

Draft:  
April 2010

## EMPLOYERS' USE OF PRESSURE AND PROFIT SHARING IN TEAMS

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### Abstract

The analysis of descriptions of job openings from the online job board Monster.com suggests that, when team work is an important part of a job, employers are more likely to reward their workers with some form of profit sharing and - by recruiting workers with a strong sense of loyalty, pride, and trust, or workers who value social ties in the workplace - to cultivate a work environment where shirking is penalized by guilt. This finding is consistent with the notion that profit sharing can elicit effectively effort in teams as long as employers make shirking sufficiently costly. This conclusion extends across different industries, occupations, and levels in a firm's hierarchy, and is robust to firm fixed effects and alternative definitions of team work.

JEL classification codes: J23, M52

Keywords: Incentives, Teams, Recruitment

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*“...a team can generate magic. But don’t count on it.”*  
From an interview with Richard Hackman (Harvard Business Review, 2009, page 100)

## **1. Introduction**

When team work is an important component of a job and the contribution of each team member to team output is difficult to discern, rewarding team members on the basis of team output causes shirking (Holmström, 1982). However, shirking in teams can be prevented if conditions in the workplace ensure that shirking is sufficiently costly. For example, if employers manage to cultivate a work environment that promotes the application of external pressure (by encouraging monitoring among coworkers) or internal pressure (by cultivating pride or loyalty), shirking is costly because it causes shame and guilt (Kandel and Lazear, 1992).

Given that team work constitutes a large component of many jobs (Lazear and Shaw, 2007, page 92), understanding the role of incentives in teams is important. In this paper, we examine whether and how employers ensure that shirking is costly in the workplace. We focus on one channel: employers’ efforts to recruit workers who incur large costs when shirking; i.e., workers with a strong sense of loyalty, pride, and trust, or workers who value social ties in the workplace. In our analysis, we rely on descriptions of close to 380,000 job vacancies that were posted on the online job board Monster.com. For each job vacancy, we observe information about the job, the attributes that a new hire has to have, and the workplace.

We find that employers were more likely to offer some form of profit sharing when team work was an important part of a job that a prospective worker was expected to do. Employers with jobs that required team work were also more likely to search for workers who could more easily be subjected to pressure. These findings are consistent with the idea that rewarding a worker on the basis of team output can provide sufficient incentives as long as the employer manages to cultivate a work environment where shirking is costly. These results are robust to

various definitions of team work and firm-fixed effects, and extend across occupations, industries, and levels in a firm's hierarchy. Additional robustness checks suggest that our findings cannot be explained by differences in the way the employers described their jobs.

These findings complement those in the literature on optimal incentives in teams on three counts. When analyzing the role of pressure in the workplace, the existing empirical studies have focused on assessing whether changes in the extent of pressure affect workers' efforts in a way that is consistent with the theory (e.g., Bandiera et al., 2005; Mas and Moretti, 2009).<sup>1</sup> The first interesting aspect of our analysis is that it focuses on employers rather than workers. In particular, we examine whether employers' efforts to cultivate a work environment where shirking is costly (e.g., hiring workers who incur large costs when shirking) are affected by the nature of the tasks (e.g., team work) that a worker is expected to perform on the job.

Second, because of the difference in focus, our analysis differs from related studies with respect to the nature of the empirical identification of the role of pressure. The key challenge in the existing literature has been to address adequately the two-sided selection problem (Prendergast, 1996; Soetevent, 2006). That is, due to the fact that this literature uses data on actual contracts, i.e., outcomes of matching, it has to account for attributes of job applicants that affect employers' decisions regarding the type of job to offer to the applicants (i.e., type of pay, assignment of tasks) and attributes of the applicants who accept the offers. Given that such information is rarely available, this literature has, in large part, relied on experiments to ensure that changes in workers' exposure to pressure are manipulated as a part of the experiment.

In our data, we observe the decisions that employers made before they met the job applicants. We expect that these decisions (which we can infer from job descriptions) would

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<sup>1</sup> Another strand of the literature examines the role of pressure outside the workplace; e.g., residential neighborhoods, college dormitories, and classrooms (for a review, see Soetevent, 2006; DellaVigna, 2009).

have been affected by the type of job (i.e., on-the-job tasks) that the employers were trying to find a worker to do. Hence, our analysis should not be susceptible to the two-sided selection problem. However, a key challenge remains to ensure that the information in job descriptions that the employers posted on the online job board reflects their concerns about shirking rather than unobserved heterogeneity with regards to how the jobs were described.<sup>2</sup>

The third interesting aspect of our analysis is that it is comprehensive. We examined the employers' provision of incentives in teams across different industries, occupations, and levels in a firm's hierarchy. In doing so, we used identical measures of offered compensation, team work, and sources of pressure in the workplace (e.g., loyalty, pride, trust, and social ties). The existing evidence relates to the role of a particular source of pressure for workers in one occupational group, such as monitoring and friendship among supermarket cashiers in Mas and Moretti (2009) and workers at a fruit-picking farm in Bandiera et al. (2005); norms among seamstresses in a garment plant in Hamilton et al. (2003), in steel mills in Boning et al. (2007), and among physicians in Encinosa et al. (2007); and the monitoring of workers at Continental Airlines in Knez and Simester (2001) or call-centers in Nagin et al. (2002) and Rees et al. (2003).<sup>3</sup>

Finally, our paper complements the literature that examines how conditions form in the workplace such that they ensure that pressure can be applied. For instance, Costa and Kahn (2003) examine the formation of loyalty among military men during the American Civil War. Bandiera et al. (2008) document the formation of friendships at a fruit-picking farm in the U.K. These two studies identify demographic attributes that help to explain the formation of the two sources of pressure. We identify vacancy and firm attributes that help to explain employers'

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<sup>2</sup> See Brenčić and Norris (2009) for a similar approach.

<sup>3</sup> Because this literature examines the effect of pressure on effort, it is desirable that the analysis rely on data for workers in an occupation for which there is a well-defined measure of effort.

efforts to recruit workers who can more easily be subjected to pressure (e.g., workers who are loyal, proud) and thus cultivate a work environment where pressure can be applied effectively.

The analysis in this paper is limited in the following respects. First, our empirical approach relies on the assumption that descriptions of job openings on online job boards provide a good description of the work environment. The validity of this assumption may be limited if employers differ, in unobservable ways, with respect to their propensity to reveal information or lie about the workplace. Second, our measures of work attributes were constructed on the basis of a list of words that identify the attributes. To the extent that this list is not exhaustive, the accuracy of our measures will be compromised. In a series of robustness checks, we assessed the importance of these two concerns. Future research could complement our analysis with data from human resource departments in order to shed further light on the usefulness of using descriptions of job openings from online job boards in order to learn about the workplace.

The remainder of the paper is organized as follows. In Section 2, we briefly describe the theoretical framework that motivates our empirical analysis. In Sections 3 and 4, we describe the empirical approach and its relation to the literature, the data, and the construction of key variables. In Section 5, we discuss the results. Section 6 concludes.

## **2. Theoretical framework**

Let  $f(e)$  denote the output, a function of  $N$ -dimensional vector of efforts,  $e$ , which is produced by  $N$  members of a team and let  $C(e_i)$  denote a team member  $i$ 's cost of exerting effort. Suppose that an employer can observe the output of the entire team but not each team member's contribution to the output. If each worker, a member of the team, is awarded an equal share of the output, then each worker will choose the effort that they expend as a solution to:

$$\max_{e_i} \frac{f(e)}{N} - C(e_i)$$

Whereas the socially optimal effort ensures that the marginal gain from exerting effort,  $f_i(e)$ , equals the marginal cost,  $C'(e_i)$ , worker  $i$ 's chosen effort satisfies  $\frac{f_i(e)}{N} = C'(e_i)$ . Hence, when the cost function is strictly convex and a team consists of more than one worker, a worker's effort is below the socially optimal level, a result known as free-riding (Holmström, 1982).

One important implication of this result is that employers are less likely to compensate workers on the basis of output when team work is an important part of the workers' jobs. However, Kandel and Lazear (1992) point out that employers can reward workers on the basis of performance even in a team setting, provided that they manage to make shirking sufficiently costly. Specifically, by promoting the application of pressure, employers can ensure that workers exert effort that is close to the socially optimal level. The key feature of pressure, represented by the pressure function  $P$ , is that it is affected by both the team members' effort and actions that team members undertake to exert pressure but that have no direct effect on output.<sup>4</sup>

When pressure exists in the workplace, a worker's choice of effort is  $\frac{f_i(e)}{N} = C'(e_i) + \frac{\partial P}{\partial e_i}$ .

Hence, workers work harder to avoid the costs associated with pressure ( $\frac{\partial P}{\partial e_i} < 0$ ). Employers can facilitate the application of external pressure if the workers' effort choices are observed by their team members; for instance, by encouraging the team members to monitor each other on the job. If the workers' effort cannot be observed by team members, employers can attempt to create internal pressure or guilt. Such attempts might involve investments to imbue loyalty or pride in

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<sup>4</sup> Workers will only exert pressure on their coworkers in the presence of group incentives; i.e., when their compensation is tied to the output of the entire team and hence depends on their coworkers' efforts.

the workers, which might include organizing company retreats or conducting psychological tests when recruiting to ensure that the new hires are loyal or have a strong sense of pride.

### **3. Empirical identification: A review**

There are two approaches to examining the role of pressure in the workplace; one that focuses on workers and another that focuses on employers (Prendergast, 1999, page 8).<sup>5</sup> The first approach examines whether workers' efforts change when pressure in the workplace changes. For example, Mas and Moretti (2009) found that the cashiers' productivity in a supermarket was affected by the presence of very productive cashiers and that this effect was more pronounced when productivity could be observed by coworkers or when social interactions were frequent. Bandiera et al. (2005) found that efforts by workers at a fruit-picking farm in the U.K. were affected by whether the workers could be monitored by coworkers and whether the workers' compensation depended on how their performance compared to that of their friends.

While still focusing on workers, Hamilton et al. (2003) and Minkler (2004) pursued a different approach. Hamilton et al. examined the *adoption* of teams and pay based on team output in a garment plant. The authors found that highly able workers joined teams quicker and that, conditional on the average ability of the team, teams whose members were more diverse in terms of their ability were more productive. The authors noted that this finding suggests that improved learning and a higher team norm, which is a source of pressure, had a significant effect on the workers' effort. Drawing on a *survey*, Minkler reports that peer pressure was important in determining how much effort respondents of the survey *reported* that they exerted on the job.

Several papers document a negative or absence of the effect of pressure, mostly in the professional sports setting. Dohmen (2008) found a negative effect of pressure (e.g., the size of the audience, the importance of winning) on the successful completion of penalty kicks in the

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<sup>5</sup> The role of pressure has also been examined in laboratory experiments (see DellaVigna, 2009, pages 47-48).

