

WORK REORGANIZATION IN AN ERA OF RESTUCUTURING;
TRENDS IN DIFFUSION AND IMPACTS ON EMPLOYEE WELFARE

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ABSTRACT

High Performance Work Organizations took root in the early 1990s but then faced the challenge of surviving in an environment of organizational turmoil and restructuring. This paper addresses two questions: the continued adoption, or lack thereof, of HPWO systems and whether the productivity and quality gains of these systems have rebounded to the benefit of employees. The paper draws upon a second round survey of employers which replicates and extends a 1992 survey. The new survey provides fresh estimates of the use of HPWO systems, permits the study of whether employers which had these systems in place were able to sustain them over the five years between the surveys, and provides evidence on whether employees who worked in organizations which had HPWO systems in 1992 experienced wage and/or job security gains relative to employees in organizations which lacked these systems in 1992.

The results show that HPWO systems have continued to diffuse at a rapid rate during the 1990's although the rate of expansion in the use of self-managed teams has been slower than for other elements of these work systems. Evidently restructuring has not proved a major obstacle since the research shows no relationship between whether a firm had layoffs and its adoption or sustaining of HPWO systems. Models which try to distinguish those establishments which have adopted new systems from others find that various measures of product market competition and strategy are the most important explanations. When the paper asks whether HPWO systems in fact deliver benefits for the workforce it reaches a fairly pessimistic conclusion. HPWO in 1992 systems are associated with an increased chance of layoffs in subsequent years and no compensation gains. Finally, in asking about other organizational shifts associated with innovative work systems, the data show that the adoption of HPWO systems is associated with reduced employment of managers and lower usage of contingent employees.

The late 1980s and early 1990s were characterized by a widespread interest in the transformation of work organization in American firms. Many commentators hailed so-called High Performance Work Organizations (HPWO) for two interrelated reasons. First, HPWOs were seen as more productive in both output and quality terms. This was because they made more efficient use of labor (for example by building quality considerations directly into the production process and hence avoiding the need for a separate quality unit) and because they drew upon the ideas and creativity of the workforce. Secondly, HPWOs seemed likely to yield mutual gains, that is benefits to both the firm and the workforce. This was because the workforce was deemed unlikely to contribute in the manner HPWOs require unless they were assured a share of the gains.

With these ideas in the background the research literature went in two directions. The first question concerned the spread of these HPWO systems and a number of efforts were made to determine what fraction of American employers had adopted them and what were the organizational characteristics of adopters. The broad finding (discussed in more detail below) was that by the early 1990s adoption was more widespread than had been thought, with somewhere between twenty and thirty-five percent of employers on the path towards significant use of these systems. The second research stream took up the question of whether HPWO systems lived up to their productivity promise. Using a variety of research methodologies the overall conclusion was that, when combined with the appropriate human resource policies, these innovative work arrangements did indeed produce higher levels of output and quality than did more traditional systems (Ichniowski, Kochan, Levine, Olson, and Strauss, 1996).

Taken as a whole these findings lead to the optimistic view that work systems which are more productive are in fact diffusing throughout the economy. However, this “first generation” research left several important questions unanswered. The first concerns diffusion. Just as the interest in HPWO systems peaked American firms went through a substantial wave of restructuring. This typically involved layoffs and high levels of insecurity within many firms. It is very much an open question whether the adoption of HPWO systems has survived these events. As will be discussed below, received theory is unclear on just what we should expect.

The second open question is whether employees have in fact gained from the adoption of HPWO systems. While the use of these work arrangements expanded, at least through the early 1990s, aggregate measures of employee welfare do not show commensurate gains. It is well known that wages were essentially flat and—although more controversial—many commentators also believe that economic insecurity has grown. Regardless of the precise reading of the evidence, it is certainly an open question whether these “mutual gains” systems have lived up to their billing.

The purpose of this paper is to take up these two questions: the continued adoption, or lack thereof, of HPWO systems and whether the productivity and quality gains of these systems have rebounded to the benefit of employees. I will address these issues via a unique data source, a second round survey of employers which replicates and extends a survey which I undertook in 1992. The second round of the survey enables me to generate new estimates of the use of HPWO systems, examine whether employers which had these systems in place were able to sustain them over the five years between the surveys, and learn whether employees who worked in organizations which had HPWO systems in 1992 experienced wage and/or job security gains relative to employees in organizations which lacked these systems in 1992.

To preview the results, I find that HPWO systems have continued to diffuse at a rapid rate during the 1990’s although the rate of expansion in the use of self-managed teams has been slower than for other elements of these work systems. Models which try to distinguish those establishments which have adopted new systems from others find that various measures of product market competition and strategy are the most important explanations. When I ask whether HPWO systems in fact deliver benefits for the workforce as well as for the firm I reach a fairly pessimistic conclusion. HPWO systems are associated with an increased chance of layoffs and no compensation gains. Finally, in asking about other organizational shifts associated with innovative work systems, I find that the adoption of HPWO systems is associated with reduced employment of managers and lower usage of contingent employees.

