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Markets, Networks And Internal Mobility: The Allocation Of Human Resources Within Contemporary Organizations

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Abstract
Despite the fact that more than half of all jobs are filled internally, we know surprisingly little about the organizational process used to facilitate internal mobility. This dissertation addresses this gap by examining the different ways by which current employees are allocated to new jobs within organizations. Using personnel records and job application data from a large services organization, I examine how posting and sponsorship â?? the two mostly commonly used internal hiring processes â?? shape outcomes of importance to firms and workers. Posting is a formal, market-oriented process in which a manager posts a job and interested employees apply. Sponsorship is an informal, relationship-oriented process in which a manager fills a job with a candidate known through a personal connection. In the first study, I examine how posting and sponsorship shape value creation and capture, arguing that while posting will generate higher quality of internal hires by helping managers overcome challenges associated with identifying and evaluating internal candidates, the competitive nature of the process will lead workers to negotiate for higher salaries, limiting the value a firm is able to capture through improved decision-making. Consistent with these arguments, I find that posting results in better hires but at a higher cost, highlighting important tradeoffs associated with allocating human capital formally though markets or informally through managerial networks. In the second study, I examine how posting and sponsorship shape the organizational careers of women, arguing that posting has the potential to reduce gender inequalities in advancement and pay by overcoming structural barriers imposed by job segregation and minimizing gender differences in negotiating behaviors. I also argue, however, that the posting process is gendered in such a way as to discourage women from applying for posted jobs. In finding empirical support for these arguments, this study highlights how the ability of organizational processes to remediate gender inequalities depends on the extent to which they account for both gender differences in structural constraints and gender differences in preferences and behaviors. Packaged together, these studies provide a more complete understanding of the mechanisms facilitating worker mobility in contemporary labor markets.

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MARKETS, NETWORKS AND INTERNAL MOBILITY: THE ALLOCATION OF HUMAN RESOURCES WITHIN CONTEMPORARY ORGANIZATIONS

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ABSTRACT

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Despite the fact that more than half of all jobs are filled internally, we know surprisingly little about the organizational process used to facilitate internal mobility. This dissertation addresses this gap by examining the different ways by which current employees are allocated to new jobs within organizations. Using personnel records and job application data from a large services organization, I examine how posting and sponsorship – the two mostly commonly used internal hiring processes – shape outcomes of importance to firms and workers. Posting is a formal, market-oriented process in which a manager posts a job and interested employees apply. Sponsorship is an informal, relationship-oriented process in which a manager fills a job with a candidate known through a personal connection. In the first study, I examine how posting and sponsorship shape value creation and capture, arguing that while posting will generate higher quality of internal hires by helping managers overcome challenges associated with identifying and evaluating internal candidates, the competitive nature of the process will lead workers to negotiate for higher salaries, limiting the value a firm is able to capture through improved decision-making. Consistent with these arguments, I find that posting results in better hires but at a higher cost, highlighting important tradeoffs associated with allocating human capital formally though markets or informally through managerial networks. In the second study, I examine how posting and sponsorship shape the

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INTRODUCTION

Job mobility refers to the movement of individuals between jobs (J. E. Rosenbaum, 1979b; Rosenfeld, 1992). A job is a particular set of activities to be carried out within a particular employer and few people hold the same job for the entirety of their career. Rather, people routinely move between jobs, occupying one job for a given length of time before moving to a different job[1]. According to recent statistics, the average US worker currently stays in a job for just over 4 years (BLS, 2014; Kamenetz, 2012). Millennials, who will compose more than 75 percent of the workforce by 2025, tend to stay in a job for around 3 years and expect to work until they are at least 70 years old (BLS, 2014; Meister, 2012), which would equate to holding nearly 17 different jobs over the course of a typical career.

Understanding job mobility is important not only because of its frequency, but also because of its central role in shaping the fortunes of workers, firms and society. For workers, mobility generates the sequence of matches which constitute a career (Sullivan & Baruch, 2009). As workers move across jobs, they accumulate human capital, social capital and other career resources that enable them to move into subsequent jobs. (Bidwell & Briscoe, 2010). As the majority of workers in an industrialized society obtain

[1] People may also move out of employment. Analyses of CPS data from the US Census has shown that the rate of job-to-job transitions is two to three time larger in magnitude than transitions from employment to unemployment (Fallick & Fleischman, 2004; Nagypal, 2008), though this difference is likely understated by as much as half, as these figures include only moves across firms and not moves to new jobs within firms.

income and other rewards in exchange for work (Althauser & Kalleberg, 1981), job mobility is a key avenue through which individuals accumulate income and status (Bills, 1992; Molloy, Smith, & Wozniak, 2013; Topel & Ward, 1992),

Workers represent repositories of skills, routines, and knowledge that can be carried from one job to another (Argote & Darr, 2000; Corredoira & Rosenkopf, 2010). Worker mobility therefore facilitates the transfer knowledge, human and social capital so critical to organizational learning and performance (Corredoira & Rosenkopf, 2010; Dokko & Rosenkopf, 2010; Lounsbury, 2001; Rao & Drazin, 2002). As a result, the strategic acquisition and deployment of human assets is increasingly seen as a potential source of competitive advantage for firms (Argote & Ingram, 2000; Edmondson, 2012; Michaels, Handfield-Jones, & Axelrod, 2001), consistent with the long-held maxim that managers generate value by discovering and creating uniquely valuable combinations of resources and activities (Lippman & Rumelt, 2003; Penrose, 1959; Zenger, Felin, & Bigelow, 2011, pp. 93–94). At the societal level, access to high paying jobs shapes the distribution of rewards and levels of income inequality (McCall & Percheski, 2010) and the diffusion of knowledge within and across firms stimulates the growth of intellectual capital and innovation (Ng, Sorensen, Eby, & Feldman, 2007, p. 364).

In this chapter, I selectively review the literatures on two specific types of mobility – internal mobility and external mobility, paying particular attention to work exploring the allocative processes which facilitate the movement of workers to new jobs within and across firms. In doing so, I highlight an important gap in our current understanding of job mobility in contemporary labor markets: Despite the fact that more than half of all jobs are filled internally, we know surprisingly little about the

organizational processes used to facilitate internal mobility. I begin to address this gap by describing the two most commonly used internal hiring processes in contemporary large organizations and then outlining two empirical studies designed to explore how these processes shape a variety of outcomes of consequence to workers, firms, and society.

MOBILITY TYPES & PROCESSES

There are multiple types of job mobility. Mobility can occur along multiple dimensions (Ng et al., 2007). Nicholson and West (1988), for example, identify three dimensions – employer (internal or external), status (up, lateral, down), and function (same or different) – resulting in twelve types of mobility. Others have highlighted additional dimensions, including occupation (Louis, 1980; Tolbert, 1996) and geography (Parnes, 1954). For simplicity, this chapter focuses on the employer dimension, selectively reviewing the history and recent developments in research on internal and external mobility, with *internal mobility* defined as a move between jobs within the same organization and *external mobility* defined as a move to a new job in a new organization.

The processes which facilitate job mobility are referred to as *allocative processes*; they allocate resources to opportunities (Bradach & Eccles, 1989), with workers representing the resources and jobs representing the opportunities or activities to which they are matched. Though both fall under the broader conceptual umbrella of allocative processes, most theoretical accounts of mobility tend to focus on either the supply-side or demand-side mechanisms which generate new person-job matches (Fernandez & Sosa, 2005), Supply-side accounts focus on the behaviors of job seekers while demand-side accounts focus on organizational processes and structures (Fernandez & Weinberg, 1997; Granovetter, 1981; Sorensen & Kalleberg, 1981).

In the following sections, I trace several key theoretical and empirical developments on mobility and allocative process over the past three decades. Much of the early literature in this area examined mobility within highly bureaucratic internal labor markets, detailing how an array of organizational structures and administrative rules shaped advancement within firms. In contrast, recent work has focused almost exclusively on mobility across firms, detailing the process by which workers and firms search for potential matches in the external labor market. As a result, while we know quite a lot about how internal mobility used to work and how external mobility currently works, we know very little about how internal mobility currently works.

HISTORICAL INTERNAL MOBILITY

Our understanding of internal mobility remains largely grounded in the foundational research on traditional, hierarchal internal labor markets and a closely related literature on intraorganizational careers, literatures which emerged largely in response to the rise of large corporations in the 1950s.

Emergence of Bureaucratic Internal Labor Markets

Prior to the growth of the major railroads in the late nineteenth century, the typical firm had a simple structure where the owners were the managers (Chandler, 1977). Even then there was often little to manage, as organizations typically outsourced much of the work, from sales and distribution at companies such as DuPont (Zunz, 1990), to actual production tasks, which were often outsourced to contractors who found their own workers and managed them how they saw fit (Clawson, 1980, pp. 72–80). Starting with the railroads, organizations began to expand to the point where the need for standardization and coordination became paramount, leading to the creation of what we

would now call middle management jobs. These new positions were filled through external hiring. In fact, during World War I, the Manpower Commission, which was established by the government to ensure that companies had the workers and skills needed to maintain wartime production, had the specific goal of reducing the ubiquitous pirating of workers by competitors. This led to the rapid establishment of personnel departments to develop and execute workforce planning practices focused on filling jobs internally throughout the 1920s (Jacoby, 1985). Yet these efforts were short-lived, as the Great Depression lessened the need for managers (Melman, 1951) and with it the need to develop workers internally. World War II further stagnated these efforts, as most of the candidates who would have been hired into entry-level positions and subsequently developed into managers were serving in the military.

The lack of hiring and development from the Depression through WWII led to a serious shortage of talent across nearly all industries (Whitmore, 1952). Organizations responded just as they had at the beginning of the century – by raiding competitors for talent. A prominent retail executive noted that "to go to another store for assistant buyers, buyers, and other executives" was the approach "almost universally used . . ." to meet their human capital needs (Carden, 1956). Yet external hiring proved insufficient in meeting the demand for talent, as pension plans with onerous vesting requirements, high marginal tax rates, and a lack of housing decreased the attractiveness of switching employers, even when competitors were able to offer higher salaries (Cappelli, 2010).

The difficulty in finding external talent led companies to the realization that they needed to develop talent internally. With precious little experience doing so themselves, they turned to the military for help. Recognizing the need for a huge expansion of its

officer ranks in a short period of time leading up to WWII, the Navy began what was arguably the first truly systematic effort at large scale succession planning, resulting in the publication of "Personnel Administration at the Executive Level" in 1948, which the Industrial Relations faculty at Princeton (1949) summarized as:

> *A principally graphic report of the composite practices of 53 companies in regard to executive inventory control. In these companies, reserves of trained executives are built up through five basic steps: (1) organization analysis, (2) selection, (3) evaluation, (4) development, and (5) inventory control.*

This document was widely used by many companies as the basis for building their own internal development programs (Business Week, 1949). These programs, in turn, served as the basis for the Organizational Man model of the 1950s in which expectations of lifetime employment and steady advancement opportunities emerged (Whyte, 1956). In 1943, the Conference Board could not find enough employers offering internal development programs to study them, yet by 1955 they were present in 60% of companies with 10,000 or more employees. Newcomer's (1955) study of corporate executives found that 80% had been developed from within by 1950, compared to half in 1900. As large companies came to increasingly rely on internal development to fill jobs, scholars became increasingly interested in understanding the operation of these new (at the time) internal labor markets.

Internal Allocative Processes

The classic research on internal labor markets drew sharp distinctions between the bureaucratic processes for allocating human capital operating within the firm and the market processes operating outside the firm. Doeringer and Piore (1971) first defined internal labor markets in direct opposition to external labor markets. They describe an

internal labor market in "which the pricing and allocation of labor is governed by a set of administrative rules and procedures . . . is to be distinguished from the external labor market of conventional economic theory where pricing, allocating, and training decisions are controlled directly be economic variables" (Doeringer & Piore, 1971, pp. 1–2).

This work described mobility within an internal labor market as occurring within a closed system, with jobs above entry level not freely available to outsiders (Althauser & Kalleberg, 1981; Sorensen & Kalleberg, 1981). Shielding workers from external competition encouraged the development of firm-specific skills, which in turn gave rise to an unprecedented level of employment stability for both workers and firms. As workers advanced within the firm, they developed firm specific human capital, examples of which include "familiarity with unique routines and procedures, tacit knowledge embedded in interpersonal relationships and corporate culture, skills specific to internal networks (team production), and the content of in-house training programs and on-the-job experience peculiar to the firm" (Groysberg, Lee, & Nanda, 2008, p. 1214). The nature of firm specific human capital – it is highly valued by the worker's current employer but not transferrable to other firms (Becker, 1962) – created incentives for both firms and workers to develop employment systems supporting long-term employment. The lack of portability encouraged firms to invest in training and consequently to make a concerted effort stabilize employment and reduce turnover in order to capture the value created by those investments. Combined with a lack of external opportunities for advancement arising from limited ports of entry in other firms, the lack of portability likewise encouraged workers to value opportunites for steady upward advancement within a single firm (Doeringer & Piore, 1971; Williamson, Wachter, & Harris, 1975).

This dual desire for stability gave rise to bureaucratic (or administrative) rules governing mobility within internal labor markets. Bureaucratic rules refer to the criteria used to determine which workers are eligible to be considered when a vacancy arises as well as the criteria used to select among eligible workers. These rules, which emerged from a combination of union bargaining, customary practices, and efficiency considerations (Doeringer & Piore, 1971; Kalleberg & Sorensen, 1979; Williamson et al., 1975), limited the extent to which individual workers or managers could affect allocative decisions. As a result of supervisory, technical and other relations that existed among jobs, workers were expected to advance through a series of narrowly defined jobs located along clearly defined job ladders (Sorensen, 1983). Individual managers had little room to exert discretion, as allocative decisions were largely handled by centralized personnel offices and restricted by detailed selection criteria that often favored seniority over ability. These rules created stability in part by limiting conflicts among workers through reducing internal competition for advancement opportunities, increasing retention through promises of future advancement and removing disincentives for senior workers to withhold valuable on-job-training from more junior workers. A long line of literature has also documented how these rules played a central role in generating and sustaining gender inequalities in terms of pay and advancement by segregating women into marginalized jobs with limited opportunities for advancement (Barnett, Baron, & Stuart, 2000; Bridges & Nelson, 1989; Petersen, Saporta, & Seidel, 2005; Rosenfeld, 1992).

Of course, detailed examinations of mobility within organizations often revealed that actual internal labor markets operated in ways that differed from the ideal-type internal labor markets described by theory. Hiring into various levels of the

organizational hierarchy, for example, was not uncommon, though it was not widespread (Rosen, 1988). Advancement was not so severely restricted along well-defined job ladders (Diprete, 1987; J. E. Rosenbaum, 1990), nor were all jobs were located on job ladders (Baron, Davis-Blake, & Bielby, 1986). Managers took advantage of opportunities to influence allocative decisions even in the presence of bureaucratic rules governing advancement (Jacoby, 2004; Miner, 1987). However, even if bureaucratic rules did not perfectly shape mobility, they were shown to place considerable constraints on the set of internal moves available to workers and candidates considered by hiring managers. As Diprete noted, even in organizations where significant internal boundary crossing occurred, "the boundary crossing itself [was] structured" (1987: 442).

The notion of structured advancement was also a central feature of much of the literature on intraorganizational careers, though this work paid more attention to organizational structures than allocative processes. Vacancy chain models of internal mobility were built on the assumption that advancement largely occurred through a series of vertically linked jobs (Chase, 1991; Sorensen, 1983; Stewman & Konda, 1983; Stewman, 1986). Tournament models of internal mobility in sociology revealed clear promotion patterns within organizations, with workers advancing along different paths depending on whether they won or lost promotion contests early in their organizational career (J. E. Rosenbaum, 1979a, 1979b). Tournament models of internal mobility in labor economics similarly assumed steady upward advancement in theorizing that wages can be optimally set in such a way that the size of gap between successive hierarchical levels will motivate individuals to exert maximum effort in order to "win" the competition for the next job (Lazear & Rosen, 1981).

A key takeaway from this literature is that internal mobility was (and remains) largely understood as almost entirely a product of bureaucratic rules. Because these rules typically created "a limited and usually well-defined set of candidates" (Sorensen, 1983, p. 207) for open positions and allocative decisions were largely centralized, neither workers and managers had to actively seek out opportunities for advancement. For managers, the set of candidates to be considered was essentially pre-identified and for workers, advancement opportunities were limited by seniority and location on a well-defined promotion hierarchy. These models, however, appear to bear little resemblance to contemporary internal labor markets in which "candidates as well as employers now actively seek information and opportunities to make good short-term matches inside the firm and to assemble them in ways that meet talent needs and lead to meaningful careers" (2008: 206–7).

CONTEMPORARY EXTERNAL MOBILITY

Dramatic changes in the external competitive environment over the past quarter century have brought about equally dramatic changes in the organization of work and employment within firms (Cappelli, 1995, 1999; Jacoby, 2005). Rapidly shifting consumer demands, technological advancements, increasing global competition, and shareholder pressures to minimize costs have led organizations to place a premium on labor market flexibility, which has in turn led to the gradual dismantling of the structures and processes supporting the traditional, bureaucratic internal labor markets described above (Cappelli & Keller, 2014; Cappelli, 1999b; Osterman & Burton, 2005). While these changes have undoubtedly transformed nature of mobility within contemporary organizations, the most visible consequence has been a dramatic increase in mobility

across organizations. As a result, recent research has focused almost exclusively on external mobility, as described below.

The steady decline in job tenure (particularly in the United Sates) over the last thirty-plus years has been particularly well documented (Bidwell, 2013; Farber, 2008; Hollister, 2011). One way scholars have responded is by detailing the evolution of new career structures spanning multiple organizations. The two most prominent models of contemporary careers are boundaryless and protean careers (Briscoe & Hall, 2006), both of which emphasize that individuals, rather than firms, are in control of their careers. Career typically span multiple employers and change in response to individual desires as well as shifting market conditions (Sullivan & Baruch, 2009). Bidwell and Briscoe (2010: 16) demonstrate that external moves often follow a coherent, structured logic, "as workers link together jobs across different kinds of organizations to match their evolving career needs". Contract employment arrangements – in which workers perform work for an organization without being employed by that organization – have also gained prominence in both high skill (e.g. IT) and low skill (e.g. clerical) occupations (Abraham & Taylor, 1996; Stephen R Barley & Kunda, 2004), with a related body of literature exploring how workers stitch these arrangements into a cohesive career tapestry (S.R. Barley & Kunda, 2006; Handy, 1989; O'Mahony & Bechky, 2006).

Others have highlighted the negative consequences of shorter tenure for workers, noting that decreasing tenure is not merely a result of changing worker preferences. Rather, workers have had to take control of their careers because firms are no longer willing or able to provide any assurance of continued employment, employers have encouraged workers to take control of their careers (Cappelli, 1999a). This work has

explored, for example, the myriad ways in which increased job insecurity has the potential to undermine social stability (Cappelli, 1999b; Davis, 2009), change household dynamics (Nelson, 2010), and exacerbate the unequal distribution of rewards (McCall & Percheski, 2010).

Strategy researchers have identified several ways in which external hiring can benefit firms, viewing "mobile employees [as] repositories of skills, routines, and knowledge that they carry with them from their prior employer to their new employer . . . [and] tends to find that hiring firms gain from importing these employees" (Corredoira & Rosenkopf, 2010, p. 159)[2]. Firms gain by acquiring knowledge (Rosenkopf & Almeida, 2003; Song, Almeida, & Wu, 2003), implementing strategic changes (Kraatz & Moore, 2002), and increasing the rate of innovation (Rao & Drazin, 2002). Hiring is also a key mechanism through which firms gain access to and leverage social capital for influence (Dokko & Rosenkopf, 2010); acquire new business (Somaya, Williamson, & Lorinkova, 2008); and weaken competitors through poaching (Chacar & Coff, 2000; Somaya et al., 2008). At the top of the organization, hiring is an exercise in impression management (Graffin, Carpenter, & Boivie, 2011)and thus may provide status and legitimacy benefits through its effect on how the firm is perceived by external stakeholders (Finkelstein, Hambrick, & Cannella, 2009; Khurana, 2002).

External Allocative Processes

In addition to those literatures documenting the increase in external mobility and its causes and consequences, a particular stream of research has focused on illuminating the

[2] This is not a universally held view among strategy scholars, however. For example, a foundation of the knowledge-based view of the firm is the notion that "hiring new workers is not equivalent to changing the skills of a firm" (Kogut & Zander, 1992, p. 383).

processes by which workers and firms search for potential matches in the external labor market. This work tends to conceptualize external hiring as the outcome of a two-sided search. Because "there is simply no such thing as a centralized market for buyers and sellers of labor to meet and trade at a single price" (Rogerson, Shimer, & Wright, 2005), firms and workers must actively seek out alternatives, with firms searching for workers and workers searching for job openings. On both the supply and demand side, these search processes tend to fall into two broad categories, those which are more market-oriented and those which are more network-oriented. In terms of understanding their effects on a variety of labor market outcomes, the hiring processes of firms have received considerably more attention than have the job search strategies of workers.

Supply-side processes. Empirical investigations of worker's job search behaviors reveal that the two main processes by which workers search for jobs are through personal connections, including friends (and friends of friends), relatives, classmates and colleagues, other members of their personal network, and by directly applying to open jobs (Addison & Portugal, 2002; Holzer, 1987). Using a personal network is typically classified as an informal, network-oriented search process, while direct applications are classified as a formal, market-oriented search process. About half of all US workers find their jobs through their personal network (Crispin & Mehler, 2013; Topa, 2011).

Though scholars have long recognized the distinction between network and market job search strategies, the vast majority of research has compared the outcomes of workers with different network structures (or different levels of social resources) as opposed to comparing the labor market outcomes of job seekers that obtained their jobs via personal contacts with job seekers that found their jobs through more formal means. A notable

exception is Granovetter's (1974, 1982) seminal study of the strategies used by active job seekers, which suggested that network searches are more effective than market searches at navigating workers into better jobs characterized by high job satisfaction and earnings (Drentea, 1998). Though limited, there is also some evidence that conditional on its use, network search is more likely to result in a job offer (Fernandez & Weinberg, 1997; Holzer, 1988; Silliker, 1993) and slightly higher starting salaries[3] (Burks, Cowgill, Hoffman, & Housman, 2013; Seidel, Polzer, & Stewart, 2000). Drentea (1998) compared the jobs obtained by men and women using different search processes and found that network search was more likely to steer women into lower status, female dominated jobs, but found that men were not more or less likely to be steered into male dominated jobs.

