EMPLOYEE SELECTION PRACTICES AND PERFORMANCE PAY

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ABSTRACT

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Moral hazard occurs when employee effort is unobservable and there is information asymmetry regarding the degree of congruence between employee and organizational goals. The empirical research in management control systems focuses on mitigating moral hazard in current employees, *ex post* of the hire date. However, both economics and management literature acknowledge that there is significant variation in employees' goal congruence even prior to hire. I examine the effectiveness of employee selection practices in resolving the information asymmetry regarding an applicant's *ex ante* goal congruence. I find that more extensive use of employee selection practices intended to identify goal congruence is positively associated with future employee performance. Further, I find that the association between employee selection practices and performance is weaker in firms that use performance pay in the initial employment contract. Interestingly, I also find a positive association between employee selection practices and use of performance pay in initial contracts.

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CHAPTER 1: INTRODUCTION

A significant challenge that has been extensively studied is how performance pay can be used subsequent to an employee's hire to motivate effort and reduce moral hazard. However, moral hazard can also be reduced by hiring the 'right' employees in the first place: employees who are likely to have high performance, even absent performance pay. The first step in that process is to identify which individual(s) in an applicant pool would have high performance in a given position. Information asymmetry in the hiring process makes this a nontrivial task: applicants have superior information regarding their own performance potential, and low performance applicants have an incentive to misrepresent their type. There is a wide literature in personnel economics regarding ways to resolve this information asymmetry problem in the hiring process, with the analytical work in this field modeling the 'right' employee as the one with the greatest ability.

Employee performance, however, is a multidimensional construct (Dearman and Shields 2005; Merchant and Van der Stede 2007). In addition to having the right ability, an employee must also be goal congruent to perform highly—a person with exactly the right skills and technical knowledge will not be productive unless they also have the motivation to work hard toward the goals of the firm. Information asymmetry also exists with respect to the employee's inherent goal congruence, the extent to which their personal goals and values align with the interests of the firm even prior to their hire. In this study, I isolate the information asymmetry problem regarding a new employee's goal congruence by controlling for employee ability, and examine the effectiveness of a management control system (employee selection) in resolving this problem *ex ante* to the hire date. First, I examine the association between employee selection practices and employee performance. Next, I examine the interaction between employee

selection and performance pay in their effect on employee performance. Finally, I examine if employee selection and performance pay tend to be used together in firms.

Firms expend significant time and money on employee selection practices and tools, such as in-person interviews and personality tests. For example, personality tests conducted by external sources can cost upwards of $5,000 per applicant (Daniels 2001). In-person interviews can be similarly expensive, yet are widely used across industries, job levels, and countries (Akyeampong 2006; Huo, Huang, and Napier 2002; Wilk and Cappelli 2003).[1] Since it is less costly for an employer to mitigate the information asymmetry problem regarding applicant ability by verifying the applicant's education and certifications, it can be inferred that a major role of these employee selection practices is in assessing the individual's goal congruence (Huo et al. 2002).[2]

Employee selection is not the only mechanism through which employers mitigate the information asymmetry problem in the hiring process: performance pay is widely acknowledged in the accounting and economics literature as separating high ability from low ability applicants (Banker, Lee, Potter, and Srinivasan 2001; Dohmen and Falk 2011; Lazear 1986; Rothschild and Stiglitz 1976; Wilson 1980). Employee selection and performance pay in the initial contract are thus both costly control systems that address the problem of information asymmetry in the hiring process, although it is unclear whether firms will use these controls together or independently. On the one hand, firms that are rigorous in their employee selection practices have already identified and selected goal congruent employees (employees who will work hard toward the firm's goals with or without extrinsic motivators such as performance pay). Therefore, the firm's

[1] Gatewood and Feild (1998) roughly estimate the cost per applicant per interview to be one and a half to two days of interviewer and staff costs, in addition to any travel and living expenses during the stay.
[2] In addition to evaluating goal congruence, employee selection practices are also used to evaluate 'soft' skills (such as communication skills) that are critical for job performance but difficult to objectively measure.

marginal return to performance pay contracts is lower for firms that are rigorous in their employee selection practices, so firms should trade off between investment in employee selection and investment in performance pay and the systems should be used independently. On the other hand, since the selection effect of performance pay is widely documented, firms may consider performance pay as simply another tool for employee selection, consistent with employee selection and performance pay being used together.

Employee selection practices that identify *ex ante* goal congruence should also identify intrinsic motivation. Motivation crowding theory shows that performance pay can have a negative performance effect on intrinsically motivated employees (Benabou and Tirole 2003; Bonner and Sprinkle 2002; Ellingsen and Johannesson 2008; Gneezy, Meier, and Rey-Biel 2011). Consistent with motivation crowding theory, I predict an interaction between the use of performance pay and employee selection effort, such that the association between employee selection effort and employee performance is weaker in the presence of performance pay.

I conduct my study using survey data obtained through the Canadian Workplace and Employee Survey (WES), collected annually 1999-2006 from approximately 6,300 workplaces and 24,000 employees at those workplaces. The WES is unusual in that it links employee-level responses on topics including employee selection practices, pay and benefits, job characteristics, education, and promotion/termination to firm-level data regarding business strategy, firm performance, and delegation of decision making. This structure allows me to link use of ex ante control systems (employee selection practices and compensation structure) to employee performance while controlling for firm-level factors that would affect the control environment.

I find results generally consistent with my predictions. Using an employee's salary increase in the first year of employment to proxy for performance, I find that more extensive use

of employee selection practices intended to identify goal congruence is associated with future employee performance – as expected for an effective control system. Further, I find a significant negative interaction between performance pay and employee selection practices in their effects on employee performance. I find the association between employee selection practices and future employee performance is weaker in firms that use performance pay in the initial employment contract, consistent with motivation crowding theory which predicts that explicit incentives crowd out the intrinsic motivational effects of *ex ante* goal congruence.

Finally, employee selection and performance pay tend to be used together: I find a positive association between more extensive use of employee selection practices and performance pay contracts. This is consistent with firms perceiving performance pay as an additional selection tool, despite the negative performance effect of their combined use.

This study contributes to the literature on management control systems in several ways. First, management control research generally assumes that employees are not goal congruent when they join the firm, and concentrates on ways to mitigate moral hazard *ex post* of the hiring decision. However, individuals vary in their level of goal congruence, even before they are hired (Akerlof and Kranton 2005; Heinle, Hofmann, and Kunz 2012). I provide archival evidence that employee selection practices mitigate goal congruence problems. Second, recent empirical work on employee selection and management controls uses a single employee selection practice (referral source) to detect goal congruence (Campbell 2012). I extend this literature by identifying additional indicators of goal congruence: in-person interviews, personality tests, direct recruitment by the firm, and use of headhunters. Third, I extend the literature on the adoption and use of control systems. I examine the potential tradeoffs between investing in employee selection practices and investing in performance pay, and I examine an interaction

between one-time *ex ante* controls (employee selection practices) and a control that likely persists throughout the tenure of the employee (performance pay). My findings are consistent with firms adopting control systems as a package, disregarding the costly negative interdependence between employee selection and performance pay (Grabner and Moers 2013). Finally, empirical evidence supporting the use of employee selection practices as a control mechanism to align incentives is relatively sparse and focuses on practices in a single firm (Campbell 2012). In contrast, I use a large database across industries to address this question, which allows me to examine the robustness of these results across different firm-level environmental conditions.

The remainder of the paper is organized as follows: Chapter 2 reviews current literature and formalizes the research hypotheses. Chapter 3 describes the Workplace and Employee Survey data used to conduct my analyses. Chapter 4 describes the measurement of variables and the empirical specifications used to test the hypotheses. Chapter 5 presents the results, and Chapters 6 and 7 conclude and discuss limitations and opportunities for future research.

CHAPTER 2: LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

The main focus of prior literature on management control systems has been on mitigating the moral hazard problem: implementing control systems to induce the alignment of managerial preferences with the organization's goals, with the assumption that employees' individual goals are contrary to those of the firm when they are hired. Agency theory, however, predicts another source of agency problems: adverse selection. In this chapter, I review the literature on adverse selection and moral hazard, as well as literature on employee selection and performance pay as mechanisms to alleviate these problems. I then develop hypotheses regarding the effects of employee selection and performance pay. Figure 1 shows a timeline of the hiring process, the potential information asymmetry problems associated with time periods prior to and following hire, as well as some control systems used to address these problems and their potential unintended consequences.

2.1. Adverse Selection in the Labor Market

Adverse selection arises in the labor market when there is information uncertainty regarding applicant quality prior to the employment contract, where low quality individuals are disproportionally attracted to a firm. Without the ability to observe an applicant's productivity, the firm then has a greater likelihood of hiring a low quality individual (see Figure 1 period 1). It should be noted that the concept of quality in the labor market has many definitions across the different literature streams. The economics literature generally defines employee quality in terms of overall productivity outcomes (Bedard 2001; Borjas and Goldberg 1978; Horner 2006; Kubler, Muller, and Normann 2008). The management literature often defines employee quality as the worker's 'fit' for a job (Autor 2001). Consistent with the management control literature, I define a high quality employee as one who is both high ability (has the knowledge and skills

necessary to complete the job tasks) and goal congruent (motivated to work hard toward the goals of the organization) (Alles and Datar 2002, Campbell 2012).

Two types of devices exist to address the adverse selection problem, signaling devices and screening devices, distinguished by the party (firm or individual) that undertakes an action to uncover individual quality (Riley 2001; Horner 2006). Next, I define and discuss these two types of devices in turn.