Background

Researchers seeking to document the rate of adoption of HPWOs have to make a number of methodological and definitional decisions. One question is the unit of observation. Some scholars have surveyed organizations as a whole by, for example, asking at headquarters about the use of a given practice throughout the firm. Other researchers have focussed on the establishment (a business location). Some have sought to study a broad universe, for example all private sector establishments, while others have examined one industry. Decisions about the definition of HPWOs are even less clear since the term is basically a general description of a diverse set of practices. Most researchers would include teams as an essential element of an HPWO system but there is not a total consensus about other practices. Furthermore, since many organizations have experimented with one or another work innovation researchers tend to require that more than one practice be in place and some researchers also set a minimum level of employee participation as a requirement. Finally, both for practical and conceptual reasons¹ in many studies only a sub-set of employees (sometimes termed “core” or “front-line”) employees are studied.

Given these complexities and the consequent variation in research methodologies it is reasonable to expect a range of estimates of diffusion. However, a broad consensus is discernable.

The National Survey of Establishments was a telephone survey conducted in 1992 of private sector establishments with fifty or more employees. The response rate for the survey was 65%. The survey asked about a series of practices: self-managed teams, Total Quality Management, Quality Circles, and Job Rotation (Osterman, 1994). Data were collected about the use of these practices by “core employees,” who were defined as the largest group of non-supervisory workers directly involved in the production of the good or service. These could be either blue or white collar. For these employees information was obtained both on whether or not a given practice was used and, if so, what percentage of the core workforce was involved. If we only count a practice as being adopted if 50 percent or more of the core employees are involved then

the survey found that 40.5 percent of establishments had self-managed teams, 24.5 percent had adopted TQM, 27.4 percent had adopted Quality Circles, and 26.6 percent had adopted Job Rotation.

In 1994 the Bureau of the Census, working with the University of Pennsylvania's Center on the Educational Quality of the Workforce, conducted a nationally representative survey of private sector establishments (Center on the Educational Quality of the Workforce, 1995). Unlike the National Establishment Survey described above, the size cutoff in the Census survey was twenty or more employees and work practice questions were not limited to core employees but rather included the entire workforce. Both differences would tend to reduce the usage rates compared to the National Establishment Survey. The Census survey found that 13 percent of non-managerial workers were involved in self-managed teams and 18 percent were involved in job rotation. When the National Establishment Survey data are manipulated to arrive at comparable estimates (the figures above refer to fraction of establishments, not fraction of workers) the equivalent figures are 29 percent of CORE employees in teams and 21 percent of CORE employees in rotation, estimates which are reasonably close to the Census estimates given the sampling frame differences (the Census included smaller establishments and all, not just CORE, workers).

A recent paper by Gittleman, Horrigan, and Joyce (1998) employs the 1993 Bureau of Labor Statistics Survey of Employer Provided Training, a survey aimed at establishments and with a sample of over seven thousand and a response rate of 71.3 percent. The survey did not ask questions about penetration, but among establishments of fifty or more employees 32 percent had teams in place, 46 percent TQM, 15.8 percent quality circles, and 24.2 percent job rotation. With the exception of TQM these rates are below those of the National Establishment Survey when that survey considers any use of the practice regardless of penetration. However, in the regression estimates of the determinants of adoption the Gittleman, Horrigan, Joyce research finds patterns with respect to most variables very similar to those of Osterman (1994).

Finally, a national survey of non-managerial employees by Freeman and Rogers (Freeman and Rogers, 1995) found that 34 percent reported participating in employee involvement programs at their current workplace.

Beyond these national efforts there have been several surveys aimed at narrower industry groupings. The apparel industry has been traditionally a low wage and low technology industry, quite different from the automobile or steel sectors which are often studied in research of this kind. However, in recent years innovations which are analogous to high performance work organizations--such as the bundle system and quick response--have emerged. These promise quicker times to market and better ability to meet customer needs. Thomas Bailey (1994) recently conducted a survey of a random sample of 480 production sites and examined six indicators of high performance work organization: if 50% of production workers receive training, if regularly scheduled meetings are held with workers to discuss production problems, if 50% of employees are paid through group incentives, if plants use modules or other forms of team production, if 50% of orders are handled via electronic data interchange, and if the number of operations performed by a typical operator has increased in the last five years. Among all the plants surveyed 25% used three or more of these practices and among the plants with fifty or more employees the figure was 28%. Thirty-six percent of all workers are in plants which use three or more practices.