Demand-side processes. The external recruiting and hiring practices of firms have received considerably more attention, with an abundance of literature demonstrating that a firm's choice of hiring processes "can influence the interest of prospective job applicants in a job opening and the ability of the individuals it hires, their diversity, their job performance, and their retention" (Breaugh, 2013, p. 24). The two most commonly studied hiring process are the use of referrals and job postings. As above, the use of referrals is typically classified as an informal, network-oriented search process, while job postings are classified as a formal, market-oriented search process (Marsden, 1994).

For firms, the use of referrals has several benefits. First, it is often substantially quicker and less expensive to hire through referrals as compared to engaging in a formal search (Marsden, 1994), even when accounting for referral bonuses (Fernandez, Castilla,

[3] The evidence on starting salaries is decidedly mixed, with other studies finding minimal differences in starting salaries (Bridges & Villemez, 1986; Marsden & Hurlbert, 1988)

& Moore, 2000). Second, due to the fact that referrals have access to better information about the job and the firm, they are more likely to receive and accept job offers (Burks et al., 2013; Fernandez & Weinberg, 1997). Third, both because the use of referrals allow firms to reach a richer, more qualified pool of candidates that might otherwise not apply and because referring employees are able to provide immediate social support to the new hires, referrals tend to outperform hires made though the formal posting process and are less likely to quit (Burks et al., 2013; Fernandez et al., 2000; Fernandez & Weinberg, 1997).

Employees can also use referrals to their advantage, as having a contact within an organization at the time of hire can provide access to information the job seeker can use to more effectively negotiate a higher salary (Seidel et al., 2000). However, because social networks are often homogenous (McPherson, Smith-Lovin, & Cook, 2001), the use of referrals tends to replicate an organization's demographic composition (Braddock & McPartland, 1987). Because women and minorities remain underrepresent in managerial roles and overrepresented in lower-level and marginalized roles, the use of referrals may substantially reduce the advancement opportunities available to women and minorities (Reskin & McBrier, 2000).

A key takeaway from this literature is that different external allocative processes, particularly those operating on the demand-side, play a central role in shaping a number of important outcomes, such as who gets hired, how much they are paid, how well they perform, and how long they stay. Below, I describe how this insight can be used to inform our understanding of internal mobility in contemporary organizations.

CONTEMPORARY INTERNAL MOBILITY

The same changes that have led to a dramatic increase in mobility across organizations have also transformed the processes used to facilitate mobility within organizations, with the use of bureaucratic rules being replaced by market- and network-oriented process mirroring those operating in the external market.

Changes in Internal Hiring Processes

The flattening of organizational hierarchies due to cuts in middle management (Rajan & Wulf, 2006) combined with broader job definitions (Grant & Parker, 2009) has led to the gradual disappearance of well-defined job ladders (Grimshaw, Ward, Rubery, & Beynon, 2001). Ports of entry are no longer restricted to lower-level jobs or occupations, as employers now hire externally into almost all kinds of jobs at all levels of organizations (Jacoby, 2005; Royal & Althauser, 2003). Personnel decisions have been largely decentralized, with decisions on promotions, transfers, and new hires being delegated to individual managers (Cappelli, 1999b). No longer willing or able to provide any assurance of stable employment, employers have encouraged workers to take control of their careers. Whereas bureaucratic rules were designed to reinforce organizational structures and ensure stability (Weber, 1958), organizations now operate in an uncertain environment where maintaining flexibility is seen as paramount. Piore (2002: 275) summarizes the cumulative effect of these changes quite succinctly in noting that "in the new environment, the mix of labor requirements was no longer stable; and the organizational structures began to shift in a direction which was no longer compatible with the bureaucratic rules of the internal labor market".

A notable consequence of these changes is that lacking clear rules or structures to guide advancement, it is unclear how employees should go about building careers within firms. Retention concerns and rapidly changing product markets have made employer investments in career development costly and uncertain, reducing their availability to workers. Employees, having gained significant control over their careers, "do not want to be 'developed' along the lines of the older model, in which the employer shaped careers to serve its own goals and the individuals had no choice in the matter" (Cappelli, 2008, p. 206). Moreover, having long ago abdicated responsibility for developing workers, firms themselves have difficulty understanding how employees advance within their own organizations. As a result, firms and workers must now search for matches within the firm, just as they do in the external labor market. As Cappelli describes, in the absence of clear avenues for advancement, "candidates as well as employers now actively seek information and opportunities to make good short-term matches inside the firm and to assemble them in ways that meet talent needs and lead to meaningful careers" (2008: 206–7).

Though detailed studies of internal hiring processes in contemporary organizations are scarce, a small handful of descriptive studies reveal that, absent bureaucratic rules governing internal mobility, matches are primarily generated through two demand-side processes - *posting* and *sponsorship.*

Posting

Posting is a formal, market-oriented process in which a hiring manager posts an open job and interested employees apply. Though job posting systems have existed since the 1940s mainly in union workplaces (Slichter, Healy, & Livernash, 1960), their

widespread adoption is a recent phenomenon. Less than half of companies posted anything other than blue-collar jobs in the mid-1980s, a figure that rose to 60 percent in 1999 before exploding to over 95 percent in the mid-to-late-2000s (Dobbin, Schrage, & Kalev, 2014; Kleiman & Clark, 1984; Taleo Research, 2005).

Moreover, the systems in place today look very different from their predecessors. In the early days of factory production, managers were able to exert direct control over workers and possessed the unilateral authority to pick who got what jobs (Cappelli, 2008, p. 207; Edwards, 1979). Hiring, promotion, and transfer decisions were largely determined by favoritism and prejudice as opposed to ability, a situation that was clearly disadvantageous to workers. Yet while unions were successful in earlier efforts to wrestle some control over the terms of employment from management, management retained near exclusive rights over promotion and transfer decisions until the period just before and after World War II. Early collective bargaining agreements permitted workers to file grievances against discrimination, favoritism, and nepotism, but the burden of proof rested with the union, making such claims difficult to substantiate. Unions eventually sought to curtail managerial discretion over staffing decisions in an effort to combat perceived managerial abuses. This was accomplished, in part, through the establishment of job posting systems (Slichter et al., 1960).

Union desire for job posting systems stemmed from the belief that the transparency of the process, in combination with clear advancement criteria, would make it more difficult for management to treat workers unfairly and that such instances would be easier to identify and challenge when they did occur. Management, not surprisingly saw such a system as requiring them to relinquish a long-held right, so they fought to

limit its scope. As a result, bidding was frequently limited to a narrowly defined set of workers, often those within a specific department or unit, and employees were often allowed to bid for promotions but not transfers. Even in manufacturing plants where employees were aware of the existence of job posting systems, the available methods for posting jobs – posting on bulletin boards and in cafeterias, elevators and mailrooms and the use of public address announcements – did little to ensure eligible workers across the organization were made aware of them (O'Farrell, 1980; Shaeffer & Lynton, 1979). For those jobs that were covered, detailed selection criteria were established and often privileged seniority over ability, providing individual managers with little choice over whom to hire (Jacoby, 1985; Slichter et al., 1960).

Contemporary job posting systems are much more encompassing and, as a result, have the potential to create a true market for talent within firms. Managers post information about open jobs located throughout the organization to an internal job board and invite interested candidates to apply. While C-suite jobs are rarely if ever posted, managerial jobs up to and including the level just below the executive suite often are. Restrictions governing who can apply are increasingly rare (e.g. tenure requirements or requiring permission from a current manager). Candidates are free to evaluate available opportunities and pursue those that meet their needs and preferences by submitting an application. The listed qualifications are likely to shape who applies, though candidates who lack one or more qualifications but nevertheless would like to be considered are still able to submit an application. The hiring manager extends an offer to their preferred candidate, who then has the option of negotiating, accepting, or declining the opportunity. Once the manager and worker agree to the terms of exchange, an internal hire is

completed. In many ways, the posting process closely resembles a market-based external hiring process, with the notable difference that it is typical for unsuccessful internal candidates to be notified and provided with the opportunity to learn why they were not selected (R. A. Miller, 1984; Pinfield, 1995).

Many organizations have developed policies encouraging managers to post open positions internally, in large part to protect themselves from allegations of discrimination (Grensing-Pophal, 2006; Strum, 2001). However, because internal staffing policies are rarely enforced and often allow for flexible interpretations (Pinfield, 1995; Wallrapp, 1981) managers can and often do bypass the posting system. In fact, as noted in an influential white paper published by the Society of Human Resource Management, the leading professional association for human resource professionals, "even if you have an internal process for posting available jobs, there may be times when you decide not to follow this process" (SHRM, 2000: 7).

Sponsorship

The primary alternative to posting is a relational process I refer to as sponsorship[4]. Social networks are a central feature of organizational life, as interactions among individuals inevitably lead workers to develop networks of personal relationships (Kanter, 1977; McEvily, Soda, & Tortoriello, 2014; Podolny & Baron, 1997). A sponsoring manager uses their personal social network to identify potential candidates and then appoints their preferred candidate to the job absent open competition. Though it

[4] I adopt the term sponsorship from the classic literatures on intra-organizational mobility (Rosenbaum, 1979a) and upward social mobility more generally (Turner, 1960), in which it is used to describe systems in which individuals selected for advancement are shielded from competition.

is possible for sponsoring managers to exhaust their personal connections as they search for potential candidates, the vast majority of internal hires made through sponsorship involve the consideration of a single candidate with a direct connection to the hiring manager, typically a current or previous colleague (Pinfield, 1995).

Like posting, sponsorship has a long history in organizations, though it looks quite different today than in its previous incarnations. As noted above, in the early days of factory production, individual managers had nearly unlimited discretion over promotion and transfer decisions and often filled those jobs with workers they knew personally or workers of the same race or ethnicity (Jacoby, 2004). Once bureaucratic rules were put into place[5], centralized personnel departments created shortlists for hiring managers to use to pick internal candidates. Provided a manager had a personal connection with one or more of these candidates, they had some, albeit limited, discretion to fill jobs with a preferred member of their social network. The notion of a sponsorship process whereby hiring managers create their own list of candidates, however, appears to be rather new.

It is important to note that while posting and sponsorship are conceptually distinct internal allocative processes, sponsorship may sometimes masquerade as posting in practice. That is, it is possible that a manager may post a job having already identified the candidate they are going to select through their social network, a practice referred to as a "wired search" (Bielby, 2000). However, the prevalence of "wired searches" and other practices that might artificially restrict the openness of the posting process, such as

[5] This process actually dates back as far as the 1920s in some large companies, such as General Electric (Cappelli, 2010; Loth, 1958)

shaping job requirements around a single candidate or discouraging employees from applying for certain jobs, are largely mitigated by concerns about allegations of discrimination (Strum, 2001) as well as the possibility that employees who feel they were mistreated or misled will simply leave the organization (Billsberry, 2007).

An abundance of evidence suggests that posting and sponsorship operate side-by-side within firms, as equally viable ways to fill jobs. Marsden and Gorman (1999) examined survey data on a representative sample of US work establishments and found that posting and sponsorship were widely used in combination for filling vacancies with internal candidates. Pinfield's (1995) ethnographic study of internal hiring in a forest-products company revealed that more than half of all positions were filled through sponsorship despite company policy that all jobs be posted. Moreover, though the vast majority of firms post at least some open jobs, research continues to demonstrate the importance of relationships on internal advancement (Ibarra, 1995; Podolny & Baron, 1997).

Importance of Internal Hiring and Mobility

From the descriptions above, it is clear that posting and sponsorship differ in several ways. Yet while recent work has explored differences in internal and external hiring (Bidwell & Keller, 2014; Bidwell, 2011) and variations among external hiring processes (e.g. Fernandez et al., 2000), this work has tended to treat internal hiring as a homogeneous process, unintentionally obscuring potential variations in the processes used to move workers to new jobs within firms. Exploring how these different processes shape outcomes such as who gets hired and the quality of the matches created within firms seems like a promising line of inquiry given the recent research showing that

market and network search process affect these outcomes in the context of external hiring.

Moreover, a substantial amount of mobility takes place within organizations. A decade of data on organizational hiring practices reveals that firms have been and continue to rely on a nearly equal combination internal and external hiring to fill open jobs, with external hiring dominating at lower levels and internal hiring dominating at higher levels. Figures are difficult to come by, but a handful of survey data suggest that about a third of non-managerial jobs, half of managerial jobs, and three-quarters of executive jobs are filled internally (Crispin & Mehler, 2013; Jacoby, 2005; Taleo Research, 2005). Though recent work has focused almost exclusively on external mobility, it is clear that internal and external mobility represent equally important building blocks of individual careers and firm talent management strategies.

Furthermore, there are reasons to expect that the strategic importance of internal hiring will continue to increase. Though strategy scholars have extolled the myriad benefits associated with external hiring, fully realizing their potential value can be quite difficult. Information asymmetries result in external candidates being paid a significant premium compared with internal candidates at all levels of the organization (Agrawal, Knoeber, & Tsoulouhas, 2006; Bidwell, 2011). Firms require stronger signals of observable ability from external candidates, but these signals often fail to translate into higher levels of performance (Bidwell, 2011). It takes substantial time for external hires to build the intrafirm social networks so often critical to performance (Groysberg et al., 2008; Huckman & Pisano, 2006). Socio-cognitive barriers also attenuate the performance of new hires, as individuals often have trouble overcoming institutional and

cognitive rigidities developed at prior employers (Dokko, Wilk, & Rothbard, 2009). Moreover, filling strategic jobs through external hiring may be perceived as a negative signal by external stakeholders, leading to negative stock market reactions (Groysberg et al., 2008).

This work suggests that internal mobility represents a critical yet overlooked source of value creation, enabling managers to generate greater value from their existing stock of human resources by creating complementary matches between people and jobs. For example, internal mobility facilitates the transfer of existing knowledge across internal boundaries (Argote & Ingram, 2000), motivates employees by signaling opportunities for future advancement (Bidwell & Keller, 2014), encourages the development of firm-specific skills (Campion, Cheraskin, & Stevens, 1994), increases worker satisfaction, performance and productivity (Jackson, 2013), and decreases dysfunctional turnover (Allen, Bryant, & Vardaman, 2010). Given the difficulties associated with creating value through external hiring as well as the benefits associated with internal hiring, it is not surprising that firms have begun to make substantial investments in developing their internal hiring capabilities (Murthy, 2013; Schawbel, 2012).

THEORY AND CONTRIBUTIONS

In an effort to provide a more complete understanding of labor markets and mobility, I use this dissertation to explore how key difference between posting and sponsorship shape the fortunes of firms and workers. Specifically, I highlight the mechanisms by which posting and sponsorship affect the ability of firms to create and

capture value and the impact of these process on gender inequalities in advancement and pay within organizations.

Value Creation and Value Capture

In the first study, I extend recent work in the field of strategy seeking to understanding how firms create and capture value through the strategic allocation of resources (Sirmon, Hitt, & Ireland, 2007; Sirmon, Hitt, Ireland, & Gilbert, 2011), which include an organization's current stock of human capital (Campbell, Coff, & Kryscynski, 2012; Coff & Kryscynski, 2011). I develop theory to explain how key differences between the market-oriented posting process and relationship-oriented sponsorship process affect two outcomes with implications for value creation and value capture: quality of hire – as revealed by job performance, turnover, and subsequent advancement – and compensation. Specifically, I highlight that posting is characterized by two market-like features – self-selection and formality – that are largely absent in sponsorship, which instead involves active managerial search and a reliance on personnel connections for gathering information.

I argue that introducing these two market features into the firm improves hiring decisions by helping managers to overcome challenges associated with generating and evaluating alternatives. Specifically, self-selection should generate a larger pool of alternatives, reducing the likelihood and exceptional alternative will be overlooked. Formality, on the other hand should encourage managers to both incorporate relevant information and avoid irrelevant information as they evaluate candidate qualifications against the requirements of the jobs. Moreover, employees hired through the more competitive posting should be less likely to adopt a relational orientation to salary

negotiations and therefore more likely to both initiate a negotiation and adopt a more effective, competitive approach when doing so.

Consistent with this account, I find that posting results in better hires by managers and higher salaries for workers. Posting enables firms to both create and capture substantially more value than sponsorship, as the combined performance and retention benefits associated with better internal hires are likely to far exceed the higher salary costs. The posting premium suggests that workers also share in the increased value creation, earning higher salaries for equivalent work. On the whole, the results suggest that from a value creation and value capture perspective, posting is far superior to sponsorship for both firms and workers.

Gender Inequality

While women have made substantial gains in the labor market, they continue to occupy a disproportionate number of low-level and undervalued jobs (Cohen, 2013) and are still paid less than men for similar work (Goldin, 2014; Petersen & Morgan, 1995). A small but influential body of work has emerged to explore whether and how the many recent changes to employment structures and processes have been successful in reducing longstanding gender inequalities in the workplace (Castilla, 2008, 2012; Dencker, 2008; Kalev, Dobbin, & Kelly, 2006; Kalev, 2009). In the second study, I extend this literature by exploring how posting and sponsorship shape the organizational careers of women.

I first argue that by providing unrestricted access to information about potential advancement opportunities and providing a formal mechanism through which women can make their qualifications known to potential hiring managers, posting will enhance women's opportunities for advancement overcoming the limited visibility and access to

informal strategic networks imposed by the segregation of women into marginalized jobs. Indeed, I find that workers in lower status, less visible female dominated jobs are significantly more likely to advance via the formal, market-oriented posting process than they are the informal, relationship-oriented sponsorship process.

I also argue that the transactional nature of the posting process should help to reduce within-job gender wage disparities by reducing women's reluctance both to initiate salary negotiations and to negotiate competitively when they choose to negotiate. Consistent with this reasoning, I find that when observationally equivalent men and women are hired into the same job through sponsorship, women are paid almost 2% less than men, but that this gender gap disappears entirely when a job is filled through posting. Together with the findings related to advancement, the theory and results suggest that posting has the *potential* to reduce longstanding gender inequalities in both advancement and pay.

However, there are reasons to expect that posting may fail to live up to this promise. I argue that despite appearing to be gender-neutral, the posting process is implicitly gendered, constructed on assumptions about appropriate behavior that are likely to discourage women from applying to posted jobs. Specifically, the posting process requires employees to enter into a competition, engage in self-promotion, and make judgments about the extent to which they are qualified for an open job. These very attributes may discourage women from participating in the posting process because research has demonstrated that women are more reluctant than men to enter competitions and engage in self-promotion, and are more likely than men to follow rules. Indeed, I find

that a woman occupying the same job as an equally qualified man is 10 to 20 percent less likely to apply for a posted job.

Taken together, these studies provide a more complete picture of modern job mobility and demonstrate the value in paying closer attention to the dynamics of internal mobility in contemporary organizations.

CHAPTER 2: HOW MANAGERS CREATE VALUE THROUGH INTERNAL HIRING

INTRODUCTION

Amid conversations about boundaryless careers, free-agent workers and hired guns, it is easy to forget that a substantial amount of mobility still takes place within organizations. In fact, nearly half of all open jobs in large organizations - and substantially more at the executive levels - are filled internally (e.g. Crispin & Mehler, 2013). Internal hiring is the primary process used to allocate human resources within firms and creates opportunities for internal mobility, which serves many useful functions. It facilitates the transfer of knowledge across internal boundaries (Argote & Ingram, 2000), motivates employees by signaling opportunities for future advancement (Bidwell & Keller, 2014), encourages the development of firm-specific skills (Campion et al., 1994), increases worker satisfaction, performance and productivity (Jackson, 2013), and decreases dysfunctional turnover (Allen et al., 2010). With human resources now representing the most important resource in most firms (Powell & Snellman, 2004) and in light of recent research demonstrating the high costs and even higher failure rates associated with external hires at all organizational levels (e.g. Bidwell, 2011; Groysberg, Lee, & Nanda, 2008), the ability to find and create complementary matches between people and jobs *within* the firm represents a key source of value creation in modern organizations (Zenger et al., 2011).

While scholars have explored how other key resources, such as financial capital (e.g. Stein, 1997) and managerial attention (e.g. Ocasio, 1997), are allocated within firms, we know surprisingly little about the contemporary internal allocation of human

resources. Recent work has documented how job characteristics shape both whether a job is likely to be filled internally (Bidwell & Keller, 2014) and the qualifications (e.g. experience) of the candidates likely to be placed into the job (Drazin & Rao, 2002). Yet internal hiring processes – that is, the ways in which managers search for, evaluate, and select among potential internal candidates – have received little systematic attention. However, research has shown that the use of formal versus informal external hiring processes (e.g. the use of referrals versus job postings) shapes not only who is hired, but also their pay, performance, and turnover (Burks et al., 2013; Fernandez et al., 2000; Seidel et al., 2000), as has recent research comparing internal versus external hiring (Agrawal et al., 2006; Bidwell, 2011). We therefore might expect any variations among internal hiring processes to have similarly significant consequences for both workers and firms.

Studying internal hiring also promises to contribute important insights to ongoing conversations about the changing nature of internal resource allocation more generally. As firm have transitioned away from hierarchical structures characterized by centralized decision-making and towards flatter, leaner structures characterized by decentralized decision-making, bureaucratic internal labor markets have gradually disintegrated (Cappelli & Keller, 2014), internal markets and social networks have emerged as the primary mechanisms through with current workers are matched to new jobs, echoing broader changes in how resources are allocated within organizations. Indeed, the failures of bureaucratic planning systems in contemporary firms have received considerable attention (Cowen & Parker, 1997; McEvily et al., 2014; Mintzberg, 1994), with recent work identifying internal markets and network forms of coordination as the two primary

substitutes for bureaucratic control over the allocation of key resources. Work on internal markets has generally emphasized how the use of market pricing within the firm may lead to improved managerial decision-making regarding resource allocation, as all of the information regarding the resource being considered is reflected in its price (Ellig, 2001; Felin & Zenger, 2011). Other work on internal markets has explored how high-powered incentives can be designed to reduce coordination costs by aligning the interests of managers making allocative decisions with the interests of the firm (Zenger & Hesterly, 1997; Zenger, 2002). Work on network forms of coordination has emphasized how the social relationships among actors within the firm can lead to improved allocative decisions by providing managers with opportunities to share information on resources that would be otherwise unavailable to centralized, higher-level decision-makers (Nahapiet & Ghoshal, 1998; Tsai & Ghoshal, 1998). Because internal markets and social networks have been presented as alternatives to bureaucratic control, much of the current literature has either compared internal markets with bureaucratic control (e.g. Stein, 1997) or compared social networks with bureaucratic control (e.g. Tsai, 2002). Much less work has explored the tradeoffs associated with using internal markets or personal networks to allocate internal resources, despite the fact that market mechanisms and social networks are likely to operate simultaneously within firms.