German Super League. Using data for professional baseball players, Gould and Winter (2009) found that the effect of the co-players' productivity on the player's productivity depended on the nature of the players' interactions (i.e., whether the players were substitutes or complements), rather than pressure. In their examination of random pairing of golf players in golf tournaments, Guryan et al. (2009) found no evidence that one's golf partner affects one's performance.

The empirical identification of the role of pressure in most of these papers is achieved by relying on data in which the same group of workers is observed in work settings that differ in terms of pressure, team work, or/and type of pay. In contrast, the second approach focuses on employers in order to identify whether they are more likely to promote the exertion of pressure in the workplace when team work is an important component of the job. This approach treats the presence of pressure in the workplace as one aspect of the work environment that an employer can manipulate (Kandel and Lazear, 1992, page 806).<sup>6</sup> We followed this second approach by relying on job descriptions that employers posted on the online job board Monster.com.

In particular, we examined whether the tasks that the jobs entail affect employers' efforts to hire workers who experience large costs when shirking (i.e., workers who have a strong sense of guilt or shame). By hiring such workers, employers can cultivate work environment in which shirking is costly. Consistent with this interpretation is the fact that employers are reminded that the content of a job description can affect who applies for a job.<sup>7</sup> Hence, by describing the work environment appropriately, employers can attract applications from workers who have a strong sense of pride or loyalty. It is likely that attracting such job applicants is more beneficial when

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<sup>6</sup> In this respect, findings in Heywood et al. (2008) are of interest. The authors found that firms where team work was more prevalent invested more in monitoring.

<sup>7</sup> In particular: "Provide company/job info and keywords that will attract the right people." It should be noted that the costs of posting a vacancy online did not depend on the job description's length. Monster.com also imposed no restrictions on the maximum length of the job description. The average job description in our sample consists of 2,553 characters and is about one page long.



team work is important. This interpretation is also consistent with the view in the literature on human resources management that employers describe workplace culture in job ads because it represents important intangible job benefits (Ryan et al., 2000).<sup>8</sup>

Two key concerns remain. First, because a job ad does not constitute a legal obligation, employers may exaggerate or lie about the job or the workplace. In this respect, the analysis by Menzio (2007) is of some interest. In his model, posted wage offers do not constitute contractual obligation but do constrain bargaining because they affect expectations of job searchers who apply for jobs. Menzio derives conditions, linked to labor market tightness, that ensure that the wage offers are correlated with the starting wages. In other words, the threat of having to repeat costly search if the new hires terminate bargaining because of the false claims in job ads provides an incentive for employers to be truthful about their jobs and the workplace. To control for the incentive for cheap talk one needs a measure of market tightness. For this reason, we include as explanatory variables in our models dummy variables for the region of a job and industry.<sup>9</sup>

Second, employers may be truthful about the job and the workplace but could differ with respect to information that they choose to reveal in job descriptions. In a series of robustness checks, we examine the importance of heterogeneity that may arise because of the differences in writing style. However, employers may also choose to withhold strategically information about the job. In this respect, studies by Zettelmeyer (2000) and Anderson and Renault (2006) are relevant. The two studies examine sellers' optimal provision of information about the *attributes* of a product in an advertisement. The authors show that, depending on the magnitude of the

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<sup>8</sup> The literature that offers advice on how to write an effective job ad advises employers to provide information not only about requirements but also about the benefits and responsibilities that a job entails (e.g., Georgia, 2000).

<sup>9</sup> If lying were common, we should observe that the majority of employers described their workplace as caring, for instance, because everyone would want to work in such an environment. Simple summary statistics for our sample suggest otherwise. Monster.com also encourages users to report instances of misrepresentation in job ads.

buyers' search costs, it may be optimal for sellers to withhold some information about the product even when it is costless for the sellers to reveal all the information.

Anderson and Renault (2006) demonstrate that by withholding information, the seller can ensure that consumers are willing to incur the cost of visiting the seller. Consumers may choose not to do so when all information is available to avoid the hold-up. Because the costs that job searchers incur to "visit" employers are negligible in our instance (i.e., job searchers can, for the most part, apply for a job by simply clicking on the Apply Now button displayed in an online job ad), we think that considerations in Anderson and Renault do not feature prominently in our study.<sup>10</sup> Zettelmeyer (2000) points out that sellers can - by revealing little information about their products - turn otherwise homogenous products into heterogeneous products and hence reduce price competition between sellers. The author's analysis, therefore, concerns products for which increased knowledge decreases consumers' perceived product differentiation. In our context, it is expected that access to more information reveals differences in the type of tasks and unique aspects of the workplace (i.e., colleagues) that are associated with the job opening.<sup>11</sup>

<Insert Table 1 and Figure 1>

#### **4. Data description and variables**

In 2004, we collected job descriptions for a stock of job openings that were posted on Monster.com on 10 July. From the list of 261 U.S. cities or regions, postings for jobs that were located in 10 cities were retrieved.<sup>12</sup> In a separate retrieval, job openings that were assigned to

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<sup>10</sup> In their extension, Koessler and Renault (2010) show that full disclosure of information is one and, under certain conditions, unique equilibrium.

<sup>11</sup> Another explanation, considered by Anderson and de Palma (2008, 2009), is that the number of messages the seller sends to the buyers depends on the buyers' attention span (i.e., ability to process and absorb information). We control for the job searchers' capacity to process information by variables that identify human capital of job searchers whom the job ads target (e.g., education, career level, work experience).

<sup>12</sup> The cities are Chicago, Cincinnati, Detroit, Boston, Atlanta, Dallas, Charlotte, Miami, Seattle, and San Francisco.

11 of the 67 job categories were collected.<sup>13</sup> The two retrievals resulted in 76,176 unique postings. In 2005, using the same criteria as in 2004, we collected 172,219 descriptions of job openings that were posted on Monster.com, between 30 April and 7 July (a flow). The 2006 data record 137,678 vacancies that were posted on Monster.com between 26 June and 8 July (a flow). In 2006, we collected postings regardless of the jobs' location or industry.<sup>14</sup>

Due to the way that the data were collected, each observation records a description of a job opening. For each attribute of a job or the workplace, we constructed a list of search words that identify the attribute. We ran a program that checked each job description to determine whether any of the specified search words or phrases could be found in the job description. If at least one search word or a phrase from the list was identified, a corresponding variable was set to 1 to indicate that a particular attribute was used by an employer to describe a job opening.

Table 1 presents the search words that we used to construct the main variables (for a complete list, see Appendix A). Table 1 also lists excerpts from job descriptions for which search words were identified. Figure 1 provides an example of a job posting and key attributes. In particular, an examination of the role of pressure in teams requires information about the complementarity of workers' efforts in the production process, the costs of measuring workers' efforts, and employers' efforts to promote pressure in the workplace (Kandel and Lazear, 1992, page 808). We next describe how each of these job and workplace attributes was identified.

#### **4.1. Team production**

The key job attribute that we identified from each job description is whether or not an employer mentioned that team work was an important component of the job that was advertised.

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<sup>13</sup> The industries are: banking, insurance, finance and economics, financial services, biotechnology and pharmaceutical, certified nursing assistants, registered nurses, manufacturing and production, Internet and E-commerce, information technology, and administrative and support services.

<sup>14</sup> For more details, see Brenčić and Norris (2009).

That participation in a team was mentioned in a job's description suggests that effort exerted while participating in a team contributed significantly to value that the worker would add. Instances when team work was not mentioned in a job description did not suggest that no such activities were expected, but simply that they did not constitute an important part of the job.

We constructed two other measures. First, we used different search words in order to identify different degrees of complementarity of workers' efforts in the workplace. For our baseline definition of a team, we constructed a variable that identifies whether an employer mentioned that a worker would work as a part of a team. We also searched for the single word "team" in each job description. The variable that draws on this single word also identifies jobs for which the atmosphere at work, rather than the production process, was team-oriented.

Second, we constructed a variable that identifies whether or not the job required that the successful applicant work independently. This variable identifies the *absence* of team work in the workplace. The construction of this variable is of interest for the following reason. Given that the disclosure of information about a job vacancy is voluntary, some employers may provide a detailed description of their vacancies while others, who have identical vacancies, may choose to reveal only a few attributes of the vacancies or the workplace. If such heterogeneity exists and is not accounted for by our control variables, we might observe a positive association between the importance of team work in the workplace and employers' efforts to recruit workers who have a strong sense of guilt even in the absence of employers' concerns about shirking. The variable for the absence of team work can help us to assess the importance of this concern.

Related studies relied on different definitions of a team. In Hamilton et al. (2003), for instance, a team in a garment plant consisted of six or seven workers who shared responsibility for all sewing tasks. In Boning et al. (2007), the notion of a team inside the steel mills pertained

to the existence of a formal mechanism that involved workers in the process of identifying ways to improve production. Bandiera et al. (2009) defined as a team a group of five workers who were assigned to pick fruit from a common tunnel. Knez and Simester (2001) treated workers at airports as a team if they were involved in common operations (ticketing or handling of baggage). In Heywood et al. (2008), team work entailed working together, joint decision making, or responsibility for specific products or services. Encinosa et al. (2007) defined a team as a medical practice with three or more full-time equivalent physicians.<sup>15</sup>

#### **4.2. Monitoring costs**

We next constructed a variable that identifies whether a worker was supervised on the job. When monitoring on the job is specified, it is more likely that a workers' effort can be observed. Heywood et al. (2008) uses as measures of the extent of monitoring the percentage of employees who were covered by a formal job appraisal scheme, the percentage of non-managerial supervisors, and whether these supervisors conducted formal appraisals or had received training for managing personnel. Mas and Moretti (2009) identify monitoring at work by determining the distance between cash registers occupied by cashiers at a supermarket chain. Bandiera et al. (2005) identify instances when worker effort was observed at a fruit-picking farm by determining whether the height of plants allowed workers to observe each other's efforts.

#### **4.3. Employers' investment in workplace pressure**

*Loyalty*: Lazear and Kandel (1992, page 807) note that "guilt, in the form of loyalty..., provides incentives that operate even in the absence of observability." Our variable identifies whether or not loyalty or devotion was important in the workplace and whether a job opening offered a long-term engagement. We expect that employers would want to recruit a worker with

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<sup>15</sup> We treat team work as exogenous. In this respect, our approach differs from the literature that examines how teams form in the workplace (see Hamilton et al., 2003, Boning et al., 2007, Bonatti and Hörner, 2008).

a strong sense of loyalty when team work is a very important part of the job that employers are trying to fill. Along similar lines, Costa and Kahn (2003) examine determinants of loyalty, as measured by desertion, among soldiers during the American Civil war.

