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What Makes a High-Performance Workplace? Evidence from Retail Bank Branches

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Evidence from Retail Bank Branches

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Abstract

This paper examines the effects of two high-involvement approaches to organizing work in retail bank branches: worker discretion and cross-functional flexibility. Both discretion and flexibility have positive effects on productivity and sales effectiveness. The effects of discretion and flexibility on performance in conjunction with one another are significant and negative. The worst performing branches have low-involvement work practices. Branches that have high flexibility or discretion perform better than branches with high levels of both.

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Introduction

Research into the effects of human resource management practices on organizational performance appears to be building toward a consensus. Innovative work systems comprise related practices designed to enhance worker participation, to achieve flexibility in the deployment of workers, and to decentralize responsibility and decision-making. Studies set in manufacturing contexts show that such work practices are associated with superior outcomes across a number of key operating dimensions, such as productivity, time-to-market, and production quality. In this paper we investigate whether the findings from manufacturing establishments can be extended to service workplaces and to further operating performance metrics. We examine work practices and performance in retail bank branches, small service establishments that differ considerably from the settings of previous research. We examine the relationship of work practices in bank branches to productivity and sales performance in those branches.

The high performance workplace

The term "high-performance workplace" is both a descriptor of the outcomes achieved by innovative work organization, and shorthand for particular sets of human resource practices. A number of other terms also describe workplaces with these practices, including "high-commitment management, high-involvement systems, transformed workplaces, flexible production systems and high performance work

systems" (Wood 1999: p. 391). The "high-performance workplace" term has found favor chiefly due to the results of studies in manufacturing settings. MacDuffie (1995) found that auto assembly plants with teamwork, employee involvement, and job rotation had higher labor productivity and lower levels of production defects. Arthur (1994) and Ichniowski, Shaw and Prennushi (1997) found that top-performing steel mini-mills and finishing lines (respectively) had implemented similar sets of innovative work practices. Dunlop and Weil (1996), and Berg, Appelbaum, Bailey and Kalleberg (1996) showed that team production was associated with better outcomes in the apparel industry. Kelley (1996) found that local, group-based participative structures had positive effects in the machined products sector.

Specific measures of the work practices varied across these studies. Underpinning these measures, however, were two aspects of work organization which distinguished high-performance workplaces from traditional, Taylorist workplaces.[1] First, in the high-performance workplace, workers exercise relatively broad discretionary decision-making authority, rather than suspending their independent judgment while implementing managerial or operational commands. Second, the high-performance workplace rotates and deploys workers across a relatively broad range of tasks, rather than narrowly constraining the range of tasks done by individual workers. These two workplace features – worker discretion, and cross-functional flexibility – are cornerstones of the empirical findings on the effects of work organization on operating performance.

Table 1 illustrates four kinds of organizing logics for workplaces. The upper left quadrant describes a traditional workplace, the Taylorist bureaucracy. In it, workers specialize by functional area, and have relatively low levels of discretionary decision-

making power. Extended functional flexibility, and enhanced discretion, modify the Taylorist model in different directions. In a workplace comprising high-discretion specialists, tasks continue to be divided by functional area, but decision-making is decentralized. In a cross-trained work group, workers have relatively low discretion, but handle a relatively wide range of low-discretion tasks. Table 1 illustrates the high-performance workplaces identified in the literature, which feature both high flexibility and high discretion. Workers in these settings are typically (though not always) formally organized in teams, which yield further performance advantages. With job rotation and high discretion, teams or functionally equivalent work groups regulate themselves, as group members work together to decide how work is done, to set goals, and to solve problems.

The work organization illustrated in Table 1 must be considered in the context of an underlying organizing logic for the workplace which integrates technology and production processes with work practices (MacDuffie 1995). In manufacturing, this logic has become known as flexible production. New distribution systems, new technologies, and dynamic product markets demand flexible production, featuring product variety, customization, innovation, speed, and high quality (Piore and Sabel 1984). Flexible production in turn requires workplace structures that feature both flexibility in deployment and relatively high levels of worker discretion.

The effectiveness of high-performance workplace practices depends in part on their integration with flexible production. MacDuffie (1995; 1997) showed that production strategies that include just-in-time inventory policies and the elimination of buffers required innovative work practices. Similarly, Dunlop and Weil (1996) showed

that team production systems in apparel plants were associated with better performance when coupled with more sophisticated information systems. Berg et al. (1996) traced out in detail the organizing logic of this same "modular" production system in the apparel industry, showing that greater worker discretion and more flexibility in deployment of workers across tasks were integral parts of a system that had clear performance advantages. And Youndt et al. (1996) found that positive effects of a "human-capital-enhancing" approach to human resource management in manufacturing are chiefly due to the links between this approach and a manufacturing strategy that emphasizes high quality.

Flexibility and discretion have positive effects on performance outcomes in flexible production settings through several overlapping and reinforcing routes (MacDuffie 1995; Ichniowski et al., 1996). Flexibility and discretion may lead to higher levels of worker commitment and motivation, through greater task variety and perceived autonomy, as a job enrichment model (Hackman and Oldham 1980) would predict. Kelly (1992) calls attention to direct effects of job re-design on work processes: while job enrichment is associated with better outcomes for workers (at least those workers with high growth needs), flexible and high-discretion work practices affect group and organizational performance more directly because they change and rationalize production processes. Discretion and flexibility each enable more cost-effective deployment of labor. Enhanced discretion reduces the need for supervisors, while flexibility in deployment can enable a workplace to address temporary disruptions with fewer extra workers. Enhanced discretion provides those closest to production problems with the opportunity to solve them; such workers may possess knowledge or skills that managers lack, and thus

problems are addressed more efficiently and sensibly. Flexibility in deployment enables workers to develop a broader, more holistic understanding of production problems and thus to use their discretion consistently with the goals of the broader production process. And both flexibility and discretion facilitate skill development, providing reinforcement for training and greater opportunities to apply knowledge gained through formal training or on-the-job.

The effects of innovative work practices may be contingent not only on context but on one another. Many of the studies of the high-performance workplace have found evidence for positive complementarities between different kinds of practices. Discretion and flexibility in deployment are two such practices under lean production. Workers who perform a variety of tasks understand their role in the broader production process better, and therefore are more likely to identify production problems accurately and to exercise discretion sensibly.

One further finding of the manufacturing studies is that, for a given strategy or market segment, a high-performance workplace can yield simultaneously better outcomes on a variety of important performance dimensions. The auto assembly plant studies (MacDuffie 1995; MacDuffie, Sethuraman, and Fisher 1996), for example, showed that high performance workplaces took fewer person-hours to assemble cars with fewer defects and with more varied features, while Arthur (1994) showed that in steel mini-mills these workplaces had both higher labor productivity and lower scrap rates.

The high-performance workplace and the service sector

Our review of the high-performance workplace studies suggests three conclusions

from the manufacturing sector:

(1) Workplaces with relatively high levels of flexibility in deployment and worker discretion have higher levels of performance;

(2) Flexibility and discretion have synergistic effects on performance; that is, the effects of one depend on the level of the other; and

(3) Flexibility and discretion are associated with positive outcomes on multiple performance dimensions.

Outside the manufacturing setting there is little evidence of similar effects of variation in work organization. Batt's (1999) study of work groups in telephone call centers found that higher sales performance and higher quality were achieved where workers belonged to self-directed work teams. Batt, however, showed that teams in this setting were effective because they encouraged workers to regulate themselves, not because broader discretion associated with teamwork resulted in improved performance. Batt found no positive performance effects associated with increased worker discretion, and some evidence that discretion was negatively associated with service quality. Preuss (1997), similarly, found that giving more discretionary decision-making authority to nursing assistants in hospital units led to poorer outcomes on those units.

