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Nien-Chi Liu, and Yong-Seung Park*

The Organization of Work: Changes and Their Consequences

The paper documents the changes in human resource practices from the early 1980s to the middle of the 1990s, using a unique and comprehensive data set concerning a sample of about 800 firms from a wide range of industries in the state of Minnesota. A major aspect in these changes concerns the widespread adoption of practices that emphasize employee involvement in decision-making and in firm financial returns. Focusing on cross-sectional data the paper examines the determinants of human resource practices and finds that differences in the complexity of tasks and the interdependence among the tasks of core employees explain well the prevalence of employee participation in decision-making both individually and in groups. The association between human resource practices and outcomes of interest to employees and shareholders is complicated; the empirical findings do not support strong statements concerning the effect of employee participation in decision-making and in financial returns on outcomes. JEL codes M12, L23, J53

Since the early 1980s, the organization of work and the structure of firms have been undergoing a process of change that is not yet completed. New technologies, the intensification of domestic and international competition, and various political changes that have affected many countries, have forced firms to change their business strategy in order to survive, and have allowed them to adopt policies that make them more profitable (Osterman, 1994; Ichniowski et al., 1996; Baker, 1999; Cappelli and Neumark, 2001).

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that affect the contemporary organization of work, focusing on the tasks of core employees.

What are the consequences of the organization of work? Are workplaces that rely on more employee participation safer than other workplaces? Do shareholders or workers benefit more financially in more participatory firms or in workplaces organized in the more traditional way? The third objective of the paper is to offer a preliminary analysis of the consequences of the organization of work for workers and shareholders.

The paper summarizes the results of an ongoing project conducted at the Industrial Relations Center at the University of Minnesota.[1] It is written in a fashion aimed to inform readers of the main qualitative results of the project, and since it covers a very large territory, the relevant literature and theoretical background are quite large, the data sources and issues that are related to them are numerous, and the econometric techniques employed in the analyses summarized in the paper are diverse. In order to maintain coherence of the argument and to keep the paper at a reasonable length, the paper is brief on these matters (but points to papers that contain more detailed information).

Changes in the Organization of Work Since the Early 1980s

The organization of work consists of the practices that guide and direct the work of employees. These *human resource practices* can be grouped according to various criteria. We focus on the allocation of the key rights in an organization, the rights to decision-making and to financial returns,[2] and practices that support these rights, and whether these rights are afforded to individual employees or groups of employees.[3]

Programs fostering *employee participation in decision-making* include, at the individual level, latitude for employees to make discretionary decisions; at the group level, various plans that involve employees in making some decisions (such as quality circles, self-managed work teams, and joint labor-management committees); and, at the firm level, employee representation on the board of directors.

Plans that provide for *employee participation in the financial performance* of the firm tie employees' compensation to some measure of performance. Individual financial performance plans include commissions and performance-based pay. Group bonuses and gain-sharing programs are examples of group-level financial performance plans, while stock purchases, cash profit sharing, deferred profit sharing, and employee stock ownership plans (ESOPs) are firm-level financial performance plans.

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3. Not all practices that we consider in this paper as human resource p tioners, and not all the practices that practitioners term human resour of this paper. For example, we consider employee ownership to guide resource practice, but practitioners regard it as a financial plan. And p whereby employees can arrive and leave work at individual times, as a nore it for our purposes.
4. In the remainder of this paper we ignore the distinction between grou in the text are the actual practices that are included in our empirical v
5. The Minnesota Human Resources Practices Survey focused on 2,051 p with at least 20 employees representing a broad spectrum of industrie response rate was 42% (861 surveys); in many analyses, the number o cause incomplete responses to some items or missing observations in survey data. The survey questionnaire asked respondents about plans decision-making (for example, through self-managed work teams) or for which they work (for example, through individual or group incen human resources practices (such as training, employment security, and ticipation in decision making; the degree of information sharing with out by different groups of employees; the company's reliance on comp of firm organization. The survey also asked when various programs a tinued. The dataset used for the study included information supplie strument, data made available by Minnesota state agencies, federal age mation. For further information about the study, see Ben-Ner et al. (

