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How High Performance Human Resource Practices and Workforce Unionization Affect Managerial Pay

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Abstract

Using data from a nationally representative sample of telecommunications establishments, this study finds that HR practices and workforce unionization influence managerial pay levels and the ratio of manager-to-worker pay. High performance HR practices, including investment in the skills of the workforce, in computer-based technologies, and in performance-based worker pay practices, are all positively related to managerial pay; but the use of workforce teams, which shift some managerial responsibilities to workers, has the opposite association. High performance HR practices also are associated with lower manager-to-worker pay differentials. In addition, workforce unionization is positively associated with managerial pay levels, with worker base pay mediating the relationship between managers' pay and unionization.

How High Performance Human Resource Practices
and Workforce Unionization Affect Managerial Pay

In recent years, compensation researchers have challenged the notion that variation in wages can be accounted for solely by explanations derived from human capital and other conventional economic theories. Studies have found persistent inter-organizational differences in pay levels after controlling for employee human capital and factors such as industry and size (Eisenhart, 1988; Gerhart & Milkovich, 1990; Groshen and Kreuger, 1990). These findings support the notion that organizations possess a measure of discretion in setting compensation policies, resulting in variation in pay levels between similarly situated organizations.

The nature of the factors influencing managerial compensation, however, is less well understood. Most research on managerial pay has focused on top executives, and has examined agency problems involved in alignment of owner and top management interests (Barkema & Gomez-Mejia, 1998) or whether variation in such characteristics as ownership structure, profitability, or business risk predict compensation levels (Finkelstein & Hambrick, 1989; Hambrick & Finkelstein, 1995). Some recent studies have extended these models to middle-level managers (Bloom & Milkovich 1996, 1998).

There is reason to believe, however, that the pay of middle managers may be equally or more influenced by lower level organizational factors. While top executives are primarily responsible for corporate profitability and shareholder wealth, lower level line managers are primarily responsible for operational performance. While corporations often seek to tie a portion of middle managers' pay to corporate financial performance, these managers also are likely to be rewarded for their contribution to the organization – their ability to effectively manage the production systems for which they are responsible. One way they can affect production outcomes is by implementing "high performance" human resource (HR) practices -- those that invest in the skills and abilities of employees, design work in ways that facilitate employee collaboration in problem solving, and provide incentives to motivate workers to use their discretionary effort (Appelbaum et al, 2000; Delery and Doty, 1996). A growing body of empirical research shows that these practices indeed are associated with better performance (Becker & Gerhart, 1996; Ichniowski et al., 1996; Appelbaum et al., 2000). If these practices lead to better organizational performance, then it is reasonable to consider whether managers are rewarded for implementing them. High performance HR practices may affect managerial pay directly, by altering the complexity of managers' jobs, or indirectly, by raising workers' productivity and pay, which in turn may lead to upward internal equity adjustments.

Managers' pay also may be affected by union pressures. Unions, for example, may directly affect managerial pay by constraining managerial prerogative and increasing the complexity of managers' jobs. Workforce unionization may indirectly affect managerial pay levels through unions' ability to negotiate higher wages for workers, with companies seeking to maintain manager-to-worker pay ratios for internal equity reasons. No prior research, however, has examined the relationship between workforce unionization and managerial pay levels.

Thus, in contrast to the literature that views middle managers' pay from the top down, we examine managerial pay as a function of "bottom-up" factors that influence operational performance and the complexity of their jobs. We focus on both the absolute levels of manager pay and the ratio of manager-to worker pay for middle and lower level line managers (second and third tier managers above first line supervisors). We consider these issues using data from a nationally representative survey of customer service and sales centers in the telecommunications services industry. This industry-specific focus allows us to analyze detailed measures of variation in business and HR practices. The industry is an appropriate one to examine because, like many others, the proportion of managerial employees has increased dramatically over the last two decades, from 10.1 percent in 1980 to 22 percent in 1997 (CPS, 1998).

<u>Theory and Hypotheses</u>

In the first major investigation of the compensation of middle managers, Gerhart and Milkovich (1990) found significant inter-organizational variation in compensation levels, even after controlling for the human capital of managers and differences in the organizational characteristics, such as size and sales and profitability. Other studies have demonstrated a positive relationship between manager's pay and education and tenure (Abowd, 1990; Leonard, 1990; Fisher & Govindarajan, 1992; Werner & Tosi, 1995; Bloom & Milkovich, 1998) and manager's pay and organizational size (Lambert, Larcker, & Weigelt, 1991; Fisher & Govindarajan, 1992; Werner & Tosi, 1995; Bloom & Milkovich, 1998). A recent study showed that individual characteristics account for about half of inter-industry wage differentials and firm heterogeneity accounts for the other half (Abowd and Kramarz, 2000).

Recent research on executive pay has examined two other factors as determinants of managerial compensation: ownership structure and degree of business risk faced by firms. Two studies (Werner & Tosi, 1995; Mueller & Yun, 1997) examined the relationship between ownership structure and middle managers' pay and found that middle managers in manager-controlled companies received higher pay than those in owner-controlled companies. Also, Bloom and Milkovich (1998) analyzed the relationship between degree of business risk and

middle managers' pay and found that, contrary to expectations, managers in firms facing higher levels of business risk (measured in volatility in stock prices and variation in return on assets) received lower proportions of incentive pay; but depending on the type of risk and ownership structure, they may receive higher levels of base pay.   In brief, the compensation literature has approached variation in middle manager pay from 'above', by applying the literature on executive compensation to lower level managers.