*Pride:* This variable identifies whether or not an employer cultivates a workplace where pride or integrity is important. In the literature on organizational sociology, pride is associated with a worker's willingness to exert effort on behalf of the organization. Mowday et al. (1979, page 226), for instance, note: "It involves an active relationship with the organization such that individuals are willing to give something of themselves in order to contribute to the organizations' well being." The role of pride has been also examined in the literature on economic psychology. In this context, Lea and Webley (1997) note that pride in the workplace is defined as a preference for doing high quality work even in the absence of reward.

*Trust:* A work environment that cultivates or emphasizes trust is more likely to instill guilt in instances of shirking and can thereby ensure that workers work harder (Ellingsen and Johannesson, 2007, page 140). We constructed a variable that identifies whether employers mentioned in their job descriptions that honesty and trustworthiness were important attributes of a prospective new hire. We expect that this attribute would be more likely important when employers are searching to fill a job opening that entails team work than when it does not.

*Ties between work and life:* Kandel and Lazear (1992, page 808) note that employers can instill guilt by affecting workers' utility outside the workplace. In such instances, shirking is costly because it can jeopardize workers' access to activities that they undertake outside the workplace. We measured such employers' attempts by identifying, from job descriptions, employers' reference to joint spousal appointments, access to a child-care center, membership of a fitness center or a health-club, and the reimbursement of or assistance with tuition. Related to

this variable, is a variable that identifies opportunities for personal and professional development in the workplace. In a work environment that fosters such improvements, a worker has more to lose by shirking than in an environment where such opportunities are scarce.

*Social interactions in the workplace:* This variable identifies whether or not employers foster a work environment that is friendly, caring, pleasant, or sociable. Encinosa et al. (2007) suggest that interpersonal interactions in the workplace can foster comparisons and can thereby create pressure. The authors draw on a survey questionnaire that asked physicians whether or not their job required a lot of contact with other people. Knez and Simester (2001) note that frequent social interactions provide an opportunity for the dissemination of information about shirking and might, for this reason, facilitate mutual monitoring. Bandiera et al. (2005) suggest that friends are more likely to conform to a common norm for productivity. While Bandiera et al. observe friendships, Mas and Moretti (2009) observe the frequency of interactions.

*Norms in the workplace:* This variable identifies employers' reference to standards, norms, company policies, goals, or missions. We conjecture that the employers would be more likely to advertise production or quality standards when team work is more important because such advertisements make it easier to assess whether coworkers meet these standards and exert pressure accordingly. This measure is similar to that used by Encinosa et al. (2007) when examining the 1978 survey of medical practices in the U.S. that asked physicians whether their medical practice had a formal policy or explicit guidelines regarding their expected productivity.

#### **4.4. Profit sharing**

From the job descriptions, we could not identify the proportion of a worker's salary that is determined by team output, but merely whether an employer offered pay that was based on the performance of a team. Specifically, we constructed a variable that identifies whether some form

of profit sharing or a stock purchase plan was mentioned in a job description. Hence, our measure of team output pertains to the output of the entire firm and not only a team. For this reason, we expect shirking to be a big concern at jobs that offer profit sharing.

Similar to our measure is the one used by Boning et al. (2007), who observe whether the compensation offered in a mill is tied to the mill's profits. Knez and Simester (2001) measured team pay as a bonus that is paid if a company-wide goal is achieved. Encinosa et al. (2007) observe the percentage of the total profit that is distributed to owners of a medical practice based on their productivity. Measures used in Hamilton et al. (2003) and Bandiera et al. (2009) better identify output by a team rather than the firm. Hamilton et al. consider pay to be team-based when it is tied to the output of a team of sewers. Bandiera et al. identify pay as team-based whenever a team of fruit pickers is rewarded on the basis of the team's aggregate productivity.

#### **4.5. Control variables**

Other explanatory variables include different measures of human capital; i.e., education and work experience. We also identified a job opening's position in the firm's hierarchy, industry, and occupation. These attributes are interesting because existing evidence tends to be restricted to a single industry or occupation. We used these variables in order to assess whether differences exist across different industries, occupations, or levels in the firm's hierarchy.

We also constructed a variable that measures the number of characters in a description. This is an important variable because the length of a job description may be correlated with the job tasks, workplace attributes, or the type of pay offered that are identified from the job description.<sup>16</sup> We also constructed variables that identify whether an opening was posted by a recruitment agency and that differentiate between job postings for a single opening and those for

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<sup>16</sup> If job attributes were more likely to be mentioned in longer job descriptions, failing to control for the job description's length would bias our estimates upward.



multiple job openings. Additional variables were constructed to identify the year in which a job was posted online and the location of a job to account for regional conditions in the labor market.

## 5. Evidence

### 5.1. Employers' use of profit sharing in teams

We started by estimating a simple binary probit model with a dependent variable that was set to 1 if profit sharing or a stock purchase plan was offered and 0 otherwise:

$$\Pr(\textit{profit sharing} = 1) = \Phi(a \textit{ team work} + \alpha'X) \quad (1)$$

$\Phi(\cdot)$  denotes the standard normal cumulative distribution function,  $X$  a vector of explanatory variables, and  $\alpha$  a vector of coefficients. Vector  $X$  includes variables that identify hiring requirements (e.g., required education, work experience, and skills). Other variables were also included (e.g., tasks, region, industry, and the number of characters in a job description).<sup>17</sup> This is our baseline specification. In all tables, heteroskedasticity-robust standard errors are reported.

<Insert Table 2>

The results are reported in column 1 of Table 2. In particular, we found that employers who offered jobs where team work was important were one percentage points (about 15.4%) more likely to offer some form of profit sharing or a stock purchase plan than when team work was not important (Specification 1). However, the employers were less likely to offer profit sharing when team work could be monitored (Specification 2). Presumably, in such instances, a worker's compensation was tied to team output as assessed via monitoring rather than firm output. Despite the threat of free-riding, employers who offered jobs that entailed team work and no monitoring were most likely to compensate workers with some form of profit sharing.

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<sup>17</sup> For the list of variables, see notes to Table 2. Complete results for the baseline specification are in Appendix B.

Profit sharing can provide sufficient incentives when a worker's effort cannot be observed as long as employers manage to ensure that shirking is costly, an issue that we examine in the next section. Before we proceed, we note that when we did not include control variables, pseudo  $R^2$  was only 0.2%. Once we included control variables (Specification 1 shown in Table 2), the pseudo  $R^2$  increased to 12.5% and the marginal effect for the team variable, while of the same sign, increased by four times.<sup>18</sup> Hence, much of an employer's decision to offer profit sharing remains unexplained by our model. In addition, the magnitude of the key estimate could change if the remaining determinants of profit sharing were accounted for.

## 5.2. Employers' use of pressure in teams

Our results suggest that profit sharing was more likely offered in a team setting. Such an arrangement could be effective as long as employers manage to ensure that shirking is sufficiently costly. In order to examine this hypothesis, we estimated a series of binary probit models. The dependent variable was set to 1 if we could infer from job descriptions that employers fostered a work environment that was conducive to instilling guilt:

$$\Pr(\text{workplace pressure} = 1) = \Phi(b \text{ team work} + \beta'X) \quad (2)$$

$\Phi(\cdot)$  denotes the standard normal cumulative distribution function,  $X$  a vector of explanatory variables (for details, see notes to Table 2), and  $\beta$  a vector of coefficients.

Several findings in Table 2 (columns 2 through 8 for the baseline specification) are consistent with the notion that employers were more likely to either cultivate a work environment that encouraged pressure or to search for workers who could more easily be subjected to pressure when team work was important than when it was not. For instance, employers who were searching to fill a job vacancy that specified that team work was required

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<sup>18</sup> The results from the specification with no controls are available from the author upon request.

were more likely to describe the work environment as one where loyalty, trust, pride, or social ties were important than when team work was not important. The employers were more likely to affect aspects of a worker's life outside the job or foster personal and professional development when team work was an important part of the job than when it was not.

Given that shirking is a bigger concern when a worker's contribution to the team output cannot be observed by coworkers, we expected that an employer would be more likely to foster a work environment that instills guilt when workers' effort is not monitored (columns 2 through 8 in Specification 2 in Table 2). For some specifications (pride, trust, links to activities outside the job, and the advertising of standards), we obtained results that are consistent with this prediction. In other instances, we found that employers were more likely to cultivate pressure in the workplace when team work was expected regardless of whether or not workers were supervised.

Finally, we should note that regardless of whether or not team work is prevalent in the workplace, shirking is a concern when profit sharing is an important component of a worker's compensation. Hence, we expect that employers would want to cultivate an environment that fosters pressure whenever profit sharing is a part of the workers' compensation. Thus, we complemented our analysis by estimating employers' *joint* decision to offer profit sharing *and* foster work environment where a form of pressure can be exerted easily. Table 2 (Specification 3) reports correlation coefficients between error terms from this series of bivariate probit models.

We found that profit sharing was more likely to be used in combination with some, but not all, sources of pressure. For instance, employers who were more likely to offer profit sharing also tended to promote loyalty, foster personal and professional development, and attempted to influence workers' activities outside the workplace. These are all sources of pressure that result in guilt if workers choose to shirk. Interestingly, employers who were more likely to advertise

standards and the importance of social interactions - each of which facilitates mutual monitoring on the job and therefore subjects workers to shame - were less likely to offer profit sharing.

These findings are quite interesting in light of a study by Barron and Gjerde (1997). In their extension of Kandell and Lazear (1992), the authors showed that, if the extent of peer-monitoring done by workers cannot be specified by an employer (i.e., monitoring is not contractible), rewarding workers with profit sharing is not optimal because it causes workers to engage in excessive monitoring. This happens because workers who exert pressure do not take into account the costs that they impose on their coworkers. However, when pressure is exerted upon oneself (in the form of guilt), the full cost of pressure is taken into consideration.

### **5.3. Alternative measures**

We next discuss whether our results are robust to alternative definitions of team work. Specification 4 (Table 3) reports results where the team variable identifies a reference to a team. This variable differs from the measure that we used in the baseline specification in that it also identifies jobs where the work environment was described as team-oriented. This new measure identifies about twice as many jobs as those that involved team work than does the baseline definition. The results that we obtained were similar to those in the baseline specification.

Second, if employers differ in terms of how much information they reveal in their job postings and this difference is not captured by our variable that measures the number of characters in a job description, our results will be biased. Suppose that there are two types of employer: one reveals information about all aspects of a job, while the other reveals very little information about an otherwise identical job. If such unobserved heterogeneity were to exist and be significant, we would observe a positive relation between team work and an employer's choice of offered compensation or the workplace even in the absence of concerns about shirking.

To examine the importance of this source of heterogeneity, we constructed a variable that identifies tasks that one would *not* anticipate having to perform when doing a job where team work is important. The variable identifies jobs where independence on the job is expected. We conjecture that team work requires cooperation and coordination among team members, rather than independence. We expected that if our results in the baseline specification were to be due to heterogeneity in employers' writing, we would observe a positive correlation between the importance of independence and profit sharing and workplace attributes that foster pressure.