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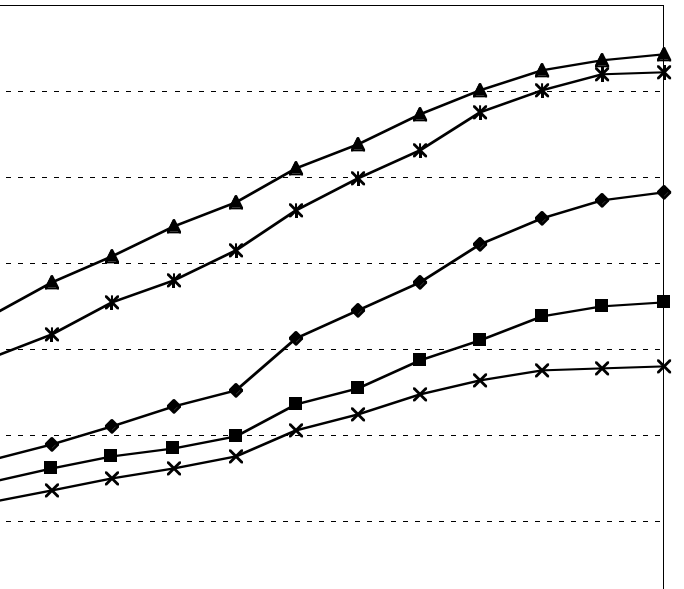

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decision-making programs, which includes only employee discretion, is
n about this category only for the year of the survey.

The Choice of Human Resource Practices

Theoretical considerations

Much has been written in recent years about the choice of the human resource practices. The theoretical perspectives employed by different authors vary, and so do their empirical frameworks. As a result, the findings are not directly and strictly comparable.[7] In this article we proceed with our theoretical perspective, which is derived primarily from organizational economics and from the sociology of organizations.[8] Management chooses practices that guide the work of employees to promote the firm's objectives. These practices address agency-managerial and technical-administrative problems.

Agency-managerial problems stem from the fact that workers prefer, when they can, to pursue their own interests rather than the objectives established by management. For example, workers may prefer to emphasize different projects than those that maximize profit for the firm, or to work less intensely than how management would like to work. The consequence of such potential behavior may be loss of productivity, and certainly loss of profits. To combat this, when workers' efforts or their results are easily observable, management requires and enforces work standards and guides directly employees' behavior, and pays fixed wages. (We shall refer to this as the 'old' or 'traditional' organization of work). When workers' efforts and direct results are not easily observable and when their behavior does not offer good clues about their productivity, management relinquishes direct control and grants workers some

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and vice versa. A firm that has only decision-making participation practices violates the principle of horizontal consistency, whereas a firm that combines individual decision-making discretion with group financial returns, but lacks individual financial returns and group decision-making is both horizontally and vertically inconsistent. A firm that has all four practices may be inconsistent, unless the practices are very carefully designed so as not to contravene each other.

The intensity of the technical-administrative and agency-managerial problems varies with several contingencies. These might include such things as a firm's business strategy; the technology of production; market forces; and the firm's size, age, and ownership structure. For example, technology may affect the complexity of tasks, and the ability of supervisors to observe workers' actions; firm size may affect the effectiveness of incentives that are subject to free-ridership problems, and so on. Consequently, the choice of human resource practices will vary among different firms because they generally face different contingencies.

Two major dimensions of *task environment* constitute the most important contingencies: the uncertainty of outcome of the employees' efforts, and the interdependence among employees' work. *Uncertainty of outcome* stems primarily from the complexity of an employee's tasks. Complexity prevents both the employee and his or her supervisor from being able to predict the exact outcome of a given task. To illustrate, let us compare a situation where the outcome is quite easy to predict – such as collecting tolls at a toll booth – with one where it is not – say, developing a new software application. The toll collector's tasks are fairly simple, and the work can be governed by simple rules and monitoring. In contrast, the software

Table 1.
Consistency in the Choice of Decision-Making and Financ
Human Resource Practices

Individual-level plans	Decision-making but no financial return
	Financial returns but no decision-making
	Decision-making and financial returns p
	Neither decision-making nor financial re
	Decision-making participation
	Financial returns participation
Group-level plans	Decision-making but no financial return
	Financial returns but no decision-making
	Decision-making and financial returns p
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	Financial returns participation

developer's tasks are significantly more complex and less predictable. Almost by definition, this situation demands that the employee exercise judgment and individual discretion rather than follow a simple set of rules or procedures handed down by a supervisor. Furthermore, such complex tasks will likely require consultation and cooperation with other software developers, as well as joint decision-making with co-workers in the context of a work team. Generally speaking, the greater the complexity of tasks and the higher the uncertainty of the outcome, the more useful it becomes to involve employees in decision-making.