An alternative approach is to view managers' pay as a function of the way they manage the workforce for which they are responsible. Recent literature documents wide inter-firm variation in HR practices, variation that reflects differences in firm-level strategic human resource decisions (Cappelli, 1999; Katz & Darbishire, 2000).   Within firms, managers also vary in their ability or willingness to implement the strategic initiatives of top management. Building on this line of reasoning, we view middle manager's pay as a function of their implementation of high performance human resource practices. Managerial pay may be affected indirectly, in response to the effects of HR practices on the productivity and pay of workers; or directly, by affecting the complexity of managers' jobs. Similarly, workforce unionization may influence manager's pay indirectly, through their effect on workers' pay, or directly, by increasing the complexity of managers' jobs. In the following sections we outline the hypothesized relationships between managers' pay and the use of high performance HR practices, subject to the pressures exerted by unions.

High Performance HR Practices and Managerial Pay

The use of high performance work systems has gained widespread interest in recent years as the source of competitive advantage (e.g., Pfeffer, 1998). Researchers have identified three interrelated dimensions of these systems that are hypothesized to contribute to organizational performance: high relative *skills* of the workforce; the *opportunity* to use those skills (e.g. employee discretion and participation in teams); and *incentives*, such as performance-based pay, to induce commitment and discretionary effort (e.g. MacDuffie, 1995; Delery & Doty, 1996; Appelbaum et al, 2000). A fourth dimension that typically accompanies the use of high performance HR practices is the use of advanced information-based technologies that require a computer-literate workforce. A growing body of evidence suggests that high performance HR practices, in combination with new technology, produce better productivity, quality, sales, and financial performance (Arthur, 1992; Bailey, 1998; Black & Lynch, 1998; MacDuffie, 1995; Huselid, 1995; Becker & Gerhart, 1996; Youndt, Snell, Dean, & Lepak, 1996; Ichniowski, et al, 1997; Batt, 1999; Appelbaum et al, 2000).

If high performance HR practices lead to better organizational performance, then manager pay may be higher where these practices are present due to the higher skills, productivity, and pay of workers in these systems. Through this channel, managers benefit <u>indirectly</u> from the effects of high performance HR practices on workers. This argument draws on human capital theory and is consistent with the economic literature that views increased wage variation as a function of "skill biased technical change" (e.g., Johnson, 1997). Economists have argued that new technologies have increased the demand for skill, thereby raising the relative wages of higher skilled workers. If technology is defined to include both hardware (e.g., computer systems) and soft technologies (e.g., HR practices), then it is reasonable to suspect that variation in the use of high performance HR practices may explain wage outcomes of workers. We extend this argument by examining whether this technologically induced variation in workers' jobs and wages exerts indirect effects on manager pay.

Researchers only recently have begun to examine the links between high performance HR practices and worker pay, and the evidence to date is mixed. In a longitudinal study using a nationally representative sample of establishments, Osterman (2000) found no evidence that establishments with high performance practices paid higher wages to workers than other firms. In contrast, in a study of the steel, apparel, and medical instruments industries, Appelbaum et al. (2000) found that the use of high performance systems was associated with higher wages. Similarly, Hunter and Lafkas (1998) found that the interactive effect of more autonomous work organization and new technology produced higher wages for retail bank workers. Other studies of self-managed teams, a key component of high performance systems, have found that workers in teams received higher wages because they worked more overtime to absorb supervisory tasks (Weisman et al., 1993; Batt, 2000). In sum, it is possible that managers who implement high performance HR systems receive higher pay indirectly because the operations and workforce they manage are more productive. However, no studies have yet examined this relationship.

The pay of managers who implement high performance HR practices also may be affected as these work practices alter the complexity of managers' jobs (a <u>direct</u> influence of these HR practices). For purposes of this discussion, it is useful to consider whether and how each of the dimensions of high performance systems – the use of a higher skilled workforce, advanced information technologies, teams, and performance-based worker pay – might directly affect the complexity of managerial jobs. First, with respect to human capital of the workforce, it is likely that managers of higher skilled workers would themselves need to have higher skills, particularly interpersonal skills. In the shift from a command-and-control to a participative

management system, for example, some research shows that managers need more sophisticated interpersonal and leadership skills (e.g., Manz and Sims, 1987; Stewart and Manz, 1997).

Investment in new technologies also is likely to affect the skill requirements of managerial jobs. Management theorists have generally distinguished between technology used to inform or complement workforce capabilities (i*nformating*) and technology used as a substitute to reduce the labor content of jobs (*automating*) and control labor (e.g., Zuboff, 1988). Informating uses of technology are consistent with the use of high performance HR practices. In manufacturing, for example, the use of computers for statistical process control requires the selection and training of computer-literate workers (MacDuffie, 1995). An analogous use of technology in the context of customer service centers in this study is to develop a rich database of information on customers to enhance workers' ability to sell and customize products. They also can use email and on-line resources for updating information on products, pricing, and procedures. Where firms use these types of systems, managers as well as workers need to be computer literate. An alternative approach to technology in call centers is to use it primarily as a control system to electronically monitor workers' performance. This approach is consistent with an engineering or production line approach to services -- allowing the use of low skilled workers in low-paid, low-discretion jobs (Levitt, 1972). Because electronic monitoring is a substitute for managerial monitoring, it simplifies the work of managers and is likely to be associated with lower manager pay levels.

The second dimension of high performance systems – the use of workforce teams – allows employers to shift some operational decisions to workers, who are viewed as having more tacit knowledge than managers for making decisions close to the point of production. Considerable research shows that reorganizing work into teams, especially self-managed teams, alters the locus of control between managers and workers, with workers absorbing some tasks previously performed by lower level managers. Research also shows that lower level managers often have resisted workforce teams because they infringe on managers' power, authority, and job security (e.g., Buchanan & Preston, 1991; Klein, 1984; Muller-Jentsch, 1995; Schlesinger and Klein, 1987). While no research has examined the relationship between workforce teams and managerial pay, these arguments suggest that the use of workforce teams will be associated with lower managerial pay levels because some managerial tasks are shifted to workers.