2.2.1. Signaling Devices

Signaling devices are characterized as costly actions taken by the individual to credibly communicate their own quality to the employer. For these actions to effectively separate high from low quality individuals, the action must be sufficiently more costly for low quality individuals than high so that low quality individuals are not tempted to mimic high quality by also investing in the action. Education has been often cited as a signal of high quality in the labor market (Spence 1973; Verrecchia 1983; Trueman 1986; Bedard 2001; Kim 2007; Kubler et al. 2008). Education is costly to both high and low quality individuals, in terms of time and effort as well as in monetary costs. Both types will only invest in education, then, if the returns to education outweigh the costs. However, the cost of education is negatively associated with quality: although tuition and financial costs of education are constant across different quality individuals, it is easier (less costly in terms of time and effort) for high quality individuals to succeed. A high quality individual can thus signal their type to the prospective employer by investing in education. When the employer observes the education signal, they will then infer the individual's type and offer a higher wage (relative to the less educated applicant). In addition to investing in education, individuals can signal their quality by accepting a low initial wage with opportunity for advancement (and the associated wage increases) over time (Tirole 1988;

Lindbeck and Snower 2001). As with investment in education, low initial wages are differentially more costly to low quality than to high quality workers.

Experimental work has shown that signaling devices (e.g., investment in education) do not form a perfect separating equilibrium. That is, real people do not always conform to the signaling investment level decisions predicted by the analytic models. High (and low) quality individuals tend to choose investment levels significantly below (above) the levels predicted by economic models, and separating equilibriums do not always occur (Kubler et al. 2008, Miller and Plott 1985). In a series of experiments, Miller and Plott (1985) show that separating equilibriums only occur when the signaling cost differential across quality types is very high.

In addition, there may be aspects of a given job for which there is no credible signal of individual quality. For example, creative problem solving (or multitasking) may be essential for high productivity in a certain job. In this environment, a credible signal of quality would be an action the individual could take that is both positively associated with problem solving creativity and more costly for individuals who are less able to think outside the box. It is difficult to imagine a credible signal for such an attribute. Similarly, it is difficult to imagine a credible signal of goal congruence (when a individual's goals are aligned with those of the organization). Therefore, signaling devices alone are unlikely to completely alleviate the information asymmetry problem in the employee selection decision. Not surprisingly, employers often also employ screening solutions to the adverse selection problem.

2.2.2. Screening Devices

In contrast to signaling devices where costly actions are undertaken by the individuals, screening devices are characterized as costly actions taken by the firm with the intent to uncover

individual quality, either directly or indirectly (by encouraging individuals of one type to self-select into the organization).

Performance pay is a screening device well noted in the economics and accounting literature (Banker et al. 2001; Banker et al. 2003; Bonner and Sprinkle 2002; Lazear 1986; Lazear and Shaw 2007; Milgrom and Roberts 1992; Prendergast 1999). Lazear (1986) notes that for any given occupation, high quality individuals will be attracted to firms that offer performance pay, since they are more likely to achieve the high pay associated with strong performance. In contrast, low quality individuals will self-select into firms where their pay is not affected by their effort or ability. In one empirical study, Banker et al. (2003) use proprietary data from a retail establishment that eliminated performance pay for sales employees, while adjusting hourly wages to reflect prior productivity. In effect, the firm removed compensation risk from these employees, while maintaining the individual's expected compensation. They find a strong negative productivity differential of individuals who joined the firm after termination of the performance pay plan relative to the productivity of employees who left the firm in the same period. They infer that the largest impact of this performance pay plan was indirect, through the self-selection of highly productive, high quality individuals into the firm. Indeed, Prendergast (1999) suggests that up to one third of the impact of performance pay on individual performance is due to self-selection. However, there are limits to the effectiveness of performance pay as a screening device. Lazear (1986) finds that the self-selection value of performance pay is reduced when the measured output is noisy or costly, when individuals are not aware of their own quality, and when high quality individuals are risk averse.

Employee selection practices are direct examples of screening devices. Firms spend time and effort in the employee selection process in order to determine (or at least get a better

indication of) individual quality. Firms use a wide variety of employee selection practices, including interviews, and pre-employment tests for cognitive ability and personality. I discuss these practices in more detail in a separate section. It should also be noted that these employee selection practices can also have an indirect, self-selection effect in the labor market. Once the potential applicant pool is aware of more intense employee selection practices used by a firm, low quality individuals (who deem themselves less likely to 'survive the gauntlet') will self-select away from the firm.

In addition to performance pay and employee selection practices, the economics literature has identified a number of other screening devices, including seniority-based pay, and probationary contracts (Milgrom and Roberts 1992; Salop and Salop 1976; Coyte 1984; Autor 2001; Gibbons and Katz 1991). Although it would be interesting to address all these devices, in this study I focus on employee selection practices and performance pay.

2.3. Moral Hazard

Information asymmetry regarding employee actions can also adversely affect firm performance. Moral hazard exists when the firm cannot monitor employee actions, allowing employee decisions to diverge from the best interests of the firm. Prior empirical literature on management control systems has focused on Figure 1 period 4, mitigating the moral hazard problem after employees have been hired (Baiman 1990; Holmstrom 1979; Indjejikian 1999; Lambert 2001).

However, firms can also use management control systems to manage their risk for moral hazard in the hiring process (the second and third periods in Figure 1) by selecting goal congruent employees (Merchant 1982). Both economics and management literature acknowledge that there is significant variation in individuals' goal congruence prior to hire (Akerlof and

Kranton 2005; Gatewood and Feild 1998; Murphy 2012; Oyer and Schaefer 2011; Sekiguchi and Huber 2011).

The focus of the current study is on use of management control systems prior to the date of hire, where the firm is identifying to which applicants they will offer contracts (period 2), and how to structure those contracts (period 3). The control problem in these two periods is to reduce the potential for moral hazard by hiring only employees with high overall performance potential, including both high ability and goal congruence.

2.4. Management Control through Employee Selection

Employee selection practices, along with other personnel controls, have long been regarded as an important management control tool (Brody 2010; Cohen and Pfeffer 1986; Merchant 1982; Merchant 1985; Ouchi 1979; Terpstra and Rozell 1993; Widener 2004; Wilk and Capelli 2003). Since firms invest in employee selection in hope of identifying the 'right' individual for a given position, employee selection practices are by definition screening solutions to the adverse selection problem. They are "designed to make it more likely that employees will perform the desired tasks satisfactorily *on their own* because, for example, the employees are experienced, honest, and hard working" (Merchant and Van der Stede 2007, p. 76, emphasis in original) and are often used to gain information regarding qualitative aspects of the selection process, such as how well the individual fits with the culture and values of the organization. Effort and expense invested in employee selection can thus reduce the risk of moral hazard by identifying individuals with goals that are innately aligned with those of the firm.

Despite the importance and potential benefits of employee selection, there is limited empirical research on how firms address the hiring problem (Campbell 2012; Oyer and Schaefer 2011). Even in the management literature, employee selection research traditionally addresses

the problem of applicant ability rather than goal congruence (Sekiguchi and Huber 2011). Certainly, finding people with the right technical and cognitive ability is important. In fact, research shows that cognitive ability tests are a significant predictor of employee performance (Murphy 2012; Ones, Dilchert, and Viswesvaran 2012). Knowing that employers will pay more for an employee with certain skills and high ability, a high ability applicant has incentive to credibly signal their type through education or certifications (Spence 1973). It is then relatively costless to resolve any information asymmetry regarding applicant ability through a basic background check to verify the employment, education, and certifications listed on an application or resume: a simple web search identifies numerous companies that will conduct basic background checks and resume verification for $7.50 - $15 per previous employer, certification, or educational degree listed on a resume.[3]

Many of the more costly commonly used employee selection practices have little value in assessing applicant technical ability, at least not incremental to the information obtained through a basic background check (Huo et al. 2002; Gatewood and Feild 1998). Huo et al. (2002) infer that the major role of employee selection is in alleviating information asymmetry regarding social skills and goal congruence. There is a wide range of commonly used employee selection practices, including in-person interviews, personality tests, and employee referral source.

First, in-person interviews are the most widely used employee selection practice, across all industries and types of jobs. Studies report that between 70% and 95% of firms use in-person interviews for employee selection, despite the fact that interviews are not seen as particularly reliable or valid predictors of performance (Akyeampong 2006; Ekuma 2012; Gatewood and Feild 1998; Graves and Karren 1996; Huo et al. 2002). Prior research extensively examines how

[3] See http://www.studentclearinghouse.org/verifiers/fees.php/ for verification of education and certification, or http://www.hireright.com/express/Background-Check-Services/ for employment verification.

to improve interview effectiveness in predicting performance. For example, research examines the style of interview question (Gatewood and Feild 1998; Janz 1982; Maurer and Fay 1988; Wiesner and Cronshaw 1988), the use of a predetermined set of questions, (Campion, Campion, and Hudson 1994; Gatewood and Feild 1998; Graves and Karren 1996; Maurer and Fay 1988; Searacy, Woods, Gatewood, and Lance 1993), and interviewer training (Ekuma 2012; Gatewood and Feild 1998; Maurer and Fay 1988).

Second, nearly 20% of U.S. firms have applicants take a personality test prior to hire (Shellenbarger 2013), and there is anecdotal evidence that firms experience significant firm level benefits from using external vendors to conduct personality interviews. For example, Stryker Corporation attributes its persistently strong organic growth rate largely to their employee selection practices, relying heavily on results from personality interviews conducted through the Gallup Organization (Suff 2012). In addition, Bristol-Meyers reports a 25% increase in retention rate following implementation of personality tests in the employee selection process (Daniels 2001). These internally validated tests are designed to identify applicants with personality traits similar to those of highly performing (and assumedly goal congruent) current employees.

A third widely used employee selection practice involves the referral source: giving preference in the hiring process to applicants who are referred by current employees. Current employees (who are assumed to be a better fit with the firm than the general population due to their continued employment and willingness to recommend the firm) are more likely to refer individuals who are, like themselves, goal congruent. Consistent with these findings, prior literature shows that employees sourced through employee referrals have better post-hire career outcomes (Autor 2001; Bidwell 2011; Campbell 2012; Montgomery 1991). Kim (2007) models employee quality as including both technical ability and social skills, and shows that high quality

individuals will underinvest in education if firms highly value social skills which can be less expensively signaled through employee referrals. Although prior literature has shown that individuals sourced through employee referrals do tend to have better posthire career outcomes, relying too heavily on internal referrals could lead to nepotism, groupthink and lower performance in the long run (Campbell 2012).

