

WORKING PAPER SERIES

**Employee Voice, Human Resource
Practices, and Quit Rates:
Evidence from the
Telecommunications Industry**

Rosemary Batt
Alexander Colvin
Jeffrey Keefe

Working Paper 01 – 04



Employee Voice, Human Resource Practices, and Quit Rates: Evidence from the Telecommunications Industry

Rosemary Batt

Industrial and Labor Relations School
Cornell University
Ithaca, NY 14853
Phone: 607-254-4437
Fax: 607-255-1836
rb41@cornell.edu

Alexander Colvin

Dept. of Labor Studies and Industrial Relations
Penn State University
University Park, PA 16802
Phone: 814-865-0754
Fax: 814-863-9545
ajc10@psu.edu

Jeffrey Keefe

Institute for Mngmnt. and Labor Relations
Rutgers University
New Brunswick, NJ
Phone: 908-899-9386
Fax: 908-899-9386
Jkeefe3@cs.com

<http://www.ilr.cornell.edu/cahrs>

This paper has not undergone formal review or approval of the faculty of the ILR School. It is intended to make results of Center research available to others interested in preliminary form to encourage discussion and suggestions

Abstract

In this paper, we examine the predictors of aggregate quit rates at the establishment level. We draw on strategic human resource and industrial relations theory to identify the sets of employee voice mechanisms and human resource practices that are likely to predict quit rates. With respect to alternative voice mechanisms, we find that union representation significantly predicts lower quit rates after controlling for compensation and a wide range of other human resource practices that may be affected by collective bargaining. Direct participation via offline problem-solving groups and self-directed teams is significantly negatively related to quit rates, but non-union dispute resolution procedures are not. In addition, higher relative wages and internal promotion policies significantly predict lower quit rates, while contingent staffing, electronic monitoring, and variable pay predict significantly higher rates.

Employee Voice, Human Resource Practices, and Quit Rates: Evidence from the Telecommunications Industry

High quit rates are a significant cost to organizations, both because they raise labor costs (Oi 1962) and lower organizational performance (e.g., Norsworthy and Zabala 1986). Research in industrial relations has shown that unionized establishments have significantly lower quit rates than non-union establishments because they provide a voice mechanism through which employees can negotiate higher relative compensation and redress problems as an alternative to exit (Freeman and Medoff 1984). More recent research on "high commitment" or "high performance" work systems has shown that coherent sets of human resource practices lead to lower quit rates (e.g., Arthur 1994) and better organizational performance (e.g., Ichniowski et al. 1996), and that high quit rates undermine performance (Alexander, Bloom, and Nuchols 1994; Huselid 1995). High commitment practices include those that invest in the skills of the workforce and provide the opportunity and incentives for employees to use those skills effectively (e.g., Appelbaum et al. 2000).

Over the last decade or so, however, firms have adopted a wide range of non-union voice mechanisms and cost-cutting or "flexible" human resource practices that have not been considered in the industrial relations or high performance literature. Alternative voice mechanisms include different types of non-union dispute resolution procedures as well as team-based work organization. Flexible human resource (HR) practices include downsizing and contingent staffing and pay, which are likely to decrease employee commitment to the firm.

In this study, we examine a comprehensive set of voice and human resource practices that are likely to influence employee quit rates. We consider quit rates at the establishment level rather than at the individual level of analysis so that we can identify the specific management practices that influence turnover -- a subject of particular interest in periods of tight labor markets. In contrast to the high performance literature, which generally examines clusters of HR practices taken

together, we examine individual practices in order to dis-aggregate the unique and potentially contradictory relationships between specific management practices and quit rates. We consider these issues among a relatively understudied group of workers: moderate and highly skilled service, sales, and technical employees. To do so, we draw on a unique 1998 data set of a nationally representative sample of union and non-union establishments in the telecommunications industry.

Voice Mechanisms as Deterrents to Turnover

The exit-voice framework (Hirschman 1970) identifies a range of circumstances where markets may fail to provide organizations with effective feedback and where customer or employee voice might lead to improved organizational performance. Voice, as defined by Hirschman, is any attempt to change rather than escape from an unsatisfactory situation. In employment context, voice involves the expression of dissatisfaction by employees; exit occurs when employees quit. The design of work and human resource practices are likely to influence the balance between employee voice and exit. The exit-voice framework provides a model of the political economy of organizations, where exit belongs to the realm of economics and voice to the realm of politics.

In recent years, employers have adopted alternative forms of voice as substitutes for unions. Employers have viewed team-based work systems as providing opportunities for collective voice or direct participation in shopfloor decisions and non-union dispute resolution procedures as providing opportunities for individual voice to redress employee grievances. In the following sections, we consider the theoretical importance of these alternative mechanisms as predictors of quit rates.

Unions As Collective Voice

In the most important application of the exit-voice model to employment, Freeman and Medoff (1984) provided evidence linking union voice to higher productivity and lower quit rates. Unions reduce the probability that workers will quit their jobs for two fundamental reasons. First,

unions provide a voice mechanism through which workers gain higher compensation relative to what they could earn in a similar non-union job. Second, unions provide workers with a voice in determining an array of other rules and conditions of work, including policies that reduce pay inequality, grievance and arbitration procedures for appealing managerial decisions, “just cause” for discipline and discharge, and seniority clauses desired by workers.

Empirical research supports the view that both union wage and voice mechanisms lead to lower quit rates in union establishments. Freeman (1980a), for example, found that union establishments had lower quit rates even after controlling for wage rates. Other researchers have replicated this finding in the United States (e.g., see Cotton and Tuttle 1986; Wilson and Peel 1991) as well as in other countries (Miller and Mulvey 1991; Lincoln and Kalleberg 1996). Recent research, however, has challenged this general view. In a study of truckers in the 1990s, for example, Delery et al. (2000) found that the significant relationship between turnover and unionization disappeared when wages and benefits were taken into account. They concluded that the union effect operated entirely through compensation. They suggested that union decline may be affecting unions' ability to influence employee voice and quit behavior, but they admitted that their findings are industry specific and could be accounted for by the independent nature of truck drivers' jobs and their greater attachment to their occupation than to their employers. Thus, Delery et al. (2000) re-open the union voice debate by questioning whether unions in the 1990s are strong or effective enough as voice mechanisms to influence employee quit behavior.

Teams As Collective Voice

In the high performance literature, team-based work systems generally are viewed as improving performance by providing workers (those closest to the point of production) with the opportunity to solve problems and improve the production process. Much less attention has been paid to teams as voice mechanisms that allow dissatisfied workers to voice their concerns, and thereby reduce the likelihood that they will quit. Those studies that have found an inverse

relationship between high performance practices and quit rates have included team participation only as part of a cluster of other practices (e.g. Arthur 1994; Huselid 1995). Other studies that have examined individual HR practices and quit rates have found mixed results. For example, Delery and colleagues found no relationship between employee participation and quit rates in the trucking industry (e.g., Shaw et al. 1998; Delery et al. 2000).

A large body of research in organizational behavior, however, has found that employees with “enhanced or enriched jobs” (e.g., those with greater autonomy, variety, or ability to complete a whole task) have higher job satisfaction and lower turnover (e.g., Hackman and Oldham 1980; McEvoy and Cascio 1985; Cotton and Tuttle 1986; Hom and Griffeth 1995). The question, therefore, is whether different types of team formations provide sufficient opportunity for voice that they enhance satisfaction and reduce the propensity to quit. If teams are merely supervised groups with little discretion to affect conditions at work, then their influence on quits will be minimal.

In general, researchers have distinguished between two types of team participation: consultative and substantive (e.g., Levine and Tyson 1990). Consultative forms include participation in problem solving groups that meet periodically and allow employees to voice their opinions to management. Substantive forms include the organization of work into self-managed or semi-autonomous teams that have considerable responsibility for making day-to-day decisions without consulting management.

Empirical research in the teams or group effectiveness literature provides mixed results on whether these different forms of team voice lower turnover. Consultative forms have a modest relationship to employee behavior and performance (Cotton 1993; Cohen and Bailey 1997). Substantive participation in self-managed teams has a significantly greater relationship to a range of employee behaviors and performance, but specific studies of turnover have shown mixed results. For example, Cordery et al. (1991) found that autonomous teams have higher turnover rates than non-autonomous teams. Weisman et al. (1993) found that nurses in self-managed

teams worked longer hours (increasing turnover), but had higher pay (decreasing turnover). Others studies have found that alternative forms of voice can reduce employee turnover (Bemmel's 1997). For example, Spencer (1986) found a negative relationship between turnover rates and number of voice mechanisms (such as grievance procedures, survey feedback, and suggestion systems). In sum, theory suggests that employees may gain sufficient voice through team participation programs to reduce turnover, but the research record is mixed.

Nonunion Dispute Resolution Procedures: Employee Voice or Voice Suppression?

Employers also have designed a variety of dispute resolution procedures in nonunion settings, including procedures for management review of grievances, peer review, and nonunion arbitration, which may provide an individualized form of voice in the workplace and thereby reduce quit rates. There is no empirical research on the relative effectiveness of these alternative procedures for reducing quit rates, but studies of variation in union grievance procedures have found that procedures that provide stronger protections for workers are associated with lower quit rates. Rees (1991), for example, found that stronger grievance procedures reduced the probability of employees quitting when compared to weaker bargained for procedures. In Delery et al.'s trucking study (2000), formal grievance procedures were negatively related to quit rates, but given a high correlation with unionization, they were insignificant in regression equations that controlled for unionization. Their measure of grievance procedures, however, did not distinguish between weaker and stronger forms of procedures. We seek to understand which types of nonunion dispute procedures provide workers with sufficient voice that they reduce quit rates.