Additional evidence comes from a survey of U.S. located Japanese transplants in manufacturing. The survey, which was conducted by Richard Florida and Davis Jenkins (Florida and Jenkins, forthcoming), surveyed 1,150 transplants and had a 40% response rate. Of these establishments 33.4% had self-managed work teams in place with 50% or more of the production workers involved, 63.2% had job rotation with a fifty percent penetration rate, 40.4% had quality circles or problem solving groups with a fifty percent penetration rate, and 40.7% had TQM programs with fifty percent or more involvement. Another study of transplants and domestic firms (Doeringer, Evans-Klock, and Terkla, 1998) used a smaller sample from three regions (the sample was 28 transplants and 20 domestic firms) They found that 37 percent of the transplants (and 15 percent of a small sample of domestic firms) had adopted job rotation, 48.1 percent (35 percent) had adopted teams.

Finally, the International Motor Vehicle Project conducted a survey of assembly plants in 1989 and again in 1993. Among a matched sample of plants they found that in 1989 15.7 percent of employees were involved in teams and 28.9 percent in problem

solving groups. By 1993 these figures had risen to 46.3 percent and 48.8 percent respectively (Pil and McDuffie, 1996, p. 437).

A fair reading of all of this evidence would seem to be that in the early 1990's a significant minority of establishments had implemented a range of practices associated with HPWO systems. There is some variation in the estimates, much of which is explicable in terms of the differing methodologies of the various surveys (size of establishment included, restriction or lack of restriction to core employees, etc.). Nonetheless, HPWO systems were clearly taking root in the early 1990's. The question is what has happened since. It is unclear whether these systems continued to diffuse as the decade moved on and also whether they have been successfully sustained in enterprises which had them in place. There are reasonable theoretical expectations on both sides of these questions.

Theoretical Expectations

There are basically two sets of reasons for predicting that in a period of extensive restructuring and layoffs the spread of HPWOs would stop and perhaps even go into retreat. The first is practical. Teams require a relatively stable membership so that members can learn their tasks and learn how to work together. This stability is at risk in restructuring, due to turnover and job-bumping, and this in turn makes it likely that the teams will not function well. Poor functioning means that the benefits of teams are unlikely to be achieved and that the organization's commitment to these innovations will weaken. An example is a Regional Bell Operating Company studied by Rosemary Batt (Batt, 1995). The firm introduced self-managed work teams in a range of areas including outdoor equipment repair and customer service representative jobs. Evaluations showed that these self-managed teams were more productive and profitable than the old work systems they replaced. Surveys of managers and front-line employees demonstrated that they enjoyed their work under the new arrangements. Nonetheless by 1997 of the 150 teams that had been established in the mid-90's only 10 were still functioning. The others were victims of turmoil due to restructuring.

The second reason for expecting retreat is that HPWO systems work best with, in fact are predicated upon, substantial employee commitment to the enterprise. Workers need to be willing to learn new skills, to offer ideas and suggestions based upon their knowledge, and to care about quality and productivity. For example, Adler reports that in NUMMI employees offered 10,000 suggestions per year of which 80 percent were adopted (Adler, 1993). The conventional expectation in the industrial relations literature is that for employees to be willing to make these kinds of commitments the employer must offer a quid pro quo in the form of enhanced job security. Absent this offer employees will see any extra contributions they make as a threat to theirs or their colleagues' jobs and will withhold effort. HPWO systems are unlikely to do well in these circumstances.

Set against these negative expectations are at least two reasons for reaching the opposite prediction. The first possibility is that employees simply prefer working in HPWO systems to traditional work arrangements and hence are willing to continue even in a difficult economic environment. The evidence on employee attitudes is not systematic and does not fall entirely on one or the other side of this question. On the negative side an example is once again NUMMI where a dissident caucus in the United Automobile Workers has long opposed many elements of the production system. There is, however considerable evidence that employees like the greater scope of team work and the opportunity to share their ideas while, at the same time, they remain wary of the firm's intentions.

In a survey of private sector non-supervisory workers and low and mid-level managers, a universe representing 70 percent of all private sector employees, Richard Freeman and Joel Rogers report that "Some 79% of non-managerial, nonunion participants in employee involvement programs report having 'personally benefited from [their] involvement in the program by getting more influence on how [their] job is done.' Among those without EI programs, 64% 'would like to have a program like this' at their company" (Freeman and Rogers, 1995, p. 340).

