

# Applicant Screening and Performance-Related Outcomes

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A central question in economics is how to ensure that employees do not shirk their workplace responsibilities. Most of the research on this question focuses on economic governance schemes that provide incentives to induce employees to act in the interests of their employers (Canice Prendergast 1999). Some studies examine arrangements to induce self-selection by potential employees having heterogeneous unobserved human capital. An alternative to self-selection, much less studied by economists (for an exception, see Casey Ichniowski, Kathryn Shaw, and Giovanna Prennushi 1997), is applicant screening, where the employer attempts to identify which applicants have the desirable attributes. An advantage of the screening approach versus self-selection is that it does not require the applicant to even be aware of possessing relevant attributes.

Virtually all employers use some level of applicant screening. It is a fundamental part of the human resources function in most firms. Although different kinds of jobs may require different attributes, arguably the most fundamental attribute and the one that cuts across virtually all jobs can be described as *work ethic*, what we might think of as the ability to work hard independent of monitoring by employers or of rewards. The field of personnel psychology has spent a great deal of time examining attributes of individuals associated with work ethic, and one of the most important is the personality construct known as “conscientiousness,” which has been found to be a reliable and consistent dimension of personality that relates strongly to job performance across types of jobs (Frank Schmidt and John Hunter 1998).

In this paper, we study the screening of job candidates to find workers with a stronger work ethic

and examine the effects on performance-related outcomes, using data from a national sample of US employers. We find that employers who screen applicants more intensively for factors that should predict work ethic are able to use less expensive monitoring of employees. They are also able to make greater use of teamwork, an approach to organizing work that uses less supervision and gives employees greater autonomy, which otherwise creates greater opportunity for shirking. This screening is associated with higher employee productivity, lower involuntary turnover rates, and higher wages via rent-sharing. Screening for other attributes, in contrast, such as more traditional human capital measures, does not produce these results.

This paper contributes to research on the synergies among work and human resource practices by highlighting the importance of screening in affecting a firm’s workplace practices and performance-related outcomes, which has not yet been systematically analyzed in the literature. Our results are also consistent with basic gift-exchange patterns in that workers make extra effort and get rewarded with higher wages (George Akerlof 1982). And a new insight from our paper, especially in the light of recent negative evidence from field experiments (Uri Gneezy and John List 2006), is that *screening* for more conscientious employees may be crucial for the gift-exchange relationship to be mutually beneficial and sustainable.

## I. Hypotheses

Several hypotheses can be generated from a theoretical model that includes costly screening and monitoring in a principal-agent framework with workers differing in work ethic, where a worker with a stronger work ethic requires less monitoring and lower extrinsic rewards to elicit effort. Work ethic is not publicly observable but can be detected by a screening technique.

The first hypothesis is that *there should be some substitution between the use of screening for work ethic and monitoring*, because greater

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use of screening can lead to a work force that is less likely to shirk and therefore requires less monitoring to achieve a given level of performance. We might also expect the monitoring/screening decision to be related to the production function and the choice of work systems. For example, employers with teamwork-based systems and those that rely on “empowered” employees (i.e., where employees have greater discretion to act) make monitoring by supervisors more difficult and should therefore make greater investments in screening. That is, we expect to find that *screening for work ethic and teamwork are complementary practices*, and this is our second hypothesis.

The following result from the model may seem counterintuitive: Employers should pay employees with a stronger work ethic more despite the fact that lower extrinsic incentives are needed to motivate them. The usual understanding is that employers pay such workers less and hence get higher profits; this may arise in a typical principal-agent model when competition among employers for talent is ignored, but it is unlikely to be an equilibrium result, because competition would bid up the wages for such employees in equilibrium. In other words, workers with better work ethics contribute value by reducing the need for monitoring, saving money for employers; and in order to retain these conscientious workers, employers may be motivated to pay them higher wages as rent-sharing. We might therefore expect *a positive relationship between screening for work ethic and employee compensation*, which is the third hypothesis. Such a compensation package with less monitoring and higher pay that is offered to workers with stronger work ethics, however, is even more attractive to weaker agents, which renders self-selection infeasible, and thus principals have to rely on careful applicant screening to separate the conscientious agents from the selfish ones, albeit imperfectly.

The fourth prediction of the model is that *more selective screening leads to higher productivity*, because the employee hired by a more selective employer has a higher probability of being a conscientious worker. This combined with the first result that those principals who screen more monitor less implies that *the involuntary turnover rates of employees are lower when the screening selectivity is higher*, which is the fifth hypothesis.

Another result of the model shows that firm profits may not strictly increase in individual screening selectivity, because the higher surplus associated with more selective screening is allocated to employees in the format of higher wages, which are essentially a part of the rent generated by agent work ethic. This may shed light on the puzzling empirical results that firms adopting high performance work practices do not necessarily earn higher profits while wages are higher (Sandra Black and Lisa Lynch 2004; Peter Cappelli and David Neumark 2001; Richard Freeman and Morris Kleiner 2000). To be sure, however, the model predicts that all employers may obtain higher profits when screening is less costly or when the average work ethic is higher, and so collectively principals do benefit from more selective screening for work ethic.