Many nonunion dispute resolution procedures provide a formal structure for employees to appeal disputes with supervisors to higher levels of management. These may range from simple procedures in which an individual manager reviews written complaints to more elaborate procedures involving hearings of complaints before appeal boards composed of senior level

managers. Under these types of nonunion procedures, managers hold decision making authority (Ewing 1989; Feuille and Delaney 1992). Under peer review procedures, by contrast, employee complaints are decided by a panel comprised of a majority of members who are peers of the complainant. Presumably, employees are more willing to trust the effectiveness of a procedure in which their fellow employees decide grievances (Ewing 1989; Colvin 1999). However, as employees of the company, peer review panelists are not comparable to third party neutrals used in arbitration or mediation procedures. Also, peer review decisions lack the legal enforceability of union grievance-arbitration procedures, and thus depend on the good faith of management.

Nonunion arbitration emerged during the 1990's as the most prominent and rapidly expanding variety of nonunion dispute resolution procedure using non-managerial decision makers. These individual employee arbitration agreements pose particular threats of suppression of employee voice. In the 1991 Supreme Court decision in *Gilmer v. Interstate/Johnson Lane*, 500 U.S. 20 (1991), the court deferred to employer sponsored arbitration procedures to resolve disputes over statutory rights. Individual employee arbitration contracts often are compulsory because employees must agree to arbitration as a condition of employment at the time of hire or, in some instances, as a condition of continuing employment or future promotions or benefits (Stone 1996, 1999). They require that an employee submit any alleged violation of state or federal law to a company-designed arbitration procedure. By agreeing to arbitration, the employee foregoes any opportunity to pursue his or her claim in court. Both the design of nonunion arbitration procedures and the decisions of arbitrators are heavily insulated from judicial review (Stone 1996, 1999). Whether this innovation enhances or suppresses employee voice is at the center of a major controversy. Some observers suggest that compulsory arbitration creates opportunities for due process in nonunion workplaces (Zack 1999), while others suggest it represents a significant curtailment of employee rights (Stone 1996, 1999). Current research suggests that the more

effective employees perceive the grievance procedure to be, the more likely they will exercise the voice option rather than quit (Boroff and Lewin 1997). If employees perceive nonunion arbitration to be directed primarily at limiting their statutory employment rights, they may be less likely to use these procedures as mechanisms for voice and more likely to quit.

Predictions about the relationship between dispute resolution procedure usage rates and employee quit rates are uncertain. Higher usage rates may indicate that employees view nonunion procedures as effective voice mechanisms. If so, then we would expect higher usage rates to be associated with lower quit rates. However, extensive research on unionized workplaces indicates that higher grievance rates are associated with higher levels of workplace conflict and reduced organizational performance (Katz, Kochan and Gobeille, 1983; Katz, Kochan and Weber 1985; Norsworthy and Zabala 1986; Ichniowski 1986; Cutcher-Gershenfeld 1991). These higher levels of workplace conflict associated with higher grievance rates also may raise quit rates. Previous research has concentrated primarily on unionized workplaces, which have less variation in grievance procedures, and hence has not examined the effect of simultaneous variation in both the type of procedure and the usage or dispute rate (Lewin 1999). The greater variation in the incidence and structure of dispute resolution procedures in the nonunion sector (Feuille and Delaney 1992; Colvin 1999) permits examination of the question of how variation in both the type of dispute resolution procedure and dispute rates affects aggregate quit rates.

Human Resource Practices and Quit Rates

Historically, the design of internal labor markets encouraged long-term employment, fostered by a set of interrelated human resource policies designed to reduce quit rates (Doeringer and Piore 1971; Schacht 1985; Jacoby 1985). Internal ladders provided a series of promotional steps that continually expanded the employees' firm specific skill sets and rewarded them with higher pay at each step. In exchange, employers gained a loyal and stable workforce with high levels of firm specific skills, amortizing the quasi-fixed cost of employment over many

years of employee tenure. The high performance literature draws heavily on internal labor market theory, (emphasizing investment in skills and training and long-term employment relations); but it also includes newer practices such as teams and performance-based pay (e.g., Osterman 1993).

Empirical research does show that commitment-enhancing internal labor market practices reduce quit rates. Firm specific training (Miller and Mulvey 1991) and higher pay (Leonard 1987; Powell, Montgomery, and Cosgrove 1994; Shaw et al. 1998; Delery et al. 2000) are associated with lower quit rates. Cappelli and Chauvin (1991) found that wage premiums or high unemployment in the outside market resulted in greater reliance on grievance procedures – presumably because the exit alternative was more costly. Meta-analyses of research in organizational behavior also find support for internal labor market theory (e.g., Cotton and Tuttle 1986; Hom and Griffeth 1995:40), with lower turnover among employees who are satisfied with promotion opportunities, perceive their employment to be secure, or have higher relative pay or pay satisfaction. Finally, studies of high performance systems have shown that turnover is lower in workplaces that adopt a cluster of high commitment practices (Arthur 1994; Huselid 1995).

Over the last decade or so, however, firms have been dismantling internal labor markets (e.g., Cappelli 1999; Osterman 1999) in an attempt to enhance labor flexibility or their ability to quickly adjust labor costs to variation in product market conditions. These flexible HR practices introduce labor market competition inside organizations and include the downsizing of core employees, greater use of subcontracting and outsourcing, greater use of contingent and part-time staffing, and higher rates of contingent pay. The result is that workplaces often have a mix of HR practices that provide contradictory incentives to workers -- commitment-enhancing investments in training on the one hand, but greater reliance on contingent staffing and pay, on the other.

Some research is emerging that shows the effects of flexible HR practices on the behavior of "core" employees - those who are regular employees and critical to the business enterprise. Firms that downsize, for example, often do so again (e.g., Wyatt 1993) and send a signal to their core employees that future employment is insecure. In response, the more qualified or skilled employees who have alternative employment opportunities are likely to quit. Use of contingent and part-time employees may be used to buffer core employees from job displacement; but recent employer surveys show that most firms use contingent staffing as a cost-cutting strategy (Houseman 1997). In these cases, firms send a signal to core employees that their jobs are insecure because future cost cutting may lead to converting more core jobs to contingent positions. Again, the more qualified or skilled employees are likely to leave. In the 1990s, firms often have downsized and withdrawn employment security commitments while simultaneously using more contingent staffing.

The availability of temporary workers as substitutes for core employee also puts downward pressure on the wages of incumbent employees. Katz and Kruegar (1999), for example, found that states with a greater share of temporary help employment experienced lower wage growth, after controlling for unemployment. They argued that the growth of the temporary help industry and other contingent arrangements facilitated wage restraint by increasing the ability of firms to locate substitute workers. Similarly, establishments that use relatively large numbers of temporary workers as substitutes for core employees, thereby putting pressure on the core employees to accept wage restraint, may find that the wages of core employees fall behind those of competing employers in the external labor market. Thus, by using contingent labor contracts to hold down labor costs, employers unintentionally may be facilitating the exit of their core employees.

In conjunction with downsizing and contingent staffing, some employers have sought to reduce labor costs by standardizing and simplifying job tasks. This re-engineering of tasks

reduces training costs and permits electronic monitoring that saves on supervision and surfaces performance problems using objective measures. In the context of the telecommunications industry in this study, advanced information systems have provided employers with a major tool for labor cost reduction through task standardization and continuous electronic monitoring. Prior research has demonstrated that such standardization and simplification of jobs and electronic monitoring is associated with higher turnover (Wilson and Peel 1991; Carayon 1993; Shaw et al. 1998). The greater use of contingent pay may accelerate turnover because performance-based pay plans increase risk and variability of workers' pay. Performance-based pay links workers' pay more closely to the variability in market conditions over which workers have little control. Given the relative risk adverse preferences reflected in the pay plans bargained by unions representing workers (Freeman 1980b and 1982), it is unlikely that variable pay plans have been introduced at the request of workers. Most workers rely only on their paycheck and lack other sources of income or a diversified portfolio to hedge risk. Moreover, most variable pay plans are not accompanied by a compensating wage increase for the greater risk born by workers.