<Insert Table 3>

We find that employers were less likely to offer profit sharing or a stock purchase plan when independence was more important (Specification 5 in Table 3). This result differs from our finding that employers were more likely to offer profit sharing when team work was more important. The link between the importance of independence and an employer's efforts to ensure that shirking is costly either does not exist or is negative (e.g., loyalty, pride, professional and personal development). In other instances, the relation is either not found or positive, but of a much smaller magnitude than in the baseline model. It seems that our estimates do capture employers' concerns about shirking, though the magnitude of the estimates may be over-stated.<sup>19</sup>

#### **5.4. Employer heterogeneity**

A potentially important limitation of the results that we discussed thus far is the fact that there are many firm attributes that we did not control for. This is an important concern for many reasons. First, the associations that we identified might be spurious because of the unobserved heterogeneity with respect to the employers' writing style. To assess the validity of this concern, we restricted the sample on the basis of the length of a job's description; i.e., we used in our

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<sup>19</sup> Because shirking is a concern when a worker works on his own and without direct supervision, it may also be important that in such instances the worker is subjected to pressure.

estimations only the quarter of the jobs that had the longest and the quarter of the jobs that had the shortest job descriptions. It is likely that these jobs were posted by employers who had a similar propensity to reveal information about a job opening. The results were consistent with the baseline results (Specifications 6 and 7 in Table 4). In the sample of jobs with relatively short descriptions, we found stronger evidence that employers were more likely to cultivate pressure in the workplace only when team work was not monitored.

<Insert Table 4>

Second, shirking may be particularly prevalent in companies that have a large number of employees. Companies also differ in their compensation policies for reasons other than their size (e.g., involvement of unions). To control for such heterogeneity, we identified the names of the companies associated with job openings. For 190,118 of the 379,310 vacancies, the name of the company was identified.<sup>20</sup> We used this information to estimate a linear probability model with firm-level fixed effects. A few estimates become insignificant (Specification 8 in Table 4). However, we found that for jobs that required team work and *no* monitoring, rather than for jobs that either did not require team work or required team work that was monitored, an employer was more likely to foster a work environment that ensures that shirking is costly.

Finally, we examined differences across employers who indicated in a job description that they were in a hurry to fill a vacancy and those who did not. Employers who incur high costs of continuing with the search may have a stronger incentive to manipulate how they describe their jobs, the workplace, or the benefits. Specification 9 in Table 4 reports the results. We found that employers who were trying to fill a position that required more team work were

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<sup>20</sup> The name was identified as text that followed “Company:” For job openings where only a logo indicated the firm’s name or the firm’s name was mentioned in the description the name was not identified. Misspelled names, different abbreviations of the company’s name, different divisions of the same company, and the company’s establishments at different locations are treated as different companies by our method.

more likely to cultivate a work environment in which shirking is costly regardless of the costs of search. The results are a bit stronger for the case in which the search costs were lower.

### **5.5. Analysis by career level, occupation, and industry**

One compelling aspect of our data is that they record information for a variety of different jobs. We exploited this aspect and disaggregated the sample by occupation, industry, and a job's position in the firm's hierarchy. Tables 5 and 6 report the results. The results tend to be consistent with our findings in Table 2. At jobs at a more advanced stage of a worker's career, employers were more likely to reward a worker with some form of profit sharing when team work was expected on the job than when it was not.

<Insert Tables 5 and 6>

Regardless of their position in the firms' hierarchy, we found that employers were more likely to cultivate a work environment with costly shirking when a worker was expected to engage in team work than when team work was not an important part of a job. Importantly, we found that this relationship is much more prevalent when monitoring was not expected on the job. The link is weaker in the administration, biotechnology, and pharmaceutical sectors.

### **5.6. Other determinants of profit sharing and pressure in the workplace**

We next review briefly other determinants of pressure in the workplace and profit sharing (see Appendix B). As expected, profit sharing was more likely to be offered when a job was at a level of a manager or an executive than at an entry level. Profit sharing was also more likely in the insurance, finance, biotechnology or pharmaceutical sector as well as in sales than in other industries and occupations. The magnitude of the effects for industry dummies is quite large in comparison to other variables. Jobs that required multitasking or quality control were less likely to offer profit sharing than jobs where such tasks were not an important part of the job.

The results in Appendix B also suggest that employers were less likely to cultivate a work environment with costly shirking when they were trying to fill a job vacancy at a higher level in the firm's hierarchy, jobs that required a higher level of education, work experience, or many skills. Employers were more likely to be searching for workers who have high costs of shirking when a job was in sales and for jobs in the financial or banking sector. Employers who offered jobs that required quality provision were more likely to foster the application of pressure in the workplace than those who offered jobs that did not require these types of tasks. This finding is consistent with the idea that pressure can be used as a powerful incentive whenever an employer has difficulties in obtaining a good measure of a worker's effort.

## **6. Concluding remarks**

The literature has paid a great deal of attention to identifying tools that employers can use to ensure that workers do the job that they were hired to do. Kandel and Lazear (1992) point out that shirking on the job can be prevented if employers manage to create conditions in the workplace that make shirking sufficiently costly. By fostering pressure, employers can ensure that workers work harder to avoid experiencing shame and guilt that accompany low efforts.

Drawing on job descriptions at the online job board Monster.com, we documented several findings that are consistent with Kandel and Lazear (1992). We found that employers were more likely either to describe their workplace as one that was conducive to the application of pressure or to search for workers who could more easily be subjected to pressure when they were looking to fill a position that entailed a lot of team work. This result tends to be robust to alternative definitions of team work, persists when we model firm-fixed effects, and is found across different levels of a firm's hierarchy, jobs in sales, and jobs in different industries.



These findings offer a new - employers' - perspective on the role of pressure in the workplace. Because of the data source that our analysis draws on, we can abstract from some of the identification problems that the related literature has had to confront. While in this paper, we explored some of the new identification problems that the use of vacancy-level data introduces, many interesting questions remain to be addressed. For instance, our analysis revealed that much of an employer's decision about the optimal incentives in teams is left unexplained by our model. Future research could examine the missing factors in greater detail. The analysis in this paper also suggests that online job boards may be a useful source of data that could be exploited for further analysis of the workplace. Future research could attempt to combine information provided in job descriptions at online job boards with the data from human resource departments.

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FIGURE 1  
An observation from Monster.com data

TABLE 1  
Construction of key variables and summary statistics

Dataset:	Job postings at Monster.com	
Time period:	Stock on July 10, 2004; Flow from 30 April to 7 July, 2005; Flow from 26 June to 8 July, 2006	
Variable name:	Search words	Excerpts from selected job ads
Measures of team production team (narrow definition)	team work, team-work, teamwork, part of team, part of a team, member of a team, member of team, team member, teammember, team-member, team player, team-player, teamplayer, team contribution, contribute as a team, team build, team-build, teambuild, team orient, team-orient, teamorient, team environ, team-environ, teamenviron, team focus, team-focus, teamfocus, team like, team-like, teamlike, team base, teambase, team-base, team center, team-center, team centre, team-centre, team spirit, team-spirit, team set, team-set, team driven, team-driven, team mind, team-mind, team dynamic, team-dynamic, group work, work in group, work in a group	<ul style="list-style-type: none"> <li>- Bob Evans is looking for individuals who are <i>team players</i>, exercise good communication and people skills and are enthusiastic and quality oriented.</li> <li>- In order to be considered, you MUST meet the following criteria: A customer service-focused individual who wants to be <i>part of a team</i>.</li> <li>- Job Description: <i>TEAM-ORIENTED</i> WORK ENVIRONMENT WITH A LOT OF TRAINING AND DEVELOPMENT.</li> <li>- At Germaine Lawrence, staff are valued <i>team members</i> dedicated to helping troubled girls rebuild their lives</li> </ul>
team (broad definition)	team	<ul style="list-style-type: none"> <li>- Join and grow with a <i>team</i> that has grown over 250% in the last two years.</li> <li>- We look for motivated, hardworking, and intelligent people from a variety of backgrounds to join our <i>team</i> of professionals.</li> </ul>
independence on the job	own hours, own boss, self-employed, have freedom, initiative, autonomy, autonomous, produces independent, produce independent, producing independent, think independent, thinks independent, thinking independent, work both independent, work independent, works independent, working independent, acts independent, act independent, acting independent, work well independent, function independent, functions independent, functioning independent, operates independent, operate independent, operating independent, self-rel, self-suffi, individualist, independent think, independent work, independent produc, independent act, independent funct, independent oper	<ul style="list-style-type: none"> <li>- That's why we let our Underwriters choose their <i>own hours</i>!</li> <li>- Job Description: Build your own business, be your <i>own boss</i>...</li> <li>- If you love people, take pride in <i>working independently</i> and managing key projects, are a <i>self-starter</i> with the ability to thrive in an environment that requires multi-tasking yet never missing a deadline, we have an opportunity for you!</li> <li>- Effective communication skills and the ability to <i>work independently</i> while meeting or exceeding production standards.</li> </ul>
Measures of observability of worker's effort on-the-job monitoring/supervision	under supervision, under direct supervision, under full supervision, under close supervision, under monitor, under direct monitor, under full monitor, under close monitor, under the direct supervision, under the full supervision, under general supervision, under the general supervision, to supervisor, supervised, your immediate supervisor, month-end report, quarterly report, annual report, monitored, under directi, under the direct, under general direct, under the general direct, take directions, report to, answer to, report any	<ul style="list-style-type: none"> <li>- Ability to work in a <i>supervised</i> team atmosphere and independently</li> <li>- The responsibilities include assisting in the preparation of monthly financial statements... Moreover, to provide support for the preparation, accuracy, timeliness, and distribution of budgets, forecasts, <i>monthly/quarterly reports to company management</i>, shareholders, regulators, and Board of Directors.</li> </ul>
lack/absence of on-the-job supervision	minimal superv, limited superv, no superv, minimal monitor, limited monitor, no monitor, minimal direction, limited direction, no direction, without direct supervision, without superv, without monitor, without	<ul style="list-style-type: none"> <li>- Must be capable of working <i>without direct supervision</i>, have good safety habits and perform heavy manual labor without restriction.</li> <li>- M's work closely with others, do mostly physical work and require</li> </ul>