Contemporary internal labor markets represent a particularly fruitful context for exploring these tradeoffs. Much of our understanding of internal hiring and mobility is grounded in the foundational research on traditional, hierarchal internal labor markets and a closely related literature on intraorganizational careers, which drew sharp distinctions between the bureaucratic processes for allocating human capital operating within the firm

and the market processes operating outside the firm. This work described how internal hiring decisions were centralized in personnel offices and governed by strict bureaucratic rules used to maintain lines of progression along clearly defined job ladders, with employees exerting little control over their careers within the firm (Althauser & Kalleberg, 1981; Glaser, 1968; Diprete, 1987; Doeringer & Piore, 1971; Rosenbaum, 1990). Contemporary internal labor markets look dramatically different: hiring decisions having been largely decentralized, with authority over promotions, transfers and external hiring delegated to individual managers; organizational delayering, broader job descriptions, and the rise of project-based work have all but eliminated clear paths for advancement; and employees have been tasked with taking control of their careers. The cumulative effect of these changes has rendered the use of bureaucratic rules for allocating human resources obsolete (Piore, 2002).

Absent bureaucratic rules, the allocation of workers to jobs now takes place through two very different processes (Marsden & Gorman, 1999; Pinfield, 1995). *Posting* is a market-oriented process. A manager creates an internal market for an open job by broadcasting information about the position throughout the organization via an internal job board and inviting current employees to apply. The use of internal job posting systems is widespread, with 95% of organizations posting jobs internally (Taleo Research, 2005). *Sponsorship* is a more relational process. A manager identifies a candidate through her personal network and appoints that candidate to the job without others being formally considered. Not only are posting and sponsorship the two most commonly used internal hiring processes, they often operate concurrently within firms, as managers have been granted substantial discretion both over the hiring decision and the

hiring process (Marsden & Gorman, 1999; Pinfield, 1995). With little if any work examining internal hiring in contemporary organizations, it is unclear whether a market-oriented or relationship-oriented allocative process is more likely to generate more valuable internal matches and what tradeoffs, if any, might be associated with the use of posting versus sponsorship.

In this paper, I shed light on these tradeoffs by developing theory to explain how key differences between the market-oriented posting process and relationship-oriented sponsorship process affect two outcomes with implications for value creation and value capture: quality of hire – as revealed by job performance, turnover, and subsequent advancement – and compensation. Though the informational benefits associated with social networks have received considerable attention (Borgatti & Cross, 2003; Bradach & Eccles, 1989; R. Cross, Parker, Prusak, & Borgatti, 2001; Granovetter, 1985), I predict that the market-oriented posting process will improve managerial decision-making relative to the more relational sponsorship process, creating more value though higher quality internal hires. In doing so, I describe how posting brings two features of markets into the firm that are largely absent in sponsorship – self-selection and formality. The behavioral theory of the firm highlights two key challenges facing boundedly rational decision makers, identifying a set of alternatives and evaluating the consequences of those alternatives (Cyert & March, 1963; Simon, 1955). I argue that in contrast to the active managerial search required in sponsorship, allowing workers to self-select into the consideration set for an open job reduces the likelihood an exceptional internal candidate will be overlooked. Moreover, when compared to the relative informality of a relationship-oriented allocative process, the formality of the market will encourage

managers to seek out information that allows them to better evaluate the fit between a candidate's qualifications and the requirements of the job, while also limiting the use of irrelevant information that may lead to poor hiring decisions.

However, I also predict that these same market features will lead to higher salaries though their effect on salary negotiations, limiting the amount of value a firm is able to capture through better internal hiring decisions. Self-selection and formality introduce open competition into the internal hiring process. While competition often drives down prices in external markets, I argue that it will serve to increase prices for human capital within the firm, as candidates who are hired though a competitive process are more likely to both initiate and adopt a competitive approach to salary negotiations.

Taken together, these predictions suggest that there are important tradeoffs associated with allocating human capital formally though markets or informally through the use of a manager's social network, with posting resulting in better hires but at a higher cost. However, with the performance and retention benefits associated with better internal hires likely to far exceed the higher salary costs, posting is likely to allow firms to both create and capture substantially more value. These arguments suggest that a market-oriented process will also benefit workers, who similarly capture more value through higher salaries.

I use multiple modeling strategies in testing these predictions, which are largely supported using five years (2008-2012) of personnel records covering all employees of a large health insurance provider, as well as data on more than 350,000 internal and external job applications. While personnel records have been previously used to identify which employees move to which jobs (Bidwell, 2011; Dencker, 2008), data on the

processes by which workers move jobs is rare. These data are distinctive in that they clearly identify the mechanism used to facilitate each of the 11,000+ internal hires made during this period, allowing me to conduct what is, to my knowledge, the first detailed study of the differences in outcomes associated with these two very different internal hiring processes.

In unpacking the processes used to allocate workers to jobs within contemporary organizations, this study helps to provide a more complete understanding of labor markets and mobility. While robust literatures are developing to explore outcomes associated with different external hiring processes (e.g. Fernandez et al., 2000) as well as the cost and quality tradeoffs associated with internal versus external hiring (e.g. Bidwell, 2011), this work has tended to treat internal hiring as a homogeneous process, unintentionally obscuring potential variations in the processes used to move workers to new jobs within firms. More broadly, this study contributes to a growing body of literature exploring how resources are bundled and deployed within contemporary organizations (Sirmon, Gove, & Hitt, 2008; Sirmon & Hitt, 2009) by highlighting the tradeoffs associated with using markets versus network approaches for allocating internal resources. This study extends recent work exploring the effects of introducing market mechanisms into firms (Felin & Zenger, 2011) by showing how mechanisms other than prices and high-powered incentives can be leveraged to improve managerial decision-making, while also adding to a small but important collection of studies which highlight the potential limitations of relational exchange (Casciaro & Lobo, 2008; Rogan & Sorenson, 2014; Sorenson & Waguespack, 2006). Moreover, in identifying the micro-level mechanisms (decision-making and negotiations) through which these two distinct

organizational processes shape outcomes which link directly to value creation and value capture (quality of hire and compensation), this study contributes to a burgeoning literature focused on identifying the micro-foundations of human-resource based competitive advantage (Coff & Kryscynski, 2011; Ployhart & Hale, 2014).

THEORY & HYPOTHESES

Internal hiring occurs when a manager fills an open job by hiring a worker currently employed by the organization in a different job, resulting in the reallocation of that worker to a new set of organizational activities. In developing theory to understand the tradeoffs between the two internal hiring process at the center of this study, I highlight the fact that posting is characterized by two market-like features, self-selection and formality, that are largely absent in sponsorship, which instead involves active managerial search and using personnel connections to gather information. I then explore the effects of the difference on quality of hire and salary a worker receives upon entering a new job within the firm.

Bounded Rationality and Quality of Hire

A key facet of behavioral theories of the firm is the presumption that decision-makers are boundedly rational. Because decision-makers are cognitively limited and have limited time, information, and resources at their disposal, neither the complete set of alternatives from which a decision maker can choose is known ex ante, nor are the consequences involved in choosing among the available alternatives (March & Simon, 1958). As a result, failures in generating and evaluating alternatives have been identified as two of the chief reasons why managers fail to optimally allocate available resources (Afuah & Tucci, 2012; Knudsen & Levinthal, 2007).

Self-selection and generating alternatives. Because the complete set of alternatives is not known ex ante, boundedly rational decision-makers must engage in search to generate alternatives. Search not costless, however, and one of the ways decision-makers economize is by considering only a small portion of available alternatives (Hauser & Wernerfelt, 1990; Shocker, Ben-Akiva, Boccara, & Nedungadi, 1991). While considering more alternatives does not guarantee a better decision (Iyengar & Kamenica, 2010), decision-making success does tend to improve when more alternatives are considered (Alexander, 1979; Gemünden & Hauschildt, 1985; Nutt, 1998), in part because it lessens the odds that a superior alternative will be left out of the consideration set.

Markets facilitate resource allocation by providing a common platform for widely dispersed buyers and sellers to exchange information about their needs and preferences (Zenger et al., 2011). Self-selection refers to the ability of market participants to choose which available opportunities to pursue based on this information rather than have those matches determined by managerial authority. One way managers (as buyers) are able to harness the power of self- selection is by broadcasting information about an opportunity and allowing interested sellers to self-select into the set of alternatives to be considered by the manager. Rather than the manager assuming the responsibility for generating alternatives through active search, sellers search for opportunities that match their preferences, enabling managers to generate more alternatives without incurring many of the costs associated with a broader search (Afuah & Tucci, 2012). Moreover, because sellers have more information on their preferences than managers and are likely to seek out alternatives that meet those preferences, searches that may be considered distant from

the perspective of the manager may often be considered local from the perspective of the seller. By essentially transforming local search into distant search (Afuah & Tucci, 2012), self-selection should be expected to expand the number of alternatives considered by a manager – and more alternatives reduces the risk that a quality alternative will be overlooked.

The posting process enables managers to harness the power of self-selection by broadcasting information about an open job and allowing internal candidates located throughout the organization, including those in in more distant areas, such as workers located in a different location, department or function, to self-select into a queue of candidates competing for the job. In contrast, sponsorship provides no formal mechanism for employees to express their interest in an open job. Rather than broadcast information about the opening and allow interested candidates to self-select into the candidate pool, the manager actively searches for alternatives (Mintzberg, Raisinghani, & Théorêt, 1976) through their personal network. The pool of potential candidates is therefore restricted by a manager's previous experience and connections. While information about internal candidates residing outside a manager's immediate network is likely accessible (e.g. through human resource information systems, talking with HR, etc.), obtaining this information takes time and effort and the likelihood of finding a superior alternative is uncertain. Moreover, managers are more likely to place a higher value on information obtained through their social network, further discouraging the search for candidates residing outside of it. As a result, sponsoring managers typically only consider those candidates with whom they are already familiar (Pinfield, 1995; Podolny & Baron, 1997),

and even the most well-connected managers in large organizations are unlikely to be familiar will all potential internal candidates.

In sum, by enabling candidates located both within and outside a hiring manager's social network to self-select into the consideration set, posting should be expected to generate a larger set of candidates than would otherwise be accessible through a manager's personal network, reducing the likelihood that an exceptional internal candidate will be overlooked.

Formality and evaluating alternatives. In addition to the challenges associated with generating alternatives, boundedly rational managers also face difficulties evaluating alternatives. In particular, recent work has called attention to the problems associated with bounded awareness, which refers to the propensity of boundedly rational individuals to fail to seek out or incorporate relevant and accessible information into their decision-making process, instead relying on less relevant information. Bounded awareness is one symptom of intuitive thinking, which often fails to allow for the possibility that evidence needed to make a good decision is missing. As a result, decision-makers tend to make decisions based on a subset of available information (Brenner, Koehler, & Tversky, 1996; Kahneman, 2011). This "misalignment between the information needed for a good decision and information included in the decision-making process" (Bazerman & Chugh, 2005, p. 10) can lead to costly errors. Such errors are problematic in the hiring context, where managers are notorious for their "stubborn reliance on intuition and subjectivity" (Highhouse, 2008, p. 333).

Research suggests that interpersonal networks serve as conduits for information exchange within organizations, providing managers with ready access to information that

is richer, more complete, and perceived as more trustworthy than information obtained from other sources (Bradach & Eccles, 1989; Granovetter, 1985; Podolny & Baron, 1997). While this information might be expected to improve decision-making, access to information alone is not enough to ensure a good decision; managers must still select which information to use and which information to ignore. In fact, studies spanning different contexts and levels of analysis, from those examining individual hiring decisions[6] to firm-level decisions about selecting merger and acquisition partners (Rogan & Sorenson, 2014), show that managers routinely struggle to objectively evaluate alternatives with whom they have an existing connection.

A market-oriented allocative process may therefore actually be superior to an information-rich relational process in helping managers to overcome problems associated with bounded awareness by shaping the information used to evaluate alternatives. Markets are institutions supported by a system of rules and conventions designed to facilitate exchange among buyers and sellers (Casson, 1982; Menard, 1995; Polyani, 1957). These rules and conventions – which I refer to as formality – are both impersonal and non-arbitrary, thereby providing a stable framework for transactions to take place

[6] There is ample evidence that managers rely on irrelevant information when making hiring decisions. For example, managers often give substantial weight to performance in a previous job despite the fact that is often a poor predictor of future performance (Cascio & Aguinis, 2008) and frequently allow attributes such as gender, race, attractiveness, and weight to influence hiring decisions (e.g. Agerström & Rooth, 2011; Bertrand & Mullainathan, 2004; Marlowe, Schneider, & Nelson, 1996). There is also an equal amount of evidence that hiring managers fail to seek out relevant information, even when it is easily accessible. For example, managers routinely bypass proven selection aids in favor of unstructured interviews (Highhouse, 2008) and use interviews to confirm their first impressions of candidates at the expense of gathering job-relevant information (Dougherty, Turban, & Callender, 1994).

(Menard, 1995: 1967). These rules and conventions serve several functions, two of which are establishing the terms of exchange and defining what constitutes legitimate behaviors (Loasby, 2000). In establishing the terms of exchange, the market generates at set of evaluation criteria; in defining what constitutes legitimate behaviors, the market imposes accountability on buyers.

Evaluation criteria and relevant information. For markets to function, there must be a mechanism for managers (as buyers) to broadcast information to potential sellers about the good or service they are looking to procure (Zenger et al., 2011). Though managers may have difficulties fully articulating their needs (Nickerson & Zenger, 2004), this initial information helps to establish the terms of exchange both by serving as the initial criteria against which sellers evaluate their interest in pursuing the opportunity and by servings as the initial criteria against which the buyer evaluates those sellers who self-select into the consideration set. As a result, buyers are likely to seek out, and sellers are likely to provide, information enabling buyers to evaluate alternatives against a set of established criteria.

One way posting introduces the formality of markets is through the use of formal job descriptions. The posting process requires a manager to create a formal job description, necessary for broadcasting information about an open job to potential candidates. Though it can be difficult to develop accurate, comprehensive job descriptions (Backhaus, 2004; Sanchez & Levine, 2012), the requirements defined at this initial stage nevertheless serve as a set of formal criteria against which potential candidates are evaluated. In contrast, sponsorship does not require the manager to create a formal job description prior to evaluating candidates. A manager must possess a

reasonable understanding of the job requirements as well as desirable candidate attributes, but because the manager does not have to broadcast information about the open job, a formal job description is not necessary. This allows the manager to informally mold the job requirements around their preferred candidate rather than evaluating the candidate against the requirements of the job (Miner, 1987; Sanchez & Levine, 2012). When compared to sponsorship, the presence of formal evaluation criteria in posting is therefore more likely to prompt managers to recognize and seek out relevant information – information enabling them to evaluate a candidate's ability to perform well in the job.

Accountability and irrelevant information. Mechanisms that impose responsibility and accountability ensure the continued participation of market participants by instilling confidence that future transactions will be completed in a fair, honest, and orderly manner. Of particular note, perceptions of the process by which firms make allocative decisions in a market can effect perceptions of fairness, with decisions that appear to be free of bias and based on objective criteria perceived as more fair and legitimate (Bies, Tripp, & Neale, 1993; Williams, 1987). Market-based accountability should therefore encourage managers to avoid using information that would lead their decisions to be perceived as biased or subjective.

Posting embeds a market-like accountability in the hiring process through the custom of requiring managers to explain to unsuccessful internal candidates why they were not selected. For every successful internal candidate there are likely to be multiple unsuccessful candidates. Because these unsuccessful internal candidates remain employees, it is important to clearly communicate the reasons why they did not get the job in order to minimize any sense of unfairness that may decrease motivation,

performance, and potentially lead to dysfunctional turnover. By ensuring that hiring decisions have to be communicated and defended, the custom of explaining to employees why they were not selected embeds accountability into the internal hiring process (Tetlock, 1992).

Sponsoring managers informally search for candidates through their personal network, so workers are often unaware they are being considered (Pinfield, 1995). As a result, accountability is more limited than it is in posting, though it is not entirely absent. Managers are required to communicate their decision to a supervisor but because supervisors typically grant managers substantial discretion over who is selected, those decisions do not have to defended to a broader audience. The higher level of accountability generated though the competitive posting process should therefore guard against managerial use of irrelevant information, as managers are more likely to use objective criteria in justifying their hiring decisions to a broader audience.

Taken together, these arguments suggest that infusing self-selection and formality into the internal hiring process will help boundedly rational managers overcome problems associated with generating and evaluating alternatives. Self-selection is likely to be more effective than active managerial search in reducing the likelihood that an exceptional candidate will be overlooked, while the formality of the market is likely to be more effective at disciplining managers to avoid costly errors associated with bounded awareness. As a result, I expect posting to create more value than sponsorship by generating higher quality internal hires, as revealed by worker performance, turnover and subsequent advancement. Specifically, I predict that when compared to sponsored internal hires:

H1: Workers hired through posting will have higher performance ratings in the new job.

H2: Workers hired through posting will be less likely to exit the firm.

H3: Workers hired through posting will be more likely to subsequently be promoted.

Competition, Negotiation and Compensation

Quality of hire is only part of story, as the value a firm is able to capture from even the highest quality hire is largely contingent on how much they are paid. It is therefore important to understand how posting and sponsorship shape compensation. To do so, it is useful to explore different approaches to salary negotiations from the perspective of the employee[7].

Markets are characterized by open competition, with sellers aware that they are competing for buyers with other sellers (Menard, 1995). Self-selection and formality are two of the key mechanisms supporting the competitive nature of markets. Self-selection allows sellers to pursue the opportunities they are interested in while formality facilitates the exchange of information that ultimately allows buyers to compare information on widely dispersed alternatives and make a selection (Zenger et al., 2011).

Posting is characterized by open competition. Interested candidates self-select into the consideration set when they apply for an open job. In doing so, they form a labor

[7] I take the perspective of the worker (and thereby minimize the role of the manager) in the salary negotiations because of the way compensation is set at InsureCo. Like many other large organizations, the HR department at InsureCo sets the pay for the job when the requisition is created rather than after the candidate is selected. That is, the amount of salary a manager can offer any candidate is determined before the hiring process begins. As a result, any effort to increase salary are likely to be initiated by the worker.

queue – a set of workers competing for a specific job at a specific time (Reskin & Roos, 1990). The formality of the posting process underscores the competitive nature of posting, as the fact that employees have to actively submit an application makes them aware that they are entering into a competition they are not assured of winning. In contrast, to the extent there is competition in sponsorship, it lacks structure and transparency. Because search is costly, managers routinely consider a small pool of internal candidates (often just a single candidate). Moreover, because managers gather information on potential candidates informally, in those cases where multiple candidates are considered, those who are not selected are often unaware of being considered (Pinfield, 1995).

While competition is often seen as a way to lower prices by pitting multiple suppliers against one another, recent work exploring the social psychological aspects of negotiation provides reason to expect the opposite in the internal hiring context. A key premise in this literature is that situational factors prime individuals to place more or less emphasis on the importance of dyadic relationships in negotiations. The more emphasis an individual places on the dyadic relationship in a negotiation context, the more likely they are to adopt a relational orientation to negotiation, and individuals adopting a relational orientation to negotiation are more likely to forgo economic gain in an effort to develop relational capital (Curhan, Elfenbein, & Xu, 2006; Curhan, Neale, Ross, & Rosencranz-Engelmann, 2008, p. 193; Gelfand et al., 2006).

Sponsorship is much more likely to cue a worker to focus on their relationship with the hiring manager. Because the hiring manager personally appointed the worker to the job absent any formal competition, the relationship with the hiring manager is likely

to be particularly salient and highly valued at the time an initial job offer is presented. This is unlikely to be case in posting, with the competitive nature of the process emphasizing the transactional nature of the employment relationship. As a result, workers hired through sponsorship are more likely to adopt a relational orientation when negotiating compensation.

Adopting a relational orientation is likely to result in a lower salary for two reasons. First, he or she is less likely to initiate a salary negotiation. Focused on developing relational capital, they will want to avoid appearing self-interested and therefore feel uncomfortable with the idea of asking for more money (Gelfand et al., 2006). They are also more likely to perceive the initial offer as fair; being more attuned to other party's goals should reduce the likelihood they will assume the other party's interests are opposed to their own, a common error in negotiations (S. E. Cross, Bacon, & Morris, 2000; Gelfand et al., 2006; Leigh Thompson & Deharpport, 1998). Second, an individual adopting a relational orientation is more likely to employ an accommodative negotiation strategy whereas an individual adopting a transactional orientation is more likely to negotiate competitively (Curhan et al., 2008), and accommodative approaches to salary negotiation have been shown to result in lower raises than competitive approaches (Marks & Harold, 2011).

These arguments suggest that relative to sponsorship, the competitive nature of the posting process will increase the likelihood that workers both initiate salary negotiations and adopt a more economically beneficial approach when they do choose to negotiate, leading me to predict that:

H4: Internal candidates hired through posting will receive higher starting salaries than sponsored employees entering equivalent jobs.

This suggests that there is an important tradeoff between the quality and costs associated with different internal hiring processes. Though posting is likely to create more value, the firm does not capture all of that value, with workers capturing a portion through higher compensation.

DATA & METHODS

I test these hypotheses using monthly personnel records covering the years 2008 to 2012 from the US operations of a large insurance company, which I call InsureCo. The primary data for my analyses consist of more than 9,000 internal hires made during the observation period, which are identified from a larger dataset consisting of 1,914,519 monthly observations covering 56,811 individual workers.