Expected Findings

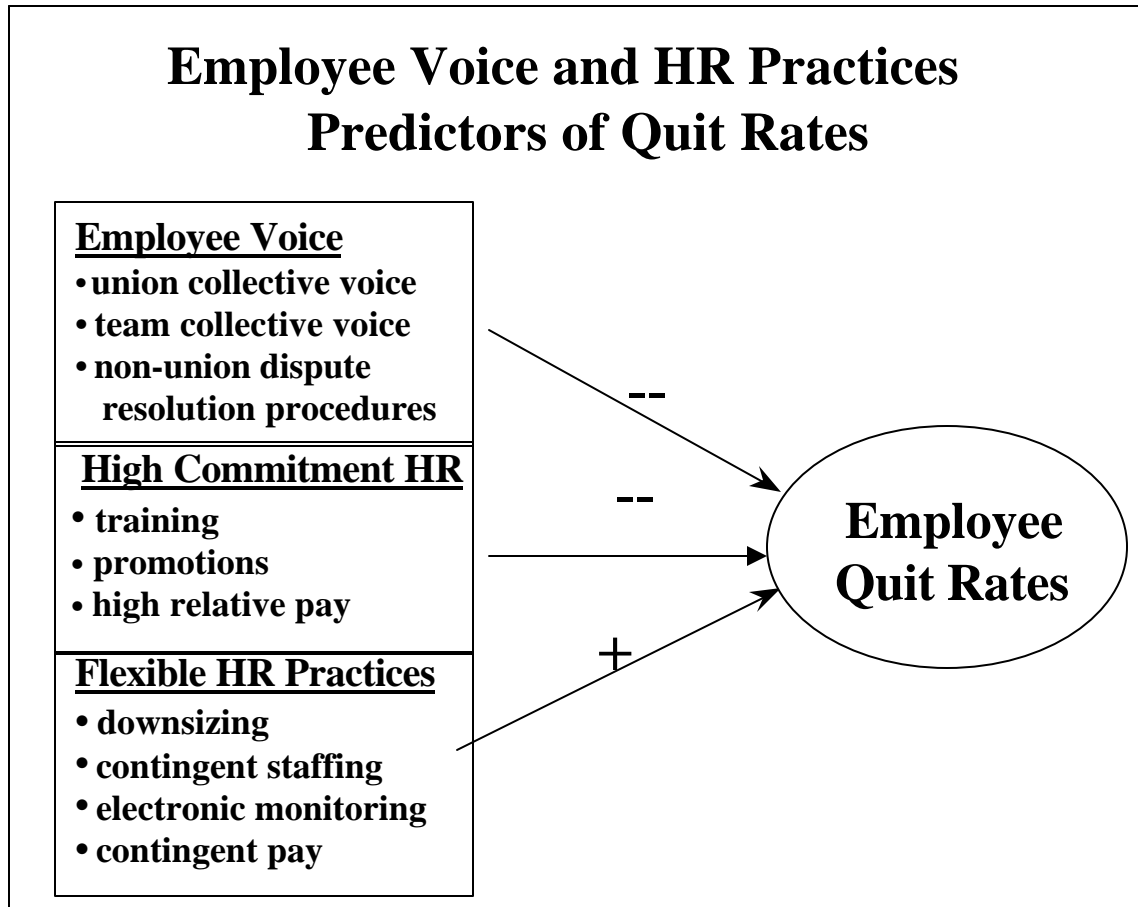
In summary, in this paper we present a model of the predictors of quit rates that includes alternative voice mechanisms and alternative human resource practices (see Figure 1). We hypothesize that union presence will have a negative relationship with quit rates, over and above the effects of the union wage and other voice and human resource practices. We hypothesize the team-based voice mechanisms will be modestly negatively related to quit rates. Predictions for nonunion dispute resolution procedures are uncertain, as they may be designed to encourage or to suppress employee voice. More effective procedures (e.g., peer review panels) should be able to reduce turnover. Holding the procedure constant, high levels of grievance activity rates

should be positively associated with quit rates because they signal higher levels of conflict and greater numbers of problems faced by employees in the workplace.

Finally, quit rates should be lower in workplaces that increase the cost of exit through high commitment human resource practices such as investment in training, internal promotions, and high relative pay. Turnover should be higher, by contrast, in workplaces that have implemented flexible human resource practices -- including downsizing, the use of contingent staffing, job standardization and electronic monitoring, and variable pay -- each of which signal a lack of employer commitment to employee welfare or long-term employment relations. We expect these relationships to hold after controlling for market, organizational, and demographic characteristics, which we discuss in the methods section below. In sum, the following model predicting quit rates is estimated in the statistical analysis that follows (See Figure 1.)

Figure 1

Quit rates = f(voice mechanisms + HR practices + organizational, market, and demographic controls)



Methods

Sample

The sample is a stratified random sample drawn from the Dun and Bradstreet listing of establishments. Establishments were stratified by size (10-99 employees, 100-plus employees) by SIC code (4812, cellular; 4813, wireline; 4841, cable), and by state location. Sixty percent of the sample is in the wireline segment, 15 percent in cable television, 14.6 percent in cellular, and 6.9 percent in Internet services. All establishments with more than 100 employees were sampled so that the survey would cover a larger percentage of the industry's workforce. Sampling of the remaining smaller establishments was done so that the total sample reflects the relative proportion of establishments in each industry segment of the Dun and Bradstreet listing. Because Internet providers are new and not systematically captured by SIC code, additional ISPs were identified through the Directory of National Dial-up Providers and Area Codes of Operation.

In the fall, 1998, a university-based survey team administered an initial telephone survey covering questions related to basic industry characteristics, management strategies, and work and human resource practices. The general manager at each establishment was the respondent. The telephone interview averaged 52 minutes, and yielded a 54 percent response rate with 636 usable surveys. Respondents were asked if they were willing to take an additional survey on dispute resolution procedures. This yielded a sample of 302 respondents, roughly proportionately divided between the two core sides of the business: network operations and service and sales.

Measures and Means

We used several techniques to reduce measurement problems found in workplace studies. Because human resource practices vary by organizational unit and occupational subgroup (e.g., Osterman 1987; Jackson et. al. 1989), survey questions asked managers about their "core" non-management group of workers: either network technicians or service and sales workers. This strategy follows Osterman (2000), among others. To reduce problems of validity, we used only general managers as respondents as some research shows that general managers are less optimistic than HR managers in their assessments of HR practices (Gerhart 1998).

Another way to improve validity and reliability is to base survey questions on field research and to frame questions in language that is context-specific. We conducted field research in numerous network operations and service and sales centers in a range of markets (local, long distance, cellular, cable) and customer segments (residential, small business, middle market). Our survey questions were based on questions from our field interviews that managers were readily able to answer without consulting other documentation. In site visits, we checked these general managers' responses against those of subject matter experts in the same organization. Also, we checked the reliability of survey responses against outside data, including the Dun and Bradstreet listing, union contracts in specific companies, and the Current Population Survey (CPS)¹.

The primary dependent variable in this study is the current annual voluntary quit rate of core employees, excluding discharges, retirements, transfers, and promotions. This definition

¹ First, we compared our survey items to data contained in the Dun and Bradstreet listing. There were three variables (date establishment founded, primary market, and size) common to both data sets, and the means for each variable in the two data sets were not statistically significantly different. Second, we examined union contracts and found that the wage rates and job titles reported by managers at specific Bell companies were comparable to those in the corresponding union contracts. Third, we compared our survey data to that in the Current Population Survey for the telecommunications industry (CPS, 1998). For example, for customer service and sales workers, the most comparable group in the CPS are clerical and sales workers. The 1998 median annual pay in the CPS is \$31,200 for union clerical and sales workers and \$26,000 for non-union workers, compared to \$33,000 for union workers and \$28,000 in our sample. The 1998 CPS unionization rate is 32 percent while that of

differs from most prior studies that collapse voluntary and involuntary turnover (e.g., Bennett et. al., 1993; Alexander et. al., 1994; Arthur 1994; Huselid 1995). It follows the measure of quit rates used by Wilson and Peel (1991), Powell et al. (1994), and Shaw et al. (1998), the latter of whom showed that the determinants of discharges and quits are distinct. The independent and control variables fall into four categories: a) employee voice mechanisms; b) flexible human resource practices; c) commitment-enhancing HR practices; and d) controls for organizational and workforce characteristics.

Table 1 reports the means, standard deviations, number of observations and ranges for all variables used in the study. The average annual quit rate in this sample is 11%. For collective voice, union presence is captured by a dummy variable (where 1 = union, 0 = no union) because the core workforce is defined in a narrow enough way that it falls completely within one bargaining unit. Twenty-four percent of the establishments are union represented. For team participation, we measured consultative participation (whether the establishment makes use of off-line problem solving groups) as the percent of employees in the establishment participating in problem solving teams. We measured substantive participation (whether it makes use of self-directed teams) as the proportion of the establishment's employees organized in self-directed teams. In this survey, the average establishment has 46% of its employees in problem-solving groups and 19% of employees organized into self-directed work teams.

Dispute resolution procedures covering nonunion core workforces are captured by dummy variables representing: any type of formal nonunion grievance procedure; nonunion arbitration; and peer review panels. Usage of these procedures is measured by a single variable consisting of the annual number of grievances or complaints per employee brought under the applicable union or nonunion procedure. The average annual number of disputes was six disputes per 100 employees. Due to the length of the survey and its cost, only a random sub-

our sample is 38 percent. Given the fact that we over-sampled large establishments that tend to pay higher wages and to be more heavily unionized, these comparisons are reasonably consistent.

sample of 302 of the respondents answered the more detailed set of questions about their dispute resolution procedures.

To capture flexible human resource practices, we included five items: downsizing, electronic monitoring, part-time workers, temporary employees, and variable pay. Downsizing is measured by taking the number core employees displaced in the past five years as a percent of the current core workforce. Market deregulation, technology advances, and mergers have led to on-going downsizing and restructuring in this industry. Electronic monitoring is the percent of a typical employee's daily performance that is electronically monitored, which on average is one-third of their work time. Contingent staffing includes the percent of the workforce that is temporary (on average 4%) and part-time (on average 5%), as opposed to permanent and fulltime. Variable pay is the percent of pay of the typical core employee that is variable, which averages 16% of pay.

