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Abstract: Using German establishment data, we show that the relationship between performance pay and intensity of applicant screening depends on the nature of production. In establishments with increased multitasking, performance pay is associated with a greater intensity of applicant screening. In establishments without increased multitasking, it is associated with a reduced intensity. The findings fit the hypothesis that performance pay induces a positive self-sorting of employees if jobs are less multifaceted. In this case, employers using performance pay need no intense applicant screening to ensure a high quality of matches between workers and jobs. However, if jobs are more multifaceted, performance pay can entail problems of adverse self-sorting. In order to mitigate or overcome these problems, employers tying pay to performance screen applicants more intensely.

Keywords: Performance pay, multitasking, self-sorting, applicant screening, non-managerial employees, managerial employees.

JEL: J33, J60, M51, M52.

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1. Introduction

Since its emergence, personnel economics has made great progress in analyzing the incentives created within firms. Much less attention has been paid to the hiring strategies of firms. As Oyer and Schaefer (2011: p. 1770) put it:

> 'The literature has been less successful at explaining how firms can find the right employees in the first place. Economists understand the broad economic forces – matching with costly search and bilateral asymmetric information – that firms face in trying to hire. But the main models in this area treat firms as simple black-box production functions. Less work has been done to understand how different firms approach the hiring problem, what determines the firm-level heterogeneity in hiring strategies, and whether these patterns conform to theory.'

This lack of knowledge is surprising given that improving the quality of matches between workers and jobs can substantially raise productivity (Autor and Scarborough 2008, Bartling et al. 2012). Usually, a careful selection of employees is viewed as a fundamental part of human resource management in order to improve the quality of matches (Breshnahan et al. 2002, Huang and Capelli 2010, Ichniowski et al. 1997). However, the quality of matches not only depends on applicant screening. A firm's personnel policy in general and the use of performance pay in particular may also have an influence on the quality of matches by inducing a self-sorting of applicants.

Our study contributes to the literature by examining the relationship between performance pay and applicant screening. Lazear (1986, 2000) has shown that performance pay can induce a self-sorting of high-ability employees. Against this background one may expect that

performance pay and applicant screening should be substitutes. Employers using performance pay can attract high-ability employees without extensive screening of applicants. Only those employers who do not rely on performance pay may need extensive applicant screening to ensure a sufficient high ability of their employees.

This prediction presupposes a comprehensive measurement of performance so that performance pay in the end adequately rewards every worker characteristic that is relevant for production. In this case, performance pay can attract workers whose skills and abilities match the various job requirements. However, if the measurement of worker performance is only available for a limited set of dimensions, performance pay may induce a distorted sorting process as it does not reward all the worker attributes needed for production. Whether or not a comprehensive measurement of performance is available depends on the nature of production. Thus, potential distortions in the self-sorting process induced by performance pay should depend on the nature of production.

Against this background, we hypothesize that the nature of production plays a moderating role in the relationship between performance pay and applicant screening. A substitutive relationship should hold if production is characterized by a lower degree of multitasking. A low degree of multitasking implies that worker performance can be more easily and comprehensively measured. In this case, performance pay rewards the worker characteristics needed for production and, hence, attracts the right workers reducing the necessity of an intensive applicant screening. By contrast, a complementary relationship should hold if production entails a higher degree of multitasking. A high degree of multitasking implies that performance pay can entail problems of adverse self-sorting. First, if performance measures are not available for all relevant tasks, performance pay may attract employees who are only strong in the measured performance

dimensions but are weak in the non-measured dimensions. Second, if employers use subjective performance evaluations to conduct a more comprehensive measurement of worker performance even in a multitask setting, they may attract employees who have a special talent in manipulating the superiors' evaluations. Thus, employers using performance pay should screen applicants more intensively to mitigate or avoid such problems of adverse self-sorting.