In a recent related study, Campbell (2012) identifies employee selection as an understudied element of management control systems. He examines the use of employee selection to increase goal congruence in a financial services organization, and demonstrates an association between individuals referred by existing employees and the effective use of decision-making authority. Campbell considers a single employee selection device (employee referrals) to indicate alignment of individual goals with the organization. Other referral sources, such as use of headhunters or direct recruitment of employees from other firms, are similarly utilized with the expectation of raising the caliber of new employees.

Kennedy and Widener (2013) find a positive association between employees' beliefs regarding the long-term security and stability of their position with the firm and employees' goal congruence. To the extent that a high investment in the employee selection process signals the firm's commitment to the worker (high selection costs would make the firm less inclined to incur further turnover), effort in the employee selection process should be positively associated with goal congruence, and thus performance.

2.5. Management Control through Performance Pay

Once the right applicant has been identified from the applicant pool, the firm sets the contract and makes an offer to the applicant, including the base pay and any performance pay in the form of bonuses, piece rates, etc. (period 3 from Figure 1). As discussed in section 2.2.2.,

performance pay addresses the risk of moral hazard *ex ante* to the actual hire date by encouraging high ability individuals to self-select into the firm (Banker et al. 2001; Dohmen and Falk 2011; Lazear 1986; Rothschild and Stiglitz 1976; Wilson 1980). In addition, there is extensive literature in both economics and accounting on the use of performance pay to mitigate moral hazard in existing employees, see Bonner and Sprinkle (2002); Dutta (2007); Indjejikian (1999); Ittner and Larcker (1998); Lambert (2001); Murphy (1999); and Prendergast (1999) for literature reviews. Analytical studies show that the effectiveness of performance pay is reduced when performance measures are noisy (Banker and Datar 1989; Feltham and Xie 1994), misaligned with the firm's goals (Feltham and Xie 1994) and insensitive to managerial effort (Antle and Demski 1988; Banker and Datar 1989; Holmstrom 1979).

However, performance pay is a costly solution to information asymmetry in the hiring process for two reasons. First, although performance pay provides an on-going solution to the moral hazard problem, this effect is transitory: the well documented short term positive response to performance pay reverses once the incentives are taken away (Banker et al. 2003; Benabou and Tirole 2003; Gneezy et al. 2011). Therefore, the firm is likely committed to paying the compensation risk premium associated with performance pay not just in the employee's first year (as agreed in the contract), but throughout the employee's entire tenure.[4] Performance pay acts like an annuity of payments, likely increasing over time as the employee rises in the hierarchy and lasting throughout the tenure of the employee at the firm.

Second, performance pay discourages self-selection into the firm based on personal characteristics other than ability. Dohmen and Falk (2011) show that self-selection into jobs that

[4] This makes it difficult to disentangle the *ex post* incentive effects from the *ex ante* self-selection effects of performance pay. Prendergast (1999) note that "studies that allowed the effects of incentives to be separated from worker selection issues suggest that perhaps one-third of the increase in performance arises from attracting better workers" (p. 17).

offer performance pay is driven by risk attitude and gender, as well as ability. Performance pay can thus result in an employee population that is predominantly male and more risk seeking than the general population, which may or may not be beneficial to the firm.

2.6. Hypothesis Development

In this section, I present the mechanism by which more extensive use of employee selection practices affects employee performance. First, I develop a baseline hypothesis linking effort in employee selection and subsequent employee performance. I then pose as an open research question whether employee selection and performance pay tend to be used together or separately. Finally, I hypothesize a negative interaction between effort in employee selection and performance pay in their effects on subsequent employee performance. The theoretical model is illustrated in Figure 2.

2.6.1. The association between the firm's employee selection effort and performance

Prior literature in the management field shows that employee selection practices are a useful control mechanism for identifying goal congruence. Cable and Judge (1997) directly examine interviewers' ability to assess goal congruence by surveying a set of interviewers and applicants through a university career office. Applicant data was collected regarding their personal values, and data regarding organizational values was collected through the interviewers. In addition, interviewers were asked the degree to which each applicant fit with the firm and its current employees. Cable and Judge (1997) then measure the applicant's inherent goal congruence as the correlation between each applicant's personal values and the firm values as identified by the interviewer, and find inherent goal congruence to be significantly and positively associated with the interviewer's perceived goal congruence.

Prior research also shows that goal congruence is positively associated with employee performance. Chatman (1991) examines the initial alignment between the personal values of entry-level auditors and the values and culture of their hiring public accounting firms. This study was unique in that it surveyed auditors as they entered the firm to assess the employee's fit with the firm values and culture, and then tracked the performance of these auditors over the following year. She finds that auditors who are a good fit with the firm at entry adjust more quickly to the new environment, are more satisfied, and stay with the firm longer. Stewardship theory in the management literature "defines situations in which managers are not motivated by individual goals, but rather are stewards whose motives are aligned with the objectives of their principals" (Davis, Schoorman, and Donaldson 1997, p. 21). In this view, goal congruent employees (stewards) are intrinsically motivated to work hard. Indeed, Wasserman (2006) finds that founder CEOs, who create the firm and are thus more likely to identify with the firm and be more goal aligned, accept lower compensation than non-founder CEOs. This is consistent with goal congruent employees requiring less extrinsic rewards, because they are intrinsically motivated to work.

In the accounting literature, empirical work on employee selection is limited. Campbell (2012) identifies employee selection as an understudied element of management control systems. He examines the use of employee selection in a financial services firm after a major shift in competitive strategy to be more customer oriented. Success of this new strategy depended on the decentralization of loan decisions to loan managers, rather than relying on strict action controls. He demonstrates an association between employees referred by existing employees and use of decision-making authority: new employees referred by current loan managers (especially those hired after the strategy change) were more likely to override the traditionally recommended loan

decision, and that these loans were profitable for the firm in the long term.

One limitation of Campbell (2012) is its narrow focus on a single employee selection device (employee referrals) to indicate alignment of employee goals with the firm. Although employee referrals are not an uncommon employee selection device, they are by no means the most widely used, and relying too heavily on employee referrals can lead to nepotism, groupthink and lower performance in the long run (Autor 2001; Bidwell 2011; Campbell 2012; Montgomery 1991).

Other research avoids this limitation by acknowledging that firms often use multiple selection practices simultaneously, examining the firm's effort in the employee selection process (Cohen and Pfeffer 1986; Huo et al. 2002; Rosse, Miller, and Stecher 1994; Terpstra and Rozell 1993; Widener 2004). Terpstra and Rozell (1993) survey the heads of human resource departments from 201 firms to collect data on five employee selection practices. They find a significant positive association between the use of more of these practices and firm performance.

In addition, firm effort in the employee selection process can affect employee attitudes and behavior. Kennedy and Widener (2013) measure goal congruence literally, comparing the employee's goals to those of the firm. They show that personnel controls (belief systems, mentoring and peer pressure) are positively associated with goal congruence, and that this association is fully mediated by the effect of personnel controls on employees' beliefs regarding the long-term security and stability of their position. To the extent that investment in employee selection indicates the firm's commitment to the employee (high selection costs would make the firm less inclined to incur further turnover), effort in the employee selection process should be positively associated with goal congruence, and thus employee performance.

Based on this research, I state my baseline hypothesis as follows:

H1: Higher effort in the employee selection process is positively associated with employee performance.

2.6.2. The association between employee selection effort and the use of performance pay

In addition to employee selection practices, performance pay (in the form of bonuses, piece rates, and other compensation directly linked to individual performance) has been widely acknowledged in the accounting and economics literature to resolve information asymmetry problems by encouraging high ability individuals to self-select into the firm (Banker et al. 2001; Dohmen and Falk 2011; Lazear 1986; Rothschild and Stiglitz 1976; Wilson 1980). However, empirical research has yet to examine if firms tend to use these two systems together, or if they trade off between investment in employee selection and investment in performance pay, as they are both costly solutions to the same control problem.

Performance pay is a costly solution to information asymmetry in the hiring process for two reasons: the performance effect of performance pay reverses once the incentives are taken away, and performance pay discourages self-selection into the firm based on personal characteristics not necessarily related to job performance. Therefore, it would benefit the employer to offer performance pay contracts only when they expect to have the greatest marginal return to those contracts. Firms that are rigorous in their employee selection practices have already identified goal congruent applicants: those who will work hard toward the firm's goals with or without extrinsic motivators such as performance pay. Therefore, the marginal return to performance pay contracts is lower for firms that are rigorous in their employee selection practices.

Recent analytical work in economics and accounting show that investment in employee selection and performance pay are optimally used separately. Akerlof and Kranton (2005) develop an analytical model in which the goal congruent employee identifies with the firm. As

such, she gains utility by working toward the interests of the firm, and loses utility when her actions conflict with the firm goals. Therefore, firms who hire goal congruent employees (as identified in the employee selection process) will have less need for performance pay structures: their employees will exert high-level effort even without extrinsic rewards. Similarly, Heinle et al. (2012) find that in a single task setting, the optimal incentive weights are decreasing in the extent to which the employee identifies with the firm. These arguments would indicate that firms should trade off between investment in employee selection and use of performance pay.

On the other hand, performance pay may be considered as an additional employee selection tool, so firms that invest heavily in employee selection would also use performance pay. The self-selection effect of performance pay systems has been widely acknowledged in the accounting and economics literature (Banker et al. 2001; Dohmen and Falk 2011; Lazear 1986; Rothschild and Stiglitz 1976; Wilson 1980). Indeed, in the same work where Akerlof and Kranton (2005) propose an analytic model where firms trade off between employee selection and performance pay, they suggest that the overwhelming success of a performance pay plan at Lincoln Electric is due to the high goal congruence of its employees.