For commitment-enhancing HR practices, we measured three dimensions: training, promotion, and pay. Training is the number of weeks of training received by the typical core employee, which is two weeks on average in this sample. Promotion is the percent of core employees who were promoted from within the company or transferred from other departments or business units within the company; the average is 44%. Pay is the ratio of median pay to the local cost of living. Median pay (the pay received by the typical core worker) was provided by survey respondents. We divided this pay level by the local cost of living, drawn from the Economic Research Institute's (ERI), *Geographic Reference Report*, which provides cost of living data for 3,568 North American cities using the "Urban Family of Four" model of analysis. The average worker pay ratio to local cost of living is 73%.

Four variables control for variation in organizational characteristics: a) size (the natural log of the total number of employees -- 4.12); b) branch location (whether the establishment is part of a larger organization -- 79%); c) Bell company (whether the establishment is owned by a

former Bell company -- 26%); d) presence of an HR department at the establishment -- 43%.

Prior research has shown that these organizational characteristics are associated with long term employment contracts (Rebitzer 1986; Osterman 1994; Jacoby 1985).

Table 1:
Telecommunications Survey Data: Means, Observations,
Standard Deviations, and Ranges

Variable Name	Obs	Mean	Std. Dev.	Min	Max
Annual quit rate	598	0.108	0.164	0	1
Employee Voice					
<u>Union</u>	635	0.241	0.428	0	1
<u>Teams</u>					
Problem solving groups %	632	0.462	0.385	0	1
Self directed teams %	632	0.193	0.341	0	1
<u>Dispute Resolution Procedures</u>					
Any nonunion procedure	300	0.357	0.480	0	1
Nonunion arbitration	291	0.162	0.369	0	1
Peer review	294	0.160	0.367	0	1
Dispute rate per employee	285	0.061	0.184	0	2
Flexible Human Resource Practices					
Downsizing rate in last five years	633	0.001	0.011	0	0.261
Part-time workers %	630	0.053	0.135	0	1
Temporary workers %	611	0.041	0.137	0	1
Electronic monitoring %	622	0.326	0.405	0	1
Variable pay	616	0.158	0.530	0	1
Internal Labor Market Practices					
Promotions %	611	0.438	0.367	0	1
Training	636	2.025	1.652	0	10
Pay to local cost of living	568	0.732	0.356	0.233	3.355
Control Variables					
Female %	625	0.401	0.360	0	1
Ln of establishment employment	634	4.124	1.600	0	10.959
Branch	636	0.794	0.405	0	1
Former Bell company	636	0.264	0.441	0	1
Human Resource department	633	0.428	0.495	0	1
College graduates	622	0.220	0.415	0	1
Field technicians	636	0.275	0.447	0	1

Office technicians	636	0.168	0.374	0	1
Service and sales workers	636	0.557	0.497	0	1

We also controlled for human capital characteristics that are known to influence employees' labor market power and external opportunities. Researchers, for example, have found significant differences in employment tenure by gender, although not when other factors such as occupation or family status are taken into consideration (Osterman 1987; Hom and Griffeth 1995). We measure female composition as the percent of the core workforce that is female, which is 40% on average. Education also has been found to be associated with higher turnover (Hom and Griffeth 1995:38). In this study, we included a dummy variable for college (where 1 = college degree, else 0) because the major educational dividing line is whether employees have a college degree or not. Twenty two percent of respondents report that the typical core employee has a college degree. Occupations are captured by a series of three dummy variables: whether the employee is a service and sales representative (the omitted category), an office technician (17%), or a field technician (28%).

Results

In this section, we first report the results of our analysis of voice mechanisms and human resource practices using the full data set (Tables 2 and 3). Then, because the alternative dispute resolution variables rely on a subset of the data, we report those results separately (Table 4). Table 2 reports the correlation matrix. The union and team voice variables are significantly correlated with lower quit rates, but the nonunion procedures and dispute rates are not. Each of the flexible human resource practices, except electronic monitoring, is associated with higher turnover. Internal labor market practices associated with lower turnover are promotions and relative pay, but training is not correlated with quits. Some control variables are significantly associated with higher turnover, including the percent of the workforce that is female, having a human resource department on site, and the percent of the

workforce that is college graduates. Other controls are correlated with lower turnover, including whether the establishment is part of a former Bell company and the percent of the workforce that is field technicians.

Table 2: Telecommunications Survey Data: Correlations

	1	2	3	4	5	6	7	8	
1 Quit Rate	1.000								
2 Union	-0.244 ***	1.000							
3 Problem solving groups %	-0.105 **	-0.253 ***	1.000						
4 Self directed teams %	-0.104 **	-0.089 *	0.261 ***	1.000					
5 Downsizing in last 5 yrs	0.202 ***	-0.038	0.046	-0.029	1.000				
6 Part-time workers %	0.266 ***	-0.150 ***	-0.026	0.009	0.101	1.000			
7 Electronic monitoring %	0.060	0.164 ***	-0.002	0.026	-0.037	0.122 ***	1.000		
8 Variable pay %	0.131 ***	-0.251 ***	0.166 ***	0.062 ***	0.015	0.039	-0.137 ***	1.000	
9 Temporary workers %	0.171 ***	-0.035	-0.017	0.036	-0.013	0.057	-0.046	-0.050	
10 Promotions %	-0.169 ***	0.124 ***	-0.012	0.096 **	0.048	-0.101 **	-0.053	-0.083 *	
11 Training	-0.039	-0.010	0.116 *	0.081 **	-0.045	-0.078 *	0.035	0.110 ***	
12 Pay to cost of living	-0.140 ***	0.035	0.072 *	0.106 **	-0.069	-0.244 ***	-0.264 ***	0.268 ***	
13 Any nonunion procedure	0.076	-0.480 ***	0.051	0.026	-0.021	0.011	-0.053	0.001	
14 Nonunion arbitration	-0.018	-0.289 ***	0.175 ***	0.145 **	-0.050	-0.045	-0.066	0.076	
15 Peer review	-0.033	-0.285 ***	0.089	0.196 ***	0.044	0.030	0.003	0.101	
16 Dispute rate per employee	0.032	0.212 ***	-0.012	-0.066	0.004	-0.080	0.039	-0.106	
17 Female %	0.160 ***	-0.091 **	0.084 **	-0.101 **	0.076 *	0.204 ***	0.179 ***	0.103 *	
18 Ln estab employment	0.003	0.353 ***	-0.205 ***	-0.140 ***	-0.078	-0.081 *	0.238 **	-0.147 ***	
19 Branch	-0.007	0.242 ***	-0.196 ***	-0.090 **	-0.081 **	-0.116 **	0.130 ***	-0.006	
20 Former Bell company	-0.086 **	0.567 ***	-0.175 ***	-0.069 ***	0.051	-0.088 **	0.109 **	-0.099 *	
21 HR dept. on premise	0.109 ***	0.115 ***	-0.069 *	-0.046	-0.048	0.023	0.248 ***	-0.056	
22 College graduate	0.084 **	-0.270 ***	0.159 ***	0.102 ***	-0.028 **	-0.121 ***	-0.204 ***	0.371 ***	
23 Field technicians	-0.216 ***	0.295 ***	-0.187 ***	-0.013 ***	-0.028	-0.197 ***	-0.046 ***	-0.231 ***	
24 Office technicians	-0.054	-0.035	0.041	0.114 ***	-0.022	-0.073	-0.077 *	-0.122 ***	
	9	10	11	12	13	14	15	16	
9 Temporary workers %	1.000								
10 Promotions %	-0.088 *	1.000							
11 Training	-0.019	0.008	1.000						
12 Pay to cost of living	-0.047	0.068	0.064	1.000					
13 Any nonunion procedure	0.000	0.018	0.001	-0.022	1.000				
14 Nonunion arbitration	-0.053	0.073	0.171 ***	0.028	0.269 ***	1.000			
15 Peer review	-0.094	0.050	0.128 *	0.021	0.419 ***	0.361 ***	1.000		
16 Dispute rate	0.194 ***	-0.031	-0.025	-0.001	0.058	-0.077	-0.013	1.000	
17 Female %	-0.086 *	-0.188 ***	-0.006	-0.294 ***	0.070	0.078	0.003	-0.105 *	
18 Ln estab employment	-0.067 *	0.068 *	0.017	0.028	-0.012	-0.097 *	-0.074	0.010	
19 Branch	0.034	0.002	0.077 *	0.118 ***	0.014	-0.091	-0.089	0.123 *	
20 Former Bell company	-0.035	0.084 *	-0.038	0.088	-0.258 ***	-0.130 *	-0.168 ***	0.106 *	
21 HR dept. on premise	0.063	0.005	0.022	-0.050	0.044	-0.047	-0.042	0.013 *	
22 College graduates	-0.020	-0.043	0.024	0.493 ***	0.097 *	0.046	0.093	-0.106 *	
23 Field technicians	0.027	0.215 ***	-0.032	0.003	-0.083	-0.095	-0.034	0.097	
24 Office technicians	0.074 *	-0.010	0.053	0.109 ***	0.006	0.023	0.025	0.085	
	17	18	19	20	21	22	23	24	
17 Female %	1.000								