Our empirical analysis uses unique data from German establishments. The data are based on an additional survey of a representative subsample of establishments participating in the IAB Establishment Panel. Importantly, the survey provides information on performance pay and the intensity of applicant screening for both managerial and non-managerial employees. We use the establishment's focus on high quality, innovativeness or customer-specific solutions as an indication of a production that requires increased multitasking. Our estimates confirm that the nature of production indeed plays a moderating role in the relationship between performance pay and applicant screening. The average share of individual performance pay in employees' earnings and the time taken for the screening of applicants are negatively associated if production is characterized by less multitasking. They are positively associated if production is characterized by increased multitasking. Thus, the findings suggest a substitutive relationship between performance pay and applicant screening in a less multifaceted work setting and a complementary relationship in a more multifaceted work setting. This holds for managerial as well as for non-managerial employees.

Our study is related to recent research on performance pay and multidimensional sorting (Cornelissen et al. 2011, Curme and Stefanec 2007, Dohmen and Falk 2011, Geddes and Heywood 2003, Grund and Sliwka 2010). This research has used employee data to show that the self-sorting into performance pay jobs can take place along multiple dimensions of the

employees' personal characteristics such as ability, risk attitude and gender. Our study indicates that the self-sorting process induced by performance pay is even more complex. Ability itself is multi-dimensional and the self-sorting process is moderated by the nature of production.

The rest of the paper is organized as follows. In the second section, we provide our background discussion. The third section presents the data and variables while the fourth section provides the estimation results. The fifth section concludes.

2. Background Discussion

Lazear (1986) models performance pay as a self-sorting process by workers of heterogeneous abilities. He divides the economy into a time rate sector and a performance pay sector. Employers in the time rate sector cannot observe individual worker performance. Thus, the wage of an individual worker does not depend on his or her ability. Each worker receives a wage equal to the average worker productivity in that sector. By contrast, employers in the performance pay sector are able to monitor individual worker performance so that they can reward workers according to their individual performance. This implies that workers with higher abilities earn higher wages. However, identifying individual worker performance involves a fixed monitoring cost. The monitoring cost is shifted to workers through a lower base payment. As a consequence, workers prefer the performance pay sector only if the performance-related pay they can earn dominates the disadvantage of a lower base payment. This condition is met by workers with sufficiently high ability. Hence, high-ability workers sort themselves into performance-pay firms while low-ability workers choose jobs in time-rate firms. The model has received empirical support in Lazear's (2000) well known case study of the Safelite Glass Corporation. The auto glass company moved 3,000 workers from hourly wages to piece rates resulting in a 44 percent

increase in output per worker. Half of the productivity gain came from more able workers being attracted into the piece rate scheme.[1]

While Lazear's model does not explicitly analyze employers' investments in the selection of new employees, it lends itself as a useful starting point to discuss such investments. The model suggests that performance pay and applicant screening should be substitutes. Employers using performance pay can attract high-ability workers without being proactive in screening job applicants for their ability. By contrast, those employers in the time rate sector who are interested in recruiting high-ability workers must rely on screening methods such as evaluations of résumés, reference and background checks, applicant testing, and extensive job interviews for selecting appropriate applicants. They offer high fixed wages to attract the applicants being successful in the screening process. However, worker performance is one-dimensional in the classical self-sorting model. Thus, the prediction of a substitutive relationship between performance pay and applicant screening may rather hold for less multifaceted tasks with a primary focus on the quantity of produced output. For these tasks, individual performance can be more easily measured.

The relationship between performance pay and applicant screening may be different if production is characterized by multitasking. Multitasking is often associated with dimensions of worker performance for which objective performance measures are not available (Holmstrom and Milgrom 1991). The literature usually focuses on the implications for the effort of workers. The inability to reward every type of productive worker activity can cause workers to cut back on productive behaviors for which they are not rewarded. For example, piece rates induce workers to exert effort increasing quantity while they provide no incentives to engage in activities such as helping colleagues, maintaining equipment, cultivating customer goodwill,

