1994, '97	As above, for technical or technical support workers
% Ofc	1994, '97	As above, for office, clerical, sales or customer service workers
(Percent "production"--if manufacturing establishment--or "sales/customer service/front-line" employees--if non-manufacturing--is the left-out category.)		
Comp Mgt Hi	1994	Dummy variable: =1 if managers and professionals compensation is "Above average" as "compare[d] to the wages paid by other employers for similar workers," else = 0
Comp Sup Hi	1994	As above, for supervisors
Comp Tec Hi	1994	As above, for technical or technical support workers
Comp Ofc Hi	1994	As above, for office, clerical, sales or customer service workers
Comp Prd Hi	1994	As above, for production workers
Comp Mgt Lo	1994	Dummy variable: =1 if managers and professionals compensation is "Below average" as "compare[d] to the wages paid by other employers for similar workers," else = 0
Comp Sup Lo	1994	As above, for supervisors
Comp Tec Lo	1994	As above, for technical or technical support workers
Comp Ofc Lo	1994	As above, for office, clerical, sales or customer service workers
Comp Prd Lo	1994	As above, for production workers
Avg Yrs Educ	1994, '97	"Average number of years of completed schooling" of the establishment's employees (1997: "permanent" employees), by the five occupation categories (as above), averaged across those occupations.
Workforce Characteristics:		
Union	1994, '97	Dummy variable: = 1 if "any of [estab.'s] employees are represented by a union or unions"
% Part-time	1994, '97	Number of employees at the end of the last year who were part-time (1997 "permanent part-time"), divided by TOTEMP; times 100

Table 2: Variable Definitions (continued).

Variable	Year(s) Available	Definition
% Temp_94	1994	Number of "employees on [estab.'s] payroll at the end of 1993 who were…temporary or contract workers," divided by TOTEMP_94; times 100
% Temp_97	1997	[Number of "contract, leased or temporary agency workers [estab.] had in 1996" plus the number of "temporary or seasonal workers on [estab.'s] payroll" at the end of 1996], divided by TOTEMP_97; times 100
% Cpt Use Mgt	1994, '97	Percentage of "managers and supervisors using computers in their jobs"
% Cpt Use Wkr	1994, '97	Percentage of "production and non-supervisory employees using computers in their jobs"
Work practices organization:		
Severence	1994, '97	Dummy variable: = 1 if estab. (1994) "employees are covered by," or (1997) "contributes toward" a "Severance plan"
Pension	1994, '97	As above, for "Pension plan"
Stock Options	1994, '97	As above, for "Stock options"
Mgt Levs Up	1994	Dummy variable: = 1 if "over [1991-to-1994] the number of levels between a first-line supervisor and the top official in your establishment" has increased, else = 0
Mgt Levs Dn	1994	As above, for decreased.
(The number of management levels "has stayed the same" is the left-out category.)		
% Self Mng Teams		
Compete Innov	1994	Dummy variable: = 1 if, of four "factors" provided, "Innovative products" is "the most important way [estab.] competes in its product market"
Compete Needs	1994	As above, for "Tailoring products to specific customers' needs"
Compete Price	1994	As above, for "Price"
("Overall quality" as "most important" is the left-out category.)		
TQM	1994	Dummy variable: = 1 if estab. "has adopted a formal Total Quality Management program," else = 0.
ProfitSh Mgt	1994	Dummy variable: = 1 if estab.'s "company [has] a profit sharing, bonus or gain-sharing plan for … Managers"
ProfitSh Sup	1994	As above, for "Supervisors"
ProfitSh Tech	1994	As above, for "Technicians"
ProfitSh Ofc	1994	As above, for "Office/clerical/sales/customer service" workers
ProfitSh Prd	1994	As above, for "Production" workers [asked of manufacturing establishments] or "Sales/customer service/front-line employees" [non-manufacturing]