	direction, with no direct supervision, with no supervision, with no direction, with no superv, with no monitor, little superv, little or no superv, little monitor, little or no monitor, little direction, minimum superv, minimum of superv, minimum monitor, minimum of monitor, minimum direction, little direct superv, little direct monitor	<p><i>little supervision.</i></p> <ul style="list-style-type: none"> <li>- An ability to set priorities, manage personal workload and resolve questions and problems with <i>limited supervision</i></li> </ul>
Measures of sources of pressure on the job		
loyalty	loyalty, loyal, devotion, devoted, dedication, dedicated, commitment, committed, long-term opport, longterm, opport, long term opport, long-term engage, long term engage, longterm engage, ardent, pledge	<ul style="list-style-type: none"> <li>- Our <i>commitment</i> to excellent service helps us deliver Non-Conforming Results.</li> <li>- EquiFirst's exceptional growth is also fueled by continued product line and geographic expansion, aggressive pricing strategy, professional training, and consistent, <i>dedicated</i> underwriters that are accessible to the broker.</li> <li>- MetLife Resources is <i>committed to</i> growing our business and rewarding our employees for their efforts.</li> <li>- We started with an idea but it is the individual people who are part of 24 Hour Fitness that have made our idea a reality for so many. Passionate people. Active people. <i>Dedicated</i> people.</li> </ul>
pride	pride, proudly, proud, integrity	<ul style="list-style-type: none"> <li>- Job description: An Air-Sur, Inc. Sales Producer is an individual of impeccable <i>integrity</i> who wholeheartedly subscribes to the company's mission and high ethical standards.</li> <li>- In the Naval Reserve, you will <i>proudly</i> serve and protect your country as you secure a better future for yourself.</li> </ul>
trust	trustworthy, trust, trusted, truthful, honest, honesty, honorable, integrity, ethical, ethic, moral, dependable, reliable, trust-worthy, trust worthy, trusty, depended upon, infallible, faithful, fair, equitable	<ul style="list-style-type: none"> <li>- <i>Honest</i>, maturity, self-discipline, initiative and an exceptional ability to deal with people and traumatic events are expected of all applicants.</li> <li>- Integrity and Strong Work <i>Ethic</i></li> </ul>
importance of social ties/interactions in the workplace	sociable, convivial, social, congenial, casual, cordial, affable, pleasant, warm, friendly, caring, easy going, easy-going, easygoing, enthusiastic, relationship, network, take care, takes care, you really count, you matter, upbeat work, positive work, fun, developing relation, develop relation, empathy, compassion, sympathy, appreciate, supportive, build strong relation, build relation, call home, meeting, gathering	<ul style="list-style-type: none"> <li>- We offer a <i>friendly</i> and <i>supportive</i> working environment in which our employees are challenged, appreciated, listened to, and enjoy coming to work every day.</li> <li>- Sounds like a <i>fun</i> and easy way to earn money? It is!</li> <li>- Our culture is energetic, collaborative and open. We value people who are <i>fun</i> to work with and who have a positive impact on everyone around them.</li> <li>- We're <i>friendly</i>, <i>supportive</i>, and motivating.</li> </ul>
integration of life in the workplace	spouse, family, friend, company retreat, educational assistance, education assistance, tuition, tuition reimbursement, tuition payment, provide the education, tuition assistance, free continuing education, scholarship opportunit, a way of life, on-site fitness, onsite fitness, on-site health, club membership, free membership, luncheons, paid lunch, casual working attire, casual work attire, work-life balance, work/life balance, picnic	<ul style="list-style-type: none"> <li>- Experience the excitement of living in and exploring new regions of the United States. Meet new people and <i>make new friends</i></li> <li>- Here are some advantages of traveling with Nurses Rx: New <i>friendships</i></li> <li>- 100% <i>tuition</i> covered toward advanced degree.</li> <li>- Free continuing education</li> <li>- As a Gardner-White customer service representative you will</li> </ul>

self-development/self-actualization	ability to grow, employee counseling, unlimited career opportunit, career path, fast paced career, advance your career, career opportunity, challenging and rewarding career, rewarding career, advancement, in-house promotion, career prospect, advance within, promote within, advance from within, promote from within, build a great career, build a career, build career, advancement option, advancement opport, advancement possibi, career possibility, long term career, long-term career, longterm career, job advance, growth opport, growth potential, advancement opport, development opport, within firm advancement, growth opportunit, potential for growth, opportunity for growth, professional aspiration, professional horizon, professional development, aspire, personal and professional growth, personal growth, professional growth, grow person, grow profession, personal development, professional development, your dreams, investing in our people, dream job, your development, opportunity to grow, growth opport, thirst for knowledge, career goal, career need, growth opport, develop your career, professional excellence, professional qualification, learning and development opportunit, learning opportunit, development opportunit, challenge you, challenging, challenged	<p>receive: <i>Tuition assistance</i></p> <ul style="list-style-type: none"> <li>- We offer paid training and are looking for professional candidates who are team players to <i>advance within our company</i>.</li> <li>- The individual has excellent <i>growth potential</i> and <i>opportunity to grow</i> with the company, including future management positions.</li> <li>- Willingness to learn and <i>grow with the company</i>.</li> <li>- Don't miss the <i>opportunity to grow</i> with a national, rapidly expanding company!</li> <li>- If you are a successful investment or insurance sales professional who is looking for significant earnings and <i>professional growth</i>, you'll want to talk to us.</li> <li>- We offer an outstanding compensation and benefits package including medical, dental, 401(K), and <i>career advancement opportunities</i>.</li> </ul>
standards	norm, rule, criterion, criteria, custom, standard, benchmark, yardstick, structured environment, maintains record, maintain record, keeps record, keep record, clean regulatory record, clean regulatory record, production goal, work goal, company goal, firm goal, organizational objective, organizational goal, company goal, company objective, our vision, strategic vision, mission, company polic, procedure, discipline, deadline, adaptability, conform, internal polic, common goal, regulation, adhere to, adhere strictly	<ul style="list-style-type: none"> <li>- Responsible for adherence to all governmental <i>regulations</i> and compliance with <i>company policies</i> and <i>procedures</i>, performs other related duties as assigned or required.</li> <li>- Ability to read and interpret documents such as instruction manuals or company <i>procedure</i> manuals</li> <li>- Effective communication skills and the ability to work independently while meeting or exceeding <i>production standards</i>.</li> <li>- Performs routine but varied clerical and support duties according to <i>standard procedures</i>.</li> </ul>



TABLE 2  
Employers' use of pressure and profit sharing in teams

		Econometric specification (Specifications 1 and 2): Binary probit model							
		Econometric specification (Specification 3): Bivariate probit model							
		Profit sharing or stocks offered	Loyalty	Pride	Trust	Standards, norms	Social ties in the workplace	Limit on alternatives	Personal and professional development
	Sample means	Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Specification 1: BASELINE									
1 if team work required on the job	0.207	0.010 (0.001)***	0.050 (0.002)***	0.038 (0.001)***	0.077 (0.002)***	0.071 (0.002)***	0.021 (0.002)***	0.013 (0.001)***	0.024 (0.002)***
Mean of dependent variable		0.065	0.203	0.107	0.177	0.658	0.629	0.895	0.234
Pseudo $R^2$		0.125	0.114	0.103	0.089	0.199	0.153	0.199	0.062
Specification 2: Observability of worker's effort									
1 if team work and monitoring	0.010	-0.009 (0.004)**	0.066 (0.009)***	0.022 (0.006)***	0.031 (0.007)***	0.018 (0.011)	0.045 (0.010)***	-0.018 (0.005)***	0.022 (0.008)***
1 if team work and no monitoring	0.197	0.010 (0.001)***	0.049 (0.002)***	0.039 (0.001)***	0.079 (0.002)***	0.072 (0.002)***	0.020 (0.002)***	0.014 (0.001)***	0.024 (0.002)***
1 if worker is monitored on the job	0.039	-0.009 (0.002)***	-0.025 (0.004)***	0.012 (0.003)***	0.024 (0.004)***	0.077 (0.004)***	0.016 (0.005)***	0.021 (0.001)***	-0.043 (0.004)***
Mean of dependent variable		0.065	0.203	0.107	0.177	0.658	0.629	0.895	0.234
Pseudo $R^2$		0.126	0.114	0.103	0.089	0.199	0.153	0.200	0.062
Specification 3: Bivariate probit									
Correlation of errors		...	0.042 (0.005)***	-0.009 (0.006)	-0.007 (0.005)	-0.034 (0.005)***	-0.085 (0.005)***	0.178 (0.007)***	0.252 (0.004)***

Notes: (i) \*Statistically significant at the .10 level; \*\*at the .05 level; \*\*\*at the .01 level. (ii) Control variables not reported in the table: dummy variables for on-the-job tasks (e.g., multitasking, quality provision), dummy variables for industry, dummy variable for job position in sales, length of job description (number of characters), dummy variables for hierarchy, dummy variables of required education, required work experience (in years), dummy variables for missing data on required education or work experience, dummy variables for drive or on-the-job independence, dummy variables for job's location and whether reallocation expenses are covered, dummy variables for year data were collected, dummy variables for whether a job posted by recruitment agency or whether multiple openings advertised in a single posting. (iii) Specification 3 reports correlation of errors from pair-wise bivariate probit models of profit sharing and source of pressure.

TABLE 3  
Alternative measures of team work and monitoring

		Econometric specification: Binary probit model								
		Profit sharing or stocks offered	Loyalty	Pride	Trust	Standards, norms	Social ties in the workplace	Limit on alternatives	Personal and professional development	
		Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)	
Sample means		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
Specification 4: Alternative definition of team work										
	1 if team work and monitoring	0.021	-0.003 (0.003)	0.040 (0.007)***	0.035 (0.006)***	0.040 (0.007)***	-0.035 (0.010)***	0.023 (0.009)**	-0.021 (0.005)***	0.051 (0.008)***
	1 if team work and no monitoring	0.430	0.014 (0.001)***	0.079 (0.001)***	0.032 (0.001)***	0.046 (0.001)***	0.068 (0.002)***	0.041 (0.002)***	0.019 (0.001)***	0.046 (0.002)***
	1 if worker is monitored on the job	0.039	-0.005 (0.002)**	0.003 (0.005)	0.007 (0.004)*	0.016 (0.005)***	0.107 (0.005)***	0.030 (0.006)***	0.028 (0.001)***	-0.043 (0.005)***
	Mean of dependent variable		0.065	0.203	0.107	0.177	0.658	0.629	0.895	0.234
	Pseudo $R^2$		0.127	0.120	0.103	0.086	0.200	0.154	0.202	0.065
Specification 5: Absence of team work on the job										
	1 if independence and monitoring	0.003	-0.008 (0.005)	-0.003 (0.011)	-0.029 (0.006)***	-0.009 (0.010)	0.044 (0.018)**	0.017 (0.016)	-0.025 (0.009)***	-0.008 (0.012)
	1 if independence and no monitoring	0.056	-0.004 (0.001)***	-0.001 (0.003)	-0.009 (0.002)***	0.024 (0.003)***	0.012 (0.004)***	0.007 (0.004)*	0.012 (0.001)***	-0.001 (0.003)
	1 if worker is monitored on the job	0.039	-0.013 (0.002)***	-0.021 (0.003)***	0.009 (0.003)***	0.014 (0.003)***	0.065 (0.004)***	0.020 (0.005)***	0.017 (0.001)***	-0.043 (0.003)***
	Mean of dependent variable		0.065	0.203	0.107	0.177	0.658	0.629	0.895	0.234
	Pseudo $R^2$		0.125	0.112	0.099	0.082	0.197	0.153	0.199	0.062

Notes: \*Statistically significant at the .10 level; \*\*at the .05 level; \*\*\*at the .01 level. Control variables not reported: dummy variables for on-the-job tasks (e.g., multitasking, quality provision), dummy variables for industry, dummy variable for job position in sales, length of job description (number of characters), dummy variables for hierarchy, dummy variables of required education, required work experience (in years), dummy variables for missing data on required education or work experience, dummy variables for drive or on-the-job independence, dummy variables for job's location and whether reallocation expenses are covered, dummy variables for year data were collected, dummy variables for whether a job posted by recruitment agency or whether multiple openings advertised in a single posting.