striving for quality and reducing chances of workplace injury (Artz and Heywood 2015, Bender et al. 2012, Bender and Theodossiou 2014, Brown 1990, Drago and Garvey 1998, Drago and Heywood 1995, Freeman and Kleiner 2005, Heywood et al. 2013). However, an emphasis on performance as measured by one or a few narrow performance indicators may not only distort the allocation of effort across tasks but may also entail problems of adverse self-sorting.[2] Performance pay may attract workers who have high abilities in the measured performance dimensions and have low abilities in the non-measured performance dimensions. Thus, taking up our example again, piece rates may induce a self-sorting of workers who are strong in producing a high quantity of output but weak in striving for quality or cooperating with colleagues. Those workers increase their individual output at the expense of product quality and helping on the job. In order to avoid such adverse self-sorting, employers using performance pay may to a larger extent invest in applicant screening. While performance pay causes a self-sorting of high-ability workers along the measured performance dimensions, applicant screening ensures sufficiently high abilities in the non-measured performance dimensions. Hence, in case of increased multitasking, combining performance pay with a more careful and in-depth applicant screening can help the employer to find the right employees.

Moreover, employers using performance pay may also rely more intensively on applicant screening if workers can engage in unproductive activities to manipulate the performance signal. Specifically in a multi-task setting, employers may adopt performance evaluation systems for a more comprehensive measurement of the various dimensions of worker performance (Brown and Heywood 2005, Gibbons 1998, Jirjahn and Poutsma 2013, Prendergast 1999). Performance evaluations are based on judgments and opinions and, thus, often entail a high degree of discretion and subjectivity (Baker et al. 1988, Lewin and Mitchell 1995, Prendergast and Topel

1993). This allows workers to strategically engage in influence activities that result in a positive evaluation but not necessarily in increased performance (Acemoglu et al. 2008, Milgrom and Roberts 1988). For example, workers may conform to the opinion of their supervisors or provide flattery and private services to the supervisors (Laffont 1990, Prendergast 1993). If workers are heterogeneous in their ability to engage in such influence activities, performance evaluation systems may attract those workers who have a special talent for manipulating their superiors' evaluations. Thus, employers using performance evaluation systems have an incentive to carefully screen applicants in order to avoid such adverse self-sorting.

Altogether, the relationship between performance pay and applicant screening should depend on the nature of production. If production is characterized by a lower degree of multitasking, we anticipate a substitutive relationship. Employers using performance pay can induce a self-sorting of high-ability workers and, hence, do not need to rely on extensive applicant screening. By contrast, if production is characterized by a higher degree of multitasking, we anticipate a complementary relationship. Employers using performance pay should engage in more extensive applicant screening in order to avoid an adverse self-sorting of workers who have low abilities in the non-measured performance dimensions or a high talent for engaging in unproductive influence activities.

3. Data and Variables

3.1 Data Set

The data used in our empirical analysis are based on an additional survey of a subsample of establishments participating in the IAB Establishment Panel. The IAB Establishment Panel is a representative sample of establishments from all sectors in the German economy (Fischer et al.

2009). Infratest Sozialforschung, a professional survey and opinion research institute, conducts the interviews on behalf of the Institute for Employment Research (IAB) which belongs to the Federal Employment Agency. The data are collected on the basis of a questionnaire and follow-up personal interviews with the owner or top manager of the establishment. Each year since 1993 (1996), the IAB Establishment Panel has surveyed establishments in Western (Eastern) Germany.

The additional survey was conducted in the 2012 wave (Kampkoetter et al. 2015). This add-on survey, the Linked Personnel Panel (LPP), consists of a questionnaire for the employer and a questionnaire for the employees. The employer questionnaire has a specific focus on topics related to HRM including hiring and performance management. The employee questionnaire asks about job characteristics and the interviewee's socio-demographic background.

For our analysis, we use the employer survey of the LPP. The population of the survey consists of private sector establishments with 50 or more employees. Owners or top managers of 1,219 establishments answered the questionnaire. In our investigation, we focus on establishments that have hired non-managerial and managerial employees respectively during the last two years. After eliminating observations for which full information is not available, the analysis on the screening of non-managerial applicants is based on data from 1,025 establishments. For the analysis on the screening of managerial applicants, information is available from 907 establishments.