18 Ln estab employment	0.085	*	1.000								
19 Branch	0.048		0.333	***	1.000						
20 Former Bell company	0.037		0.280	***	0.288	***	1.000				
21 HR dept. on premise	0.138	***	0.481	***	0.192	***	0.062	1.000			
22 College graduates	-0.042		-0.095	*	-0.063		-0.043	-0.026	1.000		
23 Field technicians	-0.576	***	0.120	***	0.105	***	0.078	* -0.042	-0.305	***	1.000
24 Office technicians	-0.252	***	-0.166	***	-0.124	***	-0.031	-0.058	0.079	* -0.277	*** 1.000

* p < .10; ** p < .05; *** p < .01

Table 3 presents the results from tobit analyses in which the dependent variable is regressed on four sets of independent variables: employee (union and team) voice, flexible human resource practices, commitment-enhancing HR practices, and the full model, each with the appropriate controls. We used a tobit procedure because the dependent variable of quit rate is truncated on the left end of the distribution at zero (Maddala 1992). That is, in this case, there are no establishments with less than zero annual quits. Tobit models correct for biasing in the coefficient estimates due to the truncation of the dependent variable, however interpretation of the coefficients also is different under a tobit model. McDonald and Moffit (1980) suggest a decomposition of the tobit coefficients into changes in the probability of observing an outcome above the left limit and changes in outcomes above the left limit. The second part of this decomposition represents the effect of changes in the independent variables on the dependent variable in the positive range, which provides an interpretation equivalent to OLS estimates for this range of outcomes once the appropriate calculation of the decomposition is made². Estimates of effect sizes reported here are based on this second part of the decomposition and provide an estimate of the expected change in the observed values of the dependent variable for a given change in an independent variable. Also, because quit rates are measured as a proportion of the current workforce, the coefficients may be interpreted, once multiplied by 100, as percentage point changes in the quit rate attributable to the given independent variable.

² The adjustment based on the second term in the McDonald and Moffit (1980) decomposition is calculated by multiplying the tobit coefficients by $[1-z*f(z)/F(z)-f(z)^2/F(z)^2]$, where $F(z)$ is the cumulative normal distribution function associated with the probability of cases being above the left limit, $f(z)$, the first derivative

In the first Tobit equation in Table 3, we analyze the effects of the three employee voice mechanisms on turnover. Union representation alone is associated with a reduction of 6.5 percentage points in the quit rate (Tobit 1), which drops to a 4.9 percentage point reduction in the quit rate in the full model (Tobit 4). Turnover is 3.9 percentage points lower in establishments where the entire workforce is in problem-solving groups compared to establishments with no employees in problem-solving groups (Tobit 1), and is 3.6 percentage points lower in the full model (Tobit 4). Self-directed teams are only weakly significant at the 10 percent level in equation one, but are significant at the five percent level in the full model, which indicates quit rates are 2.3 percentage points lower in establishments where the entire workforce is organized into self-directed teams compared to establishments with no employees in teams.

In the second equation (Tobit 2), we analyze the relationship between flexible human resource practices and turnover. Each of the five practices independently are associated with increased turnover. An increase in the size of workforce reductions equivalent to 1 percent of the current workforce is associated with an increase of 1.4 percentage points in the quit rate according to the results reported in equation 2, and the size of this association rises in the full model to a 3.5 percentage point increase in the quit rate for an increase in workforce reductions equal to 1 percent of the current size of the workforce. Increasing the proportion of part-timers by 10 percentage points is associated with a 0.9 percentage point (Tobit 2) or 1.1 percentage point (Tobit 4) rise in the quit rate for the core labor force. Increasing the proportion of temporary employees by 10 percentage points is associated with a 1.2 percentage points (Tobit 2) or 1.0 percentage point (Tobit 4) higher quit rate. Electronic monitoring of the workforce at all times during the work day is associated with a 2 percentage point higher quit rate, compared to workers who are not electronically monitored (Tobit 4). Variable pay also is associated with higher turnover at a barely significant $\alpha=0.10$ level in equation 2. In equation 4, however, it

of $F(z)$, is the unit normal density associated with this probability, and z is the corresponding z-score for this

becomes significant at the $\alpha=0.01$ level and indicates that an increase in the portion of pay that is variable by 10 percentage points would raise the quit rate by 0.5 percentage points.

The third equation (Tobit 3), estimates the relationship between three internal labor market variables and turnover. Both promotions and a higher pay ratio to the local cost of living significantly reduce turnover. Training, by contrast, is not associated with any significant change. If the portion of employees who are promoted from within the organization increased by 10 percentage points, quit rates would be reduced in the range of 0.3 percentage points (Tobit 3) to 0.2 percentage points (Tobit 4). By increasing annual wages by \$4,000 (adjusted to reflect local cost of living), an establishment can reduce quit rates in the range of 0.6 percentage points (Tobit 3) to 0.4 percentage points (Tobit 4).

In each of the models, some controls are also significant. Establishments that are larger are significantly more likely to have higher quit rates. Considering occupational characteristics, field technicians and central office technicians are considerably less likely to quit than call center workers in customer service and sales. Finally, once occupational and other characteristics are taken into account, the female composition of the workforce becomes marginally significant and is negatively associated with quits.

probability (see Roncek 1992).

Table 3: Predictors of Annual Quit Rates

	<u>Tobit 1</u>		<u>Tobit 2</u>		<u>Tobit 3</u>		<u>Tobit 4</u>	
Employee Voice:								
Union	-0.152	****					-0.114	****
	0.027						0.026	
Problem solving groups %	-0.092	***					-0.084	***
	0.023						0.024	
Self directed teams %	-0.049	*					-0.058	**
	0.026						0.028	
Cost-Cutting HR Practices								
Downsizing in last five years			3.267	****			8.088	****
			0.687				2.309	
Part-time workers %			0.212	***			0.251	***
			0.074				0.079	
Temporary workers %			0.281	****			0.236	****
			0.058				0.059	
Electronic monitoring %			0.047	**			0.050	**
			0.022				0.023	
Variable pay			0.066	*			0.107	***
			0.036				0.036	
Commitment-Enhancing HR Practices								
Promotions %					-0.073	***	-0.040	*
					0.026		0.023	
Training					-0.006		-0.005	
					0.006		0.005	
Pay to local cost of living					-0.152	***	-0.102	***
					0.034		0.033	
Control Variables								
Female %	-0.026		-0.030		-0.071	*	-0.067	*
	0.036		0.036		0.040		0.037	
Ln of establish employment	0.0130	**	0.016	**	0.010		0.020	***
	0.007		0.007		0.007		0.007	
Branch	0.025		0.033		0.051		0.022	
	0.023		0.023		0.025		0.024	
Former Bell company	0.014		-0.034	*	-0.027		0.017	
	0.024		0.020		0.022		0.023	
Human Resource department	0.046	**	0.017		0.037	*	0.025	
	0.019		0.020		0.021		0.020	
College graduates	-0.011		0.009		0.059	**	0.035	
	0.023		0.024		0.028		0.027	
Field technicians	-0.121	****	-0.134	****	-0.148	****	-0.111	****
	0.031		0.032		0.034		0.032	
Office technicians	-0.063	**	-0.066	**	-0.078	***	-0.040	
	0.028		0.029		0.031		0.029	
Constant	0.105	***	-0.024		0.199	****	0.124	***
	0.039		0.040		0.046		0.048	
Observations	576		545		521		492	
Likelihood Ratio Chi Square	113.150		124.560		84.340		173.120	
Pseudo R Squared	0.674		0.767		0.509		1.303	
Likelihood Ratio	-27.3/4149		-18.91/1291		-40.62/8212		20/1309	
p < .10; ** p < .05; *** p < .01								

In analyses not shown, we controlled for variation in industry segments (e.g., wireline, wireless, and internet services). We also controlled for local labor markets because prior research has shown that higher unemployment rates or alternative opportunities in the external market are negatively correlated with turnover (e.g., Hulin et al. 1985; Carsten and Spector 1987; Gerhart 1990). For each establishment surveyed, we included the average 1998 unemployment rate for the county or city where the establishment is located, based on the Local Area Unemployment Statistics of the Bureau of Labor Statistics (<http://stats.bls.gov/laumthd.htm>). However, we found that including these market measures had no significant effect and lowered the variance explained, so we excluded them in our final analyses.

Turning to the nonunion dispute resolution mechanisms, we noted that in the full correlation matrix reported in Table 2, none of the variables representing nonunion dispute resolution procedures and dispute rates are significantly correlated with the quit rate. However, the full sample includes observations from both union and nonunion establishments. As a result, we also investigated the possibility that establishments with nonunion arbitration and peer review procedures might have higher quit rates than union establishments, but at the same time lower quit rates than nonunion establishments that lack these procedures. Using a sub-sample consisting of only the nonunion establishments, we found marginally significant negative correlations ($p < .10$) between quit rates and the presence of nonunion arbitration procedures, peer review procedures, and the dispute rate. To further investigate the relationship between nonunion dispute resolution procedures and quit rates, we ran tobit regressions for the quit rate on our dispute resolution variables, using the variables from the full model in Table 3 as control variables.