In a difficult unionized environment the findings are similar. For example, in their survey of Chrysler employees working in plants organized by "modern operating agreements" MacDuffie, Hunter, and Doucet found that 77 percent preferred teams to the

old system. (MacDuffie, Hunter, and Doucet, 1996) In a study which compared production workers in two very different industries, telecommunications and apparel Rosemary Batt and Eileen Applebaum surveyed workers and in a formal statistical model found that “job characteristics associated with teams...significantly improves job performance” (Batt and Applebaum, 1995, p. 370). Open-ended interviews with network employees in telecommunications garnered comments that teams were better because “no supervisor is spying on you,” or “now if a job goes well, we get the credit” (Batt and Applebaum, 1995, p. 358).

In short, while employees are not naïve and do not fully trust management there is a preponderance of evidence that they find the new work systems attractive. This could help explain continued diffusion in the face of economic uncertainty.

The second reason that HPWO systems might survive and expand in the current environment is quite different in spirit. Employers may derive sufficient advantages from these systems that they will want to install and maintain them even in the face of employee reluctance. In an environment in which employers hold the upper hand they may succeed even if the traditional industrial relations prediction about worker attitudes is correct. Although there is no hard measure of “employer power” there is certainly good reason to think that employer leverage vis a vis their work force increased in the late 1980s through the mid-1990s. The continued weakness of unions, the insecurity engendered by restructuring, the fear of global competition, and the pervasiveness the rhetoric of the market all contributed to this trend. If this is true and if managers in fact want to continue down the HPWO road then we might expect to find substantial diffusion even in the face of employee resistance. Whether this can be successful in the long run and whether the firm can fully gain the potential benefits of HPWO systems under these circumstances are difficult questions which this paper does not address.

The second broad question taken up in this paper concerns whether employees share the gains of these systems, whether they are in fact “mutual gains enterprises.” Implicit in much of the discussion of high performance work systems was the view that this approach to organizing work is “win-win,” in the interest of both employees and firms

The logic for this expectation is twofold. First, these systems sufficiently improve productivity so that there are gains to be shared. Second, there is a bias in these systems towards such sharing because they function best with high levels of employee commitment. Employees need to willingly contribute their ideas and extra effort to the enterprise and they are unlikely to do so if the firm is not prepared to make a comparable commitment to them.

Although this logic is more than plausible, it is subject to the counter-arguments raised above about employer power. It may be possible for firms to implement HPWOs and capture the gains which flow from them without needing to share the benefits with the workforce. There has been no systematic research on this question and a key goal of this article to begin to remedy this gap.

The Data

The 1992 and 1997 surveys are both telephone surveys of a representative sample of American establishments which are in the private for-profit sector and which have at least fifty employees (see Osterman, 1994 for a full description of the 1992 survey). Other than these restrictions the surveys (appropriately weighted) are representative of the entire economy. The surveys were directed to establishments, i.e. specific business addresses, rather than to headquarter locations. Hence the questions were about practices at the given establishment as opposed to questions directed to headquarters about practices elsewhere in the country. This leads to more accurate responses. In the 1992 survey the response rate was 65.0 percent and in the 1997 survey the response rate was 57.7 percent. Both rates are very high for surveys of this kind and no important biases exist in the pattern of non-response.² The 1997 survey consisted of a follow-up to the establishments who responded in 1992 (a sample of 484) plus an additional sample of 200 new establishments. There is no bias in which establishments in the original sample were able to be re-interviewed in 1997.³

When the 1997 results are reported alone both sets of respondents are included and, obviously, when the longitudinal data are reported only the 1992 sample is used. Two sets of weights are used to make both samples representative although the

1992/1997 sample obviously excludes businesses which were founded between the two years as well as those which went out of business during this period.⁴

One obstacle to systematically studying these questions is that there is no unambiguous way of defining a high performance work system and knowing whether or not the establishment is following this path. The approach I followed in 1992 was to ask about a series of work practices, collecting data on whether or not the practice was in place and also on what percentage of “core” workers were involved. I look at four work practices: self managed work teams, job rotation, quality circles or off-line problem solving groups, and Total Quality Management. These are the practices which most of the literature sees as most central to the new forms of work organization.

In 1992 the “core” workers were defined as the non-managerial employees most directly involved in the production of the goods or services sold by the enterprise. They could either have been blue or white collar workers. With these data I then examined the number of HPWO practices which crossed a certain threshold with respect to the degree of employee involvement (50 percent of core employees involved). This approach has been generally accepted by other scholars and I also followed it in the 1997 survey.⁵

Results

Table 1 lays out the basic facts regarding the incidence of HPWO practices. The Table presents the data in two forms: the columns labeled “entire” refer to the entire sample for the given year while the columns labeled “merged” limit the sample to those establishments which appear in both the 1992 and the 1997 data. It is apparent, and reassuring, that the results are the same in both cases and all further analysis will be limited to those establishments which are surveyed both years.