While using data from a single firm limits the confidence with which I can generalize my results, these data are particularly well suited to test my hypotheses. The distinguishing feature of these data is that the way in which InsureCo has linked their various human resource information systems allows me to clearly identify whether posting or sponsorship was used to facilitate each and every internal hire. I am also able to link these personnel records to a companion dataset with information on more than 350,000 internal and external job applications submitted during 2012, allowing me to conduct several robustness checks. Using personnel data from a single organization has several other advantages, including the fact that my performance measures are standardized across jobs and that I am able to control for the effects of job content and the location of different jobs (and therefore different attributes of moves between jobs),

all of which would pose substantial empirical difficulties in a multi-firm study. Moreover, obtaining this type of data from even a single firm is quite challenging; many firms fail to systematically record any data related to employee mobility (ERC, 2010; Oracle, 2012) and for those that do, the fear of sanctions were internal analyses to reveal previously unrecognized patterns of illegal discrimination has the perverse effect of discouraging firms from exploring these processes (Strum, 2001). The setting itself reduces at least some concerns about generalizability, as InsureCo mirrors other large contemporary organizations in several respects: hiring decisions are delegated to individual managers, employees are explicitly encouraged to actively manage their careers amid a lack of well-defined advancement paths, and there are substantial amounts of lateral and vertical mobility across broadly defined jobs.

Identifying Internal Hires

An internal hire occurs when a manager fills an open job with a current employee[8], as indicated by a change in an employee's job code, department, or both from one month to the next. An employee who changes job codes takes on a new set of tasks and responsibilities. A move to a new department is a move to different area of the business, as departments are organized around products, geographic markets, and customers (internal and external). Entry-level jobs are filled through external hiring; internal hiring is used alongside external hiring to fill jobs above entry-level.

It is important to emphasize that a change in job code does not simply represent a change in title, with little change to the work actually performed (Miner, 1987). Jobs at

[8] InsureCo has a vacancy-driven hiring process, meaning that all hires – internal and external – are preceded by an open job.

InsureCo are broadly defined by hierarchical level, function, and role. In an average year, approximately 34,000 employees were distributed across 462 job codes. Jobs are organized into nine different levels [(1) Entry-level, (2) Team Lead, (3) Supervisor/Analyst, (4) Manager/Professional, (5) Director/Technical Leader, (6) Vice President, (7) Senior Vice President, (8) Executive Vice President, (9) CEO] and thirty functional areas, including those common to most large firms (e.g. Sales, Finance/Accounting, HR, and Marketing) as well as several more specific to the insurance industry. Roles indicate the specific competencies needed to perform the job. For example, "Creative Developer" is a Level 3 role in Marketing; "Recruiting Lead" is a Level 3 role in Human Resources; and "Architect", "Applications Consultant" and "Project Manager" are all Level 3 roles with IT, each linked to different competencies. As a result, a change in job code reflects a meaningful change in the work a person does.

Dependent Variables

Quality of hire and compensation are the two primary outcomes of interest in this study. Researchers have used a wide variety of post-hire outcomes to assess quality of hire (e.g, see Breaugh & Starke, 2000; Zottoli & Wanous, 2000). In an effort to provide a holistic accounting of the quality of internal hires with InsureCo, I test my hypotheses using multiple indicators of quality: performance ratings, relative performance, turnover, and subsequent advancement.

Performance ratings and relative performance. I use five measures of job performance from InsureCo's annual performance evaluation as a first set of quality indicators.

Contribution score. A worker's *contribution score* assesses their contribution to the success of the organization. In jobs with a less direct impact on organization-level outcomes (e.g. those at lower levels), the contribution score is typically used to assess their contribution to the department or line of business. It is measured on a 0 to 4 scale [0=not contributing (0%), 1=low contribution (3.2%), 2=moderate contribution (19%), 3=full contribution (66.8%), and 4=exemplary contribution (11%)].

Competency score. A worker's *competency score* assesses their skills relative to what is required for the job. Each worker receives a separate score for each of the eight competencies assigned to their job code[9]. Each competency is measured on a 1 to 4 scale [1=Learning, 2=Exhibiting, 3=Demonstrating, 4=Modeling]. I average these individual scores to compute an overall competency score [1-2 (11.4%), 2-3 (66.2%), 3-4 (12.4%)].

Relative performance. Managers also rank workers in similar jobs as part of an annual calibration process (described below). However, workers are not simply ordered according to their contribution and competency scores; rather, this is intended to be a measure of overall value to the organization that takes into account both previous performance and future potential. Although there are no formally established guidelines dictating how finely managers should distinguish among workers, these calibration sessions typically create "buckets" of employees; a group of 100 employees may not be ranked from 1 (highest) to 100 (lowest), but rather the top five employees may receive a 1, the next ten a 2, the next twenty-five a 3, and so on. I use these ranking to create three dichotomous measures of relative performance: whether a worker is ranked in top the

[9] Selected from an overall library of 124 competencies customized for InsureCo.

quartile (*top 25%*), bottom half (*bottom 50%*), or bottom quartile (*bottom 25%*) of her cohort in her first year in the new job.

While all of these are subjective measures of performance, several researchers have argued that subjective ratings are among the most valid measures of performance despite concerns about the potential for managerial bias to affect ratings (Cascio, 1998). Subjective ratings enable managers to take into consideration a variety of behaviors and outputs relevant to the job (Medoff & Abraham, 1981) as well as account for factors affecting performance outside the control of the individual worker (J. P. Campbell, McCloy, Oppler, & Sager, 1993). However, it is also important to note that InsureCo's annual evaluation process helps to reduce potential concerns about supervisory bias affecting individual performance ratings. Managers who supervise workers in similar jobs meet in person to review and discuss their ratings of individual workers – a process known as calibration. These calibration discussions are intended to ensure that managers are evaluating workers against a common standard and to identify and correct instances where managers may have rated employees too harshly or leniently. Research has shown that calibration tends to reduce subjectivity and bias in performance ratings both because ratings are likely to be more consistent across employees when managers share a common view on rating standards (Mclntyre, Smith, & Hassett, 1984; Pulakos, 1984) and because "fellow managers do not do not usually let each other off easily if they believe an employee has been rated unfairly, creating peer pressure that provides a powerful incentive to make accurate ratings" (Pulakos & O'Leary, 2011, pp. 152–3).

Turnover. Turnover is a second indicator of match quality (Jovanovic, 1979; Mortensen, 1988). I create two dichotomous measures of turnover indicating whether a

worker exits the organization with the first 12 months (*turnover12*) or 24 months (*turnover24*) of moving to a new job. I do not distinguish between voluntary and involuntary turnover for two reasons. Conceptually, both are indicators of poor matches, with the worker and firm both more likely to terminate an ill-fitting employment relationship. Empirically, while the data do indicate whether turnover was voluntary or involuntary, managers and HR staff at InsureCo both told me not to trust these indicators as reflecting the actual reasons an employee left the organization. Consistent with research showing that turnover rates are relatively low among internal hires in non-entry-level jobs (Bidwell, 2011), approximately 5% of internal hires exited the firm within 12 months, while 13% exited within 24 months.

Promotion. Subsequent promotion is a third indicator of quality. Promotions are internal hires that result in the employee moving into a higher level job. Because time to promotion varies across jobs, I create two dichotomous measures of subsequent advancement: whether a worker was promoted within 24 months (*prom24*) or 36 months (*prom36*) of moving into a new job. Approximately 14% of internal hires were subsequently promoted within 24 months, while 31% were promoted within 36 months.

Starting salary. The starting salary is the natural logarithm of the salary a worker receives in the first month in a new job. Salary accounts for the vast majority of compensation for most workers at InsureCo. Sales workers represent the main exception and their bonuses, which are tied to clearly defined sales targets, can account for a substantial portion of their total income. However, the bonus amount these workers are expected to receive based on their targets are factored into the annual salary figures recorded in InsureCo's personnel records. For example, if a salesperson is hired into a job

with a base salary of $80,000 and expects to earn a bonus of $40,000, for a total expected annual compensation of $120,000, her salary in the monthly personnel record from which I pull this figure will be $120,000. This means that the salary figure I use represents the total compensation she should expect to earn during the year, which is the figure upon which she will be negotiating.

Independent Variable

The independent variable is a dichotomous indicator of whether posting (1) or sponsorship (0) was used to fill the job, identified through an unambiguous indicator in the first monthly observation of a worker in her new job. 3,841 (43%) of internal hires were made through posting and 5,458 (57%) through sponsorship.

Control Variables

An important concern when using non-experimental data is the potential for omitted variables to create spurious correlations between the independent and dependent variables. Hiring managers at InsureCo are able to choose whether to fill a job through posting or sponsorship. A particular concern in this study is that there may be variables that both affect a manager's decision of which process to use as well as the outcomes of interest. In the absence of existing empirical evidence, it seems likely that the choice to use posting or sponsorship might be affected by three factors. First, it could be that there are certain jobs that are always posted and others that are always filled through sponsorship. Second, it could be that managers are different; that the choice is driven by attributes of individual managers that may also affect the performance and pay of the candidates they hire. Third, it could also be the case that managers only post jobs if they have been unable to or assume they will be unable to identify qualified candidates

through their personal network; if so, the choice may be driven by the nature of the candidate pool visible to a specific hiring manager.

Empirically, I leverage the level of detail in my data to address the first issue, which enables me to control for many of the job characteristics that might be expected to have an effect on the choice between posting and sponsorship. To address the second and third issues, I run a series of robustness checks, including using an instrumental variable approach which I describe in more detail later in the paper.

In addition to the empirical strategies described in more detail below, it is also useful to report what various HR staff and hiring managers had to say about why a manager may choose to fill a job through posting or sponsorship. I interviewed ten members of the human resources department, including three managers responsible for making hiring decisions within this department, as well as three hiring managers residing in other functional areas. These conversations revealed that to the extent there are any variables which systematically shape a manager's decision[10], the choice of internal hiring process is likely driven by whether or not a manager is already aware of a potential candidate. Five of the six hiring managers reported that they were likely to use sponsorship if a candidate they felt was qualified was readily identifiable. That is, these managers would choose to post the job if they had to engage in much more than minimal effort to identify potential candidates on their own. In addition, four of the six hiring managers, and nearly all of the HR staff supporting multiple hiring managers, noted that

[10] The majority of the HR staff answered by questions with an initial caveat such as, "I'm not sure what leads a manager to choose to post or sponsor, but I suppose it is possible that . . ." Similarly, the hiring managers themselves stated something along the line of, "I've never really though much about this before, but now that you ask, I think my previous choices might have been influenced by . . ."

even among departments with similar jobs, managers in some departments were more likely than others to post jobs. That is, the process use to filled job within a department was sometimes driven by custom rather than a result of a systematic evaluation of the costs and benefits of each approach or the attributes of individual managers[11]. The HR staff also reported that hiring managers frequently asked them how other hiring managers within the organization had filled similar jobs in the recent past, an observation which helped inform my choice of an instrumental variable.

Job attributes. In order to compare the outcomes associated with different processes used to staff similar jobs, I control for several job-level attributes. I include dummy variables to control for hierarchical rank, functional area and the state a job is located in (51% of job are located in the headquarters state). In order to control for fixed propensities of different jobs to be filled by posting or sponsorship, I also include separate dummies for each of 266 job codes filled though internal hiring during my observation period. Importantly, the data reveal no systematic differences in the types of jobs that are filled through posting or sponsorship. Of all the job codes filled internally from 2008-2012, 84% were filled by both posting and sponsorship, and moves into those jobs codes accounted for 99% of all internal hires. Of the job codes filled exclusively through either posting or sponsorship, none were filled more than six times and the vast majority were filled only two or three times. It is therefore likely that even those job codes filled exclusively through one process are nevertheless open to being filled through

[11] In fact, in unreported analyses looking at the decision to use posting or sponsorship, the only individual-level variable that had any predictive power was how a manager entered their current job, with managers who entered their current job through posting 30% more likely to fill open jobs through posting themselves.

both processes, with the apparent exclusivity an artifact of so few hires having been made into those job codes during the sample period.

Job transition attributes. Another concern is that the outcomes may be affected by the types of moves workers are making rather than how those moves are made. For example, we might expect that sponsored workers are more likely to come from similar jobs (because managers are more likely to have personal connections to workers doing similar work) and that those will workers will have higher levels of initial performance as a result. To account for this possibility, I include dummies for whether an internal hire resulted in a worker moving into a new job in the same function or same department. Similarly, I include dummies indicating whether an internal hire resulted in a promotion (a vertical advancement; n=4,843), an expansion (a lateral advancement which results in an expansion of the worker's competencies; n=3,594), or a transfer (a lateral move to the same job in a different department; n=1,122), which may affect pay and/or performance. I include the worker's salary in the final month of their previous job in some models to account for the possibility that internal salary adjustments may be based on an employee's previous salary even when moving across very different jobs.

Individual attributes. I also include controls for a variety of individual attributes. Demographic characteristics include gender, age and age-squared, and ethnicity. Tenure and tenure-squared are calculated as the number of months (squared) a worker has been employed by the firm. I include a worker's contribution and competency scores in their previous job as a rough indicator of pre-hire quality. InsureCo does not include years of education or highest degree completed in their personnel records.

Additional controls. I include dummies for each year in the sample to reflect changing labor market conditions. In models predicting relative performance, I control for the size of a worker's performance rating cohort (e.g. the number of workers in their forced ranking group).

Sample Restrictions

The samples used for each of my analyses vary according to a number of restrictions I placed on the data. In the analyses where performance ratings are used as dependent variables, I dropped observations with missing performance data, which occurred when a worker had been hired too recently to assess or exited the firm before being assessed (n=2,484). In both the turnover and advancement models, the samples are restricted to those workers who were hired early enough for me to calculate the dependent variables of interest (e.g. to be included in the model predicting turnover in 12 months, a worker either had to have exited the firm within 12 months of moving into their new job or occupied the job for 12 months). Finally, in the compensation models, I excluded observations with missing salary data (n=28).

ANALYSIS & RESULTS

Table 2.1 provides means, standard deviations, and correlations for the main dependent and independent variables, with each observation representing an internal hire. Of particular interest are the correlations between the multiple measures of quality of hire. The correlation between the contribution and competency scores (r = .67) indicates that these two measures pick up different aspects of performance. The correlations between these two measures and the relative ranking variables covary in the expected directions while also suggesting that they are picking up different aspects of performance,

as they are positively correlated with a worker ending up in the top quartile (r = .43, .45) and negatively correlated with a worker ending up in the bottom half (r = -.46, -.50) and bottom quartile (r = -.40, -.46). The low correlations among the performance rating variables and the turnover and subsequent promotion variables (none exceed r = +/- .13) similarly suggest that each of these variables are capturing a different element of performance.

It is also important to note the low correlations between salary and each of the performance measures (none exceed r = +/- .16), which underscore the notion that salary does not simply reflect a manager's expectations about performance in the new job, but is instead largely determined by a negotiation process which occurs prior to a manager observing actual performance (Jovanovic, 1979). This is important in interpreting the results, as I argue that while posting results in both higher quality hires and higher salaries, the higher salaries are not a result of the manager expecting a higher level of performance. In fact, the robustness checks suggest that, if anything, managers expect sponsored hires to perform better.

Performance

Table 2.2 presents analyses of each of the five performance measures. I use ordinary least squares regressions in models using competency and contribution scores as the dependent variables. Competency score is a continuous variable and though contribution score is a discrete, ordinal measure, the OLS model is easier to interpret than an ordered logit model (and both provide similar results). I use a logit specification for models where relative performance is outcome of interest, as the dependent variables are binary. The unit of analysis in all models is an internal hire and the performance

measures reflect performance in the first year on the job. I cluster the errors by individual to account for non-independence among the errors.

Using contribution and competency scores as the dependent variables, Models 1 and 2 provide support for Hypothesis 1, with the significant positive coefficient for posting in both models indicating that internal hires made through posting outperform internal hires made through sponsorship. The effect sizes are relatively small, however, with posting resulting in an increase of approximately one-tenth of a standard deviation on each measure of performance, an issue I return to in the robustness checks. Model 3 provides additional support for Hypothesis 1 in demonstrating that internal hires made through posting are approximately 13% more likely to be rated in the top quartile of their respective performance/potential distribution than sponsored internal hires. Models 4 and 5 further reveal that internal hires made through posting are less likely to have poor performance ratings in the new job. The significant negative coefficients for posting indicate that internal hires made through posting are approximately 13% less likely to fall in the bottom half of the ratings distribution and approximately 15% less likely to fall in the bottom quartile. Taken together, these results strongly suggest that posting leads managers to make better internal hiring decisions.

Turnover

Models 1 and 2 in Table 2.3 use logit models to test Hypothesis 2, that internal hires made through posting are less likely to exit the firm. Both models provide support for this hypothesis, with the significant negative coefficients for posting indicating that internal hires made through posting are around 20% less likely to exit the firm within 12

months (Model 6) and around 18% less likely to exit the firm within 24 months (Model 7).

Subsequent Advancement

Models 3 and 4 in Table 2.3 use logit models test Hypothesis 3, that internal hires made through posting are more likely to be subsequently promoted. I find very limited support for this hypothesis. The coefficient for posting in not significantly different from zero in Model 3, indicating that there is no difference the 24 month promotion rates of internal hires made through posting or sponsorship. The coefficient for posting is positive but only marginally significant in Model 4, providing some indication that posting *may* be more likely lead promotion over a 36 month period, but nothing conclusive.

Salary

Models 5 and 6 in Table 2.3 test Hypotheses 4, that internal hires made through posting will receive higher starting salaries than sponsored hires entering equivalent jobs. The significant positive coefficient for posting in Model 10 provides support for this hypothesis, revealing that posted hires receives nearly 4% higher salaries, on average, than sponsored hires. The 4% posting premium remains after controlling for performance in the previous job (Model 11)[12].

[12] My data do not allow me to measure negotiations directly. However, as noted in Footnote 7, the salaries for individual jobs are set by HR in advance of a candidate being hired. As a result, differences in starting salary across equivalent jobs are likely to result from differences in negotiation. My discussions with a compensation analyst at InsureCo revealed that individual workers are often able to negotiate small salary increases (rarely more than 5%) from their initial offer, consistent with posting premiums in my analyses.

Mobility Patterns and Within Department Hires

In theorizing about the effects of self-selection and formality on quality of hire, I made two complementary arguments, one suggesting that self-selection improves quality by expanding the pool of potential candidates and another suggesting that formality helps to shape the information managers use when evaluating candidates. The regression results above, however, do not allow me to whether one or both of these mechanisms are driving the results. To examine this issue in more detail, I present descriptive statistics on internal source of hire (Table 2.4), which reveal that posting is significantly more likely to result in hires from different departments, functions, cities and even different buildings, consistent with my argument that self-selection lessens the likelihood that manager will overlook an exception candidate by allowing managers to more readily identify candidates widely dispersed throughout the organization. I then ran a series of regressions restricting the analysis to internal hires made within departments (Table 2.5). Because managers are likely to be aware of and have access to much more detailed information on candidates located within their own department, this provides a stronger test of my argument that, beyond providing more alternatives, posting improves decision making by disciplining what information they use in evaluating candidates. Consistent with my theorizing, the results are nearly identical to those presented in Tables 2.2 and 2.3. In fact, if we assume that managers not only have ready access to, but already possess detailed information (both relevant and irrelevant to their ability to do the job) on candidates within their department[13], we might conclude that markets are particularly beneficial in

[13] I discussed this assumption with the hiring managers I interviewed and they uniformly agreed that hiring managers are aware of potential candidates within their department that are likely to be

helping managers to avoid the use of irrelevant information when evaluating well-known alternatives, a commonly cited reason for hiring errors (Highhouse, 2008).

Supplementary Analyses and Robustness Checks

As noted above, a potential concern with my use of ordinary least squares and logit models above is potential endogeneity arising from the manager's choice to fill the job through posting or sponsorship. While earlier analyses controlled for the fixed propensities for certain jobs to be filled by posting or sponsorship, they were unable to account for either (a) differences among hiring managers which may affect both the choice of hiring process and the performance and pay of the candidates they hire, or (b) the possibility that managers only post jobs if they are unable to first identify qualified candidates through their personal network.

In order to address individual differences among managers, I reran the analysis on the set of hires made by hiring managers who hired candidates through both posting and by sponsorship during the sample period and included managerial fixed effects. In order to address the concern that managers only post if they are not able to personally identify an exceptional candidate, I adopt an instrumental variable approach. Before describing this approach, however, it is important to note that if this were indeed the case, we would expect the endogenous nature of this choice to affect the quality of hire results in the opposite direction of what I find; if managers are most likely to use sponsorship when they are able to personally identify an excellent candidate, sponsored hires should be

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candidates for open jobs. In fact, they considered identifying talent employees and developing their skills to be one of their key roles as a managers. This is reflected in the performance ratings, as the ability to "Build Human Capital" is a central competency against which the vast majority of managers are evaluated.

expected to outperform hires made through posting. Empirically addressing this potential endogeneity nevertheless seems prudent.

An instrumental variable should correlate strongly with endogenous variable (posting) but not with the second stage error term (Hamilton & Nickerson, 2003; Semadeni, Withers, & Certo, 2014). A variable that appears to meet these two conditions is the *percentage of similar jobs filled by posting in other departments in the preceding two months*. My discussions with both hiring managers and HR staff at InsureCo confirmed that managers regularly, (a) ask other managers how they recently filled similar jobs, or (b) contact HR and ask how similar positions have been filled recently. While both mechanisms should be expected to influence the manager's decision on how to fill the job, how similar jobs are filled in other parts of the organization should have little direct effect on post-hire outcomes or salary.

Table 2.6 compares the results for competency and contribution scores across several different models. Models 1 and 2 report the OLS results from the original analyses. Models 3 and 4 include managerial fixed effects and are limited to hires made by managers utilizing both posting and sponsorship. Models 5 through 8 report the results using both a traditional 2SLS approach (Models 5 and 6) and a 2SLS treatment approach which accounts for the binary nature of my endogenous variable (Models 7 and 8). The first stage estimates (not reported) reveal that I do not have to worry about instrument weakness. As can be seen by comparing the results of the two sets of OLS models, the results are consistent even after controlling for unobservable characteristics of individual managers, including a potential preference for posting or sponsorship. The instrumental variable model results are also consistent with the original OLS results. In fact, after

controlling for endogeneity bias using the IV approaches, the effect of posting of both competency and contribution scores are substantially stronger, increasing from an increase of around one-tenth of a standard deviation to nearly four-tenths of a standard deviation for contribution and over half a standard deviation for competency.