## II. Data Description

The five hypotheses described above are tested using data from the 1997 National Employer Survey (NES97), a nationally representative sample of private establishments with more than 20 employees. Our analysis focuses exclusively on production or frontline employees in all industries. The sampling weights are taken into consideration in all the estimation results, and correlations of random errors among firms within the same industry are allowed.

We use a variety of measures to capture efforts to screen applicants for work ethic. Perhaps the most common measure of how extensively an employer screens applicants is the number of candidates interviewed for each job opening, which is labeled *Candidates#*, a measure that reflects screening for attributes of any kind, not just work ethic. The NES97 also asks a series of more specific questions about selection. The stem of the question asks the manager: “After you have established your applicant pool and obtained information about potential employee, what characteristics or attributes are most critical in making your hiring decision?” The importance scale ranges from 1 to 5, indicating respectively “no value,” “some value,” “important,” “very important,” and “essential.” Respondents use this scale to assess 12 general attributes about applicants, one of which is an applicant’s attitude toward work. This variable seems specifically oriented toward the goal of

identifying intrinsic work ethic. It is also the highest ranked item. To be clear, the variable measures the importance the employer gives to work ethic in assessing candidates, rather than the mechanisms used to do such screening, which we do not observe directly. Because most firms report either 4 or 5 for the importance of work attitude in hiring decision, a binary version (= 1 if reporting 5) of this variable, labeled *Work Attitude Screening*, is used as the measure of screening selectivity for work ethic.

The remaining 11 screening criteria can be easily divided into two groups, whose average levels of importance are labeled *Work Experience Screening* and *Academic Performance Screening*, respectively. These three selectivity variables are positively and significantly correlated with each other, and firms do vary a lot in the scores they assign to them.

We measure the extent of employer monitoring of employees with a standard measure, *Employee-Supervisor Ratio*. It is the average number of employees that report to each front-line supervisor, where higher ratios mean lower monitoring intensity. The percentage of production employees involved in self-managed teams, denoted by *Teamwork*, captures a common work system that involves low levels of monitoring, where employees manage themselves.

In terms of outcome measures, *wages* are measured by the log of the average annual pay of production employees. A simple measure of employee productivity is *Relative Productivity*, which equals one if the employer considers its employees' productivity to be higher than its major competitors and zero if not. About 50 percent of firms in the sample consider their employees relatively more productive, and so it seems to be quite reliable. It is also a commonly used measure of productivity across industries in related literature (e.g., Alex Bryson and Freeman 2008). The variable *Involuntary Turnover* equals the percentage of permanent workforce in the firm that left involuntarily (e.g., fired or laid off) in the past year.

The fact that our data are cross-sectional limits the ability to make causal arguments, but as noted above, most hypotheses are associative rather than causal. Many questions in the NES97 survey are asked only for frontline production employees, which greatly narrows the range of possible jobs we can examine, but

that limitation also helps control for exogenous sources of variation. Detailed industry and size dummies are also used to control for potential variations in the important aspects of production functions and in the costs or ability to screen and monitor employees (e.g., scale economies). Other potentially relevant factors controlled include standard human capital measures—the average years of schooling for production employees, their weekly working hours, the usage of computers on the job by supervisors and employees, the length of time for a new hire to reach job proficiency, ratios of women and minorities among permanent employees, and union strength. These variables are used as controls to account for the remaining elements in the model that may influence a firm's monitoring and screening choices as well as wage levels, employee productivity and turnover rates. Due to missing values, the sample sizes vary across regression models.

### III. Estimation Results

Table 1 summarizes our main estimation results, which are robust to alternative specifications (not reported). Column 1 shows the relationship between *Employee-Supervisor Ratio* and screening selectivity for work ethic. Firms that screen more for work ethic should hire better agents who need less monitoring to make the required effort. Because a higher employee-supervisor ratio implies a lower monitoring intensity, the coefficient of *Work Attitude Screening* should be positive in the regression, and this is indeed the case. It remains positive and significant even when controlling for *Candidates#*, the measure of overall screening selectivity, and the other two screening variables, *Work Experience Screening* and *Academic Performance Screening*, all of which, in contrast, have insignificant coefficients. The estimates suggest that treating work attitude as essential in hiring employees (as opposed to anything less than essential) enables a typical frontline manager to supervise about 2 more employees on average, which is equivalent to the effect of interviewing about 14 more job candidates for each production job opening (over 2.5 standard deviations of *Candidates#*). This suggests that the tradeoff between the intensities of screening for work ethic and monitoring can be quite substantial.