The data show that the utilization of HPWO practices has grown considerably since 1992, with the only exception being teams which have remained at the same level. This is a reasonable result since teams are probably the most difficult work innovation to implement and most likely to be disrupted by turnover and restructuring. Even here, however, it is striking that teams have not lost ground. Overall, the central message is the extension of HPWO systems.

In analyzing the 1992 survey I (arbitrarily) credited an establishment with being an HPWO if it had two or more practices in place with fifty percent penetration for each establishment. Table 2 shows the fraction of establishments with different numbers of practices in place and it is apparent that by this definition the proportion of HPWO establishments has grown considerably. The growth of HPWO systems remains even if the presence of teams is made a requirement. In 1992 24.6 percent of establishments had two or more practices at the fifty percent level of penetration, one of which was teams, while in 1997 the figure was 38.3 percent.

The foregoing data clearly imply that establishments which had HPWO systems in place in 1992 were able, by and large, to sustain them over the subsequent five years and that other establishments took up these practices for the first time. However, it is worth asking about the sustainability and adoption rates in more detail.

The top panel of Table 3 shows that the overwhelming fraction of establishments which had two or more practices in place in 1992 maintained that status in 1997. The second panel examines sustainability for each practice and what is most striking about these data is that teams stand out as the most difficult practice to sustain. As I have already noted, this makes sense given the organizational implications of teams. The final panel shows the fraction of establishments which did not have the practice in place at the 50 percent level of penetration who in the next five years adopted it at that level. The pattern is somewhat different from the top panel in that there is less variation across the practices although once again teams prove to be the most difficult practice to adopt.

Explaining the Patterns

The foregoing data answer one of the basic questions addressed in this paper: whether at the level of aggregate data the rate of diffusion of HPWO systems has increased or declined in the face of organizational turmoil and restructuring. There are, however, good reasons to pursue the question a bit further. First, we have to worry about the fallacy of composition. Although at an aggregate level both continued diffusion and restructuring appear compatible it may be that the new adopters did not themselves experience layoffs. In addition it is worthwhile asking in a more systematic

way about the characteristics of the organizations which were new adopters of these practices as well as of those organizations which were unable to sustain them.

The literature suggests three broad ways of thinking about why some firms adopted or sustained HPWO practices while others did not. The first set of ideas emphasizes economic rationality. For example, the pressures to adopt HPWO practices may be higher when firms face significant competition or when the firms' technology leaves open the possibility of important contributions from the workforce. In my earlier paper I found, for example, that the more competitive the product market environment the more likely were firms to adopt these systems, that higher skill technologies were positively associated with adoption, and that particular product market strategies (the so-called "high road") were also positively associated with adoption (Osterman, 1994).

A second line of thought emphasizes the importance of imitation and mimicry (DiMaggio and Powell, 1983). When powerful firms adopt a given practice other organizations in the institutional field may subsequently also adopt them, not for reasons of performance or efficiency but because copying the action of the originators is seen to impart legitimacy and prestige. Hence while economic rationality might explain the actions of early adopters subsequent adopters may be driven by different considerations (Tolbert and Zucker, 1983). A typical test of this model is that equations with economic variables are successful in explaining early adoption but do poorly in modeling the actions of later adopters.

The third broad explanation also emphasizes institutional considerations but with a focus on internal processes within the organization. The literature on this is not as well developed as the other models but some scholars have argued, for example, that the presence of unions helps firms sustain HPWO practices because the union acts as a pressure group in favor of the practices and hence can ally with elements of management which are also in favor of continued innovation. One might also expect that the more powerful is the human resources function in an organization the more likely are the practices to be sustained.

In order to examine these questions I will estimate a model in which the dependent variable is the number of HPWO practices newly adopted or abandoned between 1992 and 1997 and the independent variables are measures of various

establishment characteristics. I estimate the models both with and without controls for the number of HPWO practices already in place in 1992. In principle one might expect that the more practices that were already in place the harder it would be to add new ones (since there are fewer to be added) and the easier it is to eliminate practices (since there are more candidates for elimination). On the other hand, if the presence of practices creates institutional pressure to add new ones and to maintain the ones that are in place then the prediction would be reversed.

The equations are estimated using an ordered probit model. The variable definitions and their means are provided in Table 4. It is important to note that the layoff variable refers to regular, not contingent, employees. In addition to the variables listed in that Table the equations also contain industry dummy variables and controls for CORE occupation. The results are shown in Table 5.

Both sets of equations demonstrate that restructuring, at least as measured by layoffs, does not seem to have a negative impact upon the ability of the establishment to add HPWO practices nor does it lead to the abandonment of previously adopted practices. Indeed, in the model for loss of practices which contains a control for the number of practices already in place layoffs seem to actually decrease attrition. In any case, the broad conclusions reached earlier are supported.