The context for Batt's study did not permit the investigation of variation in cross-functional deployment or rotation of workers of jobs; the call center setting featured a homogeneous set of jobs with little task interdependence among workers. Other kinds of interactive customer service settings feature opportunity for variation in this dimension, with ranges of tasks divided across different functional groups, and some opportunities for the workers to interact with one another across these functions. In such settings, functional flexibility may be more important, though evidence on the effects of cross-

training in such workplaces is mixed. Preuss (1997) found no evidence that overlapping job responsibilities contributed positively to the performance of individual hospital units. Another series of studies, however, showed that "relational coordination" improved airlines' performance on a variety of measures (Gittell 1999a) and hospital's service quality and effectiveness (Gittell et al. 1999). Relational coordination, in turn, appears to be enhanced by cross-functional liaisons and accountability, and flexible work role definitions (Gittell 1999b).

The bank branch

The context for our service-sector industry study is a sample of U.S. bank branches. Bank branches are small outposts of organizations that are often quite large; several of the leading American commercial banks maintain more than 1000 branches. Despite the growing importance of telephone and internet banking, the number of bank branches in the United States actually grew in the 1990s (FDIC 1998).

Most bank branches are small establishments that provide a variety of financial services. There are two types of workers in bank branches. Branch tellers are responsible for routine transactions with customers who maintain accounts at the bank. "Platform" workers provide more advanced services. Platform workers open and close accounts; they explain and advise customers about financial products; they provide servicing for those products; and, increasingly, platform workers pursue sales opportunities, encouraging customers to choose the bank for the provision of an ever-growing range of financial services.

Tellers and platform workers saw their workplaces change considerably over the

1980s and 1990s. Concurrent pressures for cost containment and for more effective sales performance drove banks to experiment with differing approaches to the organization of work (Keltner and Finegold 1996; Hunter 1999). This diversity of approaches to work organization has had the virtue from the research perspective of producing considerable variation with respect to the way work is organized among bank tellers and platform workers. Debates, for example, have occurred within leading banks as to the appropriate range of tellers' duties, with programs for job enrichment alternating with conscious efforts to make jobs narrower and simpler (Hunter, Bernhardt, Hughes, and Skuratowicz 2001).

Both flexibility in deployment and devolution of decision-making are important issues in bank branches. Cross-training of platform workers and tellers allows leaner staffing. It also increases the likelihood that a customer's needs will be met effectively by the first worker she encounters in the branch. To take one example, a customer might enter the bank with a transaction that is typically conducted with a teller: the deposit of a cashier's check. Should the customer decide, upon receiving further information, to use the check to open a Certificate of Deposit account, cross-training could allow the teller to open the account rather than sending the customer to a platform worker, thereby avoiding repeated explanations and shortening the wait time. Cross-training can also provide efficiencies in the other direction: if platform workers can perform teller tasks, they can often quickly complete routine services rather than sending customers to the teller line to begin again. Returning to the case of the C.D.: had the customer begun her transaction by approaching a platform worker, with the intention of opening such an account, a platform worker cross-trained to the teller function might be able to open the C.D. and then to

assist the customer with a routine transaction (for instance, a cash withdrawal from an existing checking account).

Allowing workers the discretionary decision-making authority to address specific concerns of customers is another important variable in branch work organization. The value of increased discretion for workers can also be illustrated with respect to the customer opening the C.D. account. Work practices might give to individual workers the discretion to correct occasional errors that might occur in this process such as selling the CD at an incorrect rate or term. The alternative approach requires that the worker seek approval from a branch manager or central office before issuing such a correction, with corresponding customer dissatisfaction, increased waiting time, and the like. Discretion might also give a worker the authority to increase slightly the listed rate for the certificate, as a way to meet a competitors' challenge or to reward a particularly good customer.

Data sources

Our research strategy was similar to many of the manufacturing workplace studies. With colleagues, we conducted site visits to thirteen U.S. retail bank headquarters, and augmented these visits with interviews of dozens of managers and workers in numerous local branches of these banks. These field visits enabled the development of context-specific measures of performance outcomes and work practices that would be both comparable across banks and their branches, and meaningful to industry actors. For this paper, we draw on a detailed survey of technology, work practices and performance in 135 large U.S. retail banks.

We chose as our unit of analysis the bank branch. While there is some

homogeneity of branch policies within larger bank holding companies, our field visits suggested that within these larger organizations there was also some diversity of work organization (and performance) across individual branches. We therefore surveyed branches at the branch level; questionnaires targeted the "most informed respondent" (Huber and Power 1985) for a variety of questions. With respect to work organization and other branch policies this was the local branch manager. Central staff and managers tended to overestimate uniformity in branch practices and to report these practices inaccurately.

In order to gain access to a sample of branches across organizations, we nevertheless found that we had to approach central management for approval to participate in our survey. We began with a list of the of the 400 largest bank holding companies (BHCs) in America in January 1994. Merger activity, and the existence of a number of BHCs with no retail banking organization (defined as an entity that provides financial services to individual consumers), reduced this potential sample to 335 BHCs. Participation in the study was confidential, but not anonymous, enabling matching of surveys with data from other sources. Our research team approached the 70 largest U.S. BHCs directly, and in the second half of 1994, requested the participation of one retail banking entity from each BHC. 47 BHCs agreed to participate. Of these, seven BHCs engaged the participation of two or more retail banks within the BHC, yielding an initial total of 64 participating retail banks. Each organization in this sample received multiple questionnaires, including questionnaires for six bank branches in the retail bank. At the same time, our team mailed survey questionnaires to top executives of the next largest 265 BHCs, and followed this unsolicited mailing with a telephone call requesting the

participation of one of their retail banking organizations. 64 of these BHCs agreed to participate in the study, and four of these engaged the participation of two or more retail banks in the BHCs. This yielded a total of 71 retail banks, each of which provided data from one local branch. The two-pronged approach, while yielding a sample that was not representative of the industry (which comprised some 8,000 BHCs in 1994), did permit substantial coverage of the industry, gaining the participation of banks holding over 75% of the total assets in the industry in as of year-end 1994.

We excluded supermarket branches and telephone banking centers from the analysis so that the sample of branches was homogeneous: all provided a standard array of financial products to consumers and were staffed by both tellers and platform workers. After eliminating bank branches with missing data on the study variables, we were left with a sample of 235 branches from 101 retail banks.

We also matched the branch data with data from two secondary sources. First, we used census data to establish demographic and other controls for the local areas in which the branches operated. We also were able to match branches with data collected by the Claritas company on the behavior of bank customers. More detail on these measures and the matching process are given below.

Measures

Work Organization

We operationalized all measures at the level of the bank branch. We measured flexibility in deployment at the branch level with an eight-item index (Cronbach's α = 0.77). Survey items asked for the number of full-time bank tellers that were able to

perform particular functions that typically fall to the platform (e.g. open a checking account), and for the number of platform workers that worked as tellers. (Detailed wording of each item in each index is given in Appendix 1). We divided each item by the total number of full-time employees in that job category. A higher score on this index represents a more flexible branch, one with a higher share of workers cross-trained across the functions.