3.2 Key Variables

The definitions of the variables and their descriptive statistics are provided in Table 1. Our dependent variable is the intensity of applicant screening, measured as the time usually taken for

the screening of an applicant.[3] This information is provided for both managerial and non-managerial applicants. On average, the establishments in our sample spend 320 minutes of screening per managerial applicant and 166 minutes per non-managerial applicant.

The key explanatory variable is the average percentage share of individual performance pay in relation to the employees' base pay. While the classic sorting model simply distinguishes between a time rate sector and a performance pay sector, this variable provides a more nuanced measurement as it captures differences in the intensity of performance pay across establishments. Information on performance pay is also available for managerial and non-managerial employees. The mean is 3.7 percent for managerial employees and 3.2 percent for non-managerial employees.

Our theoretical considerations suggest that the relationship between performance pay and applicant screening should depend on the degree of multitasking. The indicator of increased multitasking used in the empirical analysis is a dummy variable equal to 1 if the establishment's business model aims at high quality, innovativeness or customer-specific solutions. The allocation of effort and talent across the quantitative and qualitative dimension of performance is the classic example in the literature on multitasking (Holmstrom and Milgrom 1991). Specifically, if the market strategy has a focus on high quality, the employer must ensure that workers do not increase individual output at the expense of product quality. Furthermore, innovativeness should entail increased multitasking as workers do not only have to perform their standard tasks but also have to engage in innovative activities (Hellmann and Thiele 2011, Morita 2005). Innovativeness requires that workers are flexible to switch form one task to another. Similarly, a market strategy focusing on the varying and specific needs of customers entails that workers have to perform a wider spectra of tasks (Griffith and Neely 2009, Lindbeck

and Snower 2000). This also involves greater interaction with customers in order to build reputation and customer goodwill.

Table 2 provides simple correlations between performance pay and applicant screening. The correlations are based on bivariate estimations that regress the log of the time taken for applicant screening on the intensity of performance pay. For both managerial and non-managerial employees, the table shows the same pattern of results. If we consider all establishment (without distinguishing by the degree of multitasking), we obtain a positive correlation between the intensity of performance pay and the intensity of applicant screening. However, the combined sample of establishments hides a far richer pattern. Taking the degree of multitasking into account, we find a positive correlation for establishments with increased multitasking and a negative correlation for establishments without increased multitasking. Thus, the simple correlations provide first explorative evidence for the hypothesis that the relationship between performance pay and applicant screening depends on the nature of production. At issue is now, whether this finding also holds in a multivariate regression analysis that controls for other establishment characteristics.

3.3 Control Variables

In the regressions, we take into account that the quality of matches between workers and jobs is more important to establishments with higher skill requirements (DeVaro 2005). Thus, these establishments should be characterized by a higher screening intensity. Several variables capture the skill requirements of an establishment. A dummy variable for a modern production technology is included. Moreover, the share of employees with completed apprenticeship training and the share of employees with university degrees are controlled for.

Furthermore, we take into account that establishments should screen applicants more intensively if they foster long-term employment relationships. First, we include a dummy variable equal to 1 if management views the establishment's wage policy as an important instrument to retain workers. Second, variables for industrial relations enter the regressions. Industrial relations in Germany are characterized by a dual structure of worker representation with both unions and works councils (Huebler and Jirjahn 2003). Unions usually negotiate collective bargaining contracts on an industrial level. Employers are covered by those contracts if they are members of an employers' association. Works councils provide a highly developed mechanism for codetermination at the establishment level (Freeman and Lazear 1995). The incidence of a works council depends on the initiative of the establishment's workforce. Most importantly in our context, both collective bargaining coverage and works councils have been shown to encourage internal labor markets resulting in higher tenure with the employer (Gerlach and Stephan 2008, Heywood et al. 2010, Zwick 2011).