If uncertainty influences the amount of employee involvement, the level of *interdependence* between employees helps determine the scope – that is, whether these programs should operate at the individual or group level. In general, the more employees

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ables (coded 0 if no practice of a given type is employed in a firm, 1 if at least one practice of that type is employed), our estimation method is logistic regression.

The results highlight the importance of task uncertainty in shaping human resource practices, as indicated by the results for the individual and group-level decision-making involvement practices. Interdependence among the tasks of employees is also important (but statistically somewhat less significant); it has the expected positive effect on the presence of group decision-making practices, and surprisingly, an even more significant effect on individual involvement in decision-making. However, neither uncertainty nor interdependence have apparently direct bearing on firms' adoption of financial returns plans. The level of skills is, as expected, positively associated with individual discretion in decision-making, but has no relationship with other dependent variables.

Outcomes for Owners and Workers

The operation of any firm is directed by the desire to attain certain objectives. Typically, for-profit firms are operated on behalf of their owners to maximize profits (or the value of their firms). This is done under a variety of constraints, including the need to hire managers and workers and the resulting agency-managerial and technical-administrative problems. The previous section has dealt with human resource practices that are instituted in order to ameliorate these problems, as well as with the underlying factors that affect the reliance on various practices. In this section we explore briefly

n-making nor financial returns plans are considered to have consistent hor-
those companies that have both types of plans.

Table 2.
The Choice of Human Resource Practices. ***Logistic Regression***

	Decision making induvidual level	Decision making group level	Fir inc
Task environment			
uncertainty	**0.43*****	**0.31*****	
	(0.12)	(0.11)	(0
interdependence	**0.18****	**0.14***	
	(0.09)	(0.09)	(0
Skills			
transferability	0.05	0.04	
	(0.08)	(0.08)	(0
level	**0.26****	0.07	
	(0.11)	(0.10)	(0
Control variables			
number of	-0.00	**0.16****	
employees (log)	(0.00)	(.07)	(0
unionization	-0.08	0.26	
(dummy)	(0.22)	(0.22)	(0
firm age	0.00	0.00	-0
	(0.00)	(0.01)	(0
firm age	0.00	0.00	-0
squared	(0.00)	(0.00)	(0
Industry			
commerce	-0.20	-0.07	
(dummy)	(0.19)	(0.17)	(0
services	-0.32	-0.32	
(dummy)	(0.23)	(0.22)	(0
Number of obs.	749	749	749
Prob. > chi2	0.00	0.00	
Log-likelihood	-448.4	-494.6	-475

Notes:
1. Estimated standard errors are in parentheses.
2. Significance levels are indicated by * for the .1 level, ** for the .05 level, and *** for the .001

and in a preliminary fashion the consequences of these practices for their putative intended beneficiaries, the owners, as well as for workers.[10]

Theoretical considerations

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decision-making discretion, and they are likely to emphasize safety over productivity efforts if they do not have a share in firm financial returns.

Empirical results

Table 3 summarizes the results of regressions of outcomes for firms, owners, and workers, using the same cross-sectional dataset that we used in the regressions underlying Table 2. In order to present the results succinctly as possible, a similar estimating framework is maintained across different outcome measures. The regressions include almost the same the set of independent variables: measures of human resource practices, controls for task environment and skills, and controls for firm size, industry, and union status; in the regressions represented by the first two columns we also included firm assets.[12] We present estimates only for decision-making and financial returns practices. The table includes two sets of regressions for each dependent variable. In one regression we include variables that identify the presence of decision-making and financial returns practices at the individual and group levels (the variable names, parameter estimates, F and R-squared statistics are italicized and appear on the right side of each column). In the other regression we included also interaction effects, written out in detail, with the omitted category being "no decision-making or financial returns participation plans." The parameter estimates on the variables not included in Table 3 are very similar across the two regressions. All regressions were estimated by OLS.