Therefore, I make a nondirectional hypothesis regarding the association between employee selection and performance pay:

H2: Higher effort in the employee selection process is associated with use of performance pay structures.

2.6.3. Interaction between employee selection practices and performance pay

Finally, if employee selection practices are used to identify *ex ante* goal congruence, they also identify intrinsic motivation. When an employee's own goals are aligned with those of the firm, they will be intrinsically motivated to work hard toward the firm's (a.k.a., their own) goals. Motivation crowding theory examines the interaction between performance pay (extrinsic

rewards) and intrinsic motivation, providing evidence that performance pay has a negative effect on the performance of intrinsically motivated employees, calling this a 'crowding out' effect (Benabou and Tirole 2003; Bonner and Sprinkle 2002; Ellingsen and Johannesson 2008; Gneezy et al. 2011). The crowding out effect can occur through two mechanisms. Performance pay can be viewed as 1) a negative signal regarding the desirability of the job task itself, or 2) as a signal regarding the firm's lack of trust or confidence in the employee.

First, performance pay can affect the employee's intrinsic motivation toward their specific job if the provision of performance pay is viewed as a signal that the job is undesirable. Benabou and Tirole (2003) develop an analytical model of intrinsic and extrinsic rewards. They find that when the firm has private information about the job, performance pay will signal to the employee that the job is particularly onerous, and intrinsic motivation to exert effort will be lost.

Second, performance pay has a crowding out effect on intrinsic motivation in that it affects the employee's perception of the firm itself (Cardinaels and Yin 2013; Christ, Sedatole, and Towry 2012; Ellingsen and Johanesson 2008, Gneezy et al. 2011). A performance pay contract signals a lack of trust by the firm, where the firm assumes an employee will not be productive without extrinsic rewards.[5] While purely self-interested employees are less likely to react negatively to this signal (since the lack of trust was, in fact, warranted), performance pay will hinder motivation of employees that value trust and other social influences. Therefore, to the extent that effort in the employee selection process can identify goal congruent and intrinsically motivated employees, the association between effort in employee selection and performance should be lower when performance pay contracts are used. That is, while employee selection practices are positively associated with employee performance because they allow the firm to

[5] In contrast, Christ et al. 2012 find that relative to penalty contracts, performance pay contracts signal that the firm has more trust in the employee's integrity and competence.

identify and hire intrinsically motivated employees, the association between employee selection and performance should then be weaker in the presence of performance pay contracts.

I therefore examine if use of performance pay interacts with employee selection effort in their effect on future performance, such that the association between employee selection practices and employee performance is weaker in the presence of performance pay.

H3: High effort in the employee selection process and performance pay structures interact negatively in predicting employee performance, such that the positive effect of effort on performance in the employee selection process is lessened when performance pay structures are used.

The three hypotheses are presented in graphical form in Figure 2.

CHAPTER 3: WORKPLACE AND EMPLOYEE SURVEY

I conduct my study using data from the Workplace and Employee Survey (WES), a large scale survey of matched employer-employee information developed and administered by a Canadian federal government agency, Statistics Canada. A multi-level survey structure means that employee-level responses on topics including employee selection practices, job characteristics, pay and benefits, education, promotion, and termination are linked to firm-level data regarding business strategy, competition, firm performance, delegation of decision making authority, and use of technology and innovation. This uniquely allows me to link use of control systems (e.g., employee selection practices and compensation structure) to both employee- and firm-level outcomes, as well as to control for firm-level environmental factors that would affect the control environment. It also alleviates some of the standard concerns in survey-based research regarding common method bias. Although employee level responses are self-reported by a single individual, these data are supplemented with workplace level data, as reported by a different individual.

In addition, the WES has a longitudinal component: the sample of firms is followed 1999-2006 (with new locations added periodically to maintain a representative cross section as firms exit the market). Employees sampled from within these firms were then followed for two years, with a fresh sample of employees drawn every other year. That is, a sample of employees from a given firm was surveyed in 1999, and that same sample was resurveyed in 2000. A new set of employees from that firm were then selected to be surveyed in 2001 and 2002. Workers are only followed for two years due to the cost and difficulty of integrating new companies into the workplace sample as workers change companies over time. The survey was phased out in 2006 with only firm level responses collected in the final year. Thus, the sample of workers drawn for

the 2005 survey was not resurveyed in 2006.

Each year, the WES collected data from approximately 6,200 workplaces and 20,000 employees at those workplaces. The survey sample was selected in two stages. In the first stage, the WES randomly drew a sample of workplaces from the Business Register, a list of all businesses in Canada. Workplaces in Yukon, Nunavut and the Northwest Territories were excluded from the target population, as were workplaces operating in crop or animal production, private households, religious organizations, and public administration. The sample was then stratified by industry, region, and size (based on estimated employment), and each selected business unit was assigned a sampling weight proportional to the population of business units in the stratum. By proportionally weighting the data in all estimation procedures, inferences can be made about the population frame of firms from which the sample was drawn (Sarndal, Swensson, and Wretman 1992). The selected firms then provided Statistics Canada with a full list of employees. In the second stage, a sample of employees was selected from each of these lists. Employees were selected using a probability mechanism, with a maximum of 24 employees per business unit selected. In extremely small business units (only 3-4 employees), all employees were selected. Statistics Canada interviewers then collected the WES data through computer-assisted telephone interviews. As with the workplace component, each employee-level response was assigned a sampling weight equal to the inverse of the original probability of selection.

Annual response rates for the WES were very high (ranging from 82% to 95% at the firm level, and from 83% to 91% at the employee level), since compliance with the WES was legally required by Canada's Statistics Act of 1985.[6] High response rates may also be due to the commitment to respondent confidentiality formalized in the Statistics Act, which only allows

[6] http://laws-lois.justice.gc.ca/eng/acts/S-19/FullText.html

access to survey data to "deemed employees" and expressly prohibits the disclosure of any survey information that could be identifiable at the individual, business or organization level.

It is worthwhile to note some differences between the U.S. labor market more commonly used in empirical research and the Canadian labor market used in this study. First, while most countries (including Canada) require firms to show cause prior to dismissing an employee, employment relations are generally presumed to be "at-will" in the U.S. That is, U.S. firms have the right to terminate an employee at any time, without notice or severance pay, for any reason or for no reason at all.[7] In contrast, Canadian firms are subject to a default assumption of implied contract in every hiring agreement. Canadian firms can only terminate employment without notice or severance pay for 'just cause', requiring documentation of multiple warnings for poor performance or evidence of culpable behavior such as theft, fraud, or sexual harassment. Therefore, Canadian firms face much higher penalties to poor hiring decisions, as it is much more costly to terminate poorly performing employees.

Second, differences in labor law have led to a much more conducive environment to form unions in Canada relative to the U.S. This is reflected in Canada's much higher unionization rate (28.7% in 2011) relative to the U.S. (11.8%).[8] Higher unionization rates also imply a greater cost of poor hiring decisions in Canada, as union law imposes even greater restrictions on terminating employees. For both of these reasons, it is vital for Canadian firms to mitigate the potential for moral hazard in the hiring decision, rather than relying on post-hire controls.

[7] U.S. employment relationships default to an "at-will" status in the absence of a written contract. Montana is the only U.S. state that has enacted legal protection from being terminated without cause after completing an initial probationary period. In addition, 43 states have enacted protection for employees complying with (or refusing to violate) public policy, 37 states have enacted protection for employees subject to an implied contract, and 11 states have enacted a "covenant of good faith" prohibiting terminations motivated by malice or unfairness.

[8] Center for Economic and Policy Research, 2012. http://www.cepr.net/documents/publications/canada-2012-08.pdf

CHAPTER 4: SAMPLE SELECTION, VARIABLE MEASUREMENT AND EMPIRICAL SPECIFICATION

4.1. Sample Selection

In this study, I am interested in differences in future outcomes based on the control systems used as the employee enters the firm (e.g., employee selection practices and the initial performance pay). Therefore, I restrict the available sample from the WES to employees who were surveyed within one year of their initial hire date. This maximizes the probability that the respondent's current pay structure (as of the survey response date) is the same as when they were originally hired. It also minimizes recall bias in the respondent's recollections of steps taken in the employee selection process. In addition, as I am interested in the associations between these control systems and future outcomes, I restrict my sample to employees for whom longitudinal data is available. For instance, I eliminated from the 1999 WES sample individuals who were not resurveyed in 2000. In addition, I restrict my sample to only full-time, regular employees of firms that have been in existence for at least one fiscal year and have at least 25 employees. As a result, my final working sample is composed of 906 individual observations from 746 firms. Table 1 shows the details of the sample selection process for this study.

4.2. Variable measurement

Next, I discuss the measurement of each of the constructs of interest and controls, beginning with the dependent variable: employee performance.

4.2.1. Employee performance

Measuring employee level performance in a multi-firm structure is problematic, since performance as measured within each firm is not comparable across firms. Firms often use multiple, different performance measures across different employees within the same firm, much less maintain consistency across firms. Also, firms commonly measure performance according to

different scales, and may even assign different meanings to levels on the same scale. Instead, I measure employee performance using a proxy more likely to be consistent indicators of performance across firms: the percent increase in base salary from the employee's first and second year responses to the WES.