Table 3

Job Loss 1991-1994

	Manufacturing				Non-Manufacturing			
Variable	Coef.[1]	t	Coef.[2]	t	Coef.[3]	t	Coef.[4]	t
Multi Estab	-0.031357	-0.089	-0.083194	-0.243	0.265269	0.563	0.662172	1.298
Age Estab	-0.247093	-1.303	-0.002520	-0.014	-0.209118	-0.847	-0.352967	-1.356
Added Value/wk (ln)	0.035576	1.389	0.015547	0.627	0.123824	3.488	0.145052	3.765
Capital/wk (ln)	0.130488	1.767	0.071282	1.005	0.261686	2.483	0.344731	3.114
BookCap/wk (ln)	-0.195279	-1.678	-0.202638	-1.775	-0.219676	-1.676	-0.157791	-1.114
Total Emp (ln)	-0.046212	-0.322	0.033547	0.231	-0.286329	-1.71	-0.010203	-0.055
%Capital<1yr	0.010155	0.623	0.023722	1.391	-0.000935	-0.051	-0.011587	-0.585
%Capital 1-4yr	0.013564	1.603	0.003804	0.455	0.007608	0.683	-0.006267	-0.536
%Capital 5-10yr	-0.001646	-0.225	0.000040	0.006	0.002766	0.243	-0.010849	-0.908
Comp Mgt Hi	0.213598	0.466	0.020185	0.047	1.15989	1.178	0.082165	0.117
Comp Sup Hi	0.196142	0.409	0.611929	1.343	-1.26355	-2.777	0.755723	1.036
Comp Tec Hi	-0.249613	-0.57	-0.295621	-0.722	0.431667	0.662	-1.273057	-1.862
Comp Cler Hi	-0.597587	-1.528	-0.538373	-1.455	0.108602	0.161	-0.341033	-0.523
Comp Prod Hi	0.145891	0.397	0.108550	0.308	-1.09574	-1.76	0.634743	1.008
Comp Mgt Lo	-0.098970	-0.135	-0.224273	-0.31	-0.712688	-1.199	1.157015	1.128
Comp Sup Lo	-0.319402	-0.373	-0.203695	-0.248	1.388096	2.314	-1.353277	-1.195
Comp Tec Lo	0.674413	0.884	1.077295	1.415	1.255798	1.263	-0.075759	-0.075
Comp Cler Lo	-1.381938	-1.976	-1.147587	-1.692	-0.964535	-0.865	0.570419	0.595
Comp Prod Lo	0.186575	0.273	0.387234	0.563	-0.239263	-0.234	0.105972	0.085
% Mgt	-0.045597	-3.066	-0.040243	-2.77	0.227494	0.254	-0.007847	-0.467
% Sup	-0.001412	-0.051	0.015962	0.602	0.792337	0.637	0.019342	0.694
% Tec	-0.036884	-2.53	-0.026083	-1.772	-0.024681	-1.776	-0.003530	-0.303
% Prod	0.006443	0.414	0.012453	0.744	0.016759	0.653	-0.017646	-1.26
CPU Mgt	-0.006523	-1.174	-0.001848	-0.341	-0.002923	-0.258	-0.005292	-0.599
CPU Non-Mgt	-0.005036	-0.896	-0.004203	-0.767	-0.008028	-0.618	0.013223	1.739
Union	-1.154543	-3.329	-1.235366	-3.558	-0.005550	-0.689	-2.243405	-3.929
Severance	-0.535257	-1.496	-0.258977	-0.721	0.003794	0.563	-1.664101	-3.061
Pension	0.342453	0.799	0.119707	0.277	-1.958168	-3.662	0.949302	1.713
% Part-time	-0.003781	-0.184	0.005380	0.265	-1.489647	-3.023	0.004858	0.374
% Temp	-0.009166	-0.421	-0.024862	-1.213	0.594360	1.165	0.021995	1.142
R&D Ctr			0.904050	2.059	0.007440	0.652	0.095644	0.127
R&D Priority			0.495240	1.245	0.019146	1.179	-0.380472	-0.415
Mgt Levs Up			0.939143	1.168			2.172907	2.017
Mgt Levs Dn			-2.372778	-6.879			-2.044151	-3.319
Self Mgt			0.000186	0.032			0.025982	2.323
Compete Innov			-1.229287	-1.974			2.263183	0.988
Compete Needs			-0.556845	-1.52			-1.424058	-2.232
Compete Price			-0.009771	-0.027			-0.532825	-0.922
TQM			-0.187693	-0.566			-0.277283	-0.519
Stock Opt			-0.222912	-0.661			-1.264616	-1.953
Profitsh Mgt			0.039827	0.082			0.406457	0.564
Profitsh Sup			1.566988	2.099			1.170573	1.175
Profitsh Tec			-1.402133	-1.787			0.113072	0.125
Profitsh Clr			0.097031	0.145			-1.294576	-1.206
Profitsh Prd			0.305896	0.649			0.279857	0.326
Constant	5.175194	4.427	3.276442	2.818	4.415104	2.587	3.595461	2.002
_se	3.080119		2.702969		3.401191		3.067467	

[1] Log Likelihood = -770.01697
Number of Obs = 754; chi2(32) = 129.38; Prob > chi2 = 0.0000; Pseudo R2 = 0.0775