TABLE 4  
The role of employer heterogeneity

		Econometric specification (7, 8, and 10): Binary probit model							
		Econometric specification (9): Linear probability model							
		Profit sharing or stocks offered	Loyalty	Pride	Trust	Standards, norms	Social ties in the workplace	Limit on alternatives	Personal and professional development
		Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)
Sample means		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Specification 6: Shortest 25% job descriptions									
1 if team work and monitoring	0.002	-0.006 (0.006)	-0.024 (0.009)*	-0.011 (0.003)	-0.048 (0.010)**	0.249 (0.044)***	-0.174 (0.032)***	0.027 (0.013)	-0.078 (0.010)***
1 if team work and no monitoring	0.089	0.031 (0.002)***	0.028 (0.003)***	0.005 (0.002)***	0.065 (0.004)***	0.154 (0.006)***	-0.031 (0.006)**	0.012 (0.002)***	-0.001 (0.003)
1 if worker is monitored on the job	0.014	-0.004 (0.002)	0.003 (0.006)	0.004 (0.004)	0.005 (0.008)	0.080 (0.015)***	-0.042 (0.014)***	0.032 (0.003)***	-0.042 (0.006)***
Mean of dependent variable		0.021	0.053	0.017	0.085	0.355	0.376	0.859	0.111
Pseudo $R^2$		0.153	0.089	0.038	0.115	0.124	0.105	0.332	0.079
Specification 7: Longest 25% job descriptions									
1 if team work and monitoring	0.025	-0.026 (0.006)***	0.140 (0.014)***	0.083 (0.012)***	0.083 (0.013)***	0.030 (0.006)***	0.046 (0.007)***	0.001 (0.004)	0.046 (0.013)***
1 if team work and no monitoring	0.314	0.010 (0.002)***	0.059 (0.004)***	0.062 (0.003)***	0.096 (0.004)***	0.012 (0.002)***	0.023 (0.002)***	0.009 (0.001)***	0.033 (0.003)***
1 if worker is monitored on the job	0.070	-0.006 (0.004)	-0.061 (0.008)***	-0.006 (0.006)	-0.009 (0.008)	0.013 (0.004)***	0.007 (0.005)	0.002 (0.003)	-0.041 (0.007)***
Mean of dependent variable		0.104	0.369	0.198	0.309	0.903	0.855	0.913	0.324
Pseudo $R^2$		0.123	0.057	0.036	0.050	0.078	0.054	0.194	0.037
Specification 8: Firm fixed effects									
1 if team work and monitoring	0.012	0.011 (0.005)**	0.029 (0.009)***	-0.008 (0.008)	0.014 (0.011)	-0.009 (0.010)	0.003 (0.011)	0.001 (0.001)*	0.027 (0.009)***
1 if team work and no monitoring	0.208	-0.001 (0.001)	0.043 (0.003)***	0.004 (0.002)*	0.022 (0.003)***	0.025 (0.003)***	0.027 (0.003)***	0.001 (0.000)***	0.024 (0.003)***
1 if worker is monitored on the job	0.044	-0.013 (0.003)***	-0.007 (0.005)	0.008 (0.004)*	0.024 (0.006)***	0.052 (0.006)***	0.011 (0.007)*	0.000 (0.000)	-0.028 (0.005)***
Mean of dependent variable		0.058	0.195	0.102	0.183	0.681	0.668	0.999	0.190
Overall $R^2$		0.036	0.101	0.055	0.087	0.178	0.248	0.000	0.053

Specification 9: Costs of continuing with search									
1 if team work & high search costs	0.027	0.002 (0.002)	0.058 (0.005)***	0.078 (0.005)***	0.079 (0.005)***	0.069 (0.005)***	0.018 (0.005)***	-0.027 (0.004)***	0.056 (0.005)***
1 if team work & low search costs	0.181	0.012 (0.001)***	0.049 (0.002)***	0.032 (0.001)***	0.076 (0.002)***	0.068 (0.002)***	0.019 (0.002)***	0.016 (0.001)***	0.019 (0.002)***
1 if high search costs	0.151	0.022 (0.001)***	0.011 (0.002)***	-0.039 (0.001)***	-0.026 (0.002)***	-0.065 (0.003)***	-0.064 (0.003)***	0.043 (0.001)***	0.003 (0.002)
Mean of dependent variable		0.065	0.203	0.107	0.177	0.658	0.629	0.895	0.234
Pseudo $R^2$		0.127	0.114	0.106	0.089	0.200	0.154	0.212	0.062

*Notes:* \*Statistically significant at the .10 level; \*\*at the .05 level; \*\*\*at the .01 level. Control variables not reported in the table: dummy variables for on-the-job tasks (e.g., multitasking, quality provision), dummy variables for industry, dummy variable for job position in sales, length of job description (number of characters), dummy variables for hierarchy, dummy variables of required education, required work experience (in years), dummy variables for missing data on required education or work experience, dummy variables for drive or on-the-job independence, dummy variables for job's location and whether reallocation expenses are covered, dummy variables for year data were collected, dummy variables for whether a job posted by recruitment agency or whether multiple openings advertised in a single posting.

TABLE 5  
Employers' use of incentives in teams by job's level in hierarchy

		Econometric specification: Binary probit model							
		Profit sharing or stocks offered	Loyalty	Pride	Trust	Standards, norms	Social ties in the workplace	Limit on alternatives	Personal and professional development
		Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)
Sample means		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Specification 10: Entry level jobs									
1 if team work and monitoring	0.009	0.023 (0.025)	-0.064 (0.026)**	0.057 (0.031)**	-0.057 (0.030)*	-0.141 (0.051)***	-0.025 (0.046)	-0.004 (0.009)	-0.025 (0.033)
1 if team work and no monitoring	0.183	0.005 (0.004)	0.047 (0.008)***	0.052 (0.006)***	0.043 (0.008)***	0.009 (0.008)	0.106 (0.009)***	0.001 (0.000)	0.089 (0.009)***
1 if worker is monitored on the job		-0.020 (0.005)***	0.040 (0.016)**	-0.012 (0.011)	0.075 (0.019)***	0.091 (0.014)***	0.142 (0.016)***	0.002 (0.001)**	0.024 (0.017)
Mean of dependent variable		0.054	0.231	0.120	0.260	0.704	0.614	0.992	0.275
Pseudo R <sup>2</sup>		0.110	0.198	0.160	0.118	0.213	0.156	0.198	0.098
Specification 11: Experienced non-managerial jobs									
1 if team work and monitoring	0.011	-0.005 (0.007)	0.060 (0.016)***	0.022 (0.010)**	0.033 (0.014)***	-0.031 (0.023)	0.040 (0.020)*	-0.003 (0.002)	0.058 (0.016)***
1 if team work and no monitoring	0.202	0.007 (0.002)***	0.047 (0.003)***	0.029 (0.002)***	0.040 (0.003)***	0.026 (0.004)***	0.011 (0.004)**	0.001 (0.000)***	0.045 (0.003)***
1 if worker is monitored on the job	0.039	-0.004 (0.004)	-0.025 (0.007)***	0.004 (0.005)	0.014 (0.007)*	0.059 (0.010)***	-0.005 (0.011)	-0.001 (0.001)	-0.026 (0.007)***
Mean of dependent variable		0.056	0.159	0.081	0.155	0.653	0.658	0.991	0.170
Pseudo R <sup>2</sup>		0.072	0.094	0.077	0.079	0.182	0.252	0.137	0.051
Specification 12: Managerial jobs									
1 if team work and monitoring	0.014	0.008 (0.016)	0.079 (0.028)***	0.006 (0.016)	0.022 (0.022)	0.003 (0.039)	0.027 (0.034)	0.001 (0.001)	0.048 (0.029)*
1 if team work and no monitoring	0.220	0.006 (0.004)	0.026 (0.006)***	0.034 (0.005)***	0.047 (0.006)***	0.005 (0.007)	0.048 (0.007)***	0.002 (0.000)***	0.032 (0.007)***
1 if worker is monitored on the job	0.052	-0.007 (0.007)	-0.040 (0.011)***	0.004 (0.010)	0.026 (0.013)**	0.057 (0.015)***	0.016 (0.016)	-0.003 (0.002)**	-0.057 (0.012)***
Mean of dependent variable		0.069	0.183	0.099	0.172	0.708	0.686	0.992	0.210
Pseudo R <sup>2</sup>		0.088	0.064	0.083	0.092	0.193	0.241	0.152	0.063
Specification 13: Executive jobs									
1 if team work and monitoring	0.015	-0.000 (0.028)	0.002 (0.057)	0.038 (0.045)	0.148 (0.088)**	0.126 (0.070)	0.011 (0.086)	...	0.023 (0.061)
1 if team work and no monitoring	0.179	0.037 (0.013)***	0.063 (0.019)***	0.030 (0.014)**	0.055 (0.020)***	0.023 (0.027)	0.040 (0.024)	...	0.018 (0.019)
1 if worker is monitored on the job	0.058	0.027 (0.023)	-0.016 (0.027)	0.031 (0.025)	-0.019 (0.030)	-0.134 (0.050)***	-0.079 (0.054)	...	0.059 (0.037)*
Mean of dependent variable		0.059	0.150	0.087	0.175	0.668	0.685	...	0.169
Pseudo R <sup>2</sup>		0.089	0.140	0.145	0.177	0.194	0.274		0.066

Notes: \*Statistically significant at the .10 level; \*\*at the .05 level; \*\*\*at the .01 level. Control variables not reported in the table: see notes to Table 2.