Furthermore, personnel turnover and the share of female employees are taken into account.[4] Women have a lower expected tenure than men (Farber 1998, Harhoff 1998). Thus, employers hiring female employees to a larger extent may have a reduced incentive to screen applicants. Similarly, a high personnel turnover may indicate an uncertain tenure that discourages the employer to extensively screen applicants. However, a high personnel turnover may also indicate problems with the current workforce leading the employer to more carefully select new employees.

Establishment size should also play a role in applicant screening. Larger establishments are more able to implement internal labor markets. Moreover, they may be more likely to have a professional personnel management that can help adopt effective screening procedures. We also

include a dummy equal to 1 if personnel management is embedded at the top management level. This variable indicates the importance the establishment places on personnel issues. General establishment characteristics are controlled for by variables for foreign owners, owner managers and the legal form of the establishments. Finally, we include four industry dummies and three region dummies.

4. Estimation Results

4.1 Screening of Non-Managerial Applicants

Table 3 shows the results on the determinants of the screening intensity for non-managerial applicants. The dependent variable is the logarithm of the time usually taken for the screening of a non-managerial applicant. Regression (1) does not account for the interaction of non-managerial performance pay and multitasking while regression (2) includes an interaction term.

Several of the control variables emerge with significant coefficients. The share of university graduates is positively associated with screening intensity. This conforms to the hypothesis that employers with higher skill requirements screen applicants more intensively. Furthermore, several of the indicators for internal labor markets take significant coefficients of the expected sign. Retaining workers through wages, works council incidence and establishment size are positive covariates of screening intensity.

Turning to the explanatory variable of primary interest, non-managerial performance pay takes a significantly positive coefficient in regression (1). This would suggest that performance pay and screening intensity are complements. However, as shown by regression (2), the relationship between performance pay and the intensity of screening crucially depends on the extent of multitasking. When including the interaction variable of performance pay and

multitasking, performance pay takes a significantly negative coefficient while the interaction term emerges with a significantly positive coefficient. The estimated coefficients imply that the intensity of performance pay is a negative determinant of the intensity of applicant screening if there is no increased multitasking (-0.019 + 0.027 x 0 = -0.019). By contrast, the intensity of performance pay is positively associated with the intensity of applicant screening if production is characterized by increased multitasking (-0.019 + 0.027 x 1 = 0.008).

For a quantitative assessment of the results, let us consider an 8 percentage point increase in the share of individual performance pay. This is roughly an increase by one standard deviation. The one standard deviation increase in the share of performance pay implies a decrease in the intensity of applicant screening by 15 percent in a firm without increased multitasking (-0.019 x 8 = -0.152). It implies an increase by 6 percent in a firm with increased multitasking (0.008 x 8 = 0.064).

Thus, our estimates confirm that the relationship between performance pay and screening of non-managerial applicants is moderated by the nature of production. If production is characterized by a low degree of multitasking, performance pay and applicant screening are substitutes. An employer tying pay tightly to individual performance does not need extensive applicant screening. Performance pay attracts workers who have high abilities in the rather simple tasks. However, if production is characterized by a higher degree of multitasking, performance pay and applicant screening are complements. The self-sorting process induced by performance pay does not necessarily guarantee a high quality of matches between workers and jobs. In a multitask setting, performance measures are often not available for all of the relevant tasks so that performance pay may attract workers who are only strong in the measured performance dimensions but are weak in the non-measured dimensions. The employer may use

subjective performance evaluations for a comprehensive measurement of worker performance. But using performance evaluations generates its own problems as it attracts workers who are talented in manipulating their superiors' evaluations. Hence, employers tying performance tightly to individual performance in a multitask setting screen applicants more extensively to mitigate such problems. While performance pay induces a self-sorting of high-ability workers along the measured dimensions of performance, a high intensity of applicant screening ensures productive abilities in the non-measured dimensions. Hence, combining performance pay with applicant screening can help find the right employees for jobs characterized by increased multitasking.