TABLE 1—SCREENING SELECTIVITY AND FIRM OUTCOMES

	OLS employee-supervisor ratio (1)	OLS teamwork (2)	OLS wages (3)	Logit productivity (4)	OLS turnover (5)
Work attitude screening	1.77 (0.70)**	5.84 (2.06)***	0.06 (0.03)**	0.19 (0.11)*	-1.52 (0.79)*
Candidates#	0.12 (0.08)	0.33 (0.27)	0.00 (0.00)	0.02 (0.02)	-0.00 (0.03)
Work experience screening	1.05 (1.23)	3.40 (2.40)	0.04 (0.02)**	0.10 (0.14)	-0.61 (0.97)
Academic performance screening	-0.31 (0.52)	-1.03 (0.63)	-0.02 (0.01)*	0.63 (0.30)**	0.31 (0.91)
Observations	1,960	2,020	1,930	1,974	989
R <sup>2</sup>	0.18	0.15	0.70	0.14	0.10

Notes: Standard deviations are in the parentheses. The data are from 1997 National Employer Survey (NES97) in the United States. The other control variables include the average schooling of production employees and their working hours per week, computer usage by supervisors and production employees, union representation, months to reach job proficiency for a typical new hire, the ratios of minority and women in the permanent employees, as well as five size dummies and 21 industry dummies.

\*\*\*Significant at the 1 percent level.

\*\*Significant at the 5 percent level.

\*Significant at the 10 percent level.

When *Teamwork* is the dependent variable in column 2, the results are similar: the coefficient of *Work Attitude Screening* is again positive and significant, while those of the other screening variables are still insignificant. These estimates suggest that treating work attitude as essential in hiring employees is associated with an average increase of 5.84 percentage of employees involved in teamwork, which is about 19 percentage of a standard deviation of *Teamwork*. The evidence indicates a strong synergy between screening employees for work ethic and the use of low-monitoring work practices that make use of such behavior. More generally, the results are consistent with the notion that there is a trade-off between management approaches that rely on conscientious workers and empowered working arrangements as compared to those that rely on high levels of monitoring.

The relationship between log wages and screening selectivity is tested in column 3, where the number of employee benefits contributed by the firm is also included as a control. Because more selective principals offer higher wages to their agents in order to retain them, we predict a positive coefficient for screening selectivity for work ethic, which is indeed the case. In contrast, the coefficient of *Candidates#*, though positive, is insignificant as before, while those

of the other two screening variables are significant but with different signs; the negative sign of *Academic Performance Screening* may be justifiable because academic results are presumably less important for production/frontline workers than work attitude and working experiences. Based on the estimates, treating work ethic as an essential criterion in hiring employees is associated with \$1,520.57 increase of annual pay or 77 percent of the average monthly salary of production/frontline employees. When the two monitoring variables (*Employee-Supervisor Ratio* and *Teamwork*) are further controlled, they are insignificant and hardly affect coefficients of the three screening variables. This is consistent with our theoretical arguments that screening for better workers is underlying the association between lower monitoring and higher wages.

Column 4 estimates the relationship between screening selectivity and the relative employee productivity compared to a firm's major competitors. While we understand the inherent weakness of a self-reported productivity measure, the coefficient of *Work Attitude Screening* is indeed positive and significant, which is at least consistent with our hypothesized relationship. The estimated effects of the other three screening variables are also positive, but most are insignificant. The results are similar if either

a probit or linear probability model is used. The estimates show that treating work attitude as an essential criterion is associated with 37 percent of a standard deviation increase of *Relative Productivity*.

The relationship between the involuntary turnover rate of a firm's employees and screening for work ethic is estimated in column 5. As expected, the coefficient of *Work Attitude Screening* is significant and negative, while those of the other screening variables are insignificant. The estimates suggest that treating work attitude as essential in hiring employees is associated with a reduction of the involuntary turnover rate of 17 percent of a standard deviation.

#### IV. Conclusions

We find that employers' paying more attention to positive workplace attitudes in assessing job applicants, what we describe as work ethic, is related to less monitoring, greater use of teamwork, higher employee productivity, lower involuntary turnover rates, and higher wages for production or frontline workers. The underlying intuition is that firms that are more selective in screening job candidates for work ethic are more likely to hire conscientious workers who are willing to work hard with less monitoring. These employers can then make use of practices like teamwork that involve workers more and monitor them less. Reduced monitoring costs create rents that the firm shares in the form of higher wages in order to attract and retain these good workers. Because employees with stronger work ethic are less likely to shirk, their productivity is higher relative to other firms and their involuntary turnover rates are lower. It is important to note that these relations do not hold for the other types of screening. In future research, it would be interesting to examine the causality in these relationships as well as the factors that may cause them to vary, such as whether higher

dismissal costs lead to greater screening of all kinds and how screening for different attributes might vary with labor market conditions.

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