With respect to the addition of new practices, the equations are more supportive of the interest based models than of the more institutional explanations. Both the international markets and the strategy variables are positively and significantly related to adoption in one model and in the other model these variables as well as the degree of competition in the product market are significant. All of these variables were also positively and significantly related to adoption in the 1992 survey. Of the institutional variables only the presence of a human resources department is positively related to adoption and this is true in only one of the equations.

The model explaining loss of practices does not perform well as might be expected given that very few establishments experienced such a loss (only 6.8 percent of establishments had a net decrease in the number of HPWO practices since 1992). One of the interest based variables, the degree of competition, is significantly positive in one equation (which is surprising given that the same variable is also positive in the equation

explaining the addition of practices) but it then loses significance in the more complete model. Establishments which are branches of larger organizations are less likely to drop practices as, in one of the models, are establishments which are unionized.

The most powerful conclusion from the foregoing is that even after more careful controls the earlier conclusion that restructuring does not negatively impact the adoption of HPWO practices is reaffirmed. Furthermore, the adoption of new practices can be well understood by reference to the product market strategy and the competitive position of the establishment.

Are There Mutual Gains?

Implicit in much of the discussion of high performance work systems was the view that this approach to organizing work is “win-win,” in the interest of both employees and firms (Kochan and Osterman, 1994). The logic for this expectation is twofold. First, these systems sufficiently improve productivity so that there are gains to be shared. Second, there is a bias in these systems towards such sharing because they function best with high levels of employee commitment. Employees need to willingly contribute their ideas and extra effort to the enterprise and they are unlikely to do so if the firm is not prepared to make a comparable commitment to them. This logic emerges both from observation of the Japanese system in which employee commitment is exchanged for employment security and from a long history of industrial relations in this country in which firms found themselves trading various forms of job security for increased flexibility in work design.

There is in fact support for the first part of the proposition. The evidence that there are important productivity gains inherent in these work systems is reasonably convincing and is drawn from studies of a variety of different industries. It is in the second half of the argument where things get shakier. There has not been any systematic research on whether or not the gains are shared and there is a counter-argument to suggest why they might not be. As discussed above, if employees so strongly prefer these systems that they continue to cooperate even in the face of restructuring or if the

level of fear is high and the power imbalances in the workplace are sharp then HPWO systems might function even if the gains are not shared.

These questions have been the subject of considerable speculation but very little systematic research. However, it is possible to make progress by taking advantage of the longitudinal nature of the two establishment surveys. Specifically I can ask what happened in 1997 in those establishments which had high performance work systems in place in 1992. Do employees in 1997 who work at the 1992 adopters seem better off than in establishments which had not adopted HPWO in 1992? Using the 1992 data in this way is much more powerful and reliable than asking about the work practices and outcomes with the 1997 data only. If I were to compare work practices and employee outcomes just in 1997 it would be hard to be certain whether particular work practices explained the outcomes (e.g. high performance work systems led to wage gains) or whether the causation ran in the other direction (firms doing well enough to pay good wages decided to experiment with high performance work systems). However, by looking at work practices in 1992 and outcomes in 1997 we have a much better chance at getting the direction of causation right since it is obviously unlikely that some action in 1997 explains what the firm was doing in 1992.⁶

These ideas can be translated into the following statistical model which I will estimate:

Outcome in 1997 = 1992 control variables + high performance work system variable in 1992

In asking about whether the gains for high performance work systems are shared with the labor force I will look at three outcomes:

- Whether or not the establishment reported in 1997 that it had laid off 5 percent or more of its regular employees between 1995 and 1997;
- The average real wage increase (or decrease) experienced by the establishment's core employees in 1996;

- The average real wage increase (or decrease) experienced by all of the establishment's employees in 1996.

As a preliminary to this analysis it is important to explain how the earnings data were generated. A series of earnings questions were asked about three occupational groups within the establishment: core employees, managers, and everyone else. For each group we asked the following questions:

Now I need to ask about...employee pay and benefit packages. We are asking about the paycheck before deductions, so please be sure to include these sources of compensation: wages and bonuses and profit sharing. Please omit employer contributions to benefits such as pensions and health, the value of deferred compensation such as stock options, and overtime pay.

What is the typical compensation for...employees per year from these sources.

(PROBE: BY TYPICAL WE MEAN ABOUT HALF THE WORKERS IN THIS GROUP WILL BE PAID MORE AND HALF WILL BE PAID LESS)

With compensation defined as above the survey then asked about rates of change in pay for the previous calendar year for each of the three groups. Finally, with employment numbers for each group I was able to calculate the rate of change in pay for the establishment as a whole (as well, obviously, for core workers).