We measured worker discretion at the branch level with a seventeen-item index (Cronbach's $\alpha = 0.77$) in which each item asked whether or not the worker had authority either to correct a specific type of error (e.g. a check posted twice), to waive a fee, or to change the rate for a financial product (e.g. a certificate of deposit). As with flexibility, a higher score on this index describes a branch that gives more discretionary decision-making authority to its workers. We constructed our indices in accordance with the suggestion of Becker and Gerhart (1996), using a share measure rather than a unitless index, so that results would be more readily interpretable.

Performance Outcomes

We examined two different branch-level performance outcomes. Our chief difficulty in establishing performance measures at the branch level was comparability across banks. Financial measures of company and branch performance were not especially useful. While most banks tracked the financial performance of branches, the differences in internal accounting practices precluded effective comparisons of branch financial performance across organizations. Financial outcomes were typically comparable only at the broadest organizational levels (e.g. bank holding company), and

effects of work organization in branches would quite likely have been swamped at this level by other events such as merger activity, commercial and real estate lending success, and the like.

We therefore focused (as in the manufacturing studies) on operationally based outcome measures. First, we examined a measure of the basic productivity of branches. In this model, branch labor inputs were represented by the number of full-time equivalent (fte) tellers and full-time equivalent (fte) platform employees as reported by the branch manager. Capital inputs were represented by the numbers of teller and platform computer terminals in the branch. Outputs were represented by the number of demand deposit (i.e. checking) accounts housed in the branch. Demand deposit accounts are, typically, the accounts that anchor customer relationships with the bank. They therefore provide a good representation of the total overall level of service provided by the local branch.
Following the standard approach in the literature on productivity measurement at the firm level (see e.g. Hall 1990; Griliches 1986; Brynjolfsson and Hitt, 1996), we used the Cobb-Douglas production function to represent the basic relationship between output and inputs. This formulation is superior both theoretically and empirically to other approaches such as simple ratio analysis, and also provides a straightforward way to control for differences in external conditions across branches (x, a vector) and assess the effects of work practices and branch-level managerial choices (y, a vector). Our basic estimating equation was thus:

$$\ln(\#\text{ of checking accounts}) = \text{const} + \beta_1 \ln(\text{fte tellers}) + \beta_2 \ln(\text{fte platform workers}) + \beta_3 \ln(\text{teller terminals}) + \beta_4 \ln(\text{platform terminals}) + \delta x + \gamma y + \varepsilon$$

The second operational outcome we considered was sales performance. Retail

banks devoted increasing amounts of attention in the late 1980s and early 1990s to sales efforts, encouraging workers to match customers with an appropriate set of financial products, and embarking upon specific initiatives to encourage sales (Keltner and Finegold 1996). One particularly important, useful measure is what is known as the "cross-sell" rate, or the number of financial products held per customer. Cross-sell rates are important for two reasons. First, new customer relationships are expensive and difficult to initiate, so that most banks focus heavily on capturing a larger share of the business of existing customers. Second, the more financial products a given customer holds, the less likely it is that she will sever her relationship with the bank.

There are many different ways to calculate a cross-sell rate, and asking branch managers directly for cross-sell rates for their branches did not yield comparable measures across organizations. In order to establish a standardized definition, we therefore turned to an external data source, the Market Audit conducted by the Claritas Corporation. The Market Audit is an extensive, detailed survey of household finances, in which customers describe their entire financial portfolio to surveyors. We obtained the survey data for 3rd quarter 1995, and we were able to match 9,896 customers from the Market Audit to 147 branches of the retail banks in our survey.

The Claritas survey identified the bank or banks at which respondent held financial products. The survey, however, did not ask customers for the exact location of their branch, so we used the county of residence of the customer to match to the county of the bank branch. Where multiple branches were possible matches, we used zip codes of branches and customers.[2] For each matched customer, we calculated a cross-sell rate as measured by the number of major consumer financial products (interest- and non-interest

bearing demand deposits, certificates of deposit, home equity loans, and investment products) that the customer held with the bank in question.[3] We utilized a log linear specification to estimate the effects of work practices on the cross-sell rate. This formulation fit the data slightly better than a pure linear specification, although results were similar for a linear model.

Control variables

We included three types of items as control variables in the productivity model. In choosing control variables, we considered factors that might plausibly have been both correlated with the work organization variables and associated with different levels of performance on at least some of the outcome measures. First, we included a number of measures designed to assess characteristics of the local market. We used census data to measure demographic characteristics of the immediate area surrounding each branch in the sample. The local area was defined as a circle of one mile radius centered at the address of the bank branch. We employed the log of the number of people living in the area to capture population density and captured other demographic characteristics using measures of the proportion of residents falling into different age and income categories. We included these measures as controls, since practices and outcomes of branches serving customer bases with different mixes of income or age might covary with those characteristics. We also included a measure of the level of competition in the local area: the overall number of bank branches in the county in which the branch is located.

We used data from the survey for further controls. We wanted to control for the sophistication of the technology in the branch, beyond simply the number of terminals

used in the construction of the productivity model, since it might be possible that branches with better systems would both perform better and adopt different sets of work practices. For the productivity analyses, we used an eleven-item index (Cronbach's α = 0.84) in which item was a yes-or-no question assessing the capability of the branch system to perform a particular task "on-line" (e.g. change a customer's address). For the sales analysis, we also included a five-item index (Cronbach's α = .72) comprising yes-no questions assessing the use of sales-supporting software in the branch (e.g. does the system provide cross-sell prompts?).

Third, because other supporting human resource practices may covary with the use of high-involvement work organization practices (Osterman 1994; Wood 1999), we wanted to control for the presence of such practices to reduce bias in the estimates of the effects of work organization. The list of potential practices is long (Pfeffer (1994), for example, lists thirteen categories of practice, while Huselid's (1995) indices comprise seventeen items). We report results below including five representative items: the use of higher skilled workers as proxied by (1) the share of tellers with some college education or with college degrees, and by (2) the share of platform workers with college degrees; (3) a two-item index (alpha = .73) assessing the use of variable pay in the branch; (4) the share of part-time workers in the branch; and (5) a dummy variable which took on the value of 1 if the branch employed any "limited-function" tellers (that is, tellers performing only a subset of the regular teller tasks).[4]

Many of the earlier industry studies of high-performance workplaces studied the effects of the institution of formal work teams (e.g. MacDuffie 1995; Batt 1999). For us, studying such effects was not possible. Branch workers may consider themselves

members of "teams" simply because they work in a small establishment; identification of the branch as a "team" by managers or workers bears little relationship to the work practices actually employed in the branch. Nevertheless we surveyed branch managers about the existence of work teams, both with "yes-no" survey questions and with questions about the share of branch workers that participated in team activities. The survey suggested that over 50% of the respondents considered their branch to be a "self-directed work team" in language consistent with that used by Osterman (1994). In comparison with our findings from interviews and site visits, this measure seemed to greatly overstate the actual use of team structures as an alternative to more traditional command-and-control forms of organization. Further, the team measures were not correlated with our measures of the more specific work practices that flexibility and discretion comprised. Follow-up interviews with survey respondents in organizations we had visited led us to conclude that "self-directed teams" were not a consistent or meaningful concept in this environment; managers had a wide number of different things in mind when answering these particular questions, and so we did not use this measure. The interviews revealed no such difficulty with the more context-specific questions around flexibility and discretion.