[2] Log Likelihood = -654.38647
Number of obs = 690; chi2(47) =203.35; Prob > chi2 = 0.0000; Pseudo R2 = 0.1345
Obs summary: 193 uncensored observations; 497 right-censored observations at 1_spc_e>=-1.00e-06

[3] Log Likelihood = -444.47388
Number of obs = 481; chi2(32) = 75.28; Prob > chi2 = 0.0000; Pseudo R2 = 0.0781
Obs summary: 116 uncensored observations; 365 right-censored observations at 1_spc_e>=-1.00e-06

[4] Log Likelihood = -342.98548
Number of obs = 383; chi2(47) = 105.15; Prob > chi2 = 0.0000; Pseudo R2 = 0.1329
Obs summary: 96 uncensored observations; 287 right-censored observations at 1_spc_e>=-1.00e-06

Table 3 continued

Downsizing 1991-1994

	Manufacturing				Non-Manufacturing			
Variables	Coef.[5]	t	Coef.[6]	t	Coef.[7]	t	Coef.[8]	t
Multi Estab	-0.522527	-0.949	-0.494172	-0.943	-0.656537	-1.002	0.303540	0.443
AgeEstab	-0.664902	-2.269	-0.365706	-1.314	-0.001569	-0.005	-0.058702	-0.159
AddedValue/wk (ln)	0.056208	1.494	0.043712	1.242	0.154610	3.392	0.178355	3.663
Capital/wk (ln)	0.07551	0.607	-0.012923	-0.111	0.101994	0.705	0.269625	1.783
BookCap/wk (ln)	-0.271829	-1.545	-0.181607	-1.047	-0.242170	-1.563	-0.297187	-1.769
Total Emp (ln)	-0.234189	-1.047	-0.081240	-0.37	-0.536343	-2.368	-0.274980	-1.017
%Capital<1yr	-0.001704	-0.073	-0.006843	-0.301	0.083922	2.317	0.051300	1.388
%Capital1-4yr	0.006198	0.48	-0.005199	-0.407	0.008196	0.55	0.005006	0.339
%Capital5-10yr	0.008220	0.703	0.004254	0.38	0.004441	0.294	0.004228	0.269
Comp Mgt Hi	-.3667102	-0.553	-0.360935	-0.593	0.111152	0.128	-0.284614	-0.307
Comp Sup Hi	1.547134	2.076	1.917155	2.7	0.350565	0.384	1.274682	1.249
Comp Tec Hi	-1.030128	-1.622	-1.016187	-1.752	-1.103966	-1.312	-1.308968	-1.437
Comp Cler Hi	-0.900149	-1.587	-0.852282	-1.617	-0.546354	-0.672	-0.253677	-0.281
Comp Prod Hi	0.700702	1.228	0.510412	0.962	1.603819	1.935	1.288787	1.385
Comp Mgt Lo	-1.390425	-1.118	-1.65213	-1.474	-0.282686	-0.191	0.281818	0.17
Comp Sup Lo	0.131450	0.082	0.047117	0.032	1.198725	0.683	-0.307118	-0.166
Comp Tec Lo	-0.254594	-0.195	-0.144678	-0.116	-1.768842	-1.384	-1.162086	-0.89
Comp Cler Lo	-2.313438	-2.313	-2.126267	-2.208	0.314339	0.289	1.577942	1.192
Comp Prod Lo	2.646326	2.104	2.65376	2.211	1.158832	0.619	-0.009256	-0.005
% Mgt	-0.039126	-1.769	-0.037294	-1.761	-0.004176	-0.244	0.005295	0.271
% Sup	-0.017542	-0.432	0.010605	0.286	-0.007468	-0.186	-0.011643	-0.257
% Tec	-0.034633	-1.54	0.010605	-1.537	0.015863	0.982	0.016652	0.981
% Prod	0.002204	0.1	0.009689	0.375	-0.027811	-1.639	-0.041370	-2.34
CPU Mgt	-0.012728	-1.45	-0.007533	-0.891	-0.015411	-1.245	-0.008742	-0.649
CPU Non-Mgt	-0.005796	-0.716	-0.004889	-0.637	-0.000097	-0.011	0.011506	1.121
Union	-0.896381	-1.754	-1.327329	-2.625	-2.282412	-3.195	-2.635143	-3.295
Severance	-0.453833	-0.845	-0.426665	-0.82	-1.523338	-2.338	-1.807286	-2.336
Pension	-0.143700	-0.19	0.167146	0.233	1.573734	2.116	2.122314	2.623
% Part-time	-0.010952	-0.385	-0.006769	-0.25	0.005058	0.305	-0.000718	-0.039
% Temp	0.085582	1.696	0.058731	1.249	0.043632	1.341	0.039117	1.107
R&D Ctr			1.3967	2.155			-0.662710	-0.655
R&D Priority			0.508365	0.895			-0.570348	-0.443
Mgt Levs Up			1.660679	1.165			0.059955	0.042
Mgt Levs Dn			-2.718253	-5.19			-2.142527	-2.382
Self Mgt			-0.006442	-0.817			0.013689	0.978
Compete Innov			-1.644726	-1.725			12.282	.
Compete Needs			-0.247279	-0.457			-0.822307	-0.977
Compete Price			-0.110626	-0.21			-0.095908	-0.128
TQM			-0.315498	-0.636			0.216253	0.303
Stock Opt			-0.228231	-0.48			-1.620871	-1.927
Profitsh Mgt			0.703856	0.952			0.255110	0.251
Profitsh Sup			1.248645	1.125			1.904417	1.273
Profitsh Tec			-1.523385	-1.439			-1.738204	-1.195
Profitsh Clr			-0.223873	-0.218			-1.641103	-1.029
Profitsh Prd			0.382390	0.553			1.500138	1.138
Constant	8.979046	4.659	5.890747	3.147	4.852102	2.198	2.640914	1.161
_se	3.206506				3.119853		2.663131	