Visual inspection of data suggests that there are some coding errors in the survey. For instance, extremely large positive or negative changes in annualized salary are sometimes seen, especially when the respondent also indicates a change in their pay frequency (i.e., hourly, weekly, semi-monthly, etc.). Although the potential for these errors exists, it is unlikely that coding errors are associated with the other independent variables in the model, and so would simply add noise and bias against finding results. Nevertheless, I reduce the potential impact of these outliers by winsorizing at the 5% level. In addition, it is possible that variation in the independent variables (employee selection effort and use of performance pay) exists primarily at the firm level, while variation in salary increases is at the individual level. To reduce concerns regarding a mismatch in the unit of analysis, I center this variable by industry mean salary increase ($\%Increase_{t+1}$).[9]

4.2.2. Effort in the employee selection process

I follow Ryan, McFarland, Baron, and Page (1999) and Wilk and Cappelli (2003) by measuring the extent of practices used in the employee selection process ($Selection_t$). The WES includes items regarding a variety of selection practices, including both specific tests and tools used in the selection process and measures of how the employee learned about the job opening. Since my hypotheses rely on selection practices intended to identify goal congruence, I limit this measure to the WES items that could potentially indicate employee type. For example, taking a

[9] It would be ideal to mean center the dependent variable at the firm level rather than the industry level. Data availability precludes this specification, however, as the vast majority (83%) of observations are the only respondent from that firm-year.

pre-hire medical exam is not included in my measure of employee selection effort since it is unlikely to be correlated with goal congruence. I include the following employee selection practices in my employee selection effort construct: in-person interviews, personality tests, referral by family or friend, direct recruitment by the firm, and use of headhunters. $Selection_t$ is then coded as the additive compilation of these five employee selection practices.

4.2.3. Performance pay

WES respondents are asked each year if their pay or benefits are directly affected by the results of their formal performance evaluation. I use this item directly from the WES, with PFP_t coded as 1 if the respondent indicates use of performance based pay in their first survey response. Pay structure is not necessarily fixed over the employee's tenure at the firm, so there is the chance that performance pay reported in the first survey is was not included in the initial employment contract. I mitigate this risk to the best of my ability by limiting the sample selection to only employees first surveyed within their first year at the firm.

4.2.4. Controls

Although general cognitive ability is not theoretically associated with goal congruence, there is considerable research linking ability to overall performance. High ability employees may also self-select into firms that use performance pay, making it important to disentangle employee selection tools that identify general ability from tools that identify goal congruence (as developed in my hypotheses). I control for cognitive ability in two ways. First, I control for the use of employee selection tools to identify skills and ability ($Abil\_test_t$). The WES asks respondents if they were required to take tests on general knowledge or literacy, tests for specific skills (e.g., typing or manual dexterity tests), or tests on job-related knowledge. $Abil\_test_t$ is then coded as 1 if any of these ability tools are used, and 0 otherwise.

Second, an employee's level of education has long been acknowledged as a signal of ability (Spence 1974). Therefore, I control for the extent to which the employee is overeducated for the position. The WES collects data on the minimum education requirements for the respondent's position as well as the respondent's current education level. I scale these responses from 0 (no requirements/education) to 9 (doctoral degree required/attained). I then code $Education_t$ as the difference between respondent's education level and the minimum education required for the position. Thus, $Education_t$ is positive when the employee is more highly educated than technically necessary for the position.

Next, it is also important to control for the employee's job level when hired, since employees hired in at lower levels of the firm may be expected to receive larger percentage salary increases and promotions in their early years with the firm. I therefore control for the employee's years of full-time work experience (Yrs_exp_t). In addition, the WES provides information on the employee's job category (i.e., management, professional, technical trades, marketing or sales, clerical or administration, and production employees), although the respondents' specific job titles are not available. Within each job category, employees hired at a low initial salary are likely in entry level positions with the firm. Therefore, I also calculate and control for the employee's first year salary percentile within their job category ($Sal\%ile_t$).

Performance pay is also more effective in jobs with easily measured outputs. Work in certain job categories, like sales and production, are likely to have more easily measured outputs, so I include a set of indicators for the different job categories, with the production job category taken as the base case ($JobCategory_t$). Similarly, firm strategy may be associated with greater reliance on specific control system, so I include a firm-level control for the overall strategy of the firm. A factor analysis of fifteen business strategy questions from the firm level survey identified

three types of firm strategy. Based on these results, I categorize each firm as a differentiator ($Differentiator_t$), cost leader ($Cost_t$), or quality leader ($Quality_t$). In addition, I control for $Firm\_size_t$ (proxied by the number of employees at the location) since larger firms may have the additional resources necessary to manage use of multiple employee selection practices.

Finally, I control for the respondent's age (Age_t), gender ($Gender_t$), and ethnicity ($Ethnicity_t$), as well as the survey year.[10] These attributes are not easily manipulated by the employee, but they still may be taken as a signal of employee quality if they affect the employer's perception of the employee quality probability distribution (Spence 1973). That is, an employer may believe that an employee of a given age is more or less likely to be productive. The employer will then structure the compensation contract according to their beliefs.

4.3. Empirical Specification

The WES is based on a stratified sample design, with employers selected randomly from strata identified by region, industry and firm size, and employees selected randomly from each sampled firm. Therefore, the sample is not self representing, and survey weights should be used so that estimates for both descriptive statistics and regression coefficients will generalize to the target population (Thompson 2012). Since my unit of analysis is the employee, I use employee level weights in my empirical analyses. This weight (provided by Statistics Canada) represents the inverse of the probability of the unit being selected given the sampling design, adjusted for workplace and employee nonresponse.

In addition, the WES is collected based on samples coming from a finite population (i.e., the finite population of Canadian employees, excluding (a) locations in the Yukon, Nunavut and Northwest Territories and (b) farms, hunting, private households, religious organizations, and

[10] Confidentiality requirements preclude the reporting of descriptive statistics and coefficients for the job category, firm nonprofit status, and survey year indicators.

public administration). In these types of samples, one should account for the stratified sampling design to avoid underestimation of variance (Thompson 2012). Bootstrapping techniques can be used to compute survey design consistent variances. Bootstrapping is based on resampling, with a simple random sample of as many units as in the working sample is selected (with replacement) from the working sample, and coefficients are estimated for this new sample. This procedure is replicated 100 times, and the variance of the coefficient is then computed as the variability among these resampled coefficients.

I use STATA 13 software to conduct a structural equations-based path analysis of the hypothesized theoretical model (as depicted in Figure 2). Structural equations modeling (SEM) is an appropriate tool for this model, because it allows one or more variables act as both independent and dependent variables. In my hypothesized structural model, performance pay has this characteristic: it acts as an independent variable in predicting employee performance and as a dependent variable (with employee selection effort as an independent variable).[11] STATA 13 supports the use of SEM (as well as more conventional regression models like OLS and logistic regression) when using complex survey data sets like the WES. This allows me to use employee level weights to obtain consistent coefficient estimates, and to use bootstrapping techniques to obtain more accurate variance estimates.

[11] SEM offers the additional complexity of creating a measurement model, in which relations between unobservable, latent variables and multiple observable indicators are measured. In this study, the variables of interest each have a single indicator. Therefore, I treat the items as manifest variables and estimate only the structural model component of SEM.

CHAPTER 5: EMPIRICAL RESULTS

From the employee level data collected through the WES, I conduct my analysis on a working sample of 906 full-time, regular employees hired within one year of the initial survey date, from 746 business units that have been in existence for at least one fiscal year and have at least 25 employees. Descriptive statistics and correlations are presented in Tables 3 and 4, respectively.[12] Employees reported an average salary increase of 4.2%, and 19.4% of employees received a performance-based promotion within their first two years of hire. Compensation was directly linked to evaluated performance for slightly less than half (46%) of employees in their first year at the firm, and firms used on average 1.41 different employee selection practices to reveal goal congruence in the hiring process.

I present the SEM results using salary increases to proxy for employee performance in Table 5. The goodness of fit is acceptable, with a standardized root mean squared residual of 0.03, which is smaller than the recommended 0.10 (Kline 2005). Using salary increases to proxy for employee performance, I hypothesize and find a positive association between use of employee selection effort and performance (Table 5, Model (1)), in support of H1.

In my second hypothesis, I predict a nondirectional association between employee selection effort and use of performance pay. Results are shown in Model (2) of Table 5. I find a *positive* association between employee selection effort and use of performance pay. This indicates that firms that employ more extensive use of employee selection practices also tend to use performance pay in the initial contract, using the two control systems together to resolve information asymmetry in the hiring process. This could be consistent with firms considering performance pay as an additional employee selection tool, using employee selection and

[12] Minimum and maximum values can result in a respondent's identity being revealed, so Statistics Canada's confidentiality requirements prohibit reporting these values.

performance pay to resolve different types of information asymmetry, so that firms benefit from using both control systems where the potential for moral hazard in employees is high. In addition, this is consistent with firms implementing these management control practices as a package rather than as a system, ignoring the lack of complementarity in implementing the two systems together (Grabner and Moers 2013).

Hypothesis 3 predicts a negative interaction between employee selection effort and performance pay on employee performance. The SEM results for H3 using $\%Increase_{t+1}$ to proxy for employee performance are presented in Model (1) of Table 5. In support of H3, the model shows a significant and negative interaction between employee selection effort and performance pay ($p<0.01$). Specifically, at low (25^{th} percentile) level usage of employee selection devices, use of a performance pay contract is associated with a 4.68% salary increase while at high (75^{th} percentile) level usage of employee selection devices use of a performance pay contract is associated with only a 1.25% salary increase (Table 5, Model (1)). This is consistent with the extrinsic motivation provided through performance pay crowding out the intrinsic motivational preferences of an employee whose personal goals are already aligned with those of the firm at the hiring decision.

5.1. Sensitivity analyses and alternative explanations of results

I present sensitivity tests of my analysis in Tables 6 and 7. I begin by checking if the results reported above are robust to an alternative specification for employee performance: an indicator for whether the respondent has received a performance-based promotion ($Promo_{t+1}$). The WES asks employee level respondents each year if they received a promotion in the year leading up to the survey date and if so, if past performance is a primary reason for this promotion. $Promo_{t+1}$ is then coded as 1 when the employee has received a performance based

promotion within their first two years with the firm, and 0 otherwise.

I present the SEM results using performance-based promotion to proxy for employee performance in Table 6. Contrary to H1 and in contrast to the primary results in Table 5, the association between employee selection effort and employee performance is *negative* when performance is measured with the indicator for a performance based promotion (Table 6, Model (1)). That is, the more tools a firm used in the employee selection process, the less likely that employee is to receive a performance-based promotion within their first two years with the firm.