4.2 Screening of Managerial Applicants

Table 4 presents results on the determinants of the screening intensity for managerial employees. Screening intensity is measured by the logarithm of the time usually taken for the screening of a managerial applicant. The key explanatory variable is now the intensity of managerial performance pay. Importantly, the estimations for managerial employees repeat the crucial pattern of results found for non-managerial employees. If the interaction of performance pay with multitasking is not taken into account, the estimated coefficient on performance pay is significantly positive. Yet, when accounting for the interaction, performance pay emerges with a significantly negative coefficient while the interaction term takes a significantly positive coefficient. The negative coefficient of the performance pay variable is dominated by the negative coefficient of the interaction term. Thus, the intensity of performance pay is associated with a reduced intensity of applicant screening only if there is no increased multitasking (-0.024 + 0.033 x 0 = -0.024). It is associated with a greater intensity of applicant screening if production

is characterized by increased multitasking (-0.024 + 0.033 x 1 = 0.009). Hence, also the estimates for managerial employees confirm that the relationship between performance pay and applicant screening crucially depends on the nature of production.

For a quantitative assessment, we again consider an 8 percentage point increase in the share of performance pay. Also for managerial performance pay, this roughly reflects a one standard deviation increase. The increase in the share of performance is associated with a decrease in intensity of screening managerial applicants by 19 percent if there is no increased multitasking (-0.024 x 8 = -0.192). It implies an increase in the screening intensity by 7 percent if there is increased multitasking (0.009 x 8 = 0.072). All in all, the pattern of results is very similar for the screening of managerial and non-managerial applicants with the effects being somewhat stronger for the managerial applicants.

4.3 Separate Estimates

As a check of robustness, we also ran separate estimates for establishments with and without increased multitasking. Table 5 provides the results on our key explanatory variables. The results on the control variables are suppressed to save space. Our separate estimates confirm the basic pattern of results. They show a significantly positive association between performance pay and applicant screening for establishments with increased multitasking and a significantly negative association for establishments without increased multitasking. This holds for both managerial and non-managerial employees.

5. Conclusions

The classical self-sorting model of performance pay predicts that employers tying pay to

individual performance attract high-ability workers. This suggests that employers need no intensive applicant screening if they use performance pay. Our study shows that such negative relationship between performance pay and applicant screening only holds for work arrangements with a lower degree of multitasking. If production is, however, characterized by a higher degree of multitasking, we find a positive relationship. This finding fits the hypothesis that in case of increased multitasking performance pay alone entails problems of an adverse self-selection of workers. Only by combining performance pay with applicant screening employers can ensure that they attract the right employees to the more complex jobs.

On a broader scale, our study contributes to the debate over the best practices in human resource management. Specifically, proponents of the high-performance paradigm have searched for a bundle of best practices that is of virtually universal benefit to employers.[5] Our findings support the view that a universal bundle of best practices does not exist. The relationship between performance pay and applicant screening crucially depends on the nature of production. If production is more complex, performance pay and applicant screening are complements. Yet, if production is less complex, they are substitutes.

We conclude this paper with suggestions for future research. Now that the relationship between performance pay and applicant screening has been studied, it would interesting to examine their interaction effect on firm performance and the success of hiring decisions. Specifically, future research could fruitfully examine if the interaction effect also depends on the nature of production.