Table 4 presents the findings from tobit regressions run on the sub-sample of respondents who answered the more detailed questions on dispute resolution procedures and activity. The focus of this analysis is on the question of whether there is evidence for lower quit

rates for nonunion establishments that have dispute resolution procedures compared to those lacking procedures. Equation 5 presents the results for the same variables as in the full model without any dispute resolution variables included to provide a basis for comparison. The smaller sample size used here reduces the significance levels for some variables, but the coefficient estimates in equation 5 are generally similar to those for the full sample, supporting the representativeness of the sub-sample when compared to the full sample. In each of the other models in Table 4, the quit rate is regressed on a series of combinations of dispute resolution variables added to the set of independent variables from the full model presented in Table 3. In each of these models, the procedure usage rate is included along with the dummy variables representing the type of dispute resolution procedure, so that we are simultaneously accounting for the effects of the presence and usage of procedures on quit rates. The only dispute resolution procedure type variable that reaches conventional levels of significance in Table 4 is the variable representing the presence of peer review procedures. Neither the presence of any type of nonunion procedure nor the inclusion of nonunion arbitration procedures is significant in any of the specifications in which they are included. Even in the case of peer review procedures, significance is achieved only at the $p < .10$ level in equation 8. Thus we do not find strong evidence that nonunion dispute resolution procedures provide voice mechanisms that reduce quit rates in comparison to establishments lacking such procedures. Higher dispute rates, however, are significantly associated with higher quit rates at the $p < .05$ level in all specifications. As discussed earlier, previous research on unionized workplaces linked high grievance rates to heightened levels of conflict and reduced organizational performance (Katz, Kochan and Gobeille, 1983; Katz, Kochan and Weber 1985; Norsworthy and Zabala 1986; Ichniowski 1986; Cutcher-Gershenfeld 1991). This result supports that finding by linking high dispute rates to higher quit rates and extends it to include both nonunion and union workplaces.

Discussion

Our results indicate that union institutions and managerial policies that facilitate voice can significantly reduce exits. Unions provide a strong influence on quit rates, despite significant declines in union density in this industry -- from roughly two-thirds of all employees in 1984 to one-third in 1998. The inverse relationship between unions and quit rates is significant even after controlling for team-based voice mechanisms, pay, and other human resource practices that are affected by collective bargaining. Participation in problem solving teams is negatively related to turnover; and participation in self-directed teams has a smaller effect.

Union representation and direct participation via shopfloor teams may be viewed as complementary vehicles for employee voice at work. By contrast, we found that nonunion dispute resolution procedures, designed as an alternative to union grievance procedures, did not significantly reduce quit rates. If new workplace dispute resolution procedures are going to help close the representation gap in nonunion workplaces, our results suggest they will need to be something stronger than the present employer designed procedures.

Table 4: Dispute Resolution and Quit Rates

	<u>Tobit 5</u>	<u>Tobit 6</u>	<u>Tobit 7</u>	<u>Tobit 8</u>	<u>Tobit 9</u>
Employee Voice:					
Any nonunion procedure		-0.028 0.027			-0.011 0.028
Nonunion arbitration			-0.026 0.033		-0.012 0.035
Peer review				-0.059 0.033	* -0.047 0.037
Annual dispute rate		0.139 ** 0.057	0.129 ** 0.056	0.138 ** 0.056	0.142 ** 0.057
Union	-0.110 *** 0.034	-0.133 **** 0.040	-0.125 *** 0.037	-0.128 *** 0.036	-0.140 **** 0.041
Problem solving groups %	-0.028 0.031	-0.042 0.032	-0.042 0.032	-0.040 0.032	-0.043 0.033
Self directed teams %	-0.031 0.035	-0.022 0.035	-0.015 0.036	-0.012 0.036	-0.008 0.037
Cost-Cutting HR Practices					
Downsizing in last five years	7.19 *** 2.24	7.32 *** 2.38	7.25 *** 2.42	7.37 *** 2.38	7.20 *** 2.42
Part-time workers %	0.071 0.118	0.091 0.118	0.050 0.128	0.089 0.118	0.052 0.129
Temporary workers %	0.248 *** 0.079	0.221 *** 0.080	0.228 *** 0.082	0.207 *** 0.081	0.214 *** 0.082
Electronic monitoring %	0.028 0.029	0.032 0.029	0.030 0.030	0.035 0.030	0.034 0.030
Variable Pay	0.147 *** 0.054	0.157 *** 0.055	0.161 *** 0.055	0.164 *** 0.056	0.158 *** 0.057
Commitment-Enhancing HR Practices					
Promotions %	-0.035 0.031	-0.025 0.032	-0.027 0.032	-0.027 0.032	-0.026 0.033
Training	-0.007 0.007	-0.007 0.007	-0.006 0.007	-0.006 0.007	-0.006 0.007
Pay to local cost of living	-0.105 ** 0.044	-0.103 ** 0.045	-0.100 ** 0.046	-0.102 ** 0.045	-0.097 ** 0.046
Control Variables					
Included, but not shown					
Observations	253	243	238	241	237
Likelihood Ratio Chi Square	110.99	112.75	107.45	113.45	108.82
Pseudo R Squared	1.732	1.809	1.707	1.757	1.705
-2 Log Likelihood	-46.907	-50.425	-44.490	-48.875	-45.012

• p < .10; ** p < .05; *** p < .01

It is useful to discuss the findings for non-union dispute procedures in the context of the telecommunications industry, which despite the decline in union density remains more highly unionized than most other industries in the country. Prior research suggests that firms adopt dispute resolution procedures as a union avoidance strategy. To the degree that this is true, we would expect nonunion dispute resolution procedures to be particularly strong in this industry because the threat of union organizing is high. In addition, we examined stronger forms of non-union procedures, including nonunion arbitration and peer review panels. Even with this relatively favorable setting for nonunion procedures, we found no significant results for nonunion arbitration procedures and only marginally significant results for peer review procedures, which were not robust to alternative specifications of the model. One alternative explanation is that management may introduce some nonunion procedures in response to high levels of employee complaints in the workplace. If these complaints reflect high levels of workplace conflict that are also associated with higher quit rates, we might have an effect in the opposing direction, reducing any negative relationship between procedure presence and quit rates. Although we cannot definitively exclude the possibility of this reverse mechanism, our inclusion of the dispute rate as a control in all of the dispute resolution equations helps control for the possibility that some of the procedures may have been introduced in response to high levels of workplace conflict.

With respect to human resource practices, our results show that promotions from within and higher wages are associated with lower quit rates, but flexible human resource practices that treat labor as a variable cost and introduce labor market competition into the workplace are associated with higher employee quits. Downsizing, contingent staffing, electronic monitoring, and variable pay are significantly associated with higher quit rates. On-going downsizing creates uncertainty and demoralization that often leads the most qualified to obtain jobs elsewhere. Higher use of temporary workers may signal to core employees that the employer has a ready

supply of substitute workers and is not committed to long term employment contracts. Greater reliance on electronic monitoring also significantly drives employee quits because it signals mistrust and creates more onerous working conditions. Call center employees experience electronic monitoring as unremitting surveillance of their work and personal activities, including their use of the restroom. Where possible, they are likely to seek alternative working conditions.

With respect to variable pay, some research on high performance work systems finds that variable pay clusters with teams and investment in training in a bundle of coherent practices. By contrast, our results indicate that variable pay plans are exit drivers. One explanation for these contradictory findings is that in most of the high performance literature, performance based pay is in the form of group incentives such as gainsharing or profitsharing and the percent of pay at risk rarely exceeds 5 or 10 percent of total pay. In our case, the majority of variable pay is individual commission pay for service and sales workers, and the mean percent of pay at risk is 27 percent (with a range of variation between 0-100 percent).

Commissions are a type of piece rate system where employees are directly compensated for each item they sell. While some workers may thrive on risk and individual competition and benefit through higher earnings under these plans, prior research suggests that most workers are risk averse. Because most do not have diversified portfolios, they are likely to be dissatisfied with greater risk and earnings volatility that variable pay offers. In addition, prior research shows that piece rate systems are structured as prisoner dilemma games (see for example, Levine 1992 or Gillespie 1991). That is, as employees learn how to make more pieces to increase their earnings, the employer often adjusts the piece rate to capture the gains in productivity. This dynamic of employees improving performance leading to rate reductions is well documented. It causes employees to game the system to “make out.” Under piece rate systems, gaming the pay plan often became more important to workers than getting the job done (Roy 1952; Burawoy 1979). To defeat the game of making out, management often responds by

making the incentive plan more complex, but the game continues under the new more elaborate rules. Peer pressure restrains high performers because high performance may increase an individual's earnings, but only temporarily. In the longer run, high performance leads to rate reductions, which disadvantages all employees -- hence the prisoner dilemma quality of piece rates and commissions.