TABLE 6  
Employers' use of incentives in teams by occupation and industry

		Econometric specification: Binary probit model							
		Profit sharing or stocks offered	Loyalty	Pride	Trust	Standards, norms	Social ties in the workplace	Limit on alternatives	Personal and professional development
		Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)
Sample means		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Specification 14: Jobs in sales									
1 if team work and monitoring	0.010	-0.006 (0.009)	0.060 (0.018)***	0.037 (0.013)***	0.005 (0.015)	0.002 (0.015)	-0.016 (0.016)	0.017 (0.004)***	0.021 (0.017)
1 if team work and no monitoring	0.216	0.030 (0.002)***	0.061 (0.004)***	0.066 (0.003)***	0.079 (0.003)***	0.024 (0.002)***	0.007 (0.003)***	0.009 (0.001)***	0.051 (0.003)***
1 if worker is monitored on the job	0.034	-0.010 (0.005)*	-0.016 (0.009)*	0.039 (0.008)***	0.046 (0.009)***	0.038 (0.006)***	-0.004 (0.009)	0.006 (0.003)*	-0.029 (0.009)***
Mean of dependent variable		0.087	0.286	0.146	0.235	0.825	0.729	0.913	0.291
Pseudo R <sup>2</sup>		0.087	0.103	0.096	0.084	0.145	0.122	0.206	0.051
Specification 15: Banking, finance, economics, insurance									
1 if team work and monitoring	0.011	-0.030 (0.010)***	0.079 (0.017)***	0.035 (0.013)***	0.039 (0.015)***	0.035 (0.015)**	0.042 (0.015)***	0.006 (0.004)	0.030 (0.016)*
1 if team work and no monitoring	0.209	-0.001 (0.003)	0.058 (0.004)***	0.063 (0.003)***	0.062 (0.003)***	0.024 (0.003)***	0.010 (0.004)***	-0.004 (0.001)***	0.052 (0.004)***
1 if worker is monitored on the job	0.039	-0.034 (0.005)***	-0.042 (0.008)***	0.009 (0.007)	-0.021 (0.007)***	0.041 (0.007)***	0.000 (0.009)	-0.002 (0.003)	-0.030 (0.008)***
Mean of dependent variable		0.135	0.256	0.157	0.216	0.753	0.695	0.940	0.291
Pseudo R <sup>2</sup>		0.049	0.104	0.090	0.072	0.170	0.147	0.198	0.065
Specification 16: Manufacturing									
1 if team work and monitoring	0.008	0.017 (0.020)	0.107 (0.040)***	0.034 (0.022)**	0.115 (0.040)***	-0.047 (0.069)	-0.005 (0.057)	-0.054 (0.031)***	0.041 (0.037)
1 if team work and no monitoring	0.158	0.016 (0.004)***	0.054 (0.007)***	0.011 (0.004)***	0.045 (0.008)***	0.021 (0.013)	0.044 (0.012)***	-0.001 (0.002)	0.049 (0.008)***
1 if worker is monitored on the job	0.038	-0.009 (0.005)	-0.016 (0.011)	-0.007 (0.006)	-0.001 (0.014)	0.065 (0.027)**	0.037 (0.026)	0.006 (0.003)	-0.017 (0.015)
Mean of dependent variable		0.026	0.112	0.049	0.129	0.544	0.463	0.916	0.150
Pseudo R <sup>2</sup>		0.048	0.138	0.131	0.067	0.255	0.178	0.381	0.080

Specification 17: Healthcare									
1 if team work and monitoring	0.007	0.013 (0.015)	0.025 (0.046)	0.009 (0.021)	0.048 (0.031)*	0.103 (0.059)*	-0.104 (0.079)	-0.003 (0.022)	0.069 (0.046)*
1 if team work and no monitoring	0.120	0.001 (0.002)	0.045 (0.011)***	0.029 (0.006)***	0.037 (0.007)***	0.068 (0.015)***	0.089 (0.014)***	0.003 (0.004)	0.019 (0.009)**
1 if worker is monitored on the job	0.064	-0.001 (0.003)	-0.071 (0.011)***	-0.006 (0.007)	-0.030 (0.006)***	-0.041 (0.020)**	0.096 (0.018)***	0.022 (0.004)***	-0.066 (0.008)***
Mean of dependent variable		0.015	0.198	0.069	0.076	0.497	0.561	0.927	0.129
Pseudo $R^2$		0.093	0.098	0.110	0.117	0.209	0.178	0.196	0.057
Specification 18: Internet and E-Commerce									
1 if team work and monitoring	0.014	-0.003 (0.008)	0.064 (0.025)***	-0.009 (0.013)	0.004 (0.019)	0.028 (0.039)	0.036 (0.030)	-0.026 (0.016)**	0.006 (0.023)
1 if team work and no monitoring	0.257	0.005 (0.002)**	0.023 (0.005)***	0.011 (0.004)***	0.034 (0.005)***	0.023 (0.007)***	0.016 (0.006)**	-0.000 (0.002)	0.013 (0.005)***
1 if worker is monitored on the job	0.036	-0.001 (0.005)	0.000 (0.013)	0.030 (0.012)***	0.036 (0.014)***	0.082 (0.018)***	0.000 (0.018)	0.005 (0.006)	-0.021 (0.013)
Mean of dependent variable		0.025	0.134	0.089	0.133	0.658	0.723	0.935	0.154
Pseudo $R^2$		0.045	0.091	0.104	0.101	0.194	0.177	0.226	0.075
Specification 19: Biotechnology and Pharmaceuticals									
1 if team work and monitoring	0.018	-0.006 (0.016)	-0.038 (0.028)	-0.015 (0.012)	-0.054 (0.027)*	-0.066 (0.057)	0.130 (0.034)***	0.011 (0.002)***	-0.036 (0.028)
1 if team work and no monitoring	0.216	-0.015 (0.005)***	0.048 (0.009)***	0.019 (0.005)***	0.006 (0.010)	-0.001 (0.012)	0.030 (0.011)***	0.008 (0.002)***	-0.038 (0.008)***
1 if worker is monitored on the job	0.058	-0.005 (0.009)	-0.041 (0.015)**	0.007 (0.010)	0.137 (0.023)***	0.144 (0.022)***	0.025 (0.023)	-0.012 (0.006)***	-0.042 (0.015)**
Mean of dependent variable		0.066	0.173	0.054	0.211	0.653	0.682	0.902	0.172
Pseudo $R^2$		0.069	0.114	0.081	0.103	0.161	0.190	0.435	0.089
Specification 20: Administrative and Support Services									
1 if team work and monitoring	0.007	-0.011 (0.004)	0.014 (0.034)	-0.002 (0.013)	0.126 (0.043)***	-0.082 (0.065)	-0.035 (0.057)	0.009 (0.002)*	0.052 (0.044)
1 if team work and no monitoring	0.156	0.005 (0.002)**	0.026 (0.007)***	0.026 (0.004)***	0.073 (0.008)***	0.017 (0.011)	-0.009 (0.011)	0.001 (0.001)	0.003 (0.008)
1 if worker is monitored on the job	0.029	0.004 (0.006)	-0.042 (0.010)***	0.014 (0.010)**	-0.001 (0.016)	0.059 (0.027)**	0.034 (0.026)	-0.006 (0.005)	-0.010 (0.019)
Mean of dependent variable		0.019	0.144	0.051	0.148	0.543	0.551	0.977	0.205
Pseudo $R^2$		0.063	0.270	0.117	0.049	0.175	0.163	0.154	0.068

Notes: \*Statistically significant at the .10 level; \*\*at the .05 level; \*\*\*at the .01 level. Control variables not reported in the table: dummy variables for on-the-job tasks (e.g., multitasking, quality provision), dummy variables for industry (only in specification D), dummy variable for job position in sales (except in specification D), length of job description (number of characters), dummy variables for hierarchy, dummy variables of required education, required work experience (in years), dummy variables for missing data on required education or work experience, dummy variables for drive or on-the-job independence, dummy variables for job's location and whether reallocation expenses are covered, dummy variables for year data were collected, dummy variables for whether a job posted by recruitment agency or whether multiple openings advertised in a single posting.

APPENDIX A  
Construction of variables

Variable name:	Description (search words)
Offered compensation scheme Profit sharing, stock purchase plan	stock option, stock-option, stock purchase, stock-purchase, employee stock plan, employee-stock plan, stock ownership plan, stock-ownership plan, stock ownership program, stock-ownership program, stock bonus plan, stock-bonus plan, profit sharing, profit share, profit-sharing, profit-share, share in profit, share in a profit, share in the profit, bonus plan based on profit, bonus-plan based on profit, bonus based on profit, commission based on profit, commission plan based on profit, commission-plan based on profit, profit bonus, profit-bonus, profit based commission, profit-based commission, profit based bonus, profit-based bonus
Task characteristics Multiple tasks Quality provision, attention to details	multi-task, multi task, multiple task, multitask, diverse task, numerous task, variety of task, various task, many task detailed oriented, detail oriented, attention to detail, detail-oriented, quality oriented, quality-oriented, committed to the quality, committed to quality, commitment to quality, quality service, quality control, maintains quality, quality standards, insure quality, ensure quality, provide quality, providing quality, attention to quality, assure quality, assures quality, quality results, supports quality, support quality, quality support, acquire quality, retain quality, retains quality, preserve quality, preserve high quality, deliver quality, delivering quality, delivery of quality, review quality, reviews quality, perform quality, performs quality
Job's characteristics Sales position Job's industry	sales banking; insurance; finance/economics; financial services; manufacturing, production; healthcare; biotechnology, pharmaceuticals; administrative, support services; information technology; internet/e-commerce
Entry level position Experienced non-manager position Manager supervisor of staff Executive position	Career level: entry level Career level: experienced (non-manager) Career level: manager (manager/supervisor of staff) Career level: executive
Requirements High-school degree Associate degree Bachelor's degree  Post-BA degree Required work experience in years  Count of "skill" Drive required Independence	high school, HS diploma, HS degree, GED* associate degree, associate's degree, associates degree, AS degree bachelors, bachelor's degree, bachelor degree, BS*, BA*, BA degree, BS degree, four year degree, four-year degree, 4 year degree, 4-year degree, four year college, four-year college, 4 year college, 4-year college, university degree, college degree, baccalaureate degree, undergraduate degree, college graduate MBA*, master's degree, masters degree, master degree, MA degree, MS degree, doctorate, PH.D., PHD, professional degree constructed from the indicator variables that took the following values (mid-point was taken): less than 1 year, 1 to 2 years, 2 to 5 years, 5 to 7 years, 7 to 10 years, 10 to 15 years, and more than 15 years a code was written to identify a number of times "skill" appears in the job posting's description possess drive, driven, self-motivation, motivated, self-starter, selfstarter autonomy, produces independently, produce independent, think independently, work both independent, acts independently, acting independent, work well independently, functions independent, function independently, operates independent, operating independently, works independent, working independently, work independent
Advertising and Writing Style Multiple jobs posted in a posting Job posted by a recruitment agency  Length of a job posting 1 if preference for local candidate	openings; positions staffing agency, staffing firm, recruiter, if either one of the well known recruiting agencies was identified to have posted the job: Adecco, Manpower, Kelly Services, Ranstad, Veritude, Ardelle, cdi corp, kforce, lucasgroup, Management Recruiters International, mri, Robert Walters, sanford rose, snelling, spherion, winter wyman, Accountemps, Robert Half, OfficeTeam, Allen and Associates, TAC Worldwide a code was written to count the number of characters in each job posting 1 if a job description indicated that local candidate is preferred or no relocation costs are covered

*Notes:* Each job posting was retrieved from the Monster.com website and saved as a text file. For each of these text files the program identified whether a phrase (treated as a string) could be found in the text and if so a corresponding dummy variable was set to 1. For words marked with "\*" our program searched for the words as a "stand-alone" string rather than a part of a longer string. An indicator variable records the presence of the word in the job posting if it is preceded or succeeded by a symbol other than a letter.