The third dimension of high performance systems, performance-based worker pay, is unlikely to have direct implications for managerial pay, but may have indirect effects. Manager

pay levels will be directly affected by their own performance-based pay. Managerial pay, however, may be indirectly affected by the use of performance-based pay among workers because this form of compensation is likely to induce greater effort on the part of workers, resulting in better organizational performance, and managers may share in these productivity improvements.

In sum, this discussion suggests the following set of hypotheses:

H1a: Investment in a high skilled workforce and in informating technologies will be associated with higher managerial pay levels.

H1b: Work organized to give non-managerial employees greater discretion through participation in teams will be associated with lower managerial pay levels.

H1c: HR incentives for workers, such as performance-based pay, will be associated with higher managerial pay levels.

So far we have offered hypotheses related to the <u>level</u> of managerial pay. The general argument is that if high performance HR practices produce better organizational performance and these gains are shared, then both worker and managerial pay should be higher. If the gains from high performance practices are shared equally, then manager-to-worker pay ratios might be unaltered. However, as indicated above, some dimensions of high performance systems, particularly the use of teams, may alter the relative compensation of managers and workers.

Other arguments also suggest that manager-to-worker pay ratios may be lower in establishments that use high performance HR practices. As a general principle, high performance practices are likely to have a greater effect on the skills and jobs of workers than of managers because workers are the focus of the HR practices. If we consider the dimensions of high performance systems discussed above, manager-to-worker skill and pay differentials are likely to be compressed because high performance systems raise the skills, responsibilities, and contributions made by workers relative to managers. If workers' skill requirements rise more than do those for managers, then human capital theory would predict that the wages of workers would rise relative to those of managers, reducing the managerial wage premium. Similarly, variation in technology is likely to have more direct implications for the skills and pay of workers using the technology than for managers. Thus, where technology is used to informate production work, consistent with high performance practices, then the wages of workers should rise relatively more than those of managers, resulting in a lower manger-to-worker pay ratio (and conversely, electronic monitoring is likely to increase the manager-to-worker pay gap).

Second, as noted above, if teams shift the relative roles and responsibilities between managers and workers, essentially narrowing the gap in relative status and contribution to the organization, then the manager-to-worker pay ratio is likely to be lower than would otherwise be the case. A similar outcome is likely with respect to performance-based pay. Compared to workers, managers typically have a higher percentage of pay that is variable; and evidence suggests that performance-based pay is associated with higher pay levels. Thus, if firms increase the percent of workers' pay that is variable relative to that of managers, then the manager-to-worker pay ratio should be lower than would otherwise be the case.

Finally, other organizational effects may provide a further rationale for lower manager-to-worker pay ratios under high performance work systems. MacDuffie (1995), for example, argued that lower manager-to-worker status differentials were an important part of Japanese lean production systems. Levine and D'Andrea Tyson (1990) argued that compressing manager-to-worker pay differentials can increase group cohesiveness and "reinforce the atmosphere of participation" (p. 211). Some empirical studies show that reduced inter-group pay differentials are associated with better organizational performance (Cowherd & Levine, 1992; Bloom, 1998; Pfeffer & Langton, 1993; Drago & Garvey, 1998). Thus, if reduced manager-to-worker pay ratios help elicit the level of worker participation needed for high performance systems to function effectively, then organizations that adopt these systems are likely to redesign compensation systems in ways that reduce pay differentials. In sum, these arguments suggest the following two hypotheses:

H2a: High performance HR practices will be associated with lower manager-to-worker pay ratios.

H2b: The use of informating technologies will be associated with lower manager-to-worker pay ratios and electronic monitoring will have tbe opposite association.

The Influence of Workforce Unionization on Managerial Pay

Extensive research has documented the existence of a union wage premium, with unionized workers receiving approximately 15 to 20 percent higher wages than similarly situated nonunion workers (Freeman, 1980, 1984; Lewis, 1986; Jakubson, 1991; Raphael, 2000). This research also has shown that unions reduce the white collar/blue collar wage premium by raising the level of blue collar wages (Freeman and Medoff 1984). Due to the exclusion of managers from coverage by the National Labor Relations Act, any wage premium obtained through collective bargaining only applies to the workers who are in the bargaining unit and not to managerial employees. As a result, the direct effect of union representation should be to

raise the wages of workers relative to managers, thereby reducing the manager-to-worker pay ratio.

There are reasons to believe, however, that unions also exert indirect effects on manager pay levels, albeit of smaller size than for workers. First, there may be "spillover" effects, as firms pass on union-negotiated wage increases to managers in order to enhance perceptions of intra-organizational distributive justice (Cowherd & Levine, 1992). Institutional theory (DiMaggio & Powell, 1983; Eisenhardt, 1988) also provides a related rationale for why organizations would attempt to maintain existing manager-to-worker wage differentials within the organization. Collective bargaining may serve as a mechanism through which norms about appropriate wage increases become institutionalized within the organization, with expectations developed that managers will receive pay increases corresponding to those obtained by unionized workers. In his study of managers in the auto industry, for example, MacDuffie (1996:95) showed that from 1948 to the early 1980s, the big three auto makers routinely passed on to salaried employees the pay and benefit increases negotiated by the auto workers union.

In addition, unionization may affect managerial compensation more directly by adding a level of complexity to managers' jobs. Unions, for example, may make it difficult for managers to exercise their prerogative or unilaterally introduce innovative work practices. Thus, middle managers in unionized workplaces are likely to need more interpersonal and negotiating skills. They are likely to have to negotiate with the union or set up on-going labor-management committees as a prerequisite for union support for high performance HR practices. For these reasons, we hypothesize that the institution of unionization will be associated with higher manager pay but only modest reductions in manager-to-worker pay ratios.