Our dataset includes observations of different branches that are part of the same banking organization. We wanted to account for unique aspects of individual banks that might have systematically affected performance. Should such factors have been common across banks but not correlated with our other independent variables, then a random effects regression specification would be appropriate. If, however, these factors were also correlated with our other regressors, then a fixed effects specification (including a control

variable for each bank) would be more appropriate. The fixed effects approach, while more conservative, has the disadvantage of subsuming some of the effects we are interested in identifying, should the work practice variables be common across banks. We therefore show results from both approaches, utilizing a Hausman specification test to determine which approach yields unbiased and efficient estimates.

Results - Descriptive Statistics

Table 2 reports means and standard deviations for the variables used in the analysis.[5] Table 3 reports pairwise correlation coefficients between the variables. Many of the reported control variables are highly correlated (as were some of the variables measuring local demographic shares). The multicollinearity implies that the estimates for any individual control variable might not be taken too seriously; since the aim of the study is to focus attention on the work organization variables, we began by including all of the controls in each model. Table 3 also shows that there is a statistically significant, positive association between the measures of discretion and flexibility. There is no correlation between the work organization variables and the other measures of human resource practices.

Table 4 shows the proportion of the sample that fell into each of the four possible combinations of discretion and flexibility, defining "high" and "low" by median splits on the respective variables. Taylorist work practices are the dominant approach in banks in our sample, employed by just over a third of all banks. The high performance work system is employed by roughly a quarter of the branches in the sample. Consistent with the correlational results in Table 3, flexibility and discretion are positively associated

($\chi^2(3)=9.26$, $p<0.01$). This association is consistent with the notion that discretion and flexibility are complementary. However, the substantial population of banks in each cell suggests a wide diversity of work approaches.

Results – Performance Comparisons

We report the results of our productivity comparisons in Table 5. In the first column, we report random effects estimates (grouped by bank) of our basic productivity equation,[6] including the discretion and flexibility variables. In this equation, the input variables (employees and terminals) are positively and statistically significantly associated with output. The model has a good fit overall with an R^2 of 61%. Most of the individual control variables, with the exception of new accounts, are statistically insignificant. The age and income variables may have small effects on productivity ($\chi^2(7)=11.9$, $p<.11$ for age; $\chi^2(6)=9.94$, $p<.13$ for income), but the degree of sales automation or service automation has little influence above and beyond the number of terminals utilized ($\chi^2(2)=1.52$, $p<.5$).

A fixed effect model, otherwise identical to the model reported in Column 1, shows similar results, except for substantial changes in the new accounts and platform terminals coefficients (Column 2). These changes are sufficient to cause the model to fail the Hausman specification test for equality of the fixed and random effects coefficients ($\chi^2(27)=57.8$, $p<.01$).[7] We therefore focus our report on the fixed effects results, which are more conservative, although there is no evidence that our coefficients of interest are sensitive to specification.

Columns 1 and 2 show positive coefficients for discretion and flexibility. These

work practices, however, have no statistically significant effects on productivity either individually or jointly ($\chi^2(2)=0.74$, $p<.7$ for random effects; $F(2,145) =0.85$, $p<.5$ for fixed effects). The failure of the joint test suggests that the apparent absence of a significant direct effect of discretion and flexibility is not due to their positive correlation.[8]

Column 3 reports estimates from a fixed effects model that includes an interaction term between discretion and flexibility to capture possible synergies between these practices. To make the interpretation of the coefficients consistent with the estimates from the other regressions, we subtract the mean of each variable before calculating the interaction.[9] The point estimates for the discretion and flexibility terms are positive but small (and statistically insignificant). The interaction between discretion and flexibility is negative and statistically significant ($t=2.6$, $p<.01$), while the joint effect of discretion, flexibility, and their interaction is significant as well ($F(3,145)=2.83$, $p<.0405$). Column 3, in comparison with Column 2, suggests that the relationship between work organization and productivity is not fully revealed until flexibility and discretion are considered together.

The estimates from Column 3 imply that productivity is highest when branches combine a high level of flexibility with a low level autonomy *or* a high level of autonomy with a low level of flexibility. Extreme points "on the diagonal" (low-low and high-high) have lower performance. A further conclusion to be drawn from the analysis reported in Column 3 is that even when implemented together, at modest levels of adoption the high-involvement practices are more effective than Taylorism. The estimates suggest that a branch that has moderate levels of flexibility and discretion (45% on each) is nearly 50%

more productive than a pure-type Taylorist branch. A Wald test between these alternatives reveals that the difference is highly significant statistically ($t=2.76$, $p<.01$).

While we discuss effect sizes more fully in the next section, we note here that the model implies that branches that utilize very low levels of flexibility and discretion are substantially less productive than the average branch. Over the range of values from zero to the sample mean, productivity is increasing as branches move toward the characteristics of high performance workplaces. However, once the adoption of high performance workplace practices exceeds the adoption levels of the mean firm, further concurrent increases in flexibility and discretion are detrimental to performance. Further increases are beneficial if the firm specializes in either flexibility or discretion, but not both.

Table 6 reports results for sales performance using log of the mean cross-sell rate as the dependent variable and a similar set of control variables to the regressions in Table 5. In Column 1 we report the results of a random effects regression using the full complement of control variables. Here the regression F-test suggests that collectively this set of variables has no statistically significant relationship to the cross-sell rate.[10] We therefore focus on a minimalist specification which includes only discretion and flexibility with and without the interaction term. The base regression appears using random effects in Column 2 and fixed effects in Column 3. As with productivity, we find that discretion and flexibility have little influence on performance either individually or jointly ($\chi^2(2)=3.92$, $p<.14$). While the Hausman specification test for fixed versus random effects cannot reject the null hypothesis that the coefficients are the same, we retain the fixed effects specification because it is comparable to the productivity analysis and more

conservative.

Column 4 of Table 6 reports results from a fixed effects model, this time with a term measuring the interaction between discretion and flexibility. Results for the cross-sell rates parallel those for productivity: discretion and flexibility are positively related to cross-sell rates, with the interaction of the two having a negative and statistically significant effect ($t=2.62$, $p<.01$). However, the direct effect of flexibility is larger in magnitude and nearly significant ($t=1.69$, $p<.1$), whereas the direct effect was small and insignificant in the productivity analysis. Maximizing flexibility in combination with minimal discretion is thus a weakly dominant approach for effective cross-selling. Aside from this, the cross-sell regressions yield quite similar results to the productivity regressions. Again, Taylorist branches have substantially lower cross-sell rates than alternatives such as specialized branches or a branch with modest levels of both kinds of high-involvement practices.

Results – Effect Sizes

Both Becker and Gerhart (1996) and Ichniowski et al. (1996) recommend that estimates of the effects of work practices on performance give some attention to effect size. Because we used the logarithm of our dependent variables in all specifications, the effect sizes are most easily interpreted in terms of percentage changes.

To compare effect sizes at different levels of flexibility and discretion, we constructed contour plots for both the productivity and cross sell results (see Figures 1 and 2). These plots are obtained from the coefficients from the fixed effects with interaction specifications for productivity (Table 5, Column 3) and cross-sell (Table 6,

Column 4). We set the productivity effect to be zero at the sample mean as a comparison point (this occurs at 40% flexibility and 38% discretion). The contours represent the different productivity and cross-sell levels that would be predicted by the model with the graph normalized to zero for a firm at the sample mean of both flexibility and discretion.