Table 2.7 presents the results for relative performance using manager fixed effects (Models 4-6) and using instrumental variable probit models (Models 7-9). Aside from the change in coefficient magnitudes, the only difference is that there is no significant relationship between how a worker enters a job and their likelihood of landing in the top quartile of the performance distribution using the IV approach. Taken together, the interpretation of these results remains unchanged – posting disciplines managers to make better internal hiring decisions, in part by avoiding hiring mistakes.

Table 2.8 presents the results for turnover using manager fixed effects (Models 3 and 4) and using instrumental variable probit models (Models 5 and 6). Table 2.9 presents the results for subsequent advancement using manager fixed effects (Models 3 and 4) and using instrumental variable probit models (Models 5 and 6). Table 2.10 presents the results for salary using manager fixed effects (Models 3 and 4) and using a traditional 2SLS approach (Models 5 and 6). Again, the results lead to similar interpretations as the main analyses, with the primary difference being the magnitude of the coefficients. The one substantive difference is that the IV probit specification indicates that while internal hires are less likely to exit the firm within 12 months, they are not more or less likely to exit the firm within the longer 24 month time period (Model 6 in Table 2.8).

Wired Searches

While posting and sponsorship are conceptually distinct, it is possible for a manager to post a job having already decided who they are going to select. Though these jobs are posted, they are actually filled through sponsorship. If this was a common occurrence and/or these instances were difficult to identify empirically, it would be difficult to interpret my results. These so-called "wired searches" are likely to be most common in firms that require managers to post all jobs. Because InsureCo has established formal systems for filling jobs through both posting and sponsorship, managers are able to avoid posting jobs when they already have a candidate in mind and thereby avoid the potential negative consequences that emerge from other employees having felt they participated in an unfair selection process (Billsberry, 2007). I nevertheless conducted two additional robustness checks to rule of the possibility that my results are affected by the inclusion of wired searches. First, I reviewed each of the 1,695 internal hires made in 2012 for which I have detailed application data. Those instances where there was only a single internal applicant (and no external applicants) could potentially be wired searches, with managers either tailoring the job description around a particular candidate and/or discouraging others employees from applying. Less than 5% of internal hires meet these criteria and of those, two-thirds were open for more than a month, suggesting that the hiring manager was hoping to find additional candidates. A total of 30 posted internal hires (1.4%) are potentially wired searches, leading me to believe that such searches are not driving my results. Second, I identified all of the postings during this period which were open a week or less ($n = 45$), another potential indication that the hiring manager created the posting for a specific candidate and therefore wanted to limit the number of

other candidates who would apply. In both cases, dropping these observations from the analyses does not substantively change the results.

External Candidates as an Alternative Explanation

I ran an additional series of robustness checks to ensure that the results for posting were not driven by external market forces. When posting a job, a manager has the option of restricting the competition to internal candidates by only posting the job internally, or opening the competition to both internal and external candidates. An alternative explanation for the performance findings might be that the inclusion of external candidates allows managers to benchmark internal candidates against the market, leading to better hires when an internal candidate is selected (Billsberry, 2007). Perhaps more importantly, an alternative explanation for the higher starting salaries associated with posting might be that mere exposure to the external market drives up the starting salaries for posted jobs, with the results driven by those instances in which external candidates were considered but an internal candidate was selected.

In order to rule out these alternative explanations, I use data from 2012 that allows me to identify the number of internal and external candidates that applied to every posted job and how far they made it through the hiring process. This allows me to identify which job postings were restricted to internal candidates and which were open to external candidates. Table 2.9 reveals the result of analyses including a dummy variable equal to one if external candidates were considered for the position. Because this data begin in 2012, I am unable to calculate results for turnover and subsequent advancement. Of the 869 internal hires for whom I have both performance ratings and salary data, 578 (66%) were hired without considering an external candidate; 291 (34%) internal hires

competed against at least one external candidate. The results indicate that opening the job to external candidates has no effect on performance (Models 1-5) or starting salary (Models 6-7).

DISCUSSION

This research advances our understanding of how human resources are allocated within firms by shedding light on the processes used to facilitate internal hiring within contemporary organizations. Despite the prevalence of internal hiring and its impact on the fortunes of firms and workers, our current models of internal hiring are still largely based on literatures exploring advancement with highly bureaucratic internal labor markets that bear little resemblance to their more contemporary counterparts. This study provides a much-needed update to these earlier models, identifying and describing the two most commonly used internal hiring processes – market-oriented posting and relationship-oriented sponsorship. I develop theory predicting the relative effects of posting and sponsorship on quality of hire and compensation by highlighting that posting is characterized by two market-like features, self-selection and formality, that are largely absent in sponsorship, which instead involves active managerial search and a reliance on personnel connections for gathering information.

I argued that introducing these market features would improve decision-making by helping managers to overcome challenges associated with generating and evaluating alternatives. Self-selection should generate a larger pool of alternatives, reducing the likelihood and exceptional alternative will be overlooked, while the formality of the market should encourage managers to both incorporate relevant information and avoid irrelevant information as they evaluate candidate qualifications against the requirements

of the jobs. Consistent with these arguments, I found that employees hired through posting outperform their counterparts hired through sponsorship and are less likely to exit the firm, though there is no discernable difference in their likelihood of subsequent advancement. These performance results are particularly notable given that social exchange theory would predict that sponsored workers should feel more gratitude to the hiring manager and therefore perform better (Emerson, 1976).

However, this improved decision-making comes at a price. I argued that employees hired through the more competitive posting would be less likely to adopt a relational orientation to salary negotiations and thus more likely to initiate salary negotiations and adopt a more effective, competitive approach when doing so. Though I am unable to test this mechanism directly (I do not observe the difference between initial and final salary offers), the results are consistent with this account, as employees hired through posting are paid 4% more than sponsored employees hired into equivalent jobs.

Despite this posting premium, the overall results suggest that posting enables firms to both create and capture substantially more value than sponsorship. Unfortunately, my data do not allow me to directly measure the value created by higher levels of individual performance or the savings associated with higher retention rates. However, with the costs of replacing an employee alone running anywhere between 20% and 200% of an employee's annual salary (Boushey & Glynn, 2012), the combined performance and retention benefits associated with better internal hires are likely to far exceed the higher salary costs. Moreover, the posting premium suggests that workers also share in the increased value creation, earning higher salaries for equivalent work. The posting process therefore appears to benefit both firms and workers.

CHAPTER 3: THE IMPACT OF INTERNAL HIRING PROCESSES ON WOMEN'S CAREER ADVANCEMENT AND PAY

INTRODUCTION

Dramatic changes in the external competitive environment over the past quarter century have brought about equally dramatic changes in the organization of work and employment within firms. Rapidly shifting consumer demands, constant technological advancements, increasing global competition, the decline of unions, and shareholder pressures to minimize costs have led organizations to place a premium on labor market flexibility (Bidwell, 2013; Cappelli, 1995; Jacoby, 2005; Piore, 2002). A notable consequence has been the gradual dismantling of the structures and processes supporting traditional, bureaucratic internal labor markets (ILMs) (Cappelli, 1999b; Osterman & Burton, 2005). For all of the benefits bureaucratic ILMs provided workers, namely the sense of stability and security associated with the implicit promises of lifetime employment and steady upward advancement, a long literature has also documented their central role in generating and sustaining gender inequalities by allocating women to marginalized jobs with limited opportunities for advancement (Barnett et al., 2000; Bridges & Nelson, 1989; Petersen et al., 2005; Rosenfeld, 1992). As a result, the dismantling of bureaucratic ILMs and the subsequent introduction new work structures, policies and practices designed to support more flexible employment systems represents a momentous opportunity for overcoming stubbornly persistent gender disparities in career advancement and pay within organizations.

However, we are only just beginning to understand which of the many recent changes to employment structures and process have been successful in reducing gender

inequality in the workplace. For example, while organizational delayering (Dencker, 2008), broadly defined jobs and the adoption of cross-function teams (Alexandra Kalev, 2009) have helped to increase women's prospects for internal advancement, women remain underrepresented at the most senior organizational levels (Rafter, 2015). Other initiatives intended to remediate gender disparities, such as the introduction of merit-based reward systems (Castilla & Benard, 2010; Castilla, 2008, 2012) or certain diversity initiatives (Kaiser et al., 2013; A. Kalev, F. Dobbin, & Kelly, 2006), may unintentionally introduce new sources of inequality while providing the illusion of equal treatment. Overall, women continue to occupy a disproportionate number of low-level and undervalued jobs (Cohen, 2013) and are still paid less than men for similar work (Goldin, 2014; Petersen & Morgan, 1995), highlighting the importance of identifying and testing the impact of additional mechanisms with the potential to help to chip away at these longstanding gender disparities within organizations.

This study contributes to this effort by exploring the effect of contemporary *internal hiring processes* – the processes used to allocate current employees to new jobs within organizations – on the organizational careers of women. In bureaucratic ILMs, internal hiring was governed by strict administrative rules used to maintain lines of progression along clearly defined job ladders. While these rules, which placed significant constraints over which opportunities workers were eligible to pursue and limited managerial discretion over individual hiring decisions, were useful for maintaining stable employment systems based on long-term employment (Doeringer & Piore, 1971; Sorensen, 1983) they have proven to be largely incompatible with the current efforts to develop more flexible employment systems (Piore, 2002). This paper examines how

posting and *sponsorship* – the two process which have emerged as the primarily replacements for administrative rules in large organizations (Cappelli, 2008; Marsden & Gorman, 1999; Pinfield, 1995) – shape the career advancement and pay of women.

Posting is a formal, market-oriented process in which a hiring manager posts information about an open job to an internal job board and invites interested employees to apply. Though job posting systems have existed since the 1940s in union workplace (Slichter et al., 1960), their widespread adoption is a recent phenomenon. Less than half of companies posted anything other than blue-collar jobs in the mid-1980s, a figure that rose to 60 percent in 1999 before exploding to over 95 percent in the mid-to-late-2000s (Frank Dobbin, Schrage, & Alexandra Kalev, 2014; Kleiman & Clark, 1984; Taleo Research, 2005). However, the actual percentage of internal hires made through posting substantially lower than 95 percent. Though many companies have adopted policies encouraging managers to post open jobs, few require it (Grensing-Pophal, 2006; Strum, 2001), and no state or federal laws require firms to post jobs internally. Managers therefore typically have the option of bypassing the posting process in favor of *sponsorship*, an informal, relationship-oriented process in which a hiring manager fills an open job with a candidate known through a personal connection (Pinfield, 1995). As a result, posting and sponsorship operate side-by-side as equally viable ways to identify potential *internal* candidates within most firms (Marsden & Gorman, 1999).

While the different ways in which external hiring process such as the use of referrals shape gender disparities in employment outcomes has received considerable attention (Fernandez & Mors, 2008; Petersen et al., 2005), internal hiring processes and their corresponding effects on the fortunes of women within firms have remained largely

unexplored. This lack of attention, however, does not reflect a lack of scholarly interest in the topic, as scholars have long-speculated, but have thus far been largely unable to test, how the use of markets and networks within firms might affect the fortunes of women (Bielby, 2000; Cannings & Montmarquette, 1991). Rather, this oversight can be partially attributed to the fact that the most visible consequence of the dismantling of bureaucratic ILMs has been a dramatic increase in mobility across organizations. Amidst the increasing attention paid to the rise of interorganizational careers, it has been easy to overlook the fact that internal hiring remains a key avenue of attainment. In fact, nearly half of all open jobs – and three quarters of executive-level jobs – in large organizations are currently filled internally (Chapelle, 2014; Crispin & Mehler, 2013) and firms across the globe are devoting increasing resources towards developing their internal hiring capabilities (Murthy, 2013). Access to data has also hindered efforts to develop and test theory. Variations in internal hiring processes operating within firms limit the insights to be gained from surveys of employer hiring practices, as simply having a posting system or policy in place does little to ensure that a majority of jobs are filled actually filled through posting (Dobbin et al., n.d.; Marsden & Gorman, 1999). Obtaining useful data from individual firms presents its own set of challenges; many firms fail to systematically record internal hiring data (ERC, 2010) and for those that do, the fear of sanctions were internal analyses to reveal previously unrecognized biases has the perverse effect of discouraging firms from exploring these processes (Strum, 2001, p. 461).

I unpack the different ways in which contemporary internal hiring process shape the organization careers of women using uniquely detailed personnel and internal job application data from a large service organization in the United States. In doing so, I

extend the equally rich but largely separate literatures detailing the structural and behavioral barriers facing women in contemporary organizations. *Structural barriers* refer to constraints imposed by the organization of work within the firm (Reskin & Roos, 1990). A central argument in this literature is that gender inequalities arise in large part due to the jobs women hold, as women are often concentrated in marginalized roles. *Behavioral barriers*, in contrast, refer to constraints emerging from individual-level differences in preferences or behaviors that are either innate or the product of such early socialization processes that they operate as if they were innate (Hull & Nelson, 2000, p. 232). This literature has documented, for example, how women's reluctance to engage in negotiations (Gerhart & Rynes, 1991; Greig, 2008; Small, Gelfand, Babcock, & Gettman, 2007), enter competitive selection environments (Kanthak & Woon, 2014) and engage in self-promotion (Moss-Racusin & Rudman, 2010) can lead to gender differences in advancement and pay. The central argument of this paper is that because organization processes such as internal hiring often facilitate the interaction of individual employees and organization structures (e.g. individual workers moving across jobs within a firm), the ability of such processes to remediate gender inequalities within organizations depends on the extent to which they account for *both* gender differences in structural constraints, such as the different types of jobs occupied by women and men, *and* gender differences in preferences and behaviors.

I build theory around a base of several structural and behavior barriers with well-documented impacts on the organizational careers of women. My initial set of arguments suggests that posting holds tremendous potential for reducing inequalities in both advancement and pay. In terms of advancement, I expect that posting will be particularly

adept at facilitating the advancement of workers occupying low-status and/or marginalized jobs, and because women disproportionately occupy such jobs, posting should be support the internal advancement prospects of women. Workers in marginalized jobs have limited visibility to potential hiring managers as well as limited access to the informal networks though which information on potential advancement opportunities often flows (Ibarra, 1993, 1995; Alexandra Kalev, 2009; Podolny & Baron, 1997). While sponsorship reinforces these structural barriers, posting should help to alleviate them by providing open access to information about potential advancement opportunities, as well as a mechanism though which employees are able to make themselves and their qualifications visible to hiring managers.

In terms of pay, I expect to find smaller within-job gender gaps in pay when jobs are entered through posting as compared to sponsorship. Survey research and lab experiments have consistently demonstrated that women are significantly less likely to engage in salary negotiations and are less successful when they do, largely because women tend to adopt a more relational approach to such negotiations (Babcock & Laschever, 2003; Bowles, Babcock, & Lai, 2007; Marks & Harold, 2011). I argue that the transactional nature of the posting process, in contrast to more relational sponsorship process, will reduce gender differences in negotiating behavior by encouraging women both to initiate negotiations and to adopt a more competitive approach when they do negotiate.

My second set of arguments, however, suggests that while the posting hold tremendous potential for reducing gender inequalities, the gendered nature of the posting process itself will limiting its effectiveness by discouraging otherwise qualified women

from applying to posted jobs. The effective functioning of market-based matching processes requires the active participation of both buyers (in this case, hiring managers) and sellers (candidates). I show that despite appearing to be gender-neutral, the posting process itself is constructed on underlying assumptions about appropriate behavior that discourage women's participation (Acker, 1990). Specifically, the posting process requires employees to enter into a competition, engage in self-promotion, and make judgments about the extent to which they are qualified for an open job. Following recent research demonstrating women's relative reluctance to engage in competition (Niederle & Vesterlund, 2007) and self-promotion (Rudman, 1998), and increased propensity for rule following (Villalobos, 2009), I hypothesize that women will be less likely to apply for posted jobs than structurally and observationally equivalent men (e.g. men occupying the same job and possessing the same qualifications).

Taken together, my arguments suggest that posting has the *potential* to reduce gender inequalities in advancement by helping to overcome the structural barriers imposed by the segregation of women into marginalized jobs, as well as the potential to reduce gender inequalities in within-job pay by reducing gender differences in negotiating behavior. However, the effectiveness of the posting process in accomplishing these goals is severely limited by the implicitly gendered nature of the posting process itself, which reinforces a number of behavior barriers emerging from gender differences in preferences and behaviors that are likely to reduce women's willingness to apply for posted jobs.

I use multiple modeling strategies in testing these predictions, which are largely supported using five years (2008-2012) of annual personnel records covering all

employees of a large health insurance provider and detailed data on more than 20,000 internal job applications. The personnel data are distinctive in that they clearly identify whether posting or sponsorship was used to facilitate each one of the more than 9,000 internal hires (resulting in more than 4,600 internal advancements) made over this period. Together, these data allow me to conduct what is, to my knowledge, the first detailed study of the whether and how these two very different internal hiring processes affect gender inequalities in advancement and pay within contemporary organizations.

THEORY AND HYPOTHESES

The central argument of this paper is that the ability of internal hiring process to remediate gender inequalities within organizations depends on the extent to which they account for both gender differences in structural constraints *and* gender differences in preferences and behaviors. In order to fully develop this argument, it is important to first define some key terms.

Internal hiring occurs when a manager fills an open job by hiring a worker currently employed by the organization in a different job, resulting in the reallocation of that worker to a new set of organizational activities[14]. From the perspective of the worker, an internal hire results in an *advancement* when the move results in a substantive increase in responsibility, which is frequently accompanied by an increase in pay. I use the term advancement rather than promotion to more accurately represent changes the way workers and firms think about mobility within contemporary organizations. In the past, workers advanced primarily through promotions up a job ladder (Stewman & Konda,

[14] Internal hiring is conceptually distinct from corporate restructurings, in which large groups of workers – often entire departments or lines of business – are redeployed, en masse, to new products or markets (Capron, Dussauge, & Mitchell, 1998; London, 1996).

1983). With the transition to flatter hierarchies, broadly defined jobs, and an emphasis on cross-functional experience (Grant & Parker, 2009; Rajan & Wulf, 2006; Sanchez & Levine, 2012), lateral advancements, in which a worker receives a substantive increase in salary and responsibility[15] by moving to a job in the same hierarchical level, have become commonplace. These lateral advancements are distinct from *transfers*, which are lateral moves to similar jobs with similar pay.

Structural Barriers to Equal Advancement

A *structural barrier* to advancement is a constraint resulting from organization of work within the firm (Reskin & Roos, 1990). A number of personnel practices channel women into lower status jobs at all levels of the organization (Anderson & Tomaskovic-Devey, 1995; Fernandez & Friedrich, 2011; Kmec, 2005; Petersen et al., 2005; Reskin & McBrier, 2000) and recent work has called attention to two informal structural barriers to advancement imposed on workers segregated into lower status or marginalized jobs – *limited visibility* and *access to strategic networks* (Kalev, 2009).

Workers in lower status jobs tend to have limited interaction with others outside their work group, limiting opportunities for organizational decision makers to notice and evaluate their contributions (Acker, 1990; Kanter, 1977; McGuire, 2002). This limited visibility is further exacerbated by fact that these jobs are disproportionately occupied by women, and social scientists have long documented how organizations devalue the work – in terms of its relative importance to the goals of the organization – done in jobs

[15] In the organization I study, vertical and lateral advancements and are virtually indistinguishable from the perspective of employees and managers; lateral advancement are officially recognized as advancements in the employee's personnel records and are often accompanied with similar (and often larger) increases in salary and responsibility than promotions.

occupied primarily by women (Baron & Newman, 1990; Ridgeway, 2011; Tomaskovic-Devey, 1993).

Workers in lower status jobs also have limited access to strategic networks (Ibarra, 1993; McGuire, 2002). An individual's selection of network members is constrained by the availability of potential alternatives (Ibarra, 1992, 1993) and job segregation leads workers to build networks composed of similarly situated others. As a result, the networks of workers in marginalized jobs tend to be composed of individuals with limited power and authority (Bielby & Baron, 1986; McGuire, 2000). Moreover, gender scholars have demonstrated that job segregation perpetuates negative stereotypes of worker's competence (Ridgeway, 1997), reducing the attractiveness of workers occupying marginalized jobs as potential network partners to high-status others (Ibarra, 1993).

The limited visibility and access to strategic networks available to workers in lower status jobs limits their opportunities for internal advancement. In the absence of clear rules or structures to guide advancement, managers and workers must now actively search for internal matches that meet organizational needs and allow workers to assemble meaningful internal careers (Cappelli, 2008, p. 206). For matches to take place, managers must be aware of potential internal candidates and/or potential internal candidates must be aware of potential opportunities. Managers are less likely to be aware of individual candidates occupying lower status jobs because of their limited visibility and candidates in these jobs are less likely to be aware of potential opportunities to pursue because information about such opportunities often flows through the informal networks they have difficulty accessing (Podolny & Baron, 1997).

Because women are disproportionately represented in lower status jobs, these arguments suggest that even if managers were completely gender neutral in their evaluation of candidates, women will be less likely than men to advance simply because of the jobs they occupy; by virtue of their position in marginalized jobs, women are less likely than men to enter a hiring manager's consideration set.

Sponsorship should be expected to reinforce these structural constraints to women's advancement, while posting should be expected to alleviate them. A sponsoring manager's consideration set is limited to internal candidates that manager is personally aware of and candidates recommended through the manager's informal network. Workers in lower status jobs – who are less visible and have limited access to informal networks – are clearly disadvantaged. The opposite should be expected in posting. In allowing interested candidates to apply for an open position, posting provides a formal mechanism though which any employee is able to make themselves and their qualifications visible to hiring managers. Posting an open job on an internal job board accessible to all employees also ensures that information about potential advancement opportunities is made available to potential internal candidates regardless of the job they occupy and the composition of their network. When compared with sponsorship, posting should therefore be expected to provide more opportunities for advancement to workers with limited visibility and access to strategic networks (who are primarily female), leading me to predict that,

H1: Workers occupying lower status jobs are more likely to advance through posting as compared to sponsorship.