H3a: Unionization of workers will be associated with higher manager pay levels.

H3b: Worker base pay will partially mediate the relationship between workforce unionization and managerial pay levels.

H3c: Unionization of workers will be associated with modest reductions in manager-to-worker pay ratios.

<u>Methods</u>

<u>Data</u>

The data for this study come from a nationally representative random sample drawn from the Dun and Bradstreet listing of telecommunications establishments. Establishments were stratified by state and size, with all states represented and almost all establishments with more than 100 employees included. Smaller establishments were stratified by SIC code so that the total sample reflects the relative proportion of establishments in the three segments of the

industry: wireline (SIC 4813); cellular (SIC 4812); and cable TV (SIC 4841). Because Internet service providers (ISPs) are an important new part of the industry that is not well captured by SIC code, additional ISPs were identified through the Directory of National Dial-up Providers and Area Codes of Operation.

A university-based survey team administered the survey by telephone in the Fall of 1998. Respondents were the top (general) managers in charge of customer service and sales (call) centers. The telephone interviews averaged 52 minutes and yielded 354 usable responses, representing a 54 percent response rate. Information from the Dun and Bradstreet establishment database allowed us to check the representativeness of the respondents on a number of dimensions. There were no statistically significant differences between respondents and non-respondents on whether or not the establishment was publicly or privately held, a branch of a larger organization, or owned by a former Bell company. Internet service providers were somewhat less likely to respond, perhaps because they are less likely than other segments to self-identify with the telecommunications industry. Smaller establishments were somewhat more likely to respond than larger establishments. Missing values randomly distributed in the data reduced the final sample for the multivariate equations to 238. We tested whether there are statistically significant differences in the variables of interest between the full sample and the reduced sample, and found none.

Measures

Dependent Variables

The dependent variables in the study are the *natural log of the median pay of managers* and the *ratio of median pay of managers to workers,* at the establishment level. This measure excludes first line supervisors and captures a relatively narrow band of lower and middle-level (2nd and 3rd tier) managers. First line supervisors were specifically excluded because many first line supervisors in the industry are promoted from the ranks of non-managerial workers (Batt, 1996) and thus their labor markets might be more similar to that of workers than 2nd and 3rd tier managers, most of whom have a college degree. The average call center in this study has 181 customer service employees and 1 layer of managers between the first line supervisor and the top (general) manager or director of the center. Larger centers tend to have 2 layers of managers between the supervisor and center director.

The measure of median pay of managers is based on asking the call center's top manager, "what are the annual earnings of a typical full-time manager in your establishment? (by 'typical' we mean that about half the managers are paid more and about half are paid less)." We asked respondents to include base pay and performance-based pay such as profit-sharing,

gainsharing, and bounuses, but exclude stock options and employer contributions to benefits. We also collected measures of total compensation, including benefits; however since this measure substantially increased the amount of missing data and yielded generally similar results, we did not include it in the results reported here.

The ratio of manager-to-worker pay was constructed by comparing the median pay of managers to the same measure of pay for "core" workers, defined as the largest group of non-managerial employees who perform the core production work of the establishment. Given that our focus is on determinants of differences in pay levels rather than perceptions of pay inequity, we use the ratio of absolute pay levels. By contrast, an interest in perceptions of inequity has led some researchers to focus on relative pay levels, using as a measure of pay level the salary as a percentile of salaries in the relevant external labor market (e.g. Cowherd & Levine, 1992).

Independent Variables

Our measures of high performance HR practices capture the practices used to manage core workers in the establishment. We drew on prior literature to develop indicators of three dimensions of high performance practices: the relative skill requirements of core jobs, the design of work to enhance employee discretion through participation in teams, and the use of performance-based pay. We also measured variation in the use of information technology. To capture skill requirements of the jobs, we used measures of human capital typically included in economic models of wage determination. This allows us to identify whether technology, work design, and performance-based pay explain wage variation over and above that explained by traditional human capital variables. Included are three measures of skill level: a) years of formal education of the typical (median) core worker; b) percent of the core workforce with less than 1 year of tenure; and c) percent of the core workforce with more than ten years of tenure.

The technology used in the establishment is measured in two ways: as an information resource that is complementary to high performance HR practices ("informating") and as a control device associated with a production line approach to HR management. Technology as an information resource is measured by the number of emails sent by management to employees each day to update them on information regarding products, procedures, or regulations. Technology as a control device is represented by the percent of workers' performance that is electronically monitored each day.

Work design is measured by participation of workers in two types of teams: the percent of core workers that participate in regular off-line problem-solving groups and the percent that participate in self-directed teams. For performance-based pay, we asked the general manager to consider the pay of the typical (as defined above) core worker. Performance-based worker

pay includes profit-sharing, gainsharing, commission pay, and bonuses not included in base pay. Given the sales environment of this study, most (84 percent) of performance-based pay is accounted for by commission pay.

Union presence is measured by a dummy variable (where 1 = union, and 0 = nonunion) representing whether or not the core workforce in the establishment is unionized. Because we used a narrow definition of core workers that was consistent with bargaining unit definitions, the workforce in each establishment was either entirely union or nonunion.

Control Variables

We included economic, organizational, human capital, and HR control variables that are likely to influence managerial pay. The establishment's economic environment is measured by two variables: a) the average unemployment rate for 1998 in the county where the establishment is located, based on the Local Area Unemployment Statistics of the Bureau of Labor Statistics; and b) the local cost of living for 1998, drawn from the Economic Research Institute's *Geographic Reference Report.*   Market success is measured by the change in the establishment's sales in the prior two years (–1 = decreased, 0 = remained the same, and 1 = increased).