There are also reasons to question whether commission pay in service and sales environments improves organizational performance. On the one hand, commissions provide incentives to individuals to sell more. On the other hand, shirking under these plans takes the form of a tendency for the quality of the service to fall (Pencavel 1977). In field research for this study, for example, sales reps reported that they tried to close a sale to get their commission even when customers said they would probably drop the feature after the promotion ended. Sales reps also reported knowingly selling to customers who had been recently disconnected for failure to pay their bills. In addition, individual commission plans undermine the social organization of work and discourage participation in direct voice mechanisms such as teams, decreasing joint problem solving and sharing of knowledge and information. Recent research in call centers, for example, has shown that both service quality and sales are higher where work organization and group incentives emphasize team work (Batt 1999; Moynihan and Batt 2000). Thus, there is reason to believe that individual commission plans not only raise quit rates but are detrimental to service and sales performance because they undermine group problem-solving and shared expertise. While variable pay plans are often adopted because of their intuitive appeal of paying-for-performance, we need more research to understand how different types of plans affect worker turnover, the social organization of work, and organizational performance.

Gender differences also merit some discussion. Once occupational and human resource practices are taken into account, the female composition of the workforce is associated with lower quit rates (at a marginally significant level). This is consistent with the

prior literature as well as our field research. Occupational segregation is widespread in this industry, with women concentrated in the jobs with low discretion, continuous monitoring, and low pay. In our sample, women comprise 56 percent of customer service and sales jobs but only 12 percent of technical jobs. Within call centers, they are concentrated in operator services (80 percent) and the residential mass market (60 percent). By contrast, service and sales reps serving business clientele are 55 percent male. Thus, it is women's concentration in lower occupational titles, rather than gender per se, that is associated with higher quit rates. Once occupational differences are taken into account, women have lower quit rates.

Limitations and Conclusions

There are several limitations to this study. Because the data were collected at the establishment unit of analysis, it was not possible to obtain the kind of individual level data that captures variation in human capital characteristics or in the use of human resource and dispute resolution procedures within the establishment. Moreover, the cross-sectional nature of the data limits causal inferences. It could be, for example, that high unemployment in some localities reduces the likelihood of quit rates, thereby allowing the adoption of work innovations such as teams because managers know that the workforce is experienced and stable. Using unemployment data from the Bureau of Labor Statistics for each county where an establishment was located, we explored this explanation in analyses not shown, and found no significant correlation between local unemployment and adoption of HR practices. These analyses suggest that at least in this industry, adoption is not driven by labor market conditions.

We believe that our approach to the question of aggregate turnover is promising for a number of reasons. Our findings suggest that it is important to dis-aggregate the differential influences of alternative voice mechanisms and human resource practices on employee quit rates because they do not appear to have a consistent or coherent effect. Quit rates are substantially lower in unionized workplaces even in the presence of a broad set of controls for

compensation and a range of human resource practices. In addition, both self-directed teams and off-line problem-solving groups have strong and significant negative relationships with quit rates, lending support for the idea that these mechanisms for direct participation can provide employees with enhanced voice in the workplace. In contrast, the absence of consistent significant results for nonunion dispute resolution procedures suggests the need for further examination of the question of what features need to be incorporated into procedures in order to ensure that they can serve as effective voice mechanisms that provide employees with alternatives to quitting. In addition, differences in the results for nonunion arbitration and peer review panels provide support for distinguishing between different types of nonunion procedure in future research. Put simply, results based on research on one type of nonunion procedure may not hold for other types of procedures. Among different types of procedures, peer review panels have received very little attention in academic research and our results suggest the need for further investigation of their role in the nonunion workplace. Our results also support recommendations (e.g. Lewin 1999) that have been made for including measures of both the presence and usage of procedures in future research. Whereas the presence of peer review procedures had a marginally significant negative association with quit rates, greater usage of procedures had a consistent and significant positive association with higher quit rates. This suggests that it is important to treat availability and usage of procedures as conceptually distinct phenomena.

While this research is based on the telecommunications services industry, we believe the findings have broader implications. In the U.S. context, flexible human resource practices diffused during a period from the late 1970s to the mid-1990s when labor supply exceeded demand, real wages of workers were declining, and workers had few labor market alternatives. These HR practices disrupted the relatively stable internal labor market practices in large firms that were developed during the periods of full employment, World War I and the 1920s, and

World War II through the 1970s. In the tight labor markets of the 1990s and after, however, highly trained employees have found it relatively easy to find comparable jobs in related industries. Firms may be losing the more qualified workers and may find it necessary to return to the kinds of commitment-enhancing or internal labor market practices that firms developed in prior periods of full employment. In addition, at full employment, turnover may be the critical factor raising operating costs and preventing organizations from achieving their performance objectives, as in recent research that shows an inverse relationship between quit rates and organizational performance. Employers who have retained internal labor market practices and employee voice mechanisms may have a competitive cost and performance advantage in a full-employment environment, when compared to those who use flexible human resource practices.

References

- Alexander, Jeffrey A., Joan R. Bloom, and Beverly A. Nuchols. 1994. "Nursing Turnover and Hospital Efficiency: An Organization Level Analysis." *Industrial Relations*, Vol. 33, pp. 505-20.
- Appelbaum, Eileen, Thomas Bailey, Peter Berg, Arne L. Kalleberg. 2000. *Manufacturing Advantage*. Ithaca: Cornell University Press.
- Arthur, J. 1994. "Effects of Human Resource Systems on Manufacturing Performance and Turnover." *Academy of Management Journal*, Vol. 37, pp. 670-87.
- Batt, Rosemary. 1999. "Work Organization, Technology, and Performance in Customer Service and Sales." *Industrial and Labor Relations Review*, 52(4):539-64.
- Bemmel, Brian. 1997. "Exit, Voice, and Loyalty In Employment Relationships." In D. Lewin, D.J.B. Mitchell, and M.A. Zaidi, eds., *The Human Resource Management Handbook, Part II*. Greenwich, CT: JAI Press, pp. 245-59.
- Bennett, Nathan, Terry C. Blum, Rebecca G. Long, and Paul M. Roman. 1993. "A Firm Level Analysis of Employee Attrition." *Group and Organization Management*, Vol. 18, No. 4, pp. 482-99.
- Boroff, Karen E., and David Lewin. 1997. "Loyalty, Voice, and Intent to Exit a Union Firm: A Conceptual and Empirical Analysis." *Industrial and Labor Relations Review*, Vol. 51, No. 1, pp. 50-63.
- Burawoy, Michael. 1979. *Manufacturing Consent: Changes in the Labor Process Under Monopoly Capitalism*. Chicago: University of Chicago Press.
- Cappelli, Peter. 1999. *The New Deal at Work*. Cambridge: Harvard Business School Press.
- Cappelli, Peter, and Keith Chauvin. 1991. "A Test of an Efficiency Model of Grievance Activity." *Industrial and Labor Relations Review*, Vol. 45, No. 1, pp. 3-14.
- Carayon, P. 1993. "Effect of Electronic Performance Monitoring on Job Design and Worker Stress: Review of the Literature and Conceptual Model." *Human Factors*, Vol. 35, pp. 385-95.
- Carsten, Jeanne M., and Paul E. Spector. 1987. "Unemployment, Job Satisfaction, and Employee Turnover." *Journal of Applied Psychology*, Vol. 72, No. 3, pp. 374-81.
- Cohen, Susan, and Diane Bailey. 1997. "What Makes Teams Work: Group Effectiveness Research from the Shop Floor to the Executive Suite." *Journal of Management*, Vol. 23, No. 3, pp. 239-90.
- Colvin, Alexander J.S. 1999. *Citizens and Citadels: Dispute Resolution and the Governance of Employment Relations*. Cornell University, unpublished dissertation.

Cordery, J. L., W. S. Mueller, and L.M. Smith. 1991. "Attitudinal and Behavioral Effects of Autonomous Group Working: A Longitudinal Field Study." *Academy of Management Journal*, Vol. 34, No. 2, pp. 464-76.

Cotton, J.L., and J. M. Tuttle. 1986. "Employee Turnover: A Meta-Analysis and Review with Implications for Research." *Academy of Management Review*, Vol. 11, pp. 55-70.

Cotton, John L. 1993. *Employee Involvement: Methods for Improving Performance and Work Attitudes*. Newbury Park: Sage Publications.

Cutcher-Gershenfeld, Joel. 1991. "The Impact on Economic Performance of a Transformation in Workplace Relations." *Industrial and Labor Relations Review*, Vol. 44, No. 2, pp. 241-260.

Delery, John, Nina Gupta, Jason Shaw, G. Douglas Jenkins, and Margot Ganster. 2000. "Unionization, Compensation, and Voice Effects on Quits and Retention". *Industrial Relations* Vol. 39, No. 4, pp. 625-46.

Doeringer, Peter B., and Michael J. Piore. 1971. *Internal Labor Markets and Manpower Analysis*. Lexington, MA: Heath.

Ewing, David W. 1989. *Justice on the Job: Resolving Grievances In the Nonunion Workplace*. Boston, MA: Harvard Business School Press.

Feuille, Peter, and John T. Delaney. 1992. "The Individual Pursuit of Organizational Justice: Grievance Procedures in Nonunion Workplaces." *Research in Personnel and Human Resources Management*, Vol. 10, pp. 187-232.

Freeman, Richard B. 1980a. "The Exit-Voice Tradeoff in the Labor Market: Unionism, Job Tenure, Quits, and Separations." *The Quarterly Journal of Economics*, Vol. 94, No. 3, pp. 643- 73.

Freeman, Richard B. 1980b. "Unionism and the Dispersion of Wages." *Industrial and Labor Relations Review*, Vol. 34, No. 1, pp. 3-23.