One possible explanation of this somewhat counterintuitive result relates to the firm's desire to hide employee performance from the external labor market. Waldman (1984) notes that information asymmetry regarding an employee's type is revealed to their current employer, as they observe the employee's effort (or outcomes therefrom). Although the employee's type is still hidden from other potential employers, job title is known to all parties. Internal promotion can then be taken as a signal of employee quality, making the employee more attractive to other employers and more difficult for the current employer to retain. Firms may then prefer to reward high quality employees with larger salary increases, which are less visible to the external labor market, and limit the use of internal promotion.

Results for H2 and H3 are consistent with the primary analysis. I find a positive association between employee selection effort and use of performance pay (Table 6, Model (2)) and a negative interaction between employee selection effort and use of performance pay in their effects on performance-based promotions (Table 6, Model (1)). Specifically, at mean level effort in the employee selection process, use of a performance pay contract is associated with 3.4% lower likelihood of receiving a performance based promotion.

As another (third) specification of the dependent variable, the management literature has

identified a strong association between job satisfaction and employee performance, so I examine the effects of employee selection effort and use of performance pay on employee job satisfaction. Results for all three hypotheses (untabulated) are consistent with the primary analysis.

Next, I verify that the results in the primary analysis are robust to the use of more simplistic empirical specifications. Since my primary proxy for employee performance (increases in salary) is continuous, I model the associations between salary increases, effort in employee selection, and incentive structure using linear regression and present the results in Table 7. Unfortunately, this simplistic model cannot accommodate the effects of a mediator, as performance pay is hypothesized in H2 and in the graphical presentation (Figure 2). Therefore, I limit my discussion of these analyses to H1 and H3.

Model (1) of Table 7 presents the direct effects of performance pay and employee selection effort on employee performance, without considering an interaction (as hypothesized in H3). Results are directionally consistent with the SEM analysis in regards to H1. Employee selection effort is positively associated with salary increases as a proxy for employee performance ($p<0.01$). Use of one additional employee selection tool (in-person interviews, aptitude or personality interviews, referral by family or friend, direct recruitment by the firm, or use of headhunters) is associated with a 2.0% larger salary increase after the first year of employment. This provides further support of H1.

Having demonstrated that the baseline model delivers results consistent with the path analysis model, I include the interactive effect of employee selection and incentive structure in Model (2) of Table 7. Inclusion of the interaction does not qualitatively change the inferences from the baseline model. In support of H3, the linear regression model shows a significant and negative interaction between employee selection and performance pay ($p<0.01$, both

specifications). Specifically, at low level usage (25^{th} percentile) of employee selection devices, use of a performance pay contract is associated with 5.41% salary increase, while at high level usage (75^{th} percentile) of employee selection devices use of a performance pay contract is associated with a 2.65% increase in salary (Table 7, Model (2)). This is consistent with the extrinsic motivation provided through performance pay crowding out the intrinsic motivational preferences of an employee whose goals are already aligned with those of the firm at the hiring decision.

5.2. Alternative explanations

I consider firm strategy as an alternative explanation for these results. Firms that sustain a competitive advantage by producing high quality, differentiated goods or services tend to operate in more fluid environments, where employees have more decision making authority and less measurable performance. In these types of firms, employee selection and/or performance pay may be more valuable to the firm. Therefore, I include an interaction between firm strategy and performance pay in Model (3) of Tables 7, and an interaction between firm strategy and employee selection effort in Model (4) of Tables 7. Results for H1 and H3 are not qualitatively different with the inclusion of these interactions.

CHAPTER 6: CONCLUSION

In this study, I examine the use and effectiveness of management control systems (employee selection and performance pay) in addressing the information asymmetry problem regarding an individual's goal congruence *ex ante* to the hire date. I find results generally consistent with my predictions. Using an employee's salary increase in the first year of employment to proxy for performance, I find that more extensive use of employee selection practices intended to identify goal congruence is associated with salary increases in the second year of employment. Further, I find the association between employee selection practices and future employee performance to be weaker in firms that use performance pay in the initial employment contract. This is consistent with motivation crowding theory, which predicts that explicit incentives crowd out the intrinsic motivational effects of *ex ante* goal congruence. I also find a *positive* association between more extensive use of employee selection practices and performance pay contracts. This curious result suggests that firms use employee selection practices and performance pay together, despite the fact that my results also show that their combined use reduces the performance effect of each separate control.

This study contributes to the broader literature on employee selection and performance pay in several ways. First, performance pay has been widely examined and acknowledged as a screening device to reduce information asymmetry in the hiring process. I contribute to that literature by providing empirical evidence regarding a drawback to the screening function of performance pay: an adverse motivational effect on internally motivated employees. I provide archival evidence supporting motivation crowding theory, which until now (to the best of my knowledge) has only been tested experimentally.

Second, although there is extensive research on employee selection and on performance pay, this is the first identified study on how the two systems work together. I find that employee

selection and performance pay are interdependent (the partial effect of each is reduced in the presence of the other). However, firms do not seem to take these interdependencies into account in their management control design choices: employee selection practices are positively associated with use of performance pay. My findings are consistent with firms adopting these control systems as a 'package', implementing them separately without regard for the costly interdependence between employee selection and performance pay, rather than as a 'system', taking these interdependencies into account in their design choices (Grabner and Moers 2013).

Third, the extant literature on mitigating information asymmetry in the hiring process tends to focus on either a screening device, e.g., performance pay (Banker et al. 2001; Banker et al. 2003; Bonner and Sprinkle 2002; Lazear 1986; Lazear and Shaw 2007; Milgrom and Roberts 1992; Prendergast 1999), interviews (Akyeampong 2006; Ekuma 2012; Gatewood and Feild 1998; Graves and Karren 1996; Huo et al. 2002), or referral source (Campbell 2012); or on a signaling device, e.g. education. I extend this literature by acknowledging that firms often use signaling devices and screening devices concurrently in practice. I also identify additional screening practices that can uncover goal congruence (personality tests, direct recruitment by the firm, and use of headhunters) and examine the combined use of these systems.

This study also contributes specifically to the literature on management control. First, management control research generally assumes that employees are not goal congruent when they join the firm, and concentrates on ways to mitigate moral hazard *ex post* of the hiring decision. However, individuals vary in their level of goal congruence, even before they are hired (Akerlof and Kranton 2005; Heinle et al. 2012). I provide archival evidence that employee selection practices reducing information asymmetry regarding goal congruence in the hiring process, and thus reduce the risk of moral hazard. Second, I extend the literature on the adoption

and use of control systems. I examine the potential tradeoffs between investing in employee selection practices and investing in performance pay, and I examine an interaction between one-time *ex ante* controls (employee selection practices) and a control that likely persists throughout the tenure of the employee (performance pay). Finally, empirical evidence supporting the use of employee selection practices as a control mechanism to align incentives is relatively sparse and focuses on practices in a single firm (Campbell 2012). In contrast, I use a large database across industries to address this question, which allows me to examine the robustness of these results across different firm-level environmental conditions.

CHAPTER 7: LIMITATIONS

This study is subject to certain limitations. First, the WES only captures pay structure as of the survey date (rather than the hire date). This may be a problem, as the intent of this study is to examine control systems used to mitigate information asymmetry in the hiring process. To the extent that the pay structure as of the survey date differs from the pay structure in the initial contract, I may instead be measuring the well documented post-hire use of performance pay to reduce moral hazard. In this case, the observed negative interaction is still interesting: an individual's effort is bounded, so if employee selection practices result in hiring only goal congruent individuals who are predisposed to work hard (exert high effort), adding performance pay post-hire should have no effect on the individual's performance. In any case, I mitigate this risk to the best of my ability by restricting the working sample to only respondents surveyed within one year of the initial hire.

Second, the data items in the WES do not allow me to directly measure goal congruence prior to (or following) hire, so I depend on prior literature to infer that the intent of employee selection practices is to determine an individual's innate goal congruence (and so, the risk of post-hire moral hazard) in the hiring process. In future versions of this study, I will validate the intent of employee selection practices to reveal applicant goal congruence by determining the correlations between employee selection effort and the likelihood of a respondent remaining in the survey sample through the second year. If employee selection effort is correlated with goal congruence, I would expect to see a positive association between selection effort and survival in the sample.

Third, direct performance measures are not available in the WES, so there may be construct validity concerns with the identified proxies for employee performance. I measure employee performance using three proxies likely to be consistent indicators of performance

across firms: the percent increase in base salary from the employee's first and second year response to the WES, an indicator for whether the respondent has received a performance-based promotion, and the respondent's reported level of satisfaction with their job.

Finally, it should be noted that employee selection practices and performance pay are often implemented prior to an employee's hire date to mitigate both adverse selection and the risk of moral hazard by identifying and promoting contract acceptance of high quality individuals. Data limitations make it impossible for me to draw any conclusions regarding which control problem (adverse selection or moral hazard) these control systems are intended to address. Indeed, Hagerty and Siegel (1988) show analytically that a contract written to address the moral hazard problem is indistinguishable from one intended to address adverse selection, suggesting that this distinction could only be identified experimentally. I leave this distinction to future research.

There is substantial opportunity for further research in the use of employee selection as a control system. It would be interesting to apply contingency theory to this setting, as the effects of performance pay and employee selection may be sensitive to firm environmental issues. In this study, I control for the firm's size, age, industry, and strategy, but there are other factors, such as the firm's competitive climate, that have not yet been examined. In particular, the relation between employee selection effort and firm-level delegation of decision making authority would be an interesting topic.

Also, goal congruence is not a stable trait in an individual, leaving it an empirical question as to whether further socialization processes post-hire affect the significance or direction of my results. The results of this study are consistent with a negative effect of performance pay on employee performance through the removal of an employee's intrinsic

motivation. It is possible that socialization processes post-hire can reaffirm the employee's goal congruence and intrinsic motivation, lessening the unintended consequence of performance pay.