Consistent with Tables 5 and 6, the graphs illustrate that combinations of high levels of either flexibility or discretion with low levels of the other are associated with the highest levels of performance. They also show that branches with modest levels of both flexibility and discretion perform reasonably well. For example, a branch with 10% greater flexibility and discretion than the sample means of 0.40 and 0.38 respectively, would have, all else equal, a tiny productivity advantage of 0.7% in comparison with a branch at the sample mean. A similar result holds for cross-sell rates; the same branch that is 10% above the sample mean would also enjoy a 0.8% advantage in its cross-sell rate. In both cases, these represent points close to the boundary of the regions in the center of the contour plots. Similar productivity and cross-sell outcomes are attained at a wide range of other points.

While each work practice has positive direct benefits, such benefits begin to be offset by their negative interaction at high levels of each. Where both flexibility and discretion are 20% above the mean, for example, productivity and cross-rates are lower by 4% and 1% respectively. The negative interaction can also be understood in reverse: a flexibility level 10% higher than the sample mean, coupled with a discretion score that is 10% below the sample mean, is associated with 2% higher productivity; 10% higher if the changes are increased to 20% instead of 10% (comparable numbers for cross-sell rates are 2% and 7% respectively). Here the small positive benefits of flexibility are lost, but

branches evidently gain the benefits of utilizing high performance specialists. The contour graphs illustrate these gains: the far upper right sections have regions that represent large negative effects, while the "off-diagonals" have increasingly positive effects.

The estimates suggest that the Taylorist work system is worse performing than all of the other alternatives. Being 10% below the mean on both flexibility and discretion lowers productivity by 6% and cross-sell rates by 3%; this increases to -18% on productivity and -9% on cross sell below for 20% below the mean on both. A similar result holds as firms increase beyond modest levels of high performance work systems, although the negative effect is moderated slightly by the small positive benefits of flexibility and discretion by themselves.

Examining actual observations, rather than predicted values from regression coefficients, leads to similar conclusions. We divided sample branches into 4 groups, corresponding to the Table 1 combinations of high discretion-high flexibility, low discretion-low flexibility, low discretion-high flexibility and high discretion-low flexibility (using the median to split the sample as in Table 4). We recalculated productivity and cross-sell rates for each quadrant, by replacing the discretion, flexibility, and interaction variables with dummy variables for each quadrant (using the low-low quadrant as a reference point).

The results of this comparison are shown in Table 7a for productivity and 7b for cross-sell rates. In both tables we find that the off-diagonal quadrants have similar productivity and cross-sell rates. Each is higher than the "high-performance workplace" quadrant, though the differences are not statistically significant. Branches with cross trained work groups or high discretion specialists have, on average, 15% higher

productivity and 10% higher cross-sell rates than the Taylorist group. These differences are both economically and statistically significant. High performance work systems are also substantially higher than the Taylorist group: 16% higher in productivity and 6% higher in cross-sell (although the cross sell difference is not statistically significant).

The more restrictive formulation of the 2x2 analysis shows less contrast between the high-performance work systems group and the mixed groups, and suggests strong disadvantages to Taylorist work organization. The benefits of mixed systems in comparison with the high-performance workplace featuring high discretion and high flexibility are relatively small (on the order of a few percent) at moderate levels of adoption. Only at very high levels of adoption of each do the negative interactions become important and large.

Discussion

These results provide a complement to the studies establishing clearly the existence of the high-performance manufacturing workplaces. There are elements of consistency between our findings and earlier research. Foremost, both the devolution of decision-making authority and the broadening of workers' responsibilities that have proven so effective in manufacturing workplaces seem also to be effective in retail bank branches. Broader discretion and flexibility are each associated with higher levels of productivity and higher levels of sales. Branches with cross-trained workers, or workers with considerable discretionary decision-making authority, realize performance advantages in these two critical areas.

The most substantial benefits, however, are obtained when only one of these

practices is deployed extensively, or when both are used in moderation. The negative interaction between discretion and flexibility is, in one sense, consistent with earlier research. A large part of the measurable performance disadvantages of coupling flexibility with discretion is driven by the poor performance of branches organized in the traditional Taylorist fashion. But the findings also suggest an amended understanding of the relationship between discretion and flexibility. In bank branches, these two approaches to work organization were associated with diminished effectiveness when implemented jointly. Performance advantages were realized by branches with specialists with high levels of discretion, and those with flexibly deployed workers with more limited discretion. But especially at high levels of each, higher levels of cross-training reduced the benefits of discretion (and vice versa).

Thus one of the lessons from this study is that generalization from industry studies should be undertaken cautiously, since our findings have differences from the manufacturing studies that provided the basis for identification of the high-performance workplace, and are more consistent with workplace studies in other service settings than with those from manufacturing studies. Though Batt (1999) did not examine the interaction between flexibility and discretion directly, for example, her results indicate that individual discretion in call centers was both positively associated with time spent in teams, and negatively associated with performance quality. Similarly, Preuss (1997) found poorer performance in hospital units featuring nursing assistants with both high levels of discretion and cross-functional training to traditional nursing tasks.

Ours and other service-sector industry studies suggest two lines of inquiry that might be targeted at different levels of analysis from the research presented here. First, at

a more finely grained level, a better understanding of the mechanisms through which flexibility and discretion affect workers' performance in service contexts would advance our understanding of how high-performance workplaces function. Our field visits, and responses by industry participants to earlier presentations of these results, offered a modest amount of qualitative data in this direction.

In bank branches, cross-training and worker rotation may lead to more efficient deployment of labor, just as under lean production. Benefits could include improved sales and higher levels of productivity in terms of customers served (especially through "one-stop shopping). On the other hand, cross-training may lead to diffusion of responsibility and the loss of some of the advantages that could accrue to specialization. Customers may prefer quick, one-stop shopping, and dealing with a single worker rather than a range of specialists, but only if the generalist with whom they deal is effective.

Discretion in service work may also have advantages with respect to service and sales. Discretion can allow front-line workers to solve customers' problems more immediately, and to surface systemic problems quickly, forcing a resolution. It is also possible, however, that workers may use discretion in ways that do not enhance sales or service effectiveness. The negative complementarity between discretion and flexibility is consistent with the idea that workers who are specialists may use increased decision-making authority more wisely than do generalists. In contrast, where workers do rotate across a relatively broad range of tasks, greater effectiveness may result from jobs designed so that workers have relatively little discretionary decision-making authority. Our evidence was consistent with the interpretation that branches with high levels of staffing flexibility require more carefully specified routines in order to be effective in

serving customers and selling to them, while branches which emphasize problem-solving by front-line employees benefit from focusing those employees on a relatively narrower range of tasks.

At a broader, cross-sectoral level of analysis, further theorizing and research into the boundary conditions for effectiveness of particular forms of work organization is warranted. One would not argue, for example, that the auto plants, textile shops, and steel mills featured in earlier research could enjoy continued performance benefits as flexibility or discretion increased infinitely, and in fact, some research has examined this idea more specifically in the context of the auto industry (Adler and Borys 1996).

Despite their negative joint effects, discretion and flexibility were positively correlated in our sample. This leads to an important question: why are managers adopting sets of evidently uncomplementary practices? One possibility is that these two approaches have been, in effect, mistakenly sold as a package: managers made choices between the high-performance workplace and its Taylorist opposite, but were less likely to consider the mixed alternatives. Particularly in an environment characterized by experiments in work practices, and high levels of ambiguity between practices and outcomes, we may have observed experimentation that will, over time, be sorted out as banks choose more effective approaches and discard others.