[5] Log Likelihood = -364.21871
Number of obs = 467; chi2(30) = 80.84; Prob > chi2 = 0.0000; Pseudo R2 = 0.0999
Obs summary: 95 uncensored observations; 372 right-censored observations at 1_spc_e>=-1.00e-06

[6] Log Likelihood = -305.96751
Number of obs = 430; chi2(45) = 127.46; Prob > chi2 = 0.0000; Pseudo R2 = 0.1724
Obs summary: 87 uncensored observations; 343 right-censored observations at 1_spc_e>=-1.00e-06

[7] Log Likelihood = -212.29088
Number of obs = 290; chi2(30) = 72.63; Prob > chi2 = 0.0000; Pseudo R2 = 0.1461
Obs. summary: 57 uncensored observations; 233 right-censored observations at 1_spc_e>=-1.00e-06

[8] Log Likelihood = -164.14455
Number of obs = 229; chi2(30) =89.93; Prob > chi2 = 0.0001; Pseudo R2 = 0.2150
Obs. summary: 49 uncensored observations; 108 right-censored observations at 1_spc_e>=-1.00e-06

Job Loss and Downsizing 1994-1997 (ln) Tobit Estimation

	Job Loss		Downsizing	
VARIABLE	Coefficient[I] t-stat	Coefficient[II] T-stat	Coefficient[III] T-stat	Coefficient[IV] t-stat
Multi Estab	-.8319 1.150	-1.855 2.340	-2.174 2.040	-2.628 2.232
AgeEstab	.0662 .188	.2587 .730	.4416 .877	1.537 2.560
AddedValue/wk (ln)	-.0131 0.195	-.0778 -1.023	-.0348 .398	.0142 0.168
Capital/wk (ln)	-.0915 0.504	0.1133 0.593	-.3435 1.090	-.5677 1.813
BookCap/wk (ln)	.2316 .854	-0.397 0.141	.2011 .494	-.0755 .187
Total Emp (ln)	-.0391 0.138	-.184 .588	.7795 1.678	.2002 .365
%Capital<1yr	.0208 0.694	.0359 1.123	.0026 .070	-.02730 .790
%Capital 1-4yr	.0085 0.532	.0026 0.158	.02767 1.269	.02845 1.385
%Capital5-10yr	.0016 1.10	.0206 1.349	-.0002 .012	.0035 .169
Comp Mgt Hi	.1922 0.229	-.063 0.074	-.1585 .156	-.4189 .425
Comp Sup Hi	-1.045 1.186	-1.174 1.262	-.9095 .849	-1.552 1.505
Comp Tec Hi	1.163 1.379	2.152 2.480	1.458 1.280	3.992 3.204
Comp Cler Hi	-.2594 0.341	-.4531 .544	.5474 .569	2.390 1.847
Comp Prod Hi	.0434 .0341	-.1257 0.171	.4716 .486	.6378 .632
Comp Mgt Lo	.3429 .189	.0635 0.029	13.381 -	5.614 -
Comp Sup Lo	-1.589 .776	-1.337 -0.561	10.734 -	3.038 -
Comp Tec Lo	.1578 .089	.784 0.417	.3018 .107	3.442 1.303
Comp Cler Lo	.9861 .544	1.509 0.697	-.2198 .078	.8239 .284
Comp Prod Lo	1.288 .955	1.509 .697	3.295 1.311	5.409 1.771
% Mgt	-.0413 1.215	-.0493 1.461	-.1521 2.402	-.1715 2.745
% Sup	.0953 1.543	.1258 1.863	.0312 .397	.08260 1.116
% Tec	-.0533 2.10	-.0527 2.168	-.0063 .141	.0044 .103
% Prod	-.0048 0.159	-.007 0.211	.1377 2.282	.1817 2.438
CPU Mgt	.0231 2.067	.0333 2.553	.0181 1.212	.0247 1.491
CPU Non-Mgt	-.0122 1.105	-.0046 0.393	-.0125 .814	-.0176 1.081
Union	-.9844 1.472	-.8353 1.116	-.8045 .872	-2.345 2.042
Severance	-1.334 -1.840	-1.167 1.417	-1.507 1.464	-2.176 -1.800
Pension	-.0855 .095	.208 .214	-1.385 1.100	-.0673 .053
% Part-time	-.0928 2.182	-.110 2.471	-.1417 1.814	-.2229 2.779
% Temp	.026 1.264	.0158 .776	.0864 2.342	.0640 1.697