With respect to organizational characteristics, we controlled for customer segment served by the call center. It is likely that managers of centers serving higher value added business customers will require higher skills and have more complex jobs than their counterparts serving residential consumers in commodity markets. To identify customer segmentation, establishments were dummy coded into five groups: operator services, residential target, small business target, large business market, and universal centers that do not target a particular segment (the omitted category). Operator services is included because it represents the lowest valued service channel: while historically a cost center, deregulation has turned it into a fee-generating business as directory assistance is no longer free. We also controlled for establishment size (the natural log of the total number of employees)[1].

Manager's human capital is measured by years of formal education of managers, the percent of managers with less than one year of company tenure, and the percent of managers with more than ten years of tenure. Managers' performance-based pay is measured by the

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[1] We explored a number of other organizational characteristics as control variables that theoretically might affect managerial pay. These included whether or not the establishment is part of a Bell company, whether the establishment is a branch of a larger company, whether the establishment has its own HR department, and the span of control of the manager. These were highly correlated with other characteristics, especially organizational size and unionization. The branch and Bell company characteristics also are captured by our use of a Huber (1967) technique to correct for a possible company clustering effect. Because these variables used up degrees of freedom and did not contribute significant explanatory power, they were not included in the final equations.

percent of managers' pay that is variable. Finally, worker base pay is included as a control in the models estimating manager pay. The base pay of workers is the natural log of the annual base pay of the typical (median) core worker.

Analysis

Relationships are analyzed using ordinary least squares (OLS) regressions. However, because the data include multiple establishments from some companies, the standard OLS assumption that observations are independently distributed may be violated. To deal with this possibility, we use a Huber (1967) technique to correct for a possible company clustering effect, providing robust standard errors. We entered groups of independent variables hierarchically into the equations to examine the added explanatory power of that category of variables. One of our dependent variables, the manager-to-worker pay ratio is more difficult to interpret because it is in ratio form (Cohen and Cohen, 1983, 73-76). To help analyze the results for this dependent variable, we first present the results for each of the components of the ratio, i.e. the denominator, worker pay, and the numerator, manager pay, then present the results for the ratio itself.

Results

Table 1 reports the means, standard deviations, and correlations among the variables. The mean annual median pay of managers (not transformed into natural log) is $57,458, and that of the core workforce is $35,213, yielding a manager-to-worker pay differential of 1.88. The correlations between variables support several of the hypothesized relationships. In the next sections, we report regression findings concerning the hypotheses relating to manager and worker pay levels and then turn to the regression findings concerning manager-to-worker pay ratios

Manager and Worker Pay Levels

Table 2 reports the unstandardized coefficients and standardized beta coefficients for regressions with worker and manager pay levels as the dependent variables. Worker pay level is the dependent variable in the first model.   Manager pay level is the dependent variable in the other five models. Controls for economic indicators and organizational characteristics are not reported in the table, but are included in all of the regression models.

Worker pay level is the dependent variable in the first model, which includes the control variables plus the independent variables representing unionization and human resource practices. As predicted, unionization has a significant (p<.001) positive association with worker pay levels. On average unionized workers receive 19.2 percent higher pay than nonunion

workers, holding other factors constant[2]. Among the human resource practices, both of the technology variables have the predicted relationships with worker pay. Number of emails per day has a significant ($p<.01$) positive association with worker pay, whereas the percentage of time workers are electronically monitored has a significant ($p<.001$) negative association with worker pay. As predicted, the percentage of worker pay that is variable also has a significant ($p<.001$) positive association with overall worker pay, however neither of the variables representing teams had significant associations with worker pay in this model.

The second model is the base model for manager pay level and includes only the control variables (economic environment, organizational characteristics, manager human capital, and manager variable pay), which together explain 38.1 percent of the variance in manager pay. Associations for the control variables in the base model are generally as expected. Education levels for managers ($p<.001$) and long tenure for managers ($p<.01$) have significant positive associations with manager pay. In the subsequent four models, the groups of variables representing unionization, worker base pay, worker skills, and human resource practices are added hierarchically to this base model to allow examination of the additional variance explained by each group of variables.

In the third model, the variable representing union presence is added to the base model. Hypothesis 3a states that the unionization of workers will be associated with higher levels of manager pay, and hypothesis 3b states that worker pay should partially mediate the relationship between union presence and manager pay levels. These hypotheses receive partial support. Union presence has a significant ($p<.053$) positive association with manager pay, and the coefficient estimate indicates a manager pay premium of 9.1 percent in unionized establishments compared to nonunion establishments. However, including the union presence only explains an additional 0.5 percent of the variance in manager pay and this is not a significant improvement in the model.

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[2] Use of a logged dependent variable allows interpretation of effect sizes as percentage changes in the dependent variable, once the appropriate calculation has been made using the anti-log: % change in DV for a union change in IV $= (e^B - 1) * 100$.

Table 1:
Means, Standard Deviations, and Correlation Matrix

		Mean	S.D.	1	2	3	4	5
1	Ln median worker's pay	10.334	0.498	1				
2	Ln median manager's pay	10.891	0.375	0.629	1			
3	Manager-to-worker ratio	1.880	0.736	-0.606	0.196	1		
4	Manager education (yrs.)	15.388	1.521	0.328	0.468	0.021	1	
5	Manager tenure < 1 yr. (%)	0.111	0.213	-0.020	-0.066	-0.004	0.039	1
6	Manager tenure > 10 yrs. (%)	0.344	0.388	-0.061	0.048	0.139	-0.152	-0.062
7	Manager's % variable pay	0.184	0.198	0.220	0.193	-0.096	0.210	0.111
8	Union presence	0.132	0.339	0.014	0.106	0.064	-0.012	-0.131
9	Worker education (yrs.)	13.661	1.658	0.638	0.429	-0.376	0.380	0.056
10	Worker tenure < 1 yr. (%)	0.278	0.271	-0.208	-0.242	0.028	0.039	0.308
11	Worker tenure > 10 yrs. (%)	0.305	0.344	-0.019	-0.067	-0.034	-0.035	-0.047
12	Emails/hr.	1.409	1.697	0.382	0.311	-0.188	0.147	-0.072
13	% electronically monitored	0.364	0.404	-0.381	-0.155	0.326	-0.130	0.068
14	Offline problem-solving teams	0.515	0.366	0.130	-0.044	-0.187	0.017	0.085
15	Online self-directed teams	0.162	0.322	0.178	0.012	-0.192	0.097	0.063
16	Worker % variable pay	0.193	0.219	0.516	0.203	-0.413	0.141	0.016