(1995), Park (1997), and Kong (2001) for more elaborate treatments of

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rmined in somewhat different processes which entail different estimating
ethods.

Table 3.
Outcomes for Workers and Owners: OLS Regressions. ***De***

	Productivity	Profitability	Wages
Individual-level plans			
Decision-making but no financial returns	**-.439*** (.262)	-4.74 (4.80)	.052 (.049)
Financial returns but no decision-making	.023 (.264)	2.13 (4.78)	**.094*** (.053)
Decision-making and financial returns	-.159 (.258)	**-15.28***** (4.99)	**.204*** (.060)
Decision-making participation	*-.312** *(.187)*	*-10.48**** *(3.70)*	
Financial returns participation	*.147 (.193)*	*-2.53 (3.67)*	
Group -level plans			
Decision-making but no financial returns	-.026 (.497)	-9.57 (8.49)	**-.189*** (.069)
Financial returns but no decision-making	.169 (.290)	-2.85 (5.48)	.071 (.052)
Decision-making and financial returns	.194 (.300)	-2.29 (5.67)	.010 (.056)
Decision-making participation	*.023 (.186)*	*-1.31 (3.44)*	
Financial returns participation	*.237 (.238)*	*-1.38 (4.52)*	
Number of observations	98	91	606
Mean of dependent variable	17.67	6.65	10.21
Prob>F	0.000 *0.000*	0.000 *0.00000*	0.000
R squared	.908 *.908*	.516 *.483*	.369

Notes:

1. The dependent variable in the productivity regression is log sales; in profitability it is aft extraordinary items divided by common equity); in wages it is log of average wage; in injur employment variability it is the coefficient of monthly employment variation during the y
2. All regressions include the following control variables: employment (log), union (dummy), - individual level (dummy), support practices - group level (dummy), skill complexity, and and transferability (1-5 Likert scales). The productivity and shareholder economic returns
3. The number of observations varies because of missing observations. The small number of o that dependent-variable and asset information is available only for public firms.
4. Two regressions were run for each dependent variable. In one, variables that identify the practices at the individual and group levels were included; the independent variables, para regressions are italicized and right-adjusted in each column. In the other regression interac is "no decision-making or financial returns participation plans."
5. Significance levels are indicated by * for the .1 level, ** for the .05 level, and *** for the .00

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wages. Participation in group financial returns is also associated with higher wages, but not so with group decision-making. In fact, group decision-making without group incentives is associated with lower wages than no decision-making and no financial returns plans at all.

Injury rates are slightly – but without statistical significance – lower in firms with individual discretion, and somewhat higher, with low statistical significance, in firms with group decision-making participation.[15] Finally, employment stability does not appear to be significantly associated with our measures of decision-making or financial returns participation, with the exception of individual incentives, which are associated with lesser stability (greater variability).[16]

Conclusions

The organization of work underwent a thorough transformation since the early 1980s. By and large, the typical new workplace relies more heavily on employee involvement in both decision-making and in firm performance, requires greater worker skills, and entails more complex tasks than the prevalent old workplace. A number of changes in the economy are responsible for these transformations, but the single most important proximate factor has been the increased complexity of tasks and the resulting uncertainty of outcomes. The driving forces behind this change are the increased reliance on computer-based technologies, and the change in business strategies towards greater flexibility in production. Although the changes have been sweeping, they have not affected all firms equally. Many occupations – such as those of line workers in manufacturing, services, and commerce – have become more complex and interdependent. In addition, the task of organizing workers has become much more complex than in the times of relative stability in the economic and technological environments. The flexibility that is being demanded of most employees is also required of those in positions of responsibility.

In view of the fact that managers choose human resource practices on behalf of shareholders to optimize their returns, it is surprising that the majority of the firms in our sample do not seem to benefit from their human resource practices neither in productivity nor in profitability. Individual discretion in decision-making appears to be particularly deleterious to both these important outcomes. Group-oriented practices have small negative – but statistically insignificant – effects on profitability and moderate to large effects, though again but statistically insignificant, on productivity (a 19.4% return on a combination of group decision-making and financial returns participation plans). These results must be qualified severely, given the low number of observations, the fact that the human resource practices have been summarized here rather coarsely, the great number of additional factors affecting such gross firm-level aggregates as productivity and profitability, and possible econometric

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