An alternative explanation is suggested by a crucial limit of our study. We could not analyze all kinds of operational performance outcomes that might matter to a bank branch, in part because of the difficulty in identifying measures that were comparable across a large sample of organizations. Thus our data allowed us to view some of the benefits and costs of flexibility and discretion, but not others. For example, one benefit of

a Taylorist work organization might be that such branches make fewer basic errors in the handling of money and account details. Nevertheless, the two measures which we were able to examine provided us with interesting evidence on the benefits of high-involvement work practices. Both cross-selling and productivity are important to the success of a bank branch. Both cross-functional flexibility and enhanced discretionary authority for front-line workers are associated with better performance in these critical areas, though these approaches to work organization do not appear to complement one another. Perhaps most important, our work adds to the ever increasing evidence for the disadvantages of traditional forms of work organization, with their reliance on narrow jobs and command-and-control authority relations.

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Table 1
Forms of Work Organization

	Low Flexibility	High Flexibility
Low Discretion	Taylorist Bureaucracy	Cross-Trained Work Group
High Discretion	High-Discretion Specialists	High-Performance Workplace

Table 2

Means and Standard Deviations of Variables

Variable	**Mean**	Std. Dev.
Checking accounts	3895.5	3364.2
Platform terminals	5.41	3.03
Teller terminals	8.27	4.59
F-T-E tellers	7.16	9.17
F-T-E platform workers	4.51	2.67
Population	17657.4	23116
Median income	38929.1	16430.7
All branches in county	187.6	167.6
New accounts last month	55.6	72.6
Service software	0.39	0.20
Sales software	0.47	0.36
Discretion	0.40	0.18
Flexibility	0.38	0.21
Teller education	0.44	0.30
Platform education	0.58	0.38
Variable pay	2.16	0.98
Limited-function tellers	0.17	0.38
Part-time/Full-time ratio	0.18	0.18
Cross-Sell rate	1.61	0.46

Table 3
Pairwise correlations of Variables (* p<.05)

Variable	1	2	3	4	5	6	7	8	9	10
1 Checking accounts	1									
2 Platform terminals	0.45*	1								
3 Teller terminals	0.43*	.58*	1							
4 F-T-E tellers	0.27*	.35*	.48*	1						
5 F-T-E platform workers	0.68*	.73*	.58*	0.37*	1					
6 Population	0.20*	.41*	.19*	0.09	0.29*	1				
7 Median income	-.08	0.07	-.07	0.04	-.05	-.05	1			
8 All branches in county	0.19*	0.37*	0.27*	0.24*	0.26*	0.46*	0.35*	1		
9 New accounts last month	0.43*	0.25*	0.25*	0.09	0.36*	0.08	-.01	.22*	1	
10 Service software	-.02	0.05	0.00	0.09	0.09	0.02	-.04	-.13*	-.08	1
11 Sales software	-.00	0.02	-.09	-.09	-.09	0.12	0.13*	0.07	0.11	0.06
12 Discretion	-.00	-.12	-.06	0.03	0.03	-.17*	-.04	-.17*	-.06	0.16*
13 Flexibility	-.17*	-.33*	-.33*	-.10	-.10	-.18*	-0.03	-.22*	-.18	0.02
14 Teller education	-.02	.11	-.07	-.04	-.04	0.01	0.11	0.10	0.01	0.06
15 Platform education	0.03	0.02	-.03	-.02	-.02	-.00	0.03	0.02	0.01	-.03
16 Variable pay	0.04	0.02	-.03	-.04	0.07	0.04	0.10	0.07	0.10	-.13*
17 Limited-function tellers	0.03	-.04	0.01	-.02	-.01	0.04	0.01	-.06	-.03	-.10
18 Pt-time/Full-time ratio	-.06	0.10	-.00	-.00	-.06	0.16*	0.13*	0.03	-.02	0.03
19 Cross-sell rate	-.07	-.08	-.07	-.07	0.01	0.00	-.08	-.06	-.13	-.06

Variable	11	12	13	14	15	16	17	18	19
1 Checking accounts									
2 Platform terminals									
3 Teller terminals									
4 F-T-E tellers									
5 F-T-E platform workers									
6 Population									
7 Median income									
8 All branches in county									
9 New accounts last month									
10 Service software									
11 Sales software	1								
12 Discretion	0.10	1							
13 Flexibility	-.01	.17*	1						
14 Teller education	0.09	0.02	-.02	1					
15 Platform education	0.00	0.10	0.03	0.25*	1				
16 Variable pay	0.10	0.06	0.03	0.08	-.00	1			
17 Limited-function tellers	0.02	0.06	0.05	-.11	-.01	0.05	1		
18 Pt-time/Full-time ratio	0.04	-.06	-.05	-.02	-.00	-.05	0.14*	1	
19 $ Out-of-balance	-.00	-.08	-.10	-.08	-.03	-.03	0.12	0.06	
20 Cross-sell rate	-.01	-.05	0.03	-.10	-.13	0.04	-.11	0.11	1

Table 4
Work Organization of Branches
Categorized by Median Split

	Low Flexibility	High Flexibility
Low Discretion	34.5%	19.3%
High Discretion	19.8%	26.1%

Table 5
Regression results for branch productivity

	Coefficient (Standard Error)	Coefficient (Standard Error)	Coefficient (Standard Error)
Specification	Random Effects	Fixed Effects	Fixed Effects
Ln Platform terminals	0.125 (0.100)	0.112 (0.123)	0.101 (0.0121)
Ln Teller terminals	0.142* (0.0889)	0.264* (0.121)	0.257* (0.119)
Ln F-T-E tellers	0.402** (0.0783)	0.304** (0.0981)	0.319** (0.0964)
Ln F-T-E platform workers	0.264** (0.0965)	0.284** (0.122)	0.283** (0.120)
Ln Population	0.00775 (0.0434)	0.0146 (0.0500)	0.0234 (0.0493)
Ln All branches in county	0.0403 (0.0381)	0.0386 (0.0464)	0.0426 (0.0455)
Ln New accounts last mo.	0.212* (0.0491)	0.127* (0.0667)	0.139* (0.0656)
Service software	0.0606 (0.169)	0.0499 (0.224)	0.0915 (0.220)
Sales software	-0.112 (0.0935)	0.0688 (0.128)	0.0810 (0.126)
Discretion	0.166 (0.199)	0.304 (0.251)	0.165 (0.252)
Flexibility	0.00564 (0.179)	0.315 (0.218)	0.185 (0.221)
Discretion x Flexibility			-2.762* (1.064)
Teller education	-0.0764 (0.116)	-0.0536 (0.126)	-0.0558 (0.123)
Platform education	-0.0870 (0.0902)	-0.0490 (0.107)	-0.0377 (0.105)
Variable pay	-0.0461 (0.0342)	-0.0527 (0.0484)	-0.0529 (0.0474)
Limited-function tellers	0.124 (0.0892)	0.173 (0.102)	-0.200* (0.101)
Part-time/Full-time ratio	-0.290 (0.189)	-0.353 (0.254)	-0.368 (0.250)
Other Demographic Controls	Age, Income	Age, Income	Age, Income
N	235	235	235
R^2	60.7%	62.6%	65.4%

Dependent variable is ln(# of checking accounts housed in the branch). Age and Income are a series of variables capturing the proportion of the sample in 7 income ranges and 6 age ranges. Fixed and random effects included to group branches from the same bank.