	6	7	8	9	10	11	12	13	14	15	16
6	1										
7	-0.129	1									
8	0.265	-0.041	1								
9	-0.208	0.248	-0.186	1							
10	-0.309	-0.061	-0.202	-0.020	1						
11	0.294	0.018	0.260	-0.158	0.074	1					
12	-0.177	0.106	-0.050	0.309	-0.005	-0.229	1				
13	-0.029	-0.079	0.125	-0.328	0.089	-0.007	-0.135	1			
14	-0.099	0.092	-0.137	0.156	-0.139	-0.067	0.050	-0.023	1		
15	0.000	-0.020	-0.121	0.095	-0.030	-0.052	0.192	0.009	0.211	1	
16	-0.143	0.379	-0.209	0.489	-0.031	-0.128	0.201	-0.250	0.071	0.172	1

N = 242. Note: Values >= |0.128| are significant at $p<.05$.

Table 2: Predictors of the Natural Logs of Manager and Worker Pay

Manager' skills & pay	Worker Pay (1) — (1) Coef.	(1) Std. B.	Manager Pay (2-6) — (2) Coef.	(2) Std. B.	(3) Coef.	(3) Std. B.	(4) Coef.	(4) Std. B.	(5) Coef.	(5) Std. B.	(6) Coef.	(6) Std. B.
Mngr. Education (yrs.)	0.019	0.058										
Mngr. Tenure < 1 yr.	0.131	0.056	0.091	0.368 ***	0.090	0.366 ***	0.070	0.285 ***	0.062	0.250 ***	0.066	0.268 ***
Manager tenure > 10 yrs.	-0.020	-0.016	-0.153	-0.087	-0.138	-0.079	-0.157	-0.089	-0.100	-0.057	-0.052	-0.030
Mngr's % variable pay	-0.062	-0.025	0.136	0.140 **	0.116	0.120 *	0.092	0.095 *	0.104	0.108 +	0.112	0.116 *
Unionization			0.290	0.153 *	0.284	0.150 *	0.360	0.190 **	0.281	0.149 *	0.150	0.079
Union presence	0.176	0.120										
Worker base pay		***			0.087	0.079 +	0.006	0.006	0.026	0.024	0.005	0.005
Workforce HR practices							0.325	0.410 ***	0.288	0.364 ***	0.389	0.491 ***
Worker skills												
Core education (yrs.)	0.091	0.304										
Core tenure < 1 yr.	-0.297	-0.162 ***							0.045	0.198 ***	0.019	0.082
Core tenure > 10 yrs.	0.153	0.106 **							-0.155	-0.112 +	-0.174	-0.126 +
Technology use		*							-0.081	-0.074	-0.065	-0.059
Emails/hr.	0.044	0.149										
% elect. monitored	-0.223	-0.181 **									0.020	0.090 *
Teams		***									0.080	0.087
Problem-solving teams	0.053	0.039										
Self-directed teams	0.086	0.055									-0.102	-0.100 *
Incentive pay											-0.111	-0.095 *
% wkr. variable pay	0.601	0.264										
Constant	8.166 ***	***									0.457	0.267 ***
F statistic	35.200 ***		9.014 ***		9.049		6.279 ***		6.193 ***		5.477 ***	
R-squared	0.663		13.760 ***		12.930 ***		15.080 ***		17.460 ***		19.950 ***	
Chg. R-squared			0.375		0.381		0.501		0.544		0.599	
F for Chg. in R-squared					0.005		0.120		0.044		0.055	
					1.840		54.589 ***		7.200 **		6.010 **	

N = 248. *** = p<.001; ** = p.<.01; * = p<.05; + = p.< .10., Note: Market and organizational controls included, but not shown.

To test for mediation, we followed Baron and Kenny's (1986) procedure and first tested whether the independent variable (union presence) is significantly related to managerial pay (model 3 above). We then tested whether the mediating variable alone (worker base pay added to model 1) was significantly positively related to manager pay levels and found that it was (equation not shown). Third, we tested whether the union coefficient drops in size and significance in the presence of worker base pay (Table 2, model 4). We found that with the addition of worker base pay, the union variable became insignificant and the coefficient was reduced in size to almost zero (from .087 to .006). While we hypothesized that the union would affect managerial pay both directly (by increasing the complexity of managers' jobs) and indirectly (via the union's affect on worker pay levels), our results suggest that the union effect is fully accounted for by its indirect effects on workers' pay. These results imply that there is no direct effect via increasing the complexity of managers' jobs.

The fifth model adds the three measures of workers' skills. As predicted in hypothesis 1a, workers' years of education is significantly positively related to managerial pay levels (p <.001), while low tenure among workers has a marginally significant (p<.10) negative association. Addition of these measures of workers' skill level increases the variance explained by 4.4 percentage points, which is a significant (p>.01) improvement over the fourth model. Thus, after controlling for managers' human capital and workers' base pay, the human capital of workers is significantly related to managers' pay levels. To give a sense of the magnitude of these relationships, if the typical worker has 1 additional year of education, manager pay levels are 1.9 percent higher.