Table 1: Variable Definitions and Descriptive Statistics

Variable	Description (Mean, Standard Deviation).
Time taken for the screening of a non-managerial applicant	Number of minutes taken on average for the screening of a non-managerial applicant (166, 163).
Time taken for the screening of a managerial applicant	Number of minutes taken on average for the screening of a managerial applicant (330, 280).
Non-managerial performance pay	Average percentage share of individual performance pay for non-managerial employees in relation to their base pay (3.204, 8.286).
Managerial performance pay	Average percentage share of individual performance for managerial employees in relation to their base pay (3.720, 7.465).
Increased multitasking	Dummy equals 1 if the establishment's business model aims at high quality, innovativeness, or customer-specific solutions (0.935, 0.245).
Number of employees	Number of employees in the establishment (383, 1,750).
Retaining workers through wages	Dummy equals 1 if management views wages as important or very important to retain employees (0.845, 0.362).
Personnel management	Dummy equals 1 if personnel management is embedded at the top management level (0.443, 0.497).
Owner manager	Dummy equals 1 if the establishment is managed by its owner (0.287, 0.453).
Limited company	Dummy equals 1 if the establishment is a private limited company (0.910, 0.286).
Foreign owner	Dummy equals 1 if the establishment has a dominant foreign owner (0.174, 0.379).
Collective bargaining	Dummy equals 1 if the firm is covered by a collective bargaining agreement (0.611, 0.488).
Works council	Dummy equals 1 if the establishment has a works council (0.645, 0.479).
Modern technology	Dummy equals 1 if the establishment has a modern or very modern production technology (0.716, 0.451).
Personnel turnover	A churning rate based on the first half of the year. H = number of hires and S = number of separations. The rate is equal to $1 - (H - S)^2/(H + S)^2$ if $H + S > 0$ and equal to 0 if $H + S = 0$ (0.646, 0.399).
Proportion of women	The share of the establishment's workforce that is female (0.317, 0.239).
Proportion of university graduates	The share of the workforce with university degrees (0.106, 0.148).
Proportion of skilled employees	The share of the workforce with completed apprenticeship training (0.638, 0.249).
Industry dummies	Four industry dummies are included.
Region dummies	Three region dummies are included.

N = 1,025. For the time taken for the screening of managerial employees the number of observations is equal to 907.

Table 2: Bivariate regressions

	All establishments	Establishments with increased multitasking	Establishments without increased multitasking
Non-managerial performance pay correlated with the logarithm of the time taken for the screening of a non-managerial applicant	0.007 (2.88)***	0.009 (3.55)***	-0.021 (3.38)***
N	1,025	959	66
R squared	0.005	0.040	0.008
Managerial performance pay correlated with the logarithm of the time taken for the screening of a managerial applicant	0.008 (2.45)**	0.010 (3.44)***	-0.022 (3.45)***
N	907	850	57
R squared	0.005	0.075	0.009

The table shows the coefficients of bivariate estimations that regress the log of screening intensity on the intensity of performance pay. Method: OLS. *t*-statistics are in parentheses. *** Statistically significant at the 1% level; ** at the 5% level.

Table 3: Determinants of the Time Taken for the Screening of a Non-Managerial Applicant

	(1)	(2)
Increased multitasking	0.131 (1.34)	0.064 (0.63)
Non-managerial performance pay	0.006 (2.37)**	-0.019 (2.91)***
Non-managerial performance pay x increased multitasking	----	0.027 (3.80)***
Number of employees / 1,000	0.023 (1.74)*	0.022 (1.73)*
Retaining workers through wages	0.176 (2.49)**	0.168 (2.40)**
Personnel management	-0.047 (0.90)	-0.044 (0.84)
Owner manager	-0.108 (1.61)	-0.110 (1.63)
Limited company	0.026 (0.28)	0.029 (0.30)
Foreign owner	0.046 (0.71)	0.044 (0.68)
Collective bargaining	0.075 (1.22)	0.078 (1.27)
Works council	0.145 (2.20)**	0.141 (2.14)**
Modern technology	0.055 (0.97)	0.054 (0.96)
Personnel turnover	0.105 (1.64)	0.110 (1.71)*
Proportion of women	0.080 (0.57)	0.081 (0.58)
Proportion of university graduates	0.421 (2.37)**	0.416 (2.35)**
Proportion of skilled workers	0.026 (0.21)	0.029 (0.23)
Constant	4.315 (20.37)***	4.378 (20.55)***
Industry and region dummies	Included	Included
N	1,025	1,025
R squared	0.075	0.078

Dependent variable: Log of number of minutes taken on average for the screening of a non-managerial applicant. Method: OLS. The table shows the estimated coefficients. *t*-statistics in parentheses are based on robust standard errors. *** Statistically significant at the 1% level; ** at the 5% level; * at the 10% level.