A Behavioral Barrier to Equal Pay

Aside from gender inequality in the form of advancement, we should not overlook gender inequality in pay. That requires shifting our attention to *behavioral barriers* resulting from individual-level differences in preferences or behaviors that are either innate or the product of such early socialization processes that they operate as if they were innate (Hull & Nelson, 2000, p. 232). Gender differences in negotiation are an important source of gender inequalities in pay, with lab and survey evidence indicating that women are less likely than men to initiate salary negotiations (Babcock & Laschever, 2003; Bowles et al., 2007; Greig, 2008) are more likely to use ineffective negotiation strategies when they do choose to negotiate (Marks & Harold, 2011).

Much research in social psychology suggests that these differences arise because women are more attuned to the relational aspects of negotiation than men (Barron, 2003; Curhan et al., 2008). As a result, women are more likely to adopt a relation orientation to negotiation in which they are often willing to forgo economic gain in an effort to develop and maintain relational capital (Curhan et al., 2006, 2008, p. 193; Gelfand et al., 2006). Focused on developing relational capital, women are more likely avoid appearing self-interested and feel uncomfortable with the idea of asking for more money (Gelfand et al., 2006). They will also more be likely to perceive the initial offer as fair; being more attuned to other party's goals should reduce the likelihood they will assume the other party's interests are opposed to their own, a common error in negotiations (S. E. Cross et al., 2000; Gelfand et al., 2006; Leigh Thompson & Deharpport, 1998). Conditional on choosing to negotiate, women are also more likely to employ an accommodative rather than a competitive negotiation strategy (Curhan et al., 2008), and accommodative

approaches to salary negotiation have been shown to result in lower raises than competitive approaches (Marks & Harold, 2011).

Recent research on negotiation suggests that situational contexts, such as subject of negotiation and the likelihood of future interaction, will shape an individual's relational orientation towards a specific negotiation, above and beyond individual differences (Curhan et al., 2008; Gelfand et al., 2006). In the case of internal hiring, the process itself is likely to be an important contextual variable. Sponsorship is much more likely to cue a worker to focus on their relationship with the hiring manager. Because the hiring manager personally appointed the worker to the job absent any formal competition, the relationship with the hiring manager is likely to be particularly salient and highly valued at the time an initial job offer is presented. This is unlikely to be case in posting, with the competitive nature of the process emphasizing the transactional nature of the employment relationship. As a result, sponsorship should be more likely to induce a relational orientation when the time comes to negotiate compensation, while whereas a worker hired through posting should be more likely to adopt a transactional orientation. If women are typically more inclined than men to negotiate relationally, this difference should minimized in the more transactional posting process, with women more likely to both initiate and adopting a competitive approach to negotiation. As a result, I expect that,

H2: Any gender gap in starting salaries associated with the move to a new job within the firm will be lower when jobs are filled by posting as compared to sponsorship.

Posting as a Gendered Process

The arguments above suggest that the posting process has the potential to alleviate existing gender disparities in both advancement and pay. However, the posting process, like any market-based process, requires the active participation of buyers and sellers. In this case, a manager assumes the role of buyer by posting information about an open job to an internal job board and inviting interested candidates to apply. Current employees assume the role of seller by expressing their interest in and qualifications for the job by submitting an application. For posting to reach its full potential as a mechanism for reducing persistent gender inequalities, women must actively engage in the internal market by applying for open jobs. There are several reasons, however, to expect that women may be less likely than men to apply for posted jobs[16].

Feminist scholars of organizations have long argued that many organizational structures and process are implicitly gendered. That is, certain facets of organizations that appear gender-neutral often advantage men in subtle ways. For example, Acker (1989, 1990) has argued that job evaluation appears to be a gender-neutral process built on an objective comparison of the knowledge, skill, and abilities required to perform a job, with a job representing an abstract category that has no actual human occupant and is instead filled by a disembodied (and therefore genderless) hypothetical worker. Yet the concept of a "job" is implicitly gendered because the hypothetical worker filling a job exists only

[16] A number of recent popular press articles have suggested that women are less likely than men to apply for open jobs (Kay & Shipman, 2014; Mohr, 2014; Sandberg, 2013), To date, however, little empirical evidence exists to support this claim, nor has the issue received much theoretical consideration. For example, the notion that women only apply for jobs if they are 100% qualified is based almost entirely on a single anecdote from a McKinsey interview with one executive from one company (Rice, 2014).

to fill that job, whose closest real world counterpart is the male worker whose life centers on his job. Empirical support for this argument can be found in recent work by the economist Claudia Goldin (2014), who has argued that the remaining gender gap in pay can largely be attributed to expectations about the number of hours worked and what constitutes appropriate work hours that largely favor men. Consistent with the idea that "gender is a constitutive element in organizational logic, or the underlying assumptions and practices that construct most contemporary work organizations" (Acker, 1990, p. 147), in the following sections I describe three specific ways in which the posting process is implicitly gendered, each of which discourages women from applying to jobs.

Posting and competition. The first way posting is gendered is through its emphasis on open competition (Marsden & Gorman, 1999). When an employee submits an application, they join a labor queue – a set of workers competing for a specific job at a specific time (Reskin & Roos, 1990). The formal nature of the process – the fact that employees have to actively submit an application – sends a clear message to employees that they are entering into a competition that they are not assured of winning.

The competitive nature of the posting process is likely to shape gender differences in participation, as multiple studies have demonstrated that women tend to be less competitively inclined than men. Behavioral economists, for example, have consistently found that women are less likely to choose to compete than men despite the fact that women who choose to compete tend to perform just as well as men (Andersen, Ertac, Gneezy, List, & Maximiano, 2013; Booth & Nolen, 2012; Croson & Gneezy, 2009). Additional studies have shown that women are consistently less likely to select into tournaments characterized by competitive compensation schemes (Brandts, Groenert, &

Rott, 2014; Mayr, Dave Wozniak, Davidson, Kuhns, & Harbaugh, 2012; Niederle & Vesterlund, 2007). Perhaps most relevant to this study, Kanthak and Woon (2014) designed a lab experiment to test whether the competitiveness of the selection environment effect the decision of women to seek political office. They found that while men and women volunteered to represent their groups at equal rates when asked, women's willingness to represent their group decreased substantially when women were told they would have to participate in an election, suggesting that women are indeed sensitive to the competitiveness of the selection process.

The existing literature offers two explanation for women's reluctance to enter competitions. One explanation attributes gender difference in competitiveness to biological differences that have evolved over time in response to ecological conditions (Colarelli, Spranger, & Hechanova, 2006; Wozniak, Harbaugh, & Mayr, 2014). Others attributes gender difference in competitiveness to early childhood socialization processes which dampen girls' willingness to compete as early as kindergarten and persist until adulthood (Carpenter & Huston-Stein, 1980; Freeman, 2007; Sutter & Glätzle-Rützler, 2014; Weinberger & Stein, 2008). Studies in behavioral economics showing that gender differences in competitiveness are stronger in patriarchal societies than in matrilineal societies (Andersen et al., 2013; Gneezy, Leonard, & List, 2009) as well studies in developmental psychology demonstrating the influence of parental and environmental influences over competitive behaviors among toddlers (Carpenter & Huston-Stein, 1980; Freeman, 2007; Weinberger & Stein, 2008) lend support to the socialization explanation. Whether women's reluctance to enter competitions emerges from innate biological differences, socialized preferences, or both, we should expect that the competitive nature

of the posting process will discourage potential female candidates to from applying for posted jobs.

Posting and self-promotion. The second way posting is gendered is that is requires interested internal candidates to engage in self-promotion. Self-promotion is a form of impression management that includes "pointing with pride to one's accomplishments, speaking directly about one's strengths and talents, and making internal rather than external attributions for achievements" (Rudman, 1998, p. 629). The simple act of putting together an application, including writing a resume, requires a worker to highlight their strengths and talents. The need to self-promote only increases throughout the hiring process, as the candidate passes the initial screening interview with an internal recruiter and then interviews with the hiring manager (and potentially several other decision-makers). Indeed, research on the hiring process has shown that applicants frequently engage in self-promotion during interviews (Stevens & Kristof, 1995) and that self-promotion frequently has a positive impact on perceived person-job fit and manager's hiring recommendations (Kristof-Brown, 2000; Proost, Schreurs, De Witte, & Derous, 2010).

Requiring interested candidates to self-promote presents a particularly unique behavioral barrier for women. According to gender role theory, men are seen as agentic in nature and thus more likely to engage in independent, assertive, and more instrumentally-driven behaviors. Women, on the other hand, are seen as communal in nature and thus more likely to engage in friendly and unselfish behaviors that demonstrate a concern for others (Eagly & Wood, 1991; Eagly, 1987). Self-promotion is an agentic trait, and thus is "intuitively more normative and acceptable for men than for

women" (L. C. Miller, Cooke, Tsang, & Morgan, 1992; Rudman, 1998: 629). Women incur social costs for violating gender-stereotypic norm prescriptions (Eagly, 1987; Heilman, Wallen, Fuchs, & Tamkins, 2004) and thus may avoid self-promoting for fear of violating the prescriptive elements of their gender stereotype and being judged as unfeminine, pushy, and domineering. Indeed, a sustainable body of evidence has demonstrated that in order to avoid potential backlash, women often choose not to engage in self-promotion even when they are aware that self-promotion is likely to lead to more successful career outcomes, including opportunities for internal advancement (Catalyst, 2007; Moss-Racusin & Rudman, 2010; Singh, Kumra, & Vinnicombe, 2002). I therefore expect that by virtue of the subtle requirement that interested internal candidates engage in self-promotion, the posting process will discourage potential female candidates to from applying for posted jobs.

Posting and rule following. The third way posting is gendered has to do with the way in which potential candidates evaluate the qualifications listed in the job posting. A typical job posting includes a list of job qualifications indicating the skills, knowledge, abilities, degrees, experience and personal characteristics (e.g. motivation, willingness to be team player) that an individual must have to perform the job. Job descriptions used to be based on a detailed job analyses, a process that rarely happens in contemporary organizations (Sanchez & Levine, 2012). Rather, individual hiring managers are likely to develop job extensive job descriptions that are developed based on a personal "wish list" rather than simply the characteristics a candidate needs to have to succeed on the job (Stybel, 2010). Put differently, job postings often describe the manager's ideal candidate, even when this ideal candidate is not likely to exist in reality (Cappelli, 2012).

This poses a potential barrier for women, as they are more likely than men to view the listed qualifications as a set of rules about who should apply for the job. While the propensity to follow rules can benefit women – researchers have attributed girl's propensity to follow rules as key reason that girls routinely outscore boys on mathematics tests (Villalobos, 2009) – it may disadvantage them in the labor market. If it leads women take written job qualifications more seriously than men, as indicated by a recent survey data (Mohr, 2014), then women are likely to apply only when they meet all of the listed qualifications, while men may be likely to apply when they only meet a portion of the listed qualifications. This difference arises from the fact that girls are socialized both at home and in school to follow rules from an early age (Babcock & Laschever, 2003, p. 35; Carpenter & Huston-Stein, 1980; Fagot, 1978; McDonald & Rogers, 1995). As a number of gender scholars have observed, "despite the modern social milieu in which assertive, soccer ball-kicking girls are a socially accepted expression of adolescent femininity, there are myriad forces at play in a girl's life which still disproportionately support rule following and carefulness" (Villalobos, 2009, p. 33). We should therefore expect that women will be less likely to apply for posted jobs than men in similar jobs and with similar qualifications, which presents a barrier to women's advancement because managers frequently hire "imperfect" candidates.

Taken together, these arguments suggest that subtle and implicit gendering of the posting process will discourage women from apply to internally posted jobs at the same rate as men occupying similar jobs and with similar qualifications. More formally, I expect that

H3: Women will be less likely than structurally and observationally equivalent men to apply for jobs posted internally.

While my data do not allow me to tease out the separate effects of competition, self-promotion, and rule-following, I am able to observe the qualification of internal applicants, which does allow me to test the rule following argument offered above. Specifically, if women are likely to apply only when they feel they meet all of the listed qualifications, while men apply even if they only meet a portion of the listed qualifications, I expect to find that women internal applicants will be more qualified than male internal applicants, which will be reflected in their performance ratings. Specifically. I predicate that:

H4: Women internal applicants will have higher performance ratings than men applying to the same job.

DATA

The arguments above suggest that though the posting process has the potential to alleviate existing gender disparities within organizations by overcoming structural barriers to women's advancement imposed by job segregation and by mitigating gender difference in negotiating behavior, its effectiveness in doing so will be limited by the implicit gendering of the posting process, which will discourage female candidates from applying for open jobs. I test these arguments using two different sources of data from a large health insurance company in the United States, which I call InsureCo. The first dataset, from InsureCo's centralized talent management system, contains annual personnel records covering all fulltime workers employed by InsureCo from 2008 through 2012, with the exception the very top (C-suite) executives. Each of the 68,018

person-year observations includes detailed demographic, pay, and performance information. The second data set, from InsureCo's applicant tracking system, contains detailed information on each of the 20,694 internal applications (successful and unsuccessful) submitted to one of the 1,697 jobs posted internally in 2012, including the job applied for and how far in the hiring process the candidate progressed. I am able to link these two datasets together through the use of unique employee identifiers.

While generalizability is always a concern when using data from a single firm, these data are uniquely suited to test my hypotheses due to the way in which InsureCo has linked their various human resource information systems. Hiring decisions at InsureCo are decentralized; individual managers are responsible for filling the jobs that fall under their supervision are given substantial latitude over who is hired as well as how those jobs are filled. To post a job, a manager submits a request though one system, and to sponsor a candidate, a manager submits a request through a different system. While both requests are routed to the same place for approval (typically the manager's immediate supervisor) they create unique identifiers in the hired employees personnel record, allowing me identify whether the hire was made through posting or sponsorship. The setting itself reduces at least some concerns about generalizability, as InsureCo mirrors other large contemporary organizations in several respects: hiring decisions are delegated to individual managers, employees are explicitly encouraged to actively manage their careers amid a lack of well-defined advancement paths, and there are substantial amounts of lateral and vertical mobility across broadly defined jobs.

Internal mobility variables

An internal hire results when a manager fills an open job with a current employee[17], as indicated by a change in an employee's job code or department. Each job code at InsureCo represents a unique set of tasks and responsibilities. As a result, a change in an employee's job code reflects a meaningful change in the work a person does, as opposed to a change in title with little change to the work actually performed (Miner, 1987). A move to a new department represents a move to different area of the business, as departments are organized around products, geographic markets, and customers. In any given year, approximately 34,000 employees were distributed across 450 job codes and 50 departments.

I used the changes in job code to distinguish between *advancements* and *transfers*. Consistent with the way employees and managers think about mobility within InsureCo, I define an advancement as an internal hire resulting in a promotion or expansion, and a transfer as a lateral move to the same job but in a different department. During the five year observation period, there were are total of 4,635 advancements; 57 percent of which were made through posting and 43 percent through sponsorship. Over the same period, there were 3,610 transfers, 6,458 associates exited the firm, and 7,884 workers were hired externally.

In addition to ascertaining the types of moves, I use the personnel records to identify several attributes of internal moves, including whether an employee moved to a job within the *same department*, *same function* or *same state*. Each job at InsureCo is

[17] InsureCo has a vacancy-driven hiring process, meaning that all hires – internal and external – are preceded by an open job.

assigned a unique combination of eight competencies against which employees in that job evaluated on an annual basis, allowing me to create an objective measure of *job similarity*. I calculate the number of competencies a pair of jobs has in common, ranging from 0-8, with 8 indicating a move to an identical job (e.g. they transferred in the same in a different department) and a 0 indicating a move to completely different job.

Performance and salary variables

I constructed two different measures from InsureCo's annual performance evaluations in order to control for differences in job performance and ability among current employees. A workers *contribution score* assesses their contribution to the success of the organization. In jobs with a less direct impact on organization-level outcomes (e.g. those at lower levels), the contribution score is typically used to assess their contribution to the department over the previous year. It is measured on a 1 to 4 scale (1=low contribution; 2=moderate contribution; 3=full contribution; 4=exemplary contribution).

Managers also rank workers in similar jobs as part of an annual calibration process (described below). Unlike the contribution score, which focuses on previous performance, calibration sessions are intended to provide an indication of an employee's overall value to the organization that takes into account both previous performance and future potential. Managers supervising employees in similar roles create "buckets" of employees; a group of 100 employees may not be ranked from 1 (highest) to 100 (lowest), but rather the top five employees may receive a 1, the next ten a 2, the next twenty-five a 3, and so on. I use these rankings to identify whether a worker falls into the

first (top 25%), second, third or fourth (bottom 25%) *performance quartile* of workers in similar jobs[18].

Despite concerns about the potential for managerial bias to affect ratings, both of these measures are likely to provide fairly accurate reflections of employee performance and ability. Several researchers have argued that appraisal ratings are among the most valid measures of performance (Cascio, 1998) as they enable managers to take into consideration a variety of behaviors and outputs relevant to the job (Medoff & Abraham, 1981) as well as account for factors affecting performance outside the control of the individual worker (J. P. Campbell et al., 1993). InsureCo's annual evaluation process further helps to reduce potential concerns about supervisory bias affecting individual performance ratings. Managers who supervise workers in similar jobs meet in person to review and discuss their ratings of individual workers. These calibration discussions are intended to ensure that managers are evaluating workers against a common standard and to identify and correct instances where managers may have rated employees too harshly or leniently. Research has shown that calibration tends to reduce subjectivity and bias in performance ratings both because ratings are likely to be more consistent across employees when managers share a common view on rating standards (Mclntyre et al., 1984; Pulakos, 1984) and because "fellow managers do not do not usually let each other off easily if they believe an employee has been rated unfairly, creating peer pressure that provides a powerful incentive to make accurate ratings" (Pulakos & O'Leary, 2011, pp. 152–3).

[18] In some analysis, I also include measures of whether a worker falls into Top 10% or Bottom 10% of their peer group.

Starting salary is calculated as the natural logarithm of the salary a worker receives in their first month in a new job. Salary accounts for the vast majority of compensation for most workers at InsureCo. The main exception are workers in sales job, where bonuses based on sales targets often account for a substantial portion of total compensation. Fortunately, expected bonus amounts[19] are factored into the salary figures recorded in InsureCo's personnel records. For example, if an employee moves into a sales job with a base salary of $80,000 and expects to earn a bonus of $40,000, her personnel record with indicate a salary of $120,000 (base + bonus). The salary figure reflect the total compensation she should expect to earn during the year and should therefore accurately reflect the results of any salary negotiations that may have taken place at the time of hire.

I also include dummy variables for each *year* in the sample to account for changing labor market conditions that could potentially affect starting salaries and the supply of external candidates (and thus opportunities for internal advancement).

Demographic variables

The personnel records include information the *gender*, *ethnicity* (White, Black, Asian, Other) and *age* of each employee. I calculate *firm tenure* and *job tenure* based on hiring date and job start date, respectively. InsureCo does not include years of education or highest degree completed in their personnel records.

[19] Expected bonuses are typically based on meeting a sales target calculated from the previous year's sales, market growth, and other factors.

Job variables and job status

Though I am able to include job fixed effects, I also create a vector of variables that reflect salient characteristics of different jobs within the firm in an effort to better pinpoint the specific mechanisms driving the results, including the relative status of different types of jobs within InsureCo.

Jobs are organized into four broad *job tiers* composed of *hourly* (non-exempt) jobs, *independent contributor* jobs, *managerial* jobs, and *executive* jobs. Workers in hourly jobs are located in the lowest levels of the hierarchy (levels 1-2) while workers in executive jobs are located in the highest levels (6-9; Vice President to CEO). Independent contributor and managerial jobs are clustered primarily in the middle levels of organization (3-5). Individual contributors do not have any managerial responsibilities, but occupy jobs that directly contribute the goals of the organization (e.g. Zenger, 2014). These roles typically require minimal levels of teamwork and collaboration. Managers, in contrast, are responsible for directly supervising other workers. Among these tiers, executive jobs are those with the highest status and hourly jobs the lowest status by virtue of their location in the organizational hierarchy. Though independent contributor and managerial job are both clustered in the middle of the organizations hierarchy, independent contributor jobs are generally convey a higher level of status within the organization because individual performance and contribution to organization are both more visible and easier to evaluate.

Jobs are further organized into six broad *functional areas*: sales, advisory, products, operations, and products. Workers in sales roles are responsible for developing and maintaining relationships with individual, employer and government purchasers of

the firm's various product offerings. Workers in central office roles occupy a variety of "back office" functions, including human resources, compliance, technology, legal, and government relations. Workers in advisory roles provide guidance and advice to individuals and organizations covered by InsureCo's insurance plans. Workers in product roles are responsible for the evaluation and improvement of the firm's product offerings. Worker in operations roles are responsible for the day-to-day logistics of operating an insurance business, such as billing and enrollment. Among these functions, sales roles tend to occupy the highest status at InsureCo given that sales are the organizations key source of revenue. Though there is some variation in status within central office roles, these roles are generally considered to be high status role (though less so than sales) and include many of jobs designated as strategic/specialist roles by the organization (and thus key to organizational performance), including underwriting, financial, actuarial, and government relations jobs. The vast majority of advisory, product and operations role are considered to be support roles which, while critical to the day-to-day running of the business, are typically viewed as lower in status.

Percentage female is the percent of females in a given job across the entire organization[20]. While no one at InsureCo specifically mentioned that jobs with high percentages of females were lower status, previous research has consistently shown that work done in jobs occupied primarily by women is systematically devalued (Baron & Newman, 1990; Ridgeway, 2011; Tomaskovic-Devey, 1993). Moreover, the clustering of

[20] I also calculated the percentage of females in a given job within a work group. These two measures are highly correlated and produce similar empirical results.

women in devalued jobs perpetuates negative stereotypes of women's competence (Ridgeway, 1997), further diminishing the status of female dominated jobs.

Work group size is calculated as the number of individuals occupying the same job code within the same department. Work group size is a further proxy for status, as more workers occupying the same job code within the same department downplays the value of any single worker's performance to the organization. As a result, individual workers in larger work groups are likely to be less visible to hiring managers, even if the managers is aware that workers in a specific type of job might be a good fit for an open position.

Additional jobs variables unrelated to job status include dummy variables indicating whether a worker reports to a *female supervisor* or is located job located at InsureCo's *headquarters*.