The sixth model adds the five variables measuring technology use, teams, and performance-based pay. With the addition of these variables, the coefficient on worker education becomes insignificant and smaller in size, consistent with the idea that high performance HR practices are typically used in conjunction with higher skilled workers. The results of model 5 show that hypotheses 1a-c are supported for all but 1 of the HR variables. Hypothesis 1a states that the informating use of technology will be associated with higher managerial pay, and electronic monitoring with lower pay levels. The results show that the number of emails sent by management to workers has a significant (p<.05) positive association with manager pay, but electronic monitoring is not significant. Hypothesis 1b states that the use of teams among workers will be associated with lower managerial pay. Both problem-solving teams and self-directed teams have a significant (p<.05) negative association with manager pay, thus providing support for hypothesis 1b. Finally, the percent of worker pay that is variable

has a significant positive association (p<.001) with manager pay levels (after controlling for the percent of manager pay that is variable), supporting hypothesis 1c.

To give a sense of the magnitude of these relationships, a 10-percentage point increase in the percent of the workforce in problem-solving teams is associated with a 1 percent lower pay level for managers. The same change in the percent of the workforce organized into self-directed teams is associated with a 1.1 lower pay for managers. The same increase in the percent of workers' pay that is variable is associated with 5.6 percent higher manager pay levels.

Manager-to-Worker Pay Differentials

Table 3 reports the results when the manager-to-worker pay ratio is the dependent variable in a regression analysis with four hierarchically ordered models. However, because median worker pay is used to construct the dependent variable, worker base pay is excluded from the independent variables in the manage-to-worker pay equations in Table 3. The first model in Table 3 includes only the control variables and explains 18 percent of the variance in the ratio of manager-to-worker pay. In Model 2, the union variable is added to the first model, increasing the variance explained by only 0.4 percentage points, which is a non-significant improvement in the model. In the third model, the measures of workforce skills are added, and they explain an additional 7 percent of the variance, which is a significant improvement over the second model. The fourth model, which includes the measures of technology use, teams, and performance-based pay, explains an additional 13.6 percent of the variance, which is a significant improvement of the model (p<.001).

Hypothesis 3b, which states that workforce unionization will be associated with lower manager-to-worker pay ratios, receives support in the fourth model. The relationship between unionization and the manager-to-worker pay ratio is not statistically significant at even the .10 level when unionization is added in the second model. However, the coefficient on unionization increases and becomes statistically significant in the fourth model when the remaining human resource practice variables are added, indicating that these variables had a suppressor effect for unionization. In the fourth model, controlling for variation in human resource practices, unionized establishments have on average a 23.2 percentage point lower manager-to-worker pay ratio relative to non-union workplaces.

Table 3: Predictors of Manager to Worker Pay Ratio

	(1)		(2)		(3)		(4)	
	Coef.	Std. B.	Coef.	Std. B.	Coef.	Std. B.	Coef.	Std. B.
Manager' skills & pay								
Mngr. Education (yrs.)	0.054	0.112 +	0.055	0.114 +	0.097	0.201 **	0.096	0.199 ***
Mngr. tenure < 1 yr.	0.012	0.003	-0.014	-0.004	-0.020	-0.006	-0.104	-0.030
Manager tenure > 10 yrs.	0.216	0.114 +	0.251	0.132 +	0.260	0.137	0.282	0.149 +
Mngr's % variable pay	-0.197	-0.053	-0.187	-0.050	-0.002	-0.001	0.308	0.083
Unionization								
Union presence			-0.154	-0.071	-0.130	-0.060	-0.264	-0.122 *
Workforce HR practices								
<u>Worker skills</u>								
Core education (yrs.)					-0.143	-0.322 ***	-0.060	-0.136 *
Core tenure < 1 yr.					0.073	0.027	0.016	0.006
Core tenure > 10 yrs.					-0.244	-0.114	-0.255	-0.119 +
<u>Technology use</u>								
Emails/hr.							-0.013	-0.029
% elect. monitored							0.415	0.228 ***
<u>Teams</u>								
Problem-solving teams							-0.240	-0.119 *
Self-directed teams							-0.310	-0.135 **
<u>Incentive pay</u>								
% wkr. Variable pay							-0.946	-0.281 ***
Constant	1.128 *		1.067 *		2.410 ***		1.768 ***	
F statistic	5.700 ***		5.410 ***		5.180 ***		9.060 ***	
Prob > F	0.000		0.000		0.000		0.000	
R-squared	0.180		0.184		0.254		0.390	
Chg. R-squared			0.004		0.070		0.136	
F for Chg. in R-squared			1.12		7.038 **		9.809 **	

N = 248. *** = p<.001; ** = p.<.01; * = p<.05; + = p.< .10., Note: Market and organizational controls included, but not shown.

Hypothesis 2a states that use of teams, informating technology, and worker incentives will be associated with a lower manager-to-worker pay ratio, whereas Hypothesis 2b predicts that electronic monitoring will be associated with a higher manager-to-worker pay ratio. These arguments receive some support in the third model. While email use has no significant association with the ratio of manager-to-worker pay, electronic monitoring is associated with a larger pay gap between managers and workers (p<.001). An increase of ten percentage points in the percentage of worker time that is electronically monitoring is associated with a 5.2 percentage point higher manager-to-worker pay ratio.