Table 3 (continued)
Job Loss and Downsizing 1994-1997 (ln) Tobit Estimation

	Job Loss		Downsizing	
VARIABLE	Coefficient t-stat	Coefficient T-stat	Coefficient T-stat	Coefficient t-stat
R&D Ctr		1.444 1.500		2.235 1.848
R&D Priority		.4871 .551		1.926 1.711
Mgt Levs Up		-1.201 .739		16.46 -
Mgt Levs Dn		-1.769 2.21		-2.788 2.447
Self Mgt		-.0024 0.199		-.0163 1.019
Compete Innov		-1.096 0.768		-1.113 .524
Compete Needs		-1.687 2.124		-1.388 1.371
Compete Price		-.0723 .0944		2.143 1.849
TQM		.0713 0.109		1.541 1.790
Stock Opt		-.0247 0.036		.7419 .858
Profitsh Mgt		-1.331 1.201		-4.959 2.990
Profitsh Sup		1.76671		6.013 3.086
Profitsh Tec		-4.672 2.766		-5.273 2.689
Profitsh Clr		2.896836 1.998		2.546 1.456
Profitsh Prd		.5056 0.485		-.1436 .108
Above Capacity	.6881 .618	.9989 .851		
Below Capacity	-.0835 .113	-.2343 .362		
Constant	.6744 .301	2.051 .809	-3.112 -0.933	-4.357 1.329
_se	3.200	2.841	3.0327	2.244

[i] Log Likelihood = 257.446
Number of obs = 247; chi2(11) = 8.66; Prob >chi2 = 0.653; Psuedo R2 = 0.016
Obs summary: 65 uncensored observations; 182 right-censored observations at 1_spc_e>=-1.00e-06

[ii] Log Likelihood = 2-3.463
Number of obs = 228; chi2(47) = 71.29; Prob > chi2 = 0.0127; Pseudo R2 = 0.149
Obs summary: 59 uncensored observations; 169 right-censored observations at 1_spc_e>=-1.00e-06

[iii] Log Likelihood = 147.336
Number of obs = 149; chi2(9) = 7.15; Prob > chi2 = 0.622; Pseudo R2 = 0.023
Obs summary: 37 uncensored observations; 112 right-censored observations at 1_spc_e>-1.00e-06

[iv] Log Likelihood = 100.87
Number of obs = 141; chi2(45) = 78.60; Prob > chi(2) = 0.0014; Pseudo R2 = 0.280
Obs summary: 34 uncensored observations; 107 right-censored observations at 1_spc_e>-1.00e-06

Table 4: Job Loss, Downsizing, and Performance

1991-1994 Job Loss and Downsizing on Performance in 1994

	Manufacturing			Non-Manufacturing		
	LnSales/wk	%labor cost (1994 only)	Labor cost/wk(ln)	LnSales/wk	%labor cost (1994 Only)	Labor cost/wk(ln)
Job Loss	-.001	-0.226	-0.003	0.006	-0.36	-0.009
(t-stats)	1.04	1.9	1.6	0.93	1.88	4.7
Downsize	0.007	0.14	0.0006	0.008	0.25	0.007
(t-stats)	3.15	-0.79	0.22	0.077	0.81	2.35
N =	750	640	640	N = 475	441	441

1994-1997 Job Loss and Downsizing and Performance in 1997

	Manufacturing			Non-Manufacturing
Job Loss	-0.007	-0.006	---	0.007
(t-stats)	3.22	0.92	----	2.83
Downsize	0.008	-0.003	----	-0.03
(t-stats)	2.36	0.36	---	5.1
N =	239	234		130