APPENDICES

APPENDIX A

Figures

Figure 1: Timeline of the hiring process, with the associated control problems and control systems

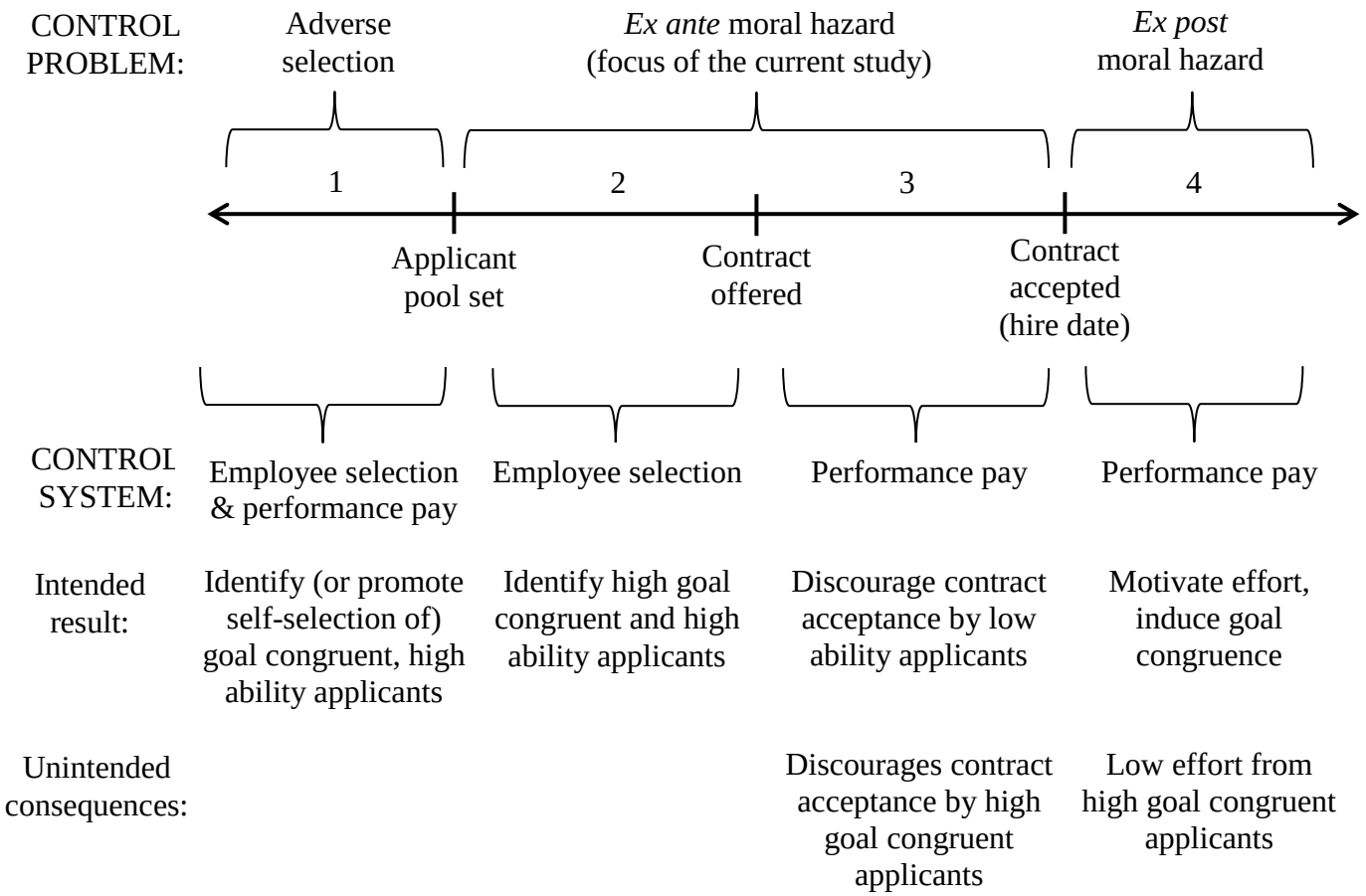
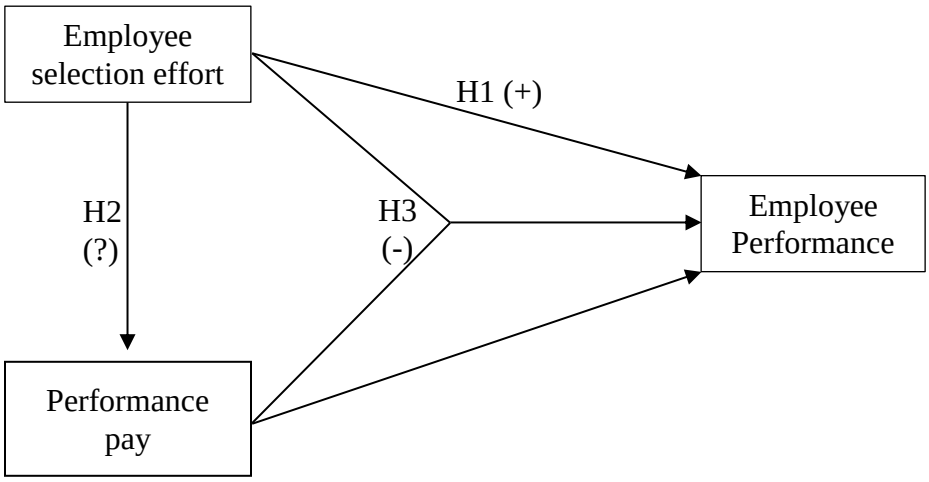


Figure 2: Theoretical model for the effects of employee selection and performance pay on employee performance



APPENDIX B

Tables

Table 1: Survey sample selection

	1999	*2001*	*2003*	*Total*
Employee-level survey responses	23,210	19,450	20,382	63,042
less part-time employees	6,285	6,563	6,452	19,300
less temporary/contract employees	889	644	653	2,186
less employees with more than one year tenure	15,020	11,575	12,625	39,220
less business units with <25 employees	388	233	256	877
less no second year response	210	187	156	553
Final sample size	418	248	240	906

Table 2: Variable definitions

Variable	*Description*	*Scale*
$\%Increase_{t+1}$	Percent increase in respondent base salary between the first and second survey.	
$Promo_{t+1}$	WES item: Which of the following factors were important in earning that promotion: Past performance evaluations (only asked if respondent indicates Yes to the item, Have you ever been promoted while working for this employer?)	0-1
$Interview_t$	WES item: When you were first hired, were you required to take a personal interview?	0-1
$Personality_t$	WES item: When you were first hired, were you required to take aptitude or other personality testing	0-1
$Referral_t$	WES item: When you were first hired how did you learn about the job opening: Family or friend?	0-1
$Direct_t$	WES item: When you were first hired how did you learn about the job opening: Directly recruited by employer?	0-1
$Head_t$	WES item: When you were first hired how did you learn about the job opening: Recruitment agency (headhunter)?	0-1
$Selection_t$	Sum of $Interview_t, Aptitude_t, Referral_t, Direct_t,$ and $Head_t$	0-5
PFP_t	WES item: Do the results of your job evaluation directly affect your level of pay or benefits?	0-1
$Literacy_t$	WES item: When you were first hired, were you required to take aptitude or other personality testing	0-1
$Skills_t$	WES item: When you were first hired, were you required to take aptitude or other personality testing	0-1
$JobKnow_t$	WES item: When you were first hired, were you required to take aptitude or other personality testing	0-1
$Abil\_test_t$	Coded as 1 if $Literacy_t, Skills_t$, or $JobKnow_t = 1$, 0 otherwise	0-1
$Education_t$	Coded as the difference between the respondent's education level and the minimum education level required for the position, scaled from 0 (no education /requirements) to 9 (doctoral degree attained/required).	-9-9
Yrs_exp_t	WES item: Considering all jobs you have held, how many years of full-time working experience do you have?	
$Sal\%ile_t$	Salary percentile of the respondent within their job category (i.e., management, professional, technical trades, marketing or sales, clerical or administration, or production)	
$Differentiator_t$	Factor score variable based on 15 firm level strategy survey items	
$Cost_t$	Factor score variable based on 15 firm level strategy survey items	
$Firm\_size_t$	WES firm level: number of employees at the location.	
Age_t	Age of respondent as of survey date	
$Gender_t$	Gender of survey respondent, 1 = Male	0-1
$Ethnicity_t$	Coded as 0 for Caucasian, 1 otherwise	0-1
$JobCategory_t$	Categorical variables for jobs classified as *Manager*, *Professional*, *Technical/trades*, or *Clerical*, with *Production* as the base case.	0-1
$Nonprofit_t$	Coded as 1 for nonprofit firms, 0 otherwise	0-1
SurveyYr	Categorical variables for the primary survey year	0-1

Table 3: Descriptive statistics

Variable	*Mean*	*sd*	*p25*	*p50*	*p75*
$\%Increase_{t+1}$	4.2%	0.25	-3.8%	3.1%	10.8%
$Promo_{t+1}$	19.4%	0.4	0	0	0
$Selection_t$	1.41	0.73	1	1	2
PFP_t	0.46	0.5	0	0	1
$Abil\_test_t$	0.14	0.35	0	0	0
$Education_t$	-0.27	2.5	-1	0	1
Yrs_exp_t	12.2	9.24	4	9	18
$Sal\%ile_t$	46.8	27.4	24.7	46.6	70.4
Job_sat_t	4.28	0.82	4	4	5
Age_t	34	10.25	26	32	40
$Gender_t$	0.52	0.5	0	1	1
$Ethnicity_t$	0.17	0.38	0	0	0
$Firm\_size_t$	306	509	42	100	257
$Differentiator_t$	0.32	0.47	0	0	1
$Cost_t$	0.11	0.31	0	0	0
$Union_t$	0.14	0.35	0	0	0
Mfg_t	0.51	0.50	0	1	1
$Service_t$	0.42	0.49	0	0	1
Survey_1999	0.36	0.48	0	0	1
Survey_2001	0.31	0.46	0	0	1
Survey_2003	0.33	0.47	0	0	1

N = 906 for all variables. Variables are as described in Table 2.