APPENDIX B  
Complete results for BASELINE specification in Table 2

		Econometric specification: Binary probit model							
		Profit sharing or stock purchases offered	Loyalty	Pride	Trust	Standards, norms	Social ties in the workplace	Limit on alternatives	Personal and professional development
		Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)	Marginal effect (S.E.)
Sample means		(1)	(2)	(3)	(4)	(6)	(7)	(8)	(9)
1 if team work required on the job	0.207	0.010 (0.001)***	0.050 (0.002)***	0.038 (0.001)***	0.077 (0.002)***	0.071 (0.002)***	0.021 (0.002)***	0.013 (0.001)***	0.024 (0.002)***
1 if multitasking required	0.081	-0.003 (0.001)**	-0.019 (0.002)***	-0.006 (0.002)***	0.007 (0.002)***	0.034 (0.003)***	0.026 (0.003)***	0.018 (0.001)***	-0.023 (0.002)***
1 if precision required	0.138	-0.004 (0.001)***	0.039 (0.002)***	0.036 (0.002)***	0.033 (0.002)***	0.072 (0.002)***	0.011 (0.003)***	0.018 (0.001)***	-0.002 (0.002)
1 if job in sales	0.300	0.007 (0.001)***	0.054 (0.002)***	0.012 (0.001)***	0.027 (0.001)***	0.157 (0.002)***	0.067 (0.002)***	0.008 (0.001)***	0.017 (0.002)***
1 if job in banking	0.055	0.002 (0.003)	0.040 (0.004)***	0.086 (0.004)***	0.075 (0.004)***	0.083 (0.004)***	-0.041 (0.005)***	-0.033 (0.003)***	0.145 (0.005)***
1 if job in insurance	0.190	0.177 (0.004)***	0.116 (0.004)***	0.034 (0.002)***	0.056 (0.003)***	0.040 (0.003)***	-0.079 (0.004)***	0.029 (0.001)***	0.136 (0.004)***
1 if job in finance/economics	0.018	0.023 (0.004)***	0.068 (0.007)***	0.030 (0.005)***	0.045 (0.006)***	-0.065 (0.007)***	-0.073 (0.007)***	0.016 (0.003)***	0.050 (0.007)***
1 if job in financial services	0.028	0.014 (0.004)***	0.105 (0.006)***	0.065 (0.004)***	0.093 (0.005)***	0.002 (0.006)	-0.026 (0.006)***	-0.002 (0.003)	0.065 (0.006)***
1 if job in manufacturing	0.044	0.008 (0.003)***	0.007 (0.005)	-0.030 (0.002)***	0.022 (0.004)***	-0.049 (0.005)***	-0.219 (0.005)***	-0.025 (0.003)***	0.022 (0.005)***
1 if job in healthcare	0.042	-0.008 (0.003)***	0.151 (0.006)***	0.007 (0.003)**	-0.043 (0.004)***	-0.046 (0.005)***	-0.072 (0.005)***	0.012 (0.002)***	-0.004 (0.005)
1 if job in biotechnology/pharma	0.031	0.064 (0.004)***	0.050 (0.005)***	-0.031 (0.003)***	0.079 (0.005)***	-0.001 (0.005)	-0.079 (0.006)***	-0.023 (0.003)***	0.037 (0.005)***
1 if job in administration	0.054	0.001 (0.003)	0.060 (0.005)***	-0.028 (0.002)***	0.046 (0.004)***	-0.049 (0.005)***	-0.080 (0.005)***	0.040 (0.001)***	0.093 (0.005)***
1 if missing data on occupation	0.463	0.022 (0.002)***	0.060 (0.003)***	0.005 (0.002)***	0.038 (0.003)***	-0.009 (0.003)***	-0.091 (0.003)***	-0.031 (0.002)***	0.070 (0.003)***
number of characters /1000	2.553	0.008 (0.000)***	0.079 (0.001)***	0.035 (0.000)***	0.054 (0.001)***	0.174 (0.001)***	0.158 (0.001)***	-0.002 (0.000)***	0.046 (0.001)***
1 if experienced non-manager job	0.240	0.009 (0.002)***	-0.017 (0.003)***	-0.009 (0.002)***	-0.051 (0.002)***	0.000 (0.004)	0.070 (0.004)***	-0.004 (0.004)	-0.056 (0.003)***
1 if managerial job	0.066	0.020 (0.003)***	-0.010 (0.004)**	0.004 (0.003)	-0.041 (0.003)***	0.030 (0.005)***	0.071 (0.005)***	0.002 (0.004)	-0.011 (0.004)***

1 if executive job	0.008	0.015 (0.005)***	-0.054 (0.007)***	-0.011 (0.006)**	-0.040 (0.006)***	0.007 (0.010)	0.058 (0.009)***	0.019 (0.007)***	-0.046 (0.008)***
1 if missing data on job hierarchy	0.623	0.027 (0.002)***	0.015 (0.003)***	0.013 (0.002)***	-0.036 (0.003)***	0.053 (0.004)***	0.053 (0.004)***	-0.106 (0.003)***	-0.000 (0.003)
1 if associate degree required	0.062	-0.007 (0.001)***	-0.035 (0.003)***	-0.016 (0.002)***	-0.010 (0.003)***	-0.041 (0.004)***	0.035 (0.004)***	-0.015 (0.003)***	0.017 (0.004)***
1 if BA degree required	0.361	0.003 (0.001)***	-0.007 (0.002)***	-0.017 (0.001)***	-0.019 (0.002)***	-0.085 (0.003)***	0.049 (0.003)***	-0.010 (0.001)***	0.014 (0.002)***
1 if graduate degree required	0.023	-0.007 (0.002)***	-0.020 (0.005)***	-0.018 (0.003)***	0.092 (0.005)***	-0.090 (0.007)***	-0.013 (0.006)**	-0.018 (0.003)***	-0.032 (0.005)***
1 if missing education required work experience (in years)	0.423 1.416	-0.013 0.000 (0.001)*** (0.000)	0.003 -0.002 (0.002) (0.000)***	-0.009 -0.002 (0.001)*** (0.000)***	-0.019 -0.005 (0.002)*** (0.000)***	-0.099 -0.003 (0.003)*** (0.001)***	0.012 0.001 (0.003)*** (0.001)**	-0.015 0.001 (0.003)*** (0.000)***	0.019 -0.007 (0.001)*** (0.001)***
1 if missing work experience	0.646	-0.005 (0.001)***	0.001 (0.003)	-0.002 (0.002)	-0.020 (0.003)***	-0.033 (0.003)***	0.018 (0.004)***	-0.024 (0.002)***	0.000 (0.003)
1 if drive required	0.158	0.021 (0.001)***	0.037 (0.002)***	0.053 (0.001)**	0.042 (0.002)***	0.032 (0.002)***	0.031 (0.002)***	-0.017 (0.001)**	0.107 (0.002)***
1 if independence required	0.060	0.003 (0.001)*	-0.006 (0.003)**	-0.014 (0.002)***	0.014 (0.003)***	0.006 (0.004)	0.005 (0.004)	0.010 (0.001)***	-0.004 (0.003)
Number of SKILL in the job ad	1.480	-0.002 (0.000)***	-0.010 (0.000)***	-0.002 (0.000)***	-0.005 (0.000)***	0.016 (0.001)***	-0.002 (0.001)***	0.008 (0.000)***	-0.001 (0.000)
1 if job in Western region	0.174	-0.001 (0.001)	-0.010 (0.002)***	0.003 (0.002)*	-0.006 (0.002)***	-0.006 (0.003)**	0.003 (0.003)	0.002 (0.001)**	0.012 (0.002)***
1 if job in the South region	0.228	-0.005 (0.001)***	-0.008 (0.002)***	0.004 (0.002)**	0.002 (0.002)	-0.003 (0.003)	-0.020 (0.003)***	0.003 (0.001)***	-0.014 (0.002)***
1 if job in the Northeast region	0.098	-0.006 (0.001)***	0.022 (0.003)***	-0.010 (0.002)***	-0.017 (0.002)***	-0.034 (0.003)***	0.007 (0.003)**	0.007 (0.001)***	-0.030 (0.003)***
1 if job in other region	0.021	-0.004 (0.002)*	-0.013 (0.005)***	0.008 (0.004)**	-0.004 (0.004)	0.020 (0.006)***	-0.003 (0.006)	0.006 (0.002)***	-0.016 (0.005)***
1 if missing job location	0.328	-0.002 (0.001)*	-0.012 (0.002)***	0.001 (0.002)	0.001 (0.002)	-0.002 (0.003)	0.022 (0.003)***	0.013 (0.001)***	-0.027 (0.002)***
1 if preference for a local candidate	0.022	0.016 (0.003)***	-0.017 (0.004)***	-0.017 (0.003)***	-0.021 (0.004)***	-0.014 (0.005)***	-0.064 (0.006)***	0.025 (0.002)***	-0.016 (0.005)***
1 if job from 2005 collection	0.454	-0.008 (0.001)***	-0.005 (0.002)**	0.013 (0.001)***	0.007 (0.002)***	0.027 (0.002)***	-0.303 (0.002)***	-0.009 (0.001)***	-0.022 (0.002)***
1 if job from 2006 collection	0.363	0.000 (0.001)	0.014 (0.002)***	0.016 (0.001)***	0.027 (0.002)***	0.022 (0.002)***	-0.314 (0.003)***	-0.030 (0.001)***	0.016 (0.002)***
1 if posting by a recruiting agency	0.293	0.012 (0.001)***	0.045 (0.002)***	0.023 (0.001)***	-0.021 (0.001)***	-0.078 (0.002)***	-0.029 (0.002)***	-0.018 (0.001)***	0.036 (0.002)***
1 if posting for multiple positions	0.186	-0.016 (0.001)***	-0.007 (0.002)***	-0.022 (0.001)***	0.044 (0.002)***	-0.042 (0.002)***	-0.059 (0.002)***	0.044 (0.001)***	0.001 (0.002)
Mean of dependent variable		0.065	0.203	0.107	0.177	0.658	0.629	0.895	0.234
Pseudo $R^2$		0.125	0.114	0.103	0.089	0.199	0.153	0.199	0.062

Notes: \*Statistically significant at the .10 level; \*\*at the .05 level; \*\*\*at the .01 level.