Results for the other human resource practice variables provide strong support for Hypothesis 2a. Employee participation in both offline problem-solving teams (p<.10) and online self-directed teams (p<.001) has significant negative associations with manager-to-worker pay ratios in the fourth model. A 10-percentage point increase in employee involvement in problem-solving teams is associated with a reduction of 2.1 percentage points in the manager-to-worker pay ratio, and a 10-percentage point increase in participation in self-directed teams is associated with a reduction in the manager-to-worker pay ratio of 2.7 percentage points. Finally, the proportion of worker pay that is variable also has a significant (p<.01) negative association with manager-to-worker pay ratios. An increase of ten percentage points in the portion of worker pay that is variable is associated with a 6.1 percentage point lower manager-to-worker pay ratio.

<div align="center">Discussion</div>

This study investigates the relationship between high performance HR practices, workforce unionization, and managerial pay in telecommunications service and sales centers. We find that high performance HR practices and workforce unionization influence both managerial pay levels and manager-to-worker pay ratios. High performance work systems have been promoted on claims that they provide major economic performance benefits and potential gains for both employees and organizations.   Our study investigates the effects of high performance HR practices from a previously unexplored direction, through their relationship with managerial compensation. Given that changes in work organization and HR practices associated with high performance systems are predominantly focused on workers, any relationship with outcomes for managers might be expected to be attenuated or even absent.

However, we find several statistically significant relationships between high performance HR practices and pay outcomes. Our findings suggest that managers benefit through higher pay levels in establishments that adopt high performance practices. However, not all high performance practices are positively related to manager pay. While high performance HR practices

conventionally are viewed as representing a coherent system that has a positive relationship to organizational performance, this study shows the importance of disaggregating the bundle of HR practices when examining employee outcomes such as pay. In this case, investment in the education of the workforce, in computer-based technologies, and in variable worker pay practices were all positively related to managerial pay, but the use of workforce teams had the opposite association (albeit of small magnitude). These findings are consistent with much of the research showing that managers often resist worker team-based systems. While the conventional interpretation of this resistance is that managers' power and authority is undermined, this study suggests that the shift in responsibilities from managers to teams of workers may have negative financial implications for managers as well. The negative relationship between worker teams and managerial pay is nonetheless consistent with the fact that teams improve organizational performance – both by allowing workers to learn from each other and use their skills more effectively and by lowering indirect labor costs.

Second, in our data, high performance HR practices are associated with lower manager-to-worker pay differentials and these associations are statistically significant for a number of HR practices. The use of worker teams and variable worker pay are particularly strongly associated with lower pay ratios. While the literature has suggested that smaller status differentials and pay compression may be components of high performance systems, we know of no prior studies that have empirically tested whether high performance systems actually include enhanced egalitarianism in relative compensation levels. There are two possible interpretations of this finding. For one thing, high performance HR practices may cause a narrowing of pay differentials by elevating the status and rewards provided to workers relative to those provided to managers. Alternatively, the forces operating within an organization that lead it to adopt a high performance system may simultaneously (or previously) lead to narrow pay differentials within the organization. For example, organizations that start out more egalitarian in their pay practices may be the very organizations more prone to adopt high performance HR practices. If these latter forces predominate, then it would be a mistake to conclude from our findings that high performance HR practices per se produce narrow manager-to-worker pay differentials. Longitudinal data on pay and the use of high performance HR practices would be needed to identify whether there is a causal connection between these HR practices and manager pay.

Third, we find that the associations between high performance HR practices and manager pay levels and the ratio of manager-to-worker pay are robust after controlling for other organizational factors including local economic conditions, sales growth, size of the establishment, and the customer segment served. The level of workforce human capital explains variation in

managers' pay levels after controlling for managers' human capital; and workforce HR practices explain variation in managers' pay after controlling for the use of performance-based pay among managers.

Fourth, this study examines how a previously ignored institutional factor, the unionization of the core workforce, influences managerial compensation. We find that workforce unionization is positively associated with managerial pay levels, with the union influence occurring entirely through its effect on the base pay of workers. Higher managerial pay in unionized establishments appears to be related to organizations' attempting to maintain internal pay equity rather than to the enhanced complexity of the managerial function in union workplaces. These results indicate the important role that unions play in wage setting, even for a group that might initially seem removed from such influences. Unionized establishments also have lower manager-to-worker pay ratios.

Limitations and Future Research

This study focuses on a single operation (service and sales channels) in one industry (telecommunications services) to better account for context-specific factors such as technology, work organization, business strategy, and HR practices. Use of an industry and occupation-specific population brings with it the inevitable trade-off between greater contextual detail versus more limited generalizability. Confirmation of the generalizability of our findings will require similar contextual analysis of managerial pay in other industries. However, given the dramatic growth in the use of call centers across many industries and the similarities in the nature of computer technology and information processing in these call centers, we suspect that our findings will generalize to call centers across other industries.

Some other limitations also are inherent in the design of our study. Because the study is of a nationally representative sample of establishments, we could not use multiple sources of data. We attempted to minimize the potential effects of common method bias by use of relatively objective context-specific questions about customer segments, union presence, and HR practices. We also compared the study data to external sources, and found consistency between the study data and Dun & Bradstreet data, union contracts, and the Current Population Survey.

The cross-sectional nature of the data limits the causal inferences that can be drawn from it. Another limitation of this study is that we focused on a single organizational level, the establishment. Again, this produces a trade-off. We were able to obtain substantial comparability between our subjects by focusing on the establishment level, but our findings may not be generalizable to other managers, such as those at higher levels in the companies. Although we employed statistical corrections for firms that have multiple establishments in our data set, we did not examine any links in managerial compensation between the establishment, divisional and

corporate levels of the telecommunications companies. Methodologically, such multi-level linkages may be better examined through qualitative case study research that provides even greater contextual detail.

　　　　We do identify quantitatively sizeable linkages between high performance HR practices, union institutions, and managerial pay. Although we cannot fully clarify the processes through which these factors influence managerial pay, given the cross-sectional nature of our data, our findings suggest the importance of further analysis of how business and HR practices affect both managers and workers in organizations.

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