In addition to the variables previously defined, several additional independent variables will appear in these models. In order to control for the business success of the establishment, a factor which obviously will influence layoffs and may influence wages through the channel of recruitment and hiring, I include the percentage growth in the value of sales or product which the establishment experienced in the three years prior to the survey. As controls for the composition of the labor force of the establishment, which might also effect layoffs and particularly wage patterns, I include the fraction of the labor force which is technical or professional, blue collar, and clerical. Finally, I include the fraction of the establishment's labor force which is female. All of these variables, with the exception of the change in the value of sales, are taken from the 1992 survey. All of the employment variables refer to regular, not contingent, workers.

Finally, the variable I use to measure HPWO is the number of practices in 1992 which had fifty percent or more core employees involved.

The results are presented in Table 6. The layoff equation is estimated using a logit specification while the wage change equations are estimated via Ordinary Least Squares. For each outcome I first estimate a simple model which contains only the HPWO variable, the control for sales growth, and industry dummy variables. I then estimate the model with the full set of controls. The central results are very robust and in no case does the addition of controls to the simple model change the conclusion regarding the impact of HPWO upon the outcome of interest.

The central conclusion from these models is that the presence of HPWO systems in 1992 is associated with a higher probability of layoffs in subsequent years and with no gains in real wages. The fact that layoffs are positively associated with HPWO systems even after controlling for employment growth suggests that the implementation of these systems is associated with reorganization and restructuring which has negative implications for the incumbent workforce. The bottom line is that there is very little evidence that HPWO systems have delivered upon the promise of “mutual gains.”

There is little that is surprising in the control variables. Most reassuringly, increases in sales are negatively associated with layoffs and positively associated with wage gains.

Additional Organizational Changes

When people use the term “restructuring” more comes to mind than innovative work practices and layoffs. Other important organizational changes are also included, notably shifts in the use of contingent work as well as compositional shifts in the firm’s labor force.

It is understandable why contingent work seems linked to layoffs. Each implies that the organization is changing the nature of its bonds or commitments to its labor force, that the character of the employment relationship is shifting. Layoffs are obviously the most severe but contingent work can represent a substantial shift in the terms and conditions of employment.

In fact, however, the theoretical expectation regarding the relationship between contingent work and HPWOs is not clear. The traditional “core/periphery” model (Osterman, 1988) seems to suggest that even if the employer is willing to make a commitment to its key employees it will seek to buffer them by also employing a contingent labor force whose size can be adjusted more easily. This would imply that as the use of HPWO systems increased so would the use of contingent employment. However, alternative arguments are possible. To the extent that HPWO systems put a premium on commitment and on firm specific knowledge (as might well be the case with teams) then the use of contingent work seems less likely, at least within that part of the firm where HPWO systems are found.

Another organizational change commonly associated with restructuring is the loss of managerial jobs (Cappelli, 1992; Heckscher, 1995; Osterman, 1996). The typical view is that organizations are flattening their hierarchies and hence reducing the number of managerial employees. Here the theoretical expectation regarding HPWOs is more clear: to the extent that HPWO systems place decision making power and skills in the hands of front line workers then we would expect to see managerial employment decline.

In the survey I distinguished between two forms of contingent employment. The first is temporary staff who work on site at the establishment but are on the payroll of another organization. These are the classic temporary help agency employees. The second group I asked about were on-payroll contingent employees, i.e. workers who are on the payroll of the establishment but are regarded as contingent and lack whatever level of employment protections regular employees receive.

The fraction of employers who use temporary or contingent workers is quite extensive. In the 1997 survey 50.1 percent of the establishments employed temporary labor and 18.2 percent hired contingent employees. However, even though most establishments make some use of contingent work, the proportion of the establishment's labor force which is temporary or contingent is not very high. Of those establishments which do employ temporary and/or contingent employees, the temporary employees are equal to 5.7 percent of the regular employees and the contingent workers are equal to 13.5 percent of employees. However, a substantial number of establishments make no use of one or both form and if these are included then temporary employment accounts

for 2.7 percent of total employment and contingent employment represents 2.4 percent. These numbers are close to those reported by the Bureau of Labor Statistics based on a supplement to the Current Population Survey.⁷ In the analysis which follows I will combine temporary help and internal contingent employment into one variable.

Table 7 shows how the means of the contingent and managerial employment variables vary depending upon whether or not the establishment in 1992 had in place two or more HPWO practices at a fifty percent or better level of penetration. As the theory suggests, these data show that managerial employment is less intensive and grew at a slower rate for the establishments which had HPWO systems in place. The data also suggest that contingent employment is negatively associated with HPWO systems.