Table 4: Pearson correlation coefficients

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1)	$\%Increase_{t+1}$																	
(2)	$Promo_{t+1}$	0.11*																
(3)	$Selection_t$	0.06	-0.04															
(4)	PFP_t	0.10*	0.05	0.13*														
(5)	$Abil\_test_t$	0.07*	-0.04	0.10*	0.04													
(6)	$Education_t$	0.02	0.14*	0.11*	0.16*	0.04												
(7)	Yrs_exp_t	0.09*	-0.04	-0.05	0.09*	-0.01	-0.01											
(8)	$Sal\%ile_t$	0.04	-0.01	0.09*	0.14*	0.05	0.11*	0.23*										
(9)	Job_sat_t	0.12*	0.02	0.08*	0.11*	-0.04	-0.08*	0.05	0.06									
(10)	Age_t	0.05	-0.04	-0.07*	0.07*	0.00	-0.06	0.85*	0.28*	-0.03								
(11)	$Gender_t$	0.09*	-0.01	-0.04	-0.13*	0.02	-0.08*	0.05	0.22*	-0.08*	0.11*							
(12)	$Ethnicity_t$	0.01	-0.04	0.02	0.06	0.03	0.01	-0.03	0.04	-0.21*	0.10*	0.08*						
(13)	$Firm\_size_t$	0.04	-0.04	0.19*	-0.01	0.00	0.00	-0.13*	0.11*	0.09*	-0.06	-0.08*	-0.12*					
(14)	$Differentiator_t$	0.00	0.04	0.10*	0.17*	-0.00	-0.03	0.04	0.06	0.08*	0.06	0.02	-0.02	0.20*				
(15)	$Cost_t$	0.03	0.08*	0.01	0.02	-0.09*	-0.07*	-0.05	-0.02	-0.04	-0.07*	0.03	0.06	-0.05	-0.13*			
(16)	$Union_t$	-0.05	-0.07*	0.06	-0.18*	0.07*	-0.01	-0.03	0.07*	-0.04	-0.01	0.01	-0.08*	0.26*	0.10*	0.01		
(17)	Mfg_t	0.05	0.06	-0.05	-0.02	-0.05	-0.12*	-0.07*	0.01	0.05	-0.05	0.16*	0.10*	-0.12*	-0.09*	0.03	-0.12*	
(18)	$Service_t$	-0.10*	-0.07*	0.00	0.02	0.03	0.08*	0.04	-0.06	-0.07*	0.03	-0.16*	-0.11*	0.14*	0.12*	-0.02	0.14*	-0.87*

* represents significance at the $p < 0.05$ level.

Table 5: SEM model using salary increase as a proxy for employee performance

		Prediction	(1) DV = $\%Increase_{t+1}$	Prediction	(2) DV = PFP_t
(1)	$Selection_t$	H1 (+)	2.17***	H2 (-)	3.55***
			(0.6)		(0.55)
(2)	PFP_t		8.11***		
			(1.07)		
(1)*(2)	$PFP*Selection_t$	H3 (-)	-3.43***		
			(0.81)		
Controls	$Abil\_test_t$		5.00***		10.73***
			(0.42)		(1.06)
	$Education_t$		0.46***		2.44***
			(0.06)		(0.17)
	Yrs_exp_t		0.37***		0.05
			(0.03)		(0.08)
	$Sal\%ile_t$		-0.05***		0.19***
			(0.01)		(0.02)
	Job_sat_t		3.72***		4.91***
			(0.19)		(0.38)
	Age_t		-0.19***		0.08
			(0.02)		(0.07)
	$Gender_t$		6.22***		-21.34***
			(0.45)		(0.9)
	$Ethnicity_t$		1.66***		6.43***
			(0.35)		(1.08)
	$Firm\_size_t$		0.00***		0***
			(0.00)		(0)
	$Differentiator_t$		-2.45***		15.07***
			(0.31)		(0.93)
	$Cost_t$		2.86***		5.35***
			(0.48)		(1.38)
	$Union_t$		-2.63***		-21.53***
			(0.38)		(1.23)
	Mfg_t		-5.84***		-4.64***
			(0.99)		(1.61)
	$Service_t$		-14.43***		2.6
			(1.1)		(1.61)
	$JobCategory_t$		Y		Y
	$Nonprofit_t$		Y		Y
	SurveyYr		Y		Y
	Observations		906		906
	R-squared		0.18		0.24

Note: All variables are defined as in Table 2. Standard errors were estimated with a bootstrapping procedure using 100 iterations, and are presented in parentheses below the coefficient estimates. ***, **, * represent p<0.01, p<0.05, p<0.1 respectively.

Table 6: SEM model using promotion as a proxy for employee performance

		Prediction	(1) DV = $Promo_{t+1}$	Prediction	(2) DV = PFP_t
(1)	$Selection_t$	H1 (+)	-1.83***	H2 (-)	3.55***
			(0.67)		(0.55)
(2)	PFP_t		5.73***		
			(1.39)		
(1)*(2)	$PFP*Selection_t$	H3 (-)	-3.82***		
			(0.85)		
Controls	$Abil\_test_t$		-3.12***		10.73***
			(0.90)		(1.06)
	$Education_t$		3.15***		2.44***
			(0.15)		(0.17)
	Yrs_exp_t		-0.59***		0.05
			(0.09)		(0.08)
	$Sal\%ile_t$		-0.04**		0.19***
			(0.02)		(0.02)
	Job_sat_t		1.89***		4.91***
			(0.36)		(0.38)
	Age_t		0.37***		0.08
			(0.07)		(0.07)
	$Gender_t$		0.00		-21.34***
			(0.73)		(0.90)
	$Ethnicity_t$		-7.04***		6.43***
			(0.77)		(1.08)
	$Firm\_size_t$		0.00*		0.00***
			(0.00)		(0.00)
	$Differentiator_t$		6.81***		15.07***
			(0.82)		(0.93)
	$Cost_t$		13.60***		5.35***
			(1.20)		(1.38)
	$Union_t$		-5.16***		-21.53***
			(0.90)		(1.23)
	Mfg_t		-1.15		-4.64***
			(1.02)		(1.61)
	$Service_t$		-5.72***		2.60
			(0.92)		(1.61)
	$JobCategory_t$		Y		Y
	$Nonprofit_t$		Y		Y
	SurveyYr		Y		Y
	Observations		906		906
	R-squared		0.18		0.24

Note: All variables are defined as in Table 2. Standard errors were estimated with a bootstrapping procedure using 100 iterations, and are presented in parentheses below the coefficient estimates. ***, **, * represent p<0.01, p<0.05, p<0.1 respectively.

Table 7: OLS Models and sensitivity tests

	(1)	(2)	(3)	(4)
$Selection_t$	1.68***	2.72***	0.03***	1.79***
	(10.52)	(10.10)	(10.17)	(5.87)
PFP_t	4.42***	8.17***	0.08***	9.07***
	(17.88)	(14.05)	(13.77)	(15.22)
$PFP*Selection_t$		-2.76***	-0.03***	-3.25***
		(-6.89)	(-6.96)	(-8.08)
$Abil\_test_t$	4.26***	4.45***	0.04***	4.44***
	(14.67)	(14.83)	(15.10)	(14.76)
$Education_t$	0.45***	0.44***	0.42***	0.45***
	(10.61)	(10.20)	(9.27)	(10.53)
Yrs_exp_t	0.30***	0.31***	0.31***	0.34***
	(13.74)	(13.98)	(14.15)	(15.59)
$Sal\%ile_t$	-0.06***	-0.05***	-0.05***	-0.05***
	(-10.29)	(-9.73)	(-9.70)	(-10.01)
Job_sat_t	3.55***	3.38***	3.39***	3.33***
	(25.95)	(23.88)	(23.77)	(23.65)
Age_t	-0.07***	-0.08***	-0.07***	-0.10***
	(-4.35)	(-4.39)	(-4.25)	(-6.08)
$Gender_t$	3.25***	3.35***	3.30***	3.71***
	(12.11)	(12.32)	(12.01)	(14.42)
$Ethnicity_t$	2.17***	2.24***	2.04***	1.92***
	(8.42)	(8.59)	(7.34)	(7.44)
$Firm\_size_t$	0.00***	0.00***	0.00***	0.00***
	(3.78)	(3.87)	(3.43)	(3.55)
$Differentiator_t$	-0.17	-0.29	-1.13***	-3.47***
	(-0.71)	(-1.15)	(-2.90)	(-5.53)
$Cost_t$	-0.36	-0.49	-0.62	-6.32***
	(-0.89)	(-1.19)	(-1.11)	(-5.91)
$Union_t$	-1.50***	-1.61***	-1.64***	-1.97***
	(-4.90)	(-5.22)	(-5.61)	(-6.86)
Mfg_t	-8.08***	-7.76***	-7.79***	-7.67***
	(-18.10)	(-18.83)	(-18.33)	(-17.94)
$Service_t$	-7.90***	-7.69***	-7.77***	-7.72***
	(-17.37)	(-17.81)	(-17.55)	(-17.27)
$Diff*PFP_t$			1.70***	
			(3.07)	
$Cost*PFP_t$			0.38	
			(0.37)	
$Diff*Selection_t$				2.38***
				(6.30)
$Cost* Selection_t$				4.36***
				(5.82)
Constant	37.91***	36.85***	36.61***	38.61***
	(25.81)	(24.89)	(24.98)	(27.25)
Observations	906	906	906	906
R-squared	0.209	0.212	0.213	0.216

Models are linear regressions using $\%Increase_{t+1}$ as the dependent variable. Variables are defined in Table 2. Z-statistics presented in parentheses. ***, **, * represent p<0.01, p<0.05, p<0.1 respectively. Controls for $JobCategory_t$, $Nonprofit_t$, $SurveyYr$ are included in each model.

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