Job application variables

In the analyses using the job application data, I create set of variable indicating whether the application represents a *potential advancement*, potential move to the *same department*, *same function* or *same state*, and the *job similarity* between the job a candidate currently occupies and the job they are applying for.

The job application data allows me to identify how far along in the hiring process each candidate advanced. The recruitment process involves seven stages: (1) initial screening by the applicant tracking system, (2) screening by an internal recruiter, (3) resume review by the hiring managers, (4) interview by the hiring manager, (5) job offer extended, (6) background check, (7) hire completed. A candidate can drop out the process after any stage prior to the hire being completed. In my analyses, I focus on whether or

not an internal candidate *received a job offer* as opposed to whether or not a candidate was hired, as this this a better outcome for assessing which attributes (including gender) affect the opportunities available to internal candidates. Once a candidate receives an offer, they have the option of accepting or declining the offer; less than 1% of internal candidates fail to pass the background check, but around 10% decline to accept an offer, most often because they had applied to multiple jobs and chose to accept another job within the organization.

In additional to creating a vector of job application variables, examining whether women are less likely to apply for posted jobs required me to identify the set of workers most likely to be at risk of applying to a particular job at a particular time. If there were clearly defined advancement paths within the organization, this would be a straightforward task; the risk set would consist of those employees located in the job leading to the focal job, typically the job located on rung down on the job ladder. In the absence of clearly defined advancement paths, I used the internal application data to construct the internal applicant risk set. For each posted job, I first identified which jobs successful internal applicants were most likely to occupy at the time of application. Specifically, workers were identified as at risk for applying to a posted job if they occupied a job that produced at least 10% of total applicants for that job (across all requisitions) and in which at least one candidate received an offer. I then excluded workers who had been in their current job for less than a year, as the data revealed that across all jobs, 92% of applicants receiving an offer had been in their current role for at least 12 months. I discussed these criteria with several recruiters at InsureCo who universally found these criterion to be reasonable. Nevertheless, I experimented with

small modifications to how the risk set was defined, such as changing the inclusion to criteria to include jobs that produced 5%, 15% or 20% of total applicants, including workers with job tenures of 8 and 10 months, and excluding candidates who ranked in the bottom 25% of their performance quartile, and found them all to yield qualitatively similar results.

Endogeneity and omitted variables

Hiring managers at Health Co. are able to choose whether to fill a job through posting or sponsorship, so a particular concern in this study is that there may be variables that both affect a manager's decision of which process to use as well as the outcomes of interest. This is a common with non-experimental data. Although such problems can be solved using instrumental variables, such variables are often difficult to identify in practice (Hamilton & Nickerson, 2003) and were not available for this study. A strength of my data, though, is its level of detail which allows us me to address the concern that there may be certain jobs that are always posted and others that are always filled through sponsorship.

The data reveal no systematic differences in the types of jobs that are filled through posting or sponsorship, as 99% of all internal hires made during the observation period involved moves into jobs that were filled by both posting and sponsorship. Moreover, of the limited number of jobs filled exclusively through either posting or sponsorship, 75% were only filled once or twice, 88% only three times, and none more than six times. It is therefore more likely that this is an artifact of so few hires having been made into those jobs rather than the fact these jobs are always filled through posting or sponsorship. Depending on the particular model, I nevertheless include either (a)

separate dummies each job filled though internal hiring during my observation period, or (b) separate dummies for each requisition filled during the observation period, in order to control for fixed propensities of different jobs to be filled by posting or sponsorship.

Wired Searches

A concern specific to this study is the ability to identify "wired searches" (Bielby, 2000). While posting and sponsorship are conceptually distinct, it is possible for a manager to post a job having already decided whom they are going to select. Though these jobs are posted, they are actually filled through sponsorship. If this was a common occurrence and/or these instances were difficult to identify empirically, it would introduce measurement error that would make it difficult to interpret my results; because these postings would actually be sponsorships, results attributed to the former would actually be due to the latter and actual differences between the two would be harder to see.

These so-called "wired searches" are likely to be most common in firms that require managers to post all jobs. Because Health Co. has established formal systems for filling jobs through both posting and sponsorship, managers are able to avoid posting jobs when they already have a candidate in mind and thereby avoid the potential negative consequences that emerge from other employees having felt they participated in an unfair selection process (Billsberry, 2007). In other words, there is no need to post a jobs when a manager already has a candidate in mind.

Nevertheless it is possible that this may happen. For example, those instances where there was only a single internal applicant for a posted job could potentially be wired searches, with managers either tailoring the job description around a particular

candidate and/or discouraging others employees from applying. Postings which were open for only a week or less could potentially be wired searches as well, indicating that the hiring manager created the posting for a specific candidate and therefore wanted to limit the number of other candidates who would apply. A total of 47 posting (2.0%) meet one or both of these criteria, leading me to believe that wired searches are not common at InsureCo and are therefore unlikely to affect interpretation of my results. In unreported robustness checks, dropping these observations from the analyses does not substantively change any of the results reported below.

METHOD & RESULTS

Table 3.1 provides descriptive statistics for the key variables calculated from the annual personnel records. Table 3.2 provides a descriptive overview of the how these variables differ by gender as of the most recent month for which I have data (December 2012). These descriptive data reveal that women are systematically more likely to occupy lower status and less visible jobs. For example, a much higher percentage of women occupy hourly jobs and job in the clinical and operations functions, which involve largely administrative tasks. Conversely, a much lower percentage of women occupy the higher status independent contributor and executive jobs and jobs in the more visible sales and central office functions. Table 3.3 shows the means and standard deviations of key variables by the different types of internal moves. Table 3.4 provides an overview of the 33,933 internal applications submitted to 4,324 job posting (requisitions) during 2012.

The analyses used to test Hypotheses 1, that workers in female dominated jobs are more likely than men to advance through posting as compared to sponsorship, are presented in Table 3.5. Models 1 and 2 are multinomial logit models which account for

the fact that in any given year, a worker may either stay in their current job ("no move"), advance through posting, advance through sponsorship, make a lateral transfer or exit the firm. Each move (or non-move) into a new job represents a mobility event, and serves as my unit of analysis. Interpretation of the probabilities in a multinomial logit models rests on the assumption that the relative probability of two different outcomes does not depend on the presence of other alternatives, known as "independence of irrelevant alternatives" (Greene, 2003). Whether a model meets this assumption is largely a theoretical question (Long & Freese, 2006), though I also carried out Hausman and Small-Hsiao tests, which examine whether results are significantly different if alternatives are dropped from the analysis (Long & Freese, 2006). Those analyses were unable to reject the null hypothesis that IIA holds, supporting the use of multinomial logit. I cluster errors by individual to account for non-independence.

The focus of my analyses is on comparing advancement through posting (in bold) with the base outcome, advancement through sponsorship. That is, conditional on advancing, what predicts advancement through posting versus sponsorship? Model 1 includes a vector of demographic and performance variables as well as controls for year. The coefficient for female is positive and statistically significant, indicating that women are 19 percent more likely to advance through posting relative to sponsorship than observationally equivalent men. Model 2 includes a vector of job-level variables to provide more detailed insights as to the mechanisms at work. The significant negative coefficient for female, in combination with the results for the job-level variables, indicates that females are more likely to advance through posting not because of their gender per se, but because of the relative status of the jobs they occupy relative to men.

Consistent with the theoretical arguments presented earlier, the results show that workers in lower status jobs – using multiple indicators of relative status – are more likely to rely on posting to advance. Workers in jobs with a higher percentage of women and in larger work groups are significantly more likely to advance through posting relative to sponsorship. Looking at job tiers, hourly and managerial workers (which consist primarily of lower-level front-line supervisors) are more likely to rely on sponsorship than workers in higher status independent contributor and executive roles. Looking at functions, workers in lower status support functions (operation, clinical, and products) are more likely to rely on posting to advance than workers in higher status sales and central office functions.

For the sake of robustness, Model 3 presents the results of logit model comparing advancement through posting to advancement through sponsorship including controls for individual jobs. This model has several benefits. First, it allows me to account for the fixed propensity of jobs to be filled by posting or sponsorship. Second, it allows me to look at gender segregation at a higher level. Because the job-level controls account for the gender ratio in a job, I include a measure of the percentage female at the department level. The results are similar to those presented in Model 2, indicating that workers in female dominated departments (and in larger work groups) similarly rely on posting. In sum, the analysis in Table 3.5 demonstrates that the greater overall tendency of women to rely on posting for advancement tends to be driven by the nature of the jobs they hold. That is, women are more likely than men to rely on the posting process to advance primary because women are segregated into lower status jobs with lower visibility and access to high-status decision-makers, the very structural barriers which posting helps to

overcome. Importantly, the results in Models 2 and 3 also indicate women are less likely than observationally equivalent men in the same job to advance through posting, a result I expect is largely driven by the fact that women are less likely to apply for posted jobs, an explanation I explore in more detail below.

Table 3.6 includes the analyses used to test Hypothesis 3, that women will be less likely than structurally and observationally equivalent men to apply for jobs posted internally. Because not all workers in the firms has the same likelihood of applying to a given job posting, this analysis required me to identify the set of workers most likely to consider applying to a particular job at a particular time. If there were clearly defined advancement paths within the organization, this would be a straightforward task; the risk set would consist of those employees located in the job leading to the focal job, typically the job located on rung down on the job ladder. In the absence of clearly defined advancement paths, I used the internal application data to identify the current workers most likely to apply for each job[21]. For each posted job, I first identified which jobs successful internal applicants were most likely to occupy at the time of application. Specifically, workers were identified as at risk for applying to a posted job if they occupied a job that produced at least 10% of total applicants for that job (across all requisitions) and in which at least one candidate received an offer[22]. I then excluded

[21] This approach is roughly equivalent to creating a propensity score of the likelihood that a given worker will apply to a given job posting (e.g. Rosenbaum & Rubin, 1983), though instead of assigning each worker a propensity score, I use the application data to create rough cutoffs based on job tenure and the job a worker occupies. In robustness checks, I also added cutoffs based on performance (see Footnote 23).

[22] The job application data allows me to identify how far along in the hiring process each candidate advanced. The recruitment process involves seven stages: (1) initial screening by the applicant tracking system, (2) screening by an internal recruiter, (3) resume review by the hiring

workers who had been in their current job for less than a year, as the data revealed that across all jobs, 92% of applicants receiving an offer had been in their current role for at least 12 months[23]. I then created a set of variables indicating whether the potential move would have represented a *potential advancement*, a move to the *same department*, *same function* or *same state*, and the *job similarity* between the job a candidate currently occupies and the job they are applying for.

For the sake of robustness, I employ multiple analytical approaches using data from 2012, for which I have complete data on posted jobs, internal applications, and all potential candidates. Models 1 and 2 use a logit specification to test whether a potential internal candidate applied for a job if they were at risk the month the job was posted. Models 3 and 4 use a logit specification to test whether a potential internal candidate applied for a job if they were at risk of applying for a job at least once during the year. Models 5 and 6 use a negative binomial specification to analyze how many applications a potential candidate made controlling for the number of times they were at risk during the year. The results are fairly consistent across the different specifications. All models without job controls (Models 1, 3, 5) show that across the firm, women apply more frequently than men, consistent with the analyses presented in Table 3.5. Once controls for current job are included (Models 2, 4, 6) , however, the negative and statistically

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managers, (4) interview by the hiring manager, (5) job offer extended, (6) background check, (7) hire completed.

[23] I discussed these criteria with several recruiters at InsureCo who universally found these criterion to be reasonable. Nevertheless, I experimented with small modifications to how the risk set was defined, such as changing the inclusion to criteria to include jobs that produced 5%, 15% or 20% of total applicants, including workers with job tenures of 8 and 10 months, and excluding candidates who ranked in the bottom 25% of their performance quartile, and found them all to yield qualitatively similar results.

coefficient for female indicates that among observationally equivalent workers occupying the same job, women are between 12 and 26 percent less likely than men to apply for an open job. The greater overall tendency of women to rely on posting for advancement, as indicated in earlier modes does to be driven by the nature of the jobs they hold.

Table 3.7 shows the probabilities of receiving a job offer[24] conditional on applying. The results indicate that conditional on applying, women and men applying to the same requisition (the term used to refer to a specific job posting) are equally likely to receive a job offer. I run the analyses using two different sample and two different modeling strategies and find similar results. Models 1 through 4 examine the likelihood of *all* applicants to a requisition receiving an offer using both fixed effects logit models and conditional logit models standard errors clustered by applicant[25]. Models 5 through 8 replicate the same analysis but includes only those candidates who passed the initial screenings and whose resumes were reviewed by the eventual hiring manager (I refer to these in the analyses as "qualified" candidates).

Table 3.8 includes the analyses used to test Hypothesis 4, that women internal applicants will have higher performance ratings than men applying to the same job. In this table, each row represent a different model/regression. The second column includes

[24] A candidate can drop out the process after any stage prior to the hire being completed. In my analyses, I focus on whether or not an internal candidate received a job offer as opposed to whether or not a candidate was hired, as this this a better outcome for assessing which attributes (including gender) affect the opportunities available to internal candidates. Once a candidate receives an offer, they have the option of accepting or declining the offer; less than 1% of internal candidates fail to pass the background check, but around 10% decline to accept an offer, most often because they had applied to multiple jobs and chose to accept another job within the organization.

[25] 7,110 candidates submitted a total of 33,933 applications. 45% of candidates submitted a single application, 33% submitted between 2 and 4 applications, 12% submitted between 5 and 10 application, and 9% submitted more than 10 applications. The most applications submitted by a single candidate in 2012 was an astounding 257 applications.

the dependent variable and the reported regression coefficient is the coefficient for female. All but the last model includes fixed effects for the requisition. This allows me to compare the gender differences in various attributes among internal candidates who applied for the same job. The results show that among applicants to the same job, women are significantly more qualified on every observable dimension. They are more likely to be top performers relative to their peers, less likely to be low performers relative to their peers, have higher absolute performance ratings on all dimensions, be slightly older, have spent longer with the organization, and apply for jobs similar to the one they currently occupy (and thus are more likely to possess the relevant qualifications).

Having examined the factors shaping advancement, I turn to the results on pay. Hypothesis 2 predicted that any gender gap in starting salaries associated with the move to a new job within the firm would be lower when jobs are filled by posting as compared to sponsorship. The data used to test this hypothesis are presented in Table 3.9 and include the starting salaries associated with each of the 9,189 internal hires made during the observation period (advancement and lateral moves). Model 1 includes a vector of demographic and of performance variables and Model 3 adds a vector of mobility variables. All models include controls for the current and previous job, controls for year and are clustered by individual to account for non-independence. The significant negative coefficient for female in both models indicate approximately a 1 percent gender gap in starting salaries between men and women, with women being paid less than observationally equivalent men. The positive and significant interaction coefficient for posting in Model 2 indicates that when workers move through posting, they receive a 2 percent higher starting salary than workers who move through posting (consisted with

posting premium show in Study 1). The positive and significant interaction term between female and posting in Model 4 indicates that the gender gap starting salary is virtually eliminated when a job is filled through posting as opposed to sponsorship; when observationally equivalent men and women enter the same job through sponsorship, men earn 1.8 percent more than women; when they enter the same job through posting, they earn the same amount. Table 3.10 presents the coefficients for all the different potential interactions between gender and posting/sponsorship. The results indicate that while men earn 1 percent more when they enter a job through posting relative to sponsorship, women earn nearly 3 percent more, which I attribute to the transactional nature of the posting process increasing women's propensity to initiate a salary negotiation (and to negotiate more competitively) more than men.

DISCUSSION

Gender inequality within organizations represents one of the most stubborn and persistent problems in the field of management. Though a number of recent changes to employment structures and process have been successful in reducing gender inequalities in the workplace (Castilla, 2015; Dencker, 2009; Kalev et al., 2006; Kalev, 2009), women remain underrepresented at the senior levels of organizations, continue to occupy a disproportionate percentage of marginalized jobs, and are still paid less than men for similar work. Not surprisingly, scholars interested in gender and organizations have called for work allowing us to identify and better understand additional mechanisms with the potential reduce gender differences in advancement and pay (Castilla, 2008, 2012). This study attempts to answer this call by exploring the impact of contemporary internal hiring processes on the organizational careers of women.

The theory and results together suggest that posting – and market-based internal hiring process in which managers post an open job to an internal job and invite interested internal candidates to apply – has the *potential* to reduce gender inequalities in advancement and pay. In term of advancement, I argued that posting helps overcome women's limited visibility and access to informal strategic networks – structural barriers imposed by segregation of women to marginalized jobs – by providing unrestricted access to information about potential advancement opportunities and providing a formal mechanism through which women can make their qualifications known to potential hiring managers. I found that workers in lower status, less visible jobs – disproportionately occupied by women – are significantly more likely to advance via the formal, market-oriented posting process than they are the informal, relationship-oriented sponsorship process. The job application data provide support for these arguments, revealing that women are more likely than men to use the posting system to seek out advancement opportunities and moves to more distant jobs (e.g. less similar jobs and jobs in other departments). In terms of pay, I argued that the transactional nature of the posting process should help to reduce within-job gender wage disparities by reducing women's reluctance both to initiate salary negotiations and to negotiate competitively when they choose to negotiate. I found that when observationally equivalent men and women were hired into the same job through sponsorship, women were paid almost 2% less than men, but that this gender gap disappeared entirely when the job was filled through posting.

However, I also argued that posting will fail to live up to its potential to reduce inequalities in advancement and pay because the posting process itself is implicitly

gendered (Acker, 1990). That is, despite appearing to be gender-neutral, the posting process constructed on assumptions about appropriate behavior that will discourage women from applying to posted jobs at the same rate as structurally and observationally equivalent men. The posting process requires employees to enter into a competition, engage in self-promotion, and make judgments about the extent to which they are qualified for an open job. These very attributes are likely to discourage women from participating the posting process because of three reinforcing gender difference in behaviors; women are more likely than men to avoid competition (Niederle & Vesterlund, 2007) and self-promotion (Rudman, 1998), and more likely than men to follow rules (Villalobos, 2009). Indeed, I find that a woman occupying with the same qualifications as a man occupying the same job is 10 and 20 percent less likely to apply for an open job. Though my data do not allow me to directly test the separate effects of each of these behavioral mechanisms, an analysis of the qualifications on internal candidates shows that women applicants are significantly more qualified than male applicants for the same job based on observable criteria, including manager ratings of performance and potential.

CHAPTER 4: CONCLUSION

This dissertation began by highlighting an important gap in our understanding of job mobility in contemporary labor markets; though internal mobility remains a key building block of individual careers and firm talent management strategies, surprisingly little work has examined the allocative processes used to facilitate internal mobility. I identified and described the two internal hiring processes mostly commonly used to generate new person-job matches within firms – posting and sponsorship. In two complementary empirical studies, I explored the relative effects on these different process on a number of outcomes of consequence to workers and firms. Taken together, these studies provide a more complete picture of modern job mobility and demonstrate the value in paying closer attention to the dynamics of internal mobility in contemporary organizations.

As with all single-firm studies, it is difficult to say how generalizable the findings are to other organizations, in part because no previous study has explored hiring processes within contemporary organizations in as much detail. Examining mobility within firms requires tradeoffs between depth and generalizability and acquiring detailed internal data from multiple sites represents a substantial hurdle for conducting multi-firm studies. This is made even more difficult by the fact that few firms actually capture data on the processes by which employees move to new jobs (Strum, 2001).

However, there are reasons to expect my results to be typical of other large organizations as well. InsureCo's organizational structures and employment systems are similar to those of other large U.S. organizations across a range of industries (Cappelli, 2008; Marsden & Gorman, 1999). My conversations with InsureCo officials and with

human resource leaders at multiple additional organizations during the course of this study have not revealed any reason to believe that InsureCo's internal hiring practices are different from other large organizations. Moreover, the company analyzed is not atypical when it comes to gender disparities in advancement and wages (e.g. Barnett et al., 2000; Catalyst, 2014; Spilerman & Petersen, 1999).

Despite these limitations, the results reported in this dissertation have significant implications for theory and practice. In highlighting the ways in which self-selection and formality shape managerial decision-making and negotiations, the first study adds to the growing insights about the benefits and limitations of bringing market mechanisms within firms (Zenger et al., 2011). To date this work has focused predominately on the ways in which the infusion of high powered incentives shapes individual behavior (Ellig, 2001; Zenger & Hesterly, 1997; Zenger, 1992). More recently, scholars have begun to explore the ways in which firms are able to harness the information aggregation powers of the market to improve internal decision-making though the use of prediction and information markets, with the idea being that the widely diffused information can be aggregated into something akin to a price (Ellig, 2001; Felin & Zenger, 2011). The study complements and extends this work by showing how two less explored features of markets – self-selection and formality – improve decision-making in the absence of a price mechanism. Moreover, it shows that, contrary to what extant theory predicts about the role of competition in external markets, infusing competition within the firm actually increases prices. In identifying the micro-level mechanisms through which these macro-level allocative processes shape individual behaviors, this work speaks to a growing body of literature interested in micro-foundations of strategic organization (Felin & Foss, 2005;

Ployhart & Hale, 2014) as well as a more specific literature on the micro foundations of human capital-based competitive advantage (Coff & Kryscynski, 2011). More generally, these results suggest that posting is a superior process for developing the extant talent within an organization, providing managers the opportunity to identify and evaluate talented individuals and deploy them in ways that allow workers to assemble meaningful internal careers while also meeting the immediate needs of the organization (Cappelli, 2008, p. 206).

In showing that allocative processes operating within organizations can have a significant impact on the organizational careers of women, the second study contributes to a burgeoning literature exploring whether and how recent changes to employment structures and processes have been successful in reducing inequality in the workplace (e.g. Castilla, 2012). While a long line of sociological inquiry explored how the bureaucratic which governed the allocation of workers to within traditional bureaucratic internal labor markets served to generate and sustain gender inequalities (Rosenfeld, 1992), little to no research has examined this issue in the context of contemporary internal labor markets. Moreover, this work bridges sociological, social psychological, and behavioral economics research on gender inequalities within organizations. Sociological studies of gender inequality tend to emphasize gender differences in structural barriers to opportunities for equal advancement and pay (Barnett et al., 2000; Spilerman & Petersen, 1999), while research in social psychology and behavioral economics tends to emphasize behavioral barriers that emerge for gender differences in preferences and behaviors (Barron, 2003; Croson & Gneezy, 2009; Greig, 2008). The central argument of this study was that the extent to which the introduction new work

structures, policies and practices are able to remediate persistent gender inequalities within organizations depends on the degree to which they address both established gender differences in structural constraints *and* gender differences in preferences and behaviors. In doing so, this paper also calls attention to need to explore whether structures and processes which appear to be gender-neutral may actually be subtlety and implicitly gendered (Acker, 1990).