As a check on these findings I regressed each of the four variables (the levels and changes in contingent work and managerial employment) upon the number of HPWO practices in place in 1992 at a fifty percent level of penetration, the sales change variable, and industry dummies. In each of the four equations the HPWO variable was significantly negatively related to the outcome variable, thus confirming the findings in Table 7.

Finally, the fact that reduction in managerial employment is associated with HPWOs might suggest that the earlier finding that layoffs are linked to HPWOs could be driven by the efforts of employers to reduce their managerial ranks. In fact, among the establishments which reported layoffs 75.8 percent indicated that some of the layoffs were among managers. However, among these establishments (i.e. the ones that laid off some workers) only 22.2 percent of the total layoffs were managerial. While managers did indeed bear a disproportionate share of layoffs (since they accounted for only about 12 percent of employment) it is clear that the earlier results are not simply a function of the attempt to cut layers of managers.

CONCLUSION

Several important findings emerge from the 1997 survey. First, HPWO work systems have continued to spread in the 1990s despite the organizational turmoil engendered by restructuring. Second, the spread of these systems can best be understood in terms of interest based motives derived from the nature of product market competition

and employers' strategies for responding. Third, these HPWO systems do not seem to have lived up to their promise for "mutual gains" given that they are positively associated with layoffs and have no relationship to pay gains. Finally, the adoption of these systems are related to other organizational changes in reasonable ways and, in particular, are associated with reduced employment of managers as well as with more limited use of contingent workers.

Clearly in terms of received theory the most striking finding is the continued spread of these systems in the face both of overall organizational restructuring as well as the failure of specific enterprises to share the presumed gains from these systems with their labor force. The question then becomes whether these patterns are sustainable in the long run. One possibility, for example, is that while the systems can be implemented they will not, in the future, be as productive as before due to passive resistance from the labor force. This possibility, however, is purely speculative. For now, what we can say with confidence is that the trend towards work reorganization has not lost steam as the decade of the 1990s progressed.

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Table 1

DISTRIBUTION OF INNOVATIVE WORK SYSTEMS
 (percent of establishments at the 50% or better level of penetration)

	1992 Entire	1992 Merged	1997 Entire	1997 Merged
Quality Circles	27.4%	29.3%	57.4%	57.6%
Job Rotation	26.6	23.8	55.5	56.4
Teams	40.5	39.8	38.4	38.1
TQM	24.5	23.6	57.2	58.0

Table 2

TOTAL NUMBER OF PRACTICES, MERGED FILE

(50% level or better of penetration)

	1992	1997
0	35.2%	14.6%
1	27.2	13.8
2	25.0	32.2
3	8.5	23.6
4	3.8	15.6

Table 3

A. PERCENT OF ESTABLISHMENTS WITH TWO OR MORE PRACTICES AT FIFTY PERCENT LEVEL OF PENETRATION OR BETTER

1992	1997	
	yes	no
yes	81.5%	18.5%
no	53.5%	46.5%

B. PERCENT OF ESTABLISHMENTS MAINTAINING EACH PRACTICE AT 50% LEVEL OF PENETRATION OR BETTER

Quality Circles	85.8%
Rotation	60.2%
Teams	48.4%
TQM	76.0%

C. PERCENT OF ESTABLISHMENTS WHICH LACKED THE PRACTICE AT 50% LEVEL OF PENETRATION OR BETTER IN 1992 WHICH ADOPTED IT AT THAT LEVEL BY 1997

Quality Circles	47.3%
Rotation	43.4%
Teams	37.7%
TQM	55.2%

TABLE 4
1997 VARIABLE DEFINITIONS AND MEANS

LAYOFF	1 if the establishment laid off at least 5 percent of its regular (not contingent) workforce in the two years prior to the survey, 0 otherwise	.22
COMPETE	1 if the respondent reports that the establishment's product market is extremely competitive, 0 otherwise	.57
INTERNAT	1 if the respondent reports that the establishment competes in international markets, 0 otherwise	.40
STRATEGY	The first principle component of three scales measuring the extent to which the establishment competes on the basis of quality, variety, and service. This variable is described in more detail in Osterman (1994)	.02
UNION	1 if some employees at the establishment are covered by collective bargaining, 0 otherwise	.16
HRDEPT	1 if the establishment has one or more employees whose full time duties are human resources, 0 otherwise	.57
LARGER	1 if the establishment is part of a larger organization, 0 otherwise	.73
AGE	The number of years since the establishment was founded	27.52
SIZE1	1 if the number of employees is 100 to 499, 0 otherwise	.40
SIZE2	1 if the number of employees is 500 to 999, 0 otherwise	.03
SIZE3	1 if the number of employees is 1000 to 2499, 0 otherwise	.04
SIZE4	1 if the number of employees is 2,500 or greater, 0 otherwise	.03