Freeman, Richard B. 1982. "Union Wage Practices and Wage Dispersion Within Establishments." *Industrial and Labor Relations Review*, Vol. 36, No. 1, pp. 3-20.

Freeman, Richard B., and James L. Medoff. 1984. *What Do Unions Do?* New York, NY: Basic Books.

Gerhart, Barry. 1990. "Voluntary Turnover and Alternative Job Opportunities." *Journal of Applied Psychology*, Vol. 75, pp. 467-73.

Gerhart, Barry. 1998. "Human Resource Management and Firm Performance: Challenges in Making Causal Inferences." In P. Wright, L. Dyer, J. Boudreau, and G. Milkovich, eds., *Research in Personnel and Human Resource Management*.

Gillespie, Richard. 1991 *Manufacturing Knowledge: A History of the Hawthorne Experiments*. Cambridge University Press.

Hackman, J. Richard, and Greg R. Oldham. 1980. *Work Redesign*. Reading, MA: Addison-Wesley Publishing Company.

Hirschman, Albert O. 1970. *Exit, Voice, and Loyalty*. Cambridge, MA: Harvard University Press.

Hom, Peter W., and Rodger W. Griffeth. 1995. *Employee Turnover*. Cincinnati, Oh.: South-western College Publishing.

Houseman, Susan. 1997. "Temporary, Part-Time, and Contract Employment in the United States: New Evidence from an Employer Survey." W.E. UpJohn Institute for Employment Research.

Hulin, C.L., M. Roznowski, and D. Hachiya. 1985 "Alternative Opportunities and Withdrawal Decisions: Empirical and Theoretical Discrepancies and An Integration." *Psychological Bulletin*, Vol. 97, pp. 233-50.

Huselid, Mark. 1995. "The Impact of Human Resources Management Practices on Turnover, Productivity, and Corporate Financial Performance." *Academy of Management Journal*, Vol. 38, pp. 635-72.

Ichniowski, Casey. 1986. "The Effects of Grievance Activity on Productivity." *Industrial and Labor Relations Review*, Vol. 40, No. 1, pp. 75-89.

Ichniowski, Casey, Thomas Kochan, David Levine, Craig Olson, and George Strauss. 1996. "What works at work: Overview and assessment." *Industrial Relations*, 35(3): 299-334.

Jackson, S. E., Schuler, R. S. & Rivero, J.C. 1989. Organizational Characteristics as Predictors of Personnel Practices. *Personnel Psychology*, 42:727-86.

Jacoby, Sanford. 1985. *Employing Bureaucracy*. New York: Columbia University Press.

Katz, Harry C., Thomas A. Kochan, and K.R. Gobeille. 1983. "Industrial Relations Performance, Economic Performance, and QWL Program: An Interplant Analysis." *Industrial and Labor Relations Review*, Vol. 37, pp. 3-17.

Katz, Harry C., Thomas A. Kochan, and M.R. Weber. 1985. "Assessing the Effects of Industrial Relations and Quality of Work Life Efforts on Organizational Effectiveness." *Academy of Management Journal*, Vol. 28, No. 3, pp. 509-27.

Katz, Lawrence F., and Alan B. Kruegar. 1999. "The High Pressure U.S. Labor Market of the 1990's." *Brooking's Papers on Economic Activity*, Vol. 0, No. 1, pp. 1-65.

Leonard, J.S. 1987. "Carrots and Sticks: Pay, Supervision, and Turnover." *Journal of Labor Economics*, Vol. 5, pp. s136-s152.

Levine, David. 1992. "Piece Rate, Output Restriction, and Conformism." *Journal of Economic Psychology* Vol. 13, pp. 473-89.

Levine, David, and Laura D'Andrea Tyson. 1990. "Participation, Productivity, and the Firm's Environment." In Alan Blinder, ed., *Paying for Productivity*. Washington, DC: Brookings Institution.

Lewin, David. 1999. "Theoretical and Empirical Research on the Grievance Procedure and Arbitration: A Critical Review", Chapter 5 in *Employment Dispute Resolution and Worker Rights in the Changing Workplace*, Adrienne E. Eaton and Jeffery H. Keefe, Editors, Madison, WI: Industrial Relations Research Association.

Lincoln, James R., and Arne L. Kalleberg. 1996. "Commitment, Quits and Work Organization in Japanese and U.S. Plants." *Industrial and Labor Relations Review*, Vol. 50, No. 1, pp. 39-59.

Maddala, G.S. 1992. *Introduction to Econometrics*. 2nd Ed. New York: Macmillan.

McEnvoy, G.M., and W.F. Cascio. 1985. "Strategies for Reducing Employee Turnover: A Meta-analysis." *Journal of Applied Psychology*, Vol. 70, pp. 342-53.

Miller, Paul, and Charles Mulvey. 1991. "Australian Evidence on the Exit/Voice Model of the Labor Market." *Industrial and Labor Relations Review*, Vol. 45, No. 1, pp. 44-57.

Moynihan, Lisa, and Rosemary Batt. 2000. "Antecedents and Consequences of Transactive Memory in Service Teams: Theory and Scale Development." Paper presented at the 2000 Academy of Management Meetings, Toronto, Ontario, August 6-9.

Norsworthy, J.R., and Craig A. Zabala. 1985. "Worker Attitudes, Worker Behavior, and Productivity in the U.S. Automobile Industry, 1959-76." *Industrial and Labor Relations Review*, Vol. 38, No. 4, pp. 544-57.

Oi, Walter. 1962. "Labor as a Quasi-Fixed Factor." *Journal of Political Economy* 70(December):538-555.

Osterman, Paul. 1987. "Turnover, Employment Security, and the Performance of the Firm." In M. Kleiner, M., Roomkin, and S.W. Salsburg, eds., *Human Resources and the Performance of the Firm*. Madison, WI: Industrial Relations Research Association.

Osterman, Paul. 1999. *Securing Prosperity*. Princeton: Princeton University Press.

Osterman, Paul. 2000. "Work Reorganization in an Era of Restructuring: Trends in Diffusion and Effects on Employee Welfare." *Industrial and Labor Relations Review*, Vol. 53, No.2, pp.179-96.

Park, H.Y., J. Ofori-Dankwa, and D. R. Bishop. 1994. "Organizational and Environmental Determinants of Functional and Dysfunctional Turnover: Practical and Research Implications." *Human Relations*, Vol. 47, pp. 353-366.

Pencavel, John H. 1977. "Work Effort, On-the-Job Screening, and Alternative Methods of Remuneration." In R. Ehrenberg, ed., *Research in Labor Economics*, Vol. 1, pp. 225-58. (JAI Press).

Powell, I., M. Montgomery, and J. Cosgrove. 1994. "Compensation Structure and Establishment Quit and Fire Rates." *Industrial Relations*, Vol. 33, pp. 229-48.

Rebitzer, James B. 1986. "Establishment Size and Job Tenure." *Industrial Relations* 292-302.

Rees, Daniel, I. 1991. "Grievance Procedure Strength and Teacher Quits." *Industrial and Labor Relations Review*. Vol. 45, No. 1, pp. 31-43.

Roy, Donald. 1952 "Quota Restriction and Goldbricking in a Machine Shop." *American Journal of Sociology*, Vol. 57, (March), pp. 432-41.

Schacht, John, 1985. *The Making of Telephone Unionism 1920-1947*. New Jersey: Rutgers University Press.

Shaw, Jason, John Delery, G. Douglas Jenkins, Jr., and Nina Gupta. 1998. "An Organization-Level Analysis of Voluntary and Involuntary Turnover." *Academy of Management Journal*, Vol. 39, No. 5, pp. 1-15.

Spencer, Daniel G. 1986. "Employee Voice and Employee Retention." *Academy of Management Journal*, Vol. 29, No. 3, pp. 488-502.

Stone, Katherine V.W. 1996. "Mandatory Arbitration of Individual Employment Rights: The Yellow Dog Contract of the 1990's." *Denver University Law Review*, Vol. 73, pp. 1017-50.

Stone, Katherine V.W. 1999. "Employment Arbitration Under the Federal Arbitration Act." Chapter 2 in A.E. Eaton and J.H. Keefe, eds., *Employment Dispute Resolution and Worker Rights in the Changing Workplace*. Champaign, IL: Industrial Relations Research Association.

Weisman, Carole S., Dorothy L. Gordon, Sandra D. Cassard, Marilyn Bergner, and Rebeca Wong. 1993. "The Effects of Unit Self-Management on Hospital Nurses' Work Process, Work Satisfaction, and Retention." *Medical Care*, Vol. 31, No. 5, pp. 381-93.

Wilson, Nicholas, and Michael J. Peel. 1991. "The Impact on Absenteeism and Quits of Profit-Sharing and Other Forms of Employee Participation." *Industrial and Labor Relations Review*, Vol. 44, No. 3, pp. 454-68.

Wyatt Data Services, Cole Surveys. 1991. *Restructuring -- Cure or Cosmetic Surgery. Results of Corporate Change in the '80s with Rx's for the '90s*. Boston: Wyatt.

Zack, Arnold M. 1999. "Agreements to Arbitrate and the Waiver of Rights under Employment Law." Chapter 3 in A.E. Eaton and J.H. Keefe, eds., *Employment Dispute Resolution and Worker Rights in the Changing Workplace*. Champaign, IL: Industrial Relations Research Association.