Table 4: Determinants of the Time Taken for the Screening of a Managerial Applicant

	(1)	(2)
Increased multitasking	0.190 (1.92)*	0.059 (0.57)
Managerial performance pay	0.006 (1.91)*	-0.024 (4.00)***
Managerial performance pay x increased multitasking	----	0.033 (4.86)***
Number of employees / 1,000	0.020 (1.89)*	0.020 (1.91)*
Retaining workers through wages	0.169 (2.24)**	0.176 (2.35)**
Personnel management	0.010 (0.18)	0.019 (0.34)
Owner manager	-0.096 (1.43)	-0.097 (1.45)
Limited company	0.049 (0.50)	0.039 (0.41)
Foreign owner	0.013 (0.18)	0.011 (0.17)
Collective bargaining	0.122 (1.99)**	0.123 (2.01)**
Works council	0.123 (1.78)*	0.120 (1.75)*
Modern technology	0.002 (0.04)	0.001 (0.02)
Personnel turnover	-0.124 (1.80)*	-0.121 (1.77)*
Proportion of women	0.079 (0.51)	0.060 (0.39)
Proportion of university graduates	0.108 (0.59)	0.105 (0.58)
Proportion of skilled workers	-0.048 (0.36)	-0.042 (0.31)
Constant	5.056 (22.17)***	5.184 (22.73)***
Industry and region dummies	Included	Included
N	907	907
R squared	0.066	0.073

Dependent variable: Log of number of minutes taken on average for the screening of a managerial applicant. Method: OLS. The table shows the estimated coefficients. *t*-statistics in parentheses are based on robust standard errors. *** Statistically significant at the 1% level; ** at the 5% level; * at the 10% level.

Table 5: Separate Estimates

	Dependent variable: Log of number of minutes taken on average for the screening of non-managerial applicants		Dependent variable: Log of number of minutes taken on average for the screening of managerial applicants	
	Establishments with increased multitasking	Establishments without increased multitasking	Establishments with increased multitasking	Establishments without increased multitasking
	(1)	(2)	(3)	(4)
Non-managerial performance pay	0.008 (3.03)***	-0.022 (1.72)*	----	----
Managerial performance pay	----	----	0.009 (2.77)***	-0.018 (1.84)*
N	959	66	850	57
R squared	0.072	0.279	0.068	0.371

Method: OLS. The table shows the estimated coefficients. *t*-statistics in parentheses are based on robust standard errors. *** Statistically significant at the 1% level; * at the 10% level. Results on the control variables are suppressed to save space.

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Endnotes

[1] The other half was attributable to higher effort.

[2] While models on multitasking usually examine moral hazard issues (e.g., Baker 2002, Drago and Garvey 1998, Holmstrom and Milgrom 1991, 1994, Itoh 1994), some recent theoretical advances consider multitasking also within models of adverse selection. Benabou and Tirole (2015) and Moen and Rosen (2005) present models showing that performance pay attracts high-ability workers only in the measurable performance dimension and distorts the allocation of effort across tasks. Increased competition for high-ability workers leads firm to rely heavily on performance pay and, hence, results in an increased distortion of the allocation of effort. In a model by Kosfeld and von Siemens (2011), workers can exert individual effort and cooperative effort. Workers differ in their willingness to cooperate with cooperation being non-verifiable. The model implies a separating equilibrium in which less cooperative workers sort themselves in firms with performance pay and cooperative workers sort themselves in firms with low-powered incentives.

[3] The dependent variable is based on the question 'How many hours do you on average spend on job interviews, tests and so on to screen a successful applicant? We mean the total time an applicant spends in the screening process.'

[4] We use the churning rate as a measure of personnel turnover. The churning rate captures the share of worker flows that is not part of growth or decline in employment.

[5] See Godard (2004) and Godard and Delaney (2000) for a critical assessment of this approach.