Table 6
Regression results for cross-sell rates

	Coefficient (Std Error)	Coefficient (Std Error)	Coefficient (Std Error)	Coefficient (Std Error)
Specification	Random Effects	Random Effects	Fixed Effects	Fixed Effects
Discretion	-0.0812 (0.122)	-0.0114 (0.102)	0.0704 (0.120)	0.0428 (0.117)
Flexibility	0.0292 (0.104)	0.0973 (0.0865)	0.131 (0.097)	0.162 (0.961)
Discretion x Flexibility				-1.25* (0.476)
Ln All branches in county	0.0319 (0.0258			
Sales software	0.0644 (0.0543			
Service Software	-0.0525 (0.0908			
Teller education	0.0014 (0.0667			
Platform education	-0.0217 (0.0504			
Variable pay	0.0066 (0.0185			
Limited-function tellers	-0.0621 (0.0483			
Part-time/Full-time ratio	0.186 (0.108)			
Other Controls	Inputs, Output, Age, Income			
N	147	147	147	147
R^2	18.4%	1.84%	2.33%	8.42%

Dependent variable is ln(cross-sell rate). Age and Income are a series of variables capturing the proportion of the sample in 7 income ranges and 6 age ranges. Inputs and outputs are as they appear in the productivity regressions (Table 5). Fixed and random effects included to group branches from the same bank.

Table 7:
Comparison of Productivity and Cross-Sell Rates
for Different Combinations of Discretion and Flexibility

7a
Productivity Comparison: Percentage Differences

	Low Flexibility	High Flexibility
Low Discretion	0 (n/a)	+22.5% (10.5%)
High Discretion	+22.4% (10.5%)	+16.3% (8.93%)

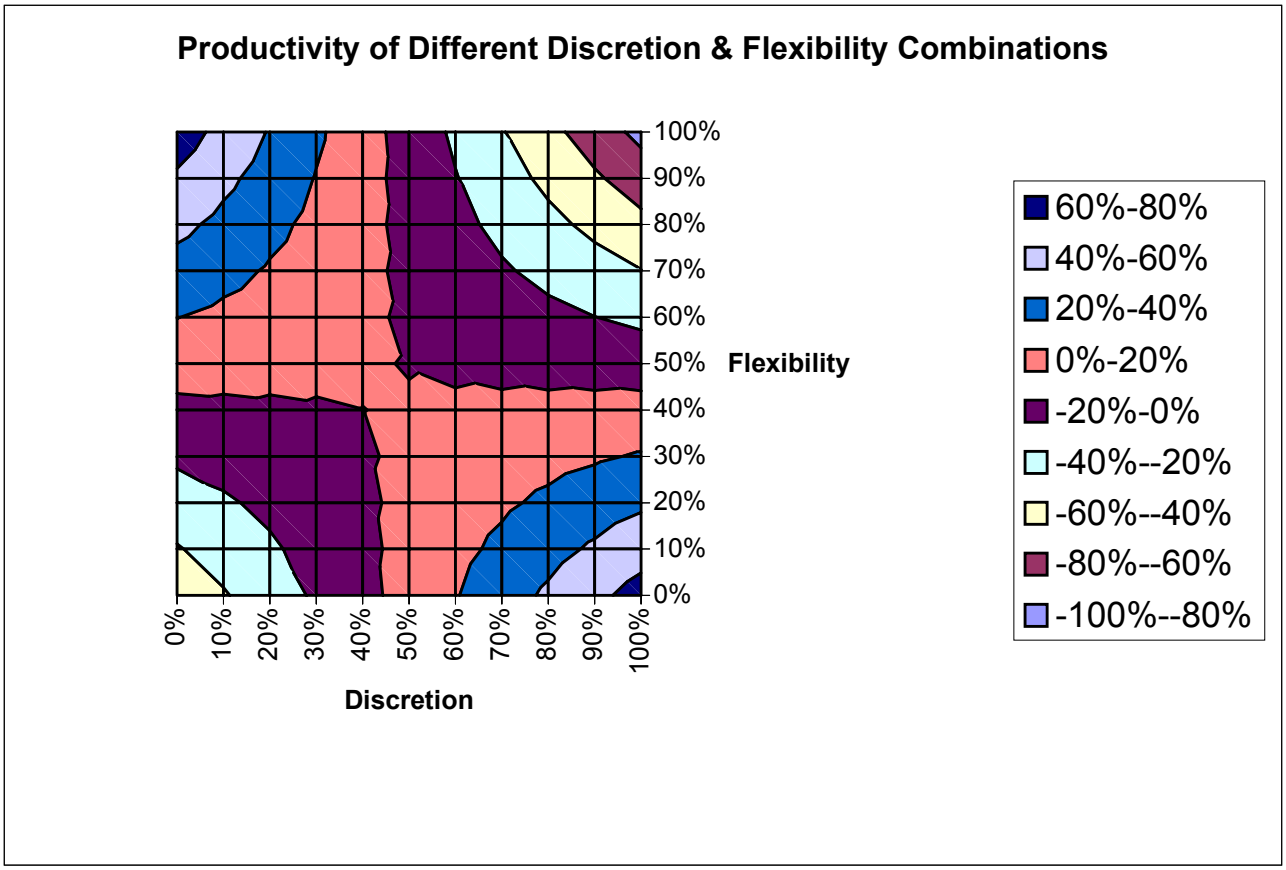
Reference point is Low-Low quadrant. Standard errors appear in parentheses.
High-High, High-Low and Low-High are all statistically different from Low-Low, but not from each other.

7b
Cross-Sell Comparison

	Low Flexibility	High Flexibility
Low Discretion	0 (n/a)	+10.5% (4.74%)
High Discretion	+9.17% (4.44%)	+5.88% (4.44%)

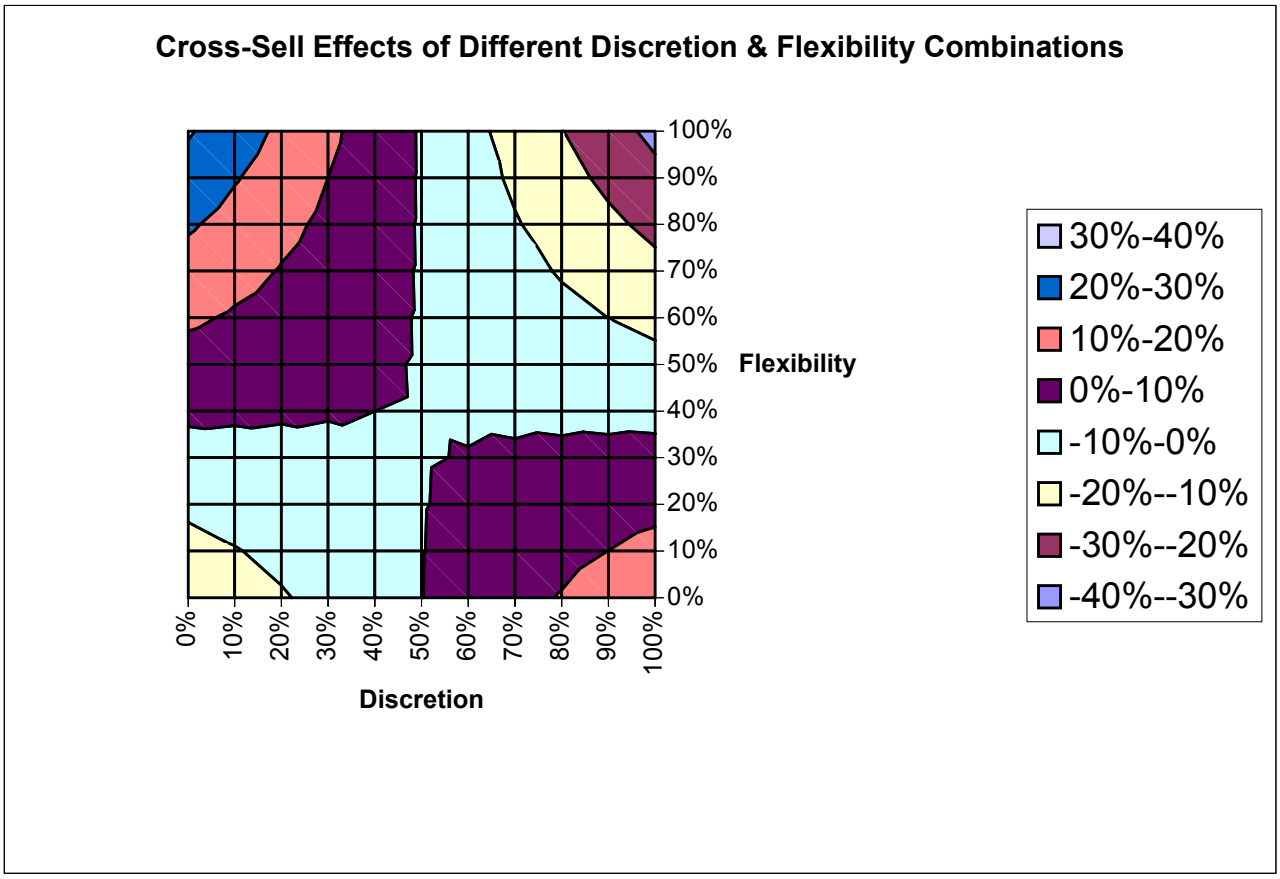
Reference point is Low-Low quadrant. Standard errors appear in parenthesis.
High-High, High-Low and Low-High are all statistically different from Low-Low, but not from each other.

Figure 1: Contour Plot of Productivity at Different Levels of Flexibility and Discretion



Contours represent productivity levels relative to a firm at the sample mean (40% discretion and 38% flexibility)

Figure 2:
Contour Plot of Cross-sell Rates at Different Levels of Flexibility and Discretion



Contours represent productivity levels relative to a firm at the sample mean (40% discretion and 38% flexibility)

Appendix 1
Index Items

Flexibility Index (alpha=0.77)
(all answers divided by number of workers in category)
How many full-time tellers can perform safe deposit functions?
How many full time tellers can perform foreign exchange functions?
How many full-time tellers are trained to open a checking account?
How many full-time tellers are trained to replace a lost ATM card?
How many full-time tellers are trained to sell a Certificate of Deposit?
How many full-time tellers are trained to correct a payment not credited to a Home Equity Loan?
How many full-time Customer Service Representatives are currently able to perform all of the regular tasks on a teller line?
How many full-time Customer Service Representatives have actually worked on a teller line in the last month?

Discretion Index (alpha=0.77)
Please indicate whether branch personnel listed below have the authority to correct the following types of errors (Y/N)
Teller
Check Posted Twice
CD sold at an incorrect rate or term
Incorrect ATM order information
Incorrect check order information
Loan Payment not credited to an account
Platform Representative
Check Posted Twice
CD sold at an incorrect rate or term
Incorrect ATM order information
Incorrect check order information
Loan Payment not credited to an account
Can your platform representative, at the point of sale, change rates for the following products? (Y/N)
Checking account
CD
Home equity loan
Small business loan
Can your platform representative, at the point of sale, waive fees for the following products? (Y/N)
Checking account
Home equity loan
Small business loan

Service Technology Index (alpha=0.81)
Please indicate the capability to perform each of the following functions on-line at the branch terminals (Y/N)
Open checking account
Add name to checking account
Account transfer from checking to savings
Close checking account
Stop payment on a check
Correct a check posted incorrectly
Remove fees from a checking account
Change a Personal ID number
Open CD account

Premature Redemption of a CD
Correct a CD issued incorrectly

Sales Technology Index (alpha=0.73)
Please indicate which of the following are available, on line, at the platform representative's terminal:
Cross-sell support with prompts
Product information and pricing display
Household inquiry (multiple accounts)
Do customers typically view their customer information on the platform representative's terminal?
Do customers typically view product features on the platform representative's terminal?

Variable Pay Index (alpha=0.73)

Question	1	2	3	4	5	6
For the typical full-time teller, what % of annual pay is "bonus" or variable (i.e. pay not built into the base wage)?	0	1-3%	4-6%	7-10%	11-15%	>15%
For the typical full-time customer service rep, what % of annual pay is "bonus" or variable (i.e. pay not built into the base wage)?	0	1-3%	4-6%	7-10%	11-15%	>15%

End Notes

[1] Other features of the high-performance workplace may in fact be consistent with a Taylorist approach to the organization of work: careful selection and pay incentives, for example.

[2] We chose to use county rather than zip code matches where we had a choice because zip code matches were too precise (many branches serve customers in more than one zip code). Using only zip code matches would have resulted in the loss of branches from the sample. Inaccuracies resulting from mismatches between branch counties and customers' counties will produce measurement error; we had to trade these possible errors off against the loss of data.

[3] Results reported below are not sensitive to a range of choices in the products included in the cross-sell measure.

[4] We might have used an index here. However, in contrast with prior research from cross-industry studies (Huselid 1995; Wood 1999) and from some of the manufacturing studies (e.g. MacDuffie 1995), the human resource practices in the banks did not covary systematically. Nor did indices comprising multiple practices (including others not listed here) yield conventionally acceptable levels of reliability. We have two non-competing explanations for this lack of coherence in human resource practices. First, in contrast with the work system variables, the range of variation in our sample for some of these practices was restricted: most banks did things about the same way. Second, to the extent that banks varied their human resource practices, the variance may have reflected responses to events such as the banks' recent merger activity rather than being part of a coherent strategy of human resource management. In any case, the results reported below were not sensitive to the choice of practices, the exclusion or inclusion of particular human resource management items, or the use of aggregated measures of practices.

[5] Descriptive statistics for the control variables reporting the percentage membership in individual age and income categories are available on request.

[6] Our sample contains a mix of banks with only 1 branch and banks with more than one branch reporting. For the fixed and random effects analyses, we treat all single branch banks as being part of the same fixed effect unit.

[7] When the new accounts control was removed (not reported here) the results remained similar for all other variables, and the Hausman test failed to reject equivalence of the specifications.

[8] In general, multicollinearity between two or more regressors can only reduce the apparent effect size and precision of hypothesis tests. In this case, we are concerned that multicollinearity between the components of a potentially complementary work system might mask a significant effect of the system as a whole even when the regression suggests that the individual components have no significant effect. This test rules out that possibility.

[9] This has no effect on the estimate of the interaction term but does prevent the coefficients on the direct effects from rising to offset the interaction term. The alternative approach is not to center these variables before constructing the interaction. This would then require subtracting the interaction term multiplied by the average value of the factor to get the correct estimate of the direct effect.

[10] Normally, it would be inappropriate to drop control variables simply because they are insignificant. However, while it is not implausible that these controls would have an effect, there is no strong reason to believe their effects should be large. There is no research on the determinants of variance in cross-sell rates across organizations, and the little research on the propensity of different consumers to buy multiple products is mostly experimental. Further, estimates of the coefficients of interest here – flexibility, discretion, and their interaction – are not sensitive to the inclusion of the control variables.