The practical implications of these study are equally important. Both studies suggest that both workers and firms benefit when the market-oriented posting process is used to fill jobs suggesting that firms should not only adopt posting systems, but require managers to post jobs in lieu of filling open jobs through sponsorship. The fact that nearly half of jobs are not filled by posting is therefore cause for concern as well as an avenue for future research, as we do not yet understand what leads managers to choose one process over the other. We would also benefit from future work exploring whether there are potential downsides associated with posting that have been fully articulated here. For example, a particularly promising avenue for future research would be to explore whether posting imposes additional costs on organizations by creating a visible set of employees who lost out in an open competition, such as lower performance or increased turnover.

While the results of the second study unambiguously demonstrate the potential of posting to decrease gender gaps in advancement and pay, they also indicates that filling more jobs through posting is not a sufficient solution. Rather, organizations also need to find ways to help women to overcome the behavioral barriers that lead them to avoid

participating in the market for open jobs. How organizations might do this is likely to be source of considerable debate.

A "fix the women" approach (Ely & Meyerson, 2000) would accept the fact that posting is a gendered process and encourage women to adjust their behavior accordingly. According to this approach, "women have not been socialized to compete successfully in the world of men, and so they must be taught the skills their male counterparts have acquired as a matter of course" (Ely, Ibarra, & Kolb, 2011, p. 475). Rather than make any changes to the posting process itself, solutions emerging form this approach would focusing on changing women's behaviors; telling women that they need to overcome their reluctance to compete and self-promote and be willing to apply for jobs even if they are unsure whether they are qualified. That is, this approach would focus on teaching women how to successfully navigate the gendered posting process.

In contrast, an "equal opportunity" approach (Ely & Meyerson, 2000) would bring the gendered nature of posting process is brought to the forefront, focusing on changing the process in ways that will encourage women's participation. This approach would involve asking how, knowing what we know about gender differences in preferences and behaviors, organizational structures and process can be modified or created in ways that come closer to representing their gender-neutral ideal. Given that changes to organizational process tend to more effective at reducing inequalities than interventions aimed at changing behaviors (Kalev et al., 2006; Castilla, 2015), this approach seems particularly promising.

There is reason to believe that small changes in the posting process might significantly increase women's participation. One such change would involve positioning

posting as an important developmental opportunity. Many organizations notify unsuccessful internal candidates that they were not selected and offer to explain the selection decision. However, these conversations are typically not developmental in nature (Billsberry, 2007). Rather than providing candidates with feedback on how they could develop their skills or other jobs they might want to consider, these conversation instead focus on the negatives, identifying the candidate's shortcomings in order to reduce concerns about unfair selection practices (Petersen & Saporta, 2004; Strum, 2001). However, recent research in behavioral economics has demonstrated that providing workers with quality feedback on their performance increases high-performing women's likelihood to enter future competitions to point that the gender gap is substantially (David Wozniak, 2012), if not fully (David Wozniak et al., 2014), reduced.

A second change would be to provide workers with formal, impartial advice on which opportunities for advancement they should pursue. A recent lab study by Brandts et al. (Brandts et al., 2014) found that when workers received advice on whether or not to enter a competition, stronger-performing women were more likely to enter while weaker-performing men were less likely to enter, significantly reducing the gender gap in participation. The challenge in the field, of course, is that the majority of career-related advice flow through the very informal networks to which women have limited access (Ibarra, 1995; Podolny & Baron, 1997). Investments in internal resources workers could turn to for career advice – internal career consultants, access to information on the career paths taken by other employees – might therefor deliver significant returns in terms of increasing women's utilization of the posting system.

A third change, and perhaps the easiest, would be to make it clear that applicants are not expected to possess all of the qualifications included in a job description. Leibbrant and List (2014) found that when they simply and explicitly state that wages were negotiable in a job posting rather than leave it ambiguous, women were more likely to apply for the job and attempt to negotiate for a higher salary. Removing ambiguity around the selection criteria may provide a similar boost in internal application made by women. Another option is to limit the list only to those qualifications used to exclude candidates (Heller, Levin, & Goransson, 2002), such as a specific degree or knowledge of a technical program and instead include a robust description of the job and environment in which the job will be performed, allowing candidates to pursue opportunities in which they feel they would be successful based on the nature of the job rather than a list of qualifications. These and other potential modifications to the posting system represent significant opportunities for future work in this area. Studies examined how internal hiring process affect inequalities based on a range of other characteristic, including age, race and socioeconomic status would be welcomed.

Table 2.1: Descriptive statistics and correlations

	Variable	n	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Posting	9318	0.41	0.49													
2	Cont Score	9318	2.85	0.64	-0.05												
3	Contrib Score	9318	2.55	0.52	-0.05	0.67											
4	Top 25%	9318	0.31	0.46	0.00	0.44	0.45										
5	Bottom 50%	9318	0.46	0.5	0.01	-0.46	-0.50	-0.59									
6	Bottom 25%	9318	0.21	0.41	0.01	-0.40	-0.46	-0.33	0.56								
7	Turnover (12 mo)	7484	0.02	0.14	0.01	-0.05	-0.03	-0.03	0.03	0.03							
8	Turnover (24 mo)	4898	0.1	0.3	0.00	-0.12	-0.11	-0.09	0.09	0.08	0.53						
9	Advance (12 mo)	5086	0.13	0.33	0.02	0.06	0.06	0.07	-0.07	-0.07	-0.01	-0.08					
10	Advance (24 mo)	3350	0.24	0.43	0.06	0.06	0.06	0.06	-0.07	-0.08	.	-0.08	0.87				
11	Salary (ln)	9300	11.01	0.4	-0.08	0.08	0.13	0.03	-0.01	-0.01	0.03	0.02	-0.15	-0.17			
12	Job Level	9318	4.63	0.76	-0.14	0.13	0.13	0.01	-0.01	-0.01	0.01	0.02	-0.32	-0.39	0.73		
13	Same Dept	9318	0.59	0.49	-0.37	0.17	0.17	0.10	-0.12	-0.10	-0.03	-0.12	-0.04	-0.10	-0.03	-0.02	
14	Same Function	9318	0.69	0.46	-0.13	0.03	0.09	0.05	-0.04	-0.04	0.00	-0.02	-0.09	-0.11	0.09	0.05	0.19
15	Advancement	9318	0.87	0.34	0.08	0.05	0.03	0.05	-0.04	-0.02	-0.05	-0.06	-0.06	-0.09	-0.12	0.03	0.21
16	Female	9318	0.64	0.48	0.00	-0.05	-0.03	0.02	-0.02	-0.03	-0.02	-0.03	0.00	-0.01	-0.22	-0.14	0.02
17	White	9318	0.77	0.42	-0.02	0.07	0.05	0.01	-0.02	-0.03	0.00	0.01	0.03	0.01	0.12	0.10	0.02
18	Black	9318	0.1	0.3	0.03	-0.09	-0.10	-0.01	0.01	0.04	-0.01	-0.02	0.00	-0.01	-0.12	-0.13	-0.04
19	Latino	9318	0.08	0.27	0.00	-0.04	0.02	0.00	0.01	-0.01	0.01	0.00	-0.03	-0.02	-0.11	-0.06	0.01
20	Asian	9318	0.03	0.18	-0.03	0.05	0.04	0.00	0.01	0.01	0.01	0.02	-0.02	0.00	0.10	0.08	0.02
21	Tenure	9318	5.45	5.2	-0.06	0.11	0.14	0.02	-0.02	-0.02	-0.02	-0.07	-0.06	-0.06	0.16	0.15	0.02
22	Tenure (sq)	9318	56.73	121.9	-0.08	0.05	0.08	0.00	-0.01	-0.01	-0.01	-0.05	-0.06	-0.07	0.14	0.12	0.04
23	Age	9318	38.62	9.91	-0.15	-0.02	0.03	-0.03	0.02	0.01	0.01	0.04	-0.15	-0.21	0.30	0.25	0.03
24	Peer Group Size	9318	482.12	408.17	0.04	0.03	-0.01	0.02	-0.04	-0.07	0.02	-0.01	0.07	0.11	-0.17	-0.23	0.05
25	Prev Salary (ln)	9311	10.93	0.41	-0.17	0.09	0.14	0.01	-0.01	-0.02	0.03	0.03	-0.13	-0.15	0.95	0.72	-0.01
26	Prev Cont Score	8071	2.89	0.61	-0.01	0.52	0.43	0.24	-0.24	-0.20	-0.05	-0.10	0.04	0.07	0.09	0.10	0.10
27	Prev Cont Score	8094	2.58	0.51	0.00	0.41	0.60	0.26	-0.26	-0.21	-0.04	-0.09	0.01	0.03	0.13	0.11	0.09

Table 2.1 cont'd: Descriptive statistics and correlations

	Variable	14	15	16	17	18	19	20	21	22	23	24	25	26
15	Advancement	-0.17												
16	Female	-0.03	-0.01											
17	White	-0.02	-0.01	-0.02										
18	Black	0.02	0.03	0.07	-0.61									
19	Latino	0.00	0.00	0.02	-0.53	-0.10								
20	Asian	0.02	-0.02	-0.07	-0.34	-0.06	-0.05							
21	Tenure	-0.04	0.01	0.08	0.06	-0.01	-0.02	-0.03						
22	Tenure (sq)	-0.04	0.00	0.08	0.06	-0.01	-0.03	-0.04	0.92					
23	Age	0.03	-0.13	0.06	0.07	-0.04	-0.03	-0.02	0.28	0.29				
24	Peer Group Size	0.00	0.00	-0.03	-0.06	0.02	0.04	0.05	0.03	0.01	-0.09			
25	Prev Salary (ln)	0.08	-0.18	-0.20	0.13	-0.12	-0.13	0.11	0.19	0.16	0.36	-0.16		
26	Prev Cont Score	-0.01	0.06	-0.03	0.07	-0.11	-0.01	0.04	0.15	0.08	-0.02	0.01	0.08	
27	Prev Cont Score	0.04	0.03	0.00	0.03	-0.10	0.05	0.02	0.20	0.11	0.05	-0.01	0.12	0.67

Table 2.2: Performance

	Model 1	Model 2	Model 3	Model 4	Model 5
	OLS	OLS	Logit	Logit	Logit
Variables	Contribution	Competency	Top 25%	Bottom 50%	Bottom 25%
Posting	0.0542**	0.0621**	0.129*	-0.133**	-0.149*
	[0.0155]	[0.0123]	[0.0548]	[0.0516]	[0.0634]
Same Department	0.208**	0.175**	0.392**	-0.439**	-0.495**
	[0.0159]	[0.0126]	[0.0586]	[0.0531]	[0.0635]
Same Function	0.0316*	0.0751**	0.295**	-0.155**	-0.152*
	[0.0149]	[0.0125]	[0.0591]	[0.0534]	[0.0644]
Promotion	0.00351	-0.0219	0.242**	-0.0874	0.0152
	[0.0216]	[0.0168]	[0.0820]	[0.0718]	[0.0857]
Female	0.0026	0.0233+	0.115*	-0.108*	-0.101
	[0.0146]	[0.0121]	[0.0550]	[0.0511]	[0.0617]
Tenure	0.0350**	0.0387**	0.0534**	-0.0476**	-0.0524**
	[0.00379]	[0.00345]	[0.0148]	[0.0129]	[0.0153]
Tenure (sq)	-0.00120**	-0.00132**	-0.00195**	0.00157**	0.00170**
	[0.000155]	[0.000148]	[0.000663]	[0.000548]	[0.000613]
Age	-0.00441**	-0.00120+	-0.00767**	0.00663*	0.00684*
	[0.000828]	[0.000676]	[0.00291]	[0.00266]	[0.00324]
Peer Group Size			0.0000295	-0.000145*	-0.000385**
			[6.87e-05]	[6.64e-05]	[8.65e-05]
Constant	2.956**	2.838**	-1.223*	0.0529	-0.973
	[0.118]	[0.0853]	[0.524]	[0.508]	[0.599]
Observations	9300	9300	9289	9276	9262
R-squared	0.136	0.154			

Standard errors, in brackets, are clustered by individual. All analyses include dummies for job, function, level, state, and ethnicity.
+ p < .10; * p < .05; ** p < .01

Table 2.3: Turnover, advancement and salary

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
	Logit	Logit	Logit	Logit	OLS	OLS
Variables	**Turnover12**	**Turnover24**	**Promotion24**	**Promotion36**	**Salary (ln)**	**Salary (ln)**
Posting	-0.202*	-0.182*	-0.0949	0.128+	0.0383**	0.0376**
	[0.0986]	[0.0761]	[0.0645]	[0.0733]	[0.00256]	[0.00272]
Same Department	-0.0925	-0.259**	0.0402	0.0012	0.000872	0.00125
	[0.0959]	[0.0738]	[0.0651]	[0.0779]	[0.00270]	[0.00275]
Same Function	-0.0336	0.0874	-0.217**	-0.0758	0.0166**	0.0152**
	[0.0987]	[0.0671]	[0.0610]	[0.0756]	[0.00264]	[0.00270]
Advancement	-0.302**	0.0791	-0.274**	-0.279**	0.0960**	0.0865**
	[0.116]	[0.0954]	[0.0777]	[0.0892]	[0.00874]	[0.00890]
Female	-0.236**	-0.148*	-0.121*	-0.123+	-0.0101**	-0.00912**
	[0.0871]	[0.0648]	[0.0577]	[0.0666]	[0.00230]	[0.00235]
Tenure	-0.104**	-0.0828**	-0.00392	0.0333+	-0.000281	-0.0009
	[0.0223]	[0.0159]	[0.0152]	[0.0187]	[0.000559]	[0.000588]
Tenure (sq)	0.00299**	0.00212**	0.0000181	-0.00150+	0.00000442	0.0000266
	[0.000912]	[0.000625]	[0.000653]	[0.000882]	[2.07e-05]	[2.09e-05]
Age	-0.00115	0.0114**	-0.0144**	-0.0153**	-0.00153+	-0.00163+
	[0.00523]	[0.00316]	[0.00319]	[0.00365]	[0.000829]	[0.000873]
Last salary (ln)					0.851**	0.863**
					[0.00924]	[0.00893]
Last contribution						0.00860**
						[0.00256]
Last competency						0.00354
						[0.00353]
Constant	-6.111**	-2.416**	0.061	0.596	1.561**	1.342**
	[0.757]	[0.594]	[0.345]	[0.633]	[0.117]	[0.101]
	7451	5056	5178	3302	9292	8017
R-Squared					0.955	0.959

Standard errors, in brackets, are clustered by individual. All analyses include dummies for job, function, level, state, and ethnicity.
+ p < .10; * p < .05; ** p < .01

Table 2.4: Source of internal hire

Source of Hire (Location of previous job within the organization)	**Posting**	**Sponsorship**	**Statistical Significance**
Different Function	40%	27%	$p < .01$
Different Department	64%	26%	$p < .01$
Different City	15%	4%	$p < .01$
Different Building	42%	8%	$p < .01$
Transfer (same job, different department)	10%	15%	$p < .01$
Expansion (same level, different job)	32%	43%	$p < .01$
Promotion (move up a level)	57%	42%	$p < .01$

Table 2.5: Performance, turnover, advancement and salary within department

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**	**Model 9**	**Model 10**
	OLS	OLS	Logit	Logit	Logit	Logit	Logit	Logit	Logit	OLS
Variables	**Contrib.**	**Comp.**	**Top 25%**	**Bottom 50%**	**Bottom 25%**	**Turn12**	**Turn24**	**Prom24**	**Prom36**	**Salary (ln)**
Posting	0.0474**	0.0678**	0.160**	-0.127*	-0.165*	-0.284*	-0.151	-0.119	0.117	0.0468**
	[0.0171]	[0.0137]	[0.0609]	[0.0585]	[0.0740]	[0.123]	[0.0988]	[0.136]	[0.150]	[0.0033]
Same Function	0.0196	0.0480**	0.261**	-0.142*	-0.138+	0.145	0.0614	-0.355**	0.054	0.0106**
	[0.0175]	[0.0150]	[0.0696]	[0.0638]	[0.0807]	[0.127]	[0.0868]	[0.133]	[0.166]	[0.0034]
Advancement	0.0392+	-0.00167	0.291**	-0.104	-0.0434	-0.324*	-0.0103	-0.568**	-0.606**	0.0679**
	[0.0236]	[0.0185]	[0.0900]	[0.0800]	[0.0975]	[0.132]	[0.114]	[0.162]	[0.176]	[0.0171]
Female	0.00949	0.0221+	0.102+	-0.0849	-0.0939	-0.177+	-0.157*	-0.233+	-0.124	-0.0007
	[0.0160]	[0.0133]	[0.0600]	[0.0570]	[0.0705]	[0.102]	[0.0765]	[0.124]	[0.135]	[0.0007]
Tenure	0.0396**	0.0441**	0.0662**	-0.0569**	-0.0637**	-0.105**	-0.0875**	0.0018	0.0842*	0.0000
	[0.00413]	[0.00376]	[0.0162]	[0.0146]	[0.0174]	[0.0250]	[0.0184]	[0.0348]	[0.0418]	[2.42e-05]
Tenure (sq)	-0.0014**	-0.0015**	-0.0023**	0.0018**	0.002**	0.0032**	0.0024**	-0.0009	-0.005*	-0.0017+
	[0.0002]	[0.0002]	[0.0007]	[0.0006]	[0.0007]	[0.001]	[0.0007]	[0.0015]	[0.0021]	[0.001]
Age	-0.0047**	-0.0015*	-0.0085**	0.0084**	0.0101**	0.0002	0.0110**	-0.0311**	-0.0328**	0.827**
	[0.0009]	[0.0007]	[0.0032]	[0.003]	[0.0036]	[0.006]	[0.0038]	[0.0067]	[0.0076]	[0.134]
Peer Grp Size			0.0000	-0.0001+	-0.0004**					
			[7.45e-05]	[7.42e-05]	[0.0001]					
Constant	2.830**	2.199**	-1.486**	0.202	-0.723	-5.912**	-3.468**	0.162	0.532	4460
	[0.0877]	[0.0738]	[0.548]	[0.528]	[0.638]	[1.115]	[0.566]	[0.746]	[0.707]	0.966
Observations	7568	7568	7559	7543	7505	5777	4044	4203	2720	7568
R-squared	0.138	0.161								

Standard errors, in brackets, are clustered by individual. All analyses include dummies for job, function, level, state, and ethnicity.

+ p < .10; * p < .05; ** p < .01

Table 2.6: Performance ratings robustness checks

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**
	OLS	OLS	OLS	OLS	2SLS	2SLS	2SLS Treatment	2SLS Treatment
Variables	**Contrib.**	**Competency**	**Contrib.**	**Competency**	**Contrib.**	**Competency**	**Contrib.**	**Competency**
Posting	0.0542**	0.0621**	0.0393*	0.0401*	0.259**	0.271**	0.227**	0.199**
	[0.0155]	[0.0123]	[0.0191]	[0.0164]	[0.0934]	[0.0764]	[0.0765]	[0.0609]
Same Department	0.208**	0.175**	0.177**	0.139**	0.296**	0.262**	0.283**	0.232**
	[0.0159]	[0.0126]	[0.0223]	[0.0171]	[0.0422]	[0.0343]	[0.0353]	[0.0281]
Same Function	0.0316*	0.0751**	0.0452*	0.0720**	0.0387*	0.0871**	0.0366*	0.0824**
	[0.0149]	[0.0125]	[0.0226]	[0.0178]	[0.0164]	[0.0136]	[0.0164]	[0.0131]
Promotion	0.00351	-0.0219	-0.00915	-0.00608	-0.0445	-0.0711**	-0.0375	-0.0555**
	[0.0216]	[0.0168]	[0.0313]	[0.0234]	[0.0300]	[0.0237]	[0.0264]	[0.0211]
Female	0.0026	0.0233+	0.0278	0.0300*	-0.00083	0.0222+	-0.000927	0.0220+
	[0.0146]	[0.0121]	[0.0194]	[0.0151]	[0.0150]	[0.0124]	[0.0143]	[0.0114]
Tenure	0.0350**	0.0387**	0.0181**	0.0258**	0.0343**	0.0387**	0.0345**	0.0391**
	[0.00379]	[0.00345]	[0.00505]	[0.00384]	[0.00387]	[0.00340]	[0.00349]	[0.00278]
Tenure (sq)	-0.00120**	-0.00132**	-0.000741**	-0.000862**	-0.00115**	-0.00128**	-0.00116**	-0.00131**
	[0.000155]	[0.000148]	[0.000192]	[0.000147]	[0.000160]	[0.000144]	[0.000146]	[0.000117]
Age	-0.00441**	-0.00120+	-0.00432**	-0.00214*	-0.00406**	-0.00062	-0.00415**	-0.000819
	[0.000828]	[0.000676]	[0.00112]	[0.000848]	[0.000878]	[0.000720]	[0.000766]	[0.000610]
lambda							-0.102*	-0.0793*
							[0.0455]	[0.0363]
Constant	2.956**	2.838**					2.331**	2.061**
	[0.118]	[0.0853]					[0.194]	[0.154]
Observations	9300	9300	8811	8811	8929	8929	8929	8929
R-squared	0.136	0.154	0.559	0.606				
Manager Fixed Effects	N	N	Y	Y	N	N	N	N

Standard errors, in brackets, are clustered by individual. All analyses include dummies for job, function, level, state, and ethnicity.
+ p < .10; * p < .05; ** p < .01

Table 2.7: Relative performance robustness checks

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**	**Model 9**
	Logit	Logit	Logit	Logit	Logit	Logit	IV Probit	IV Probit	IV Probit
Variables	**Top 25%**	**Bottom 50%**	**Bottom 25%**	**Top 25%**	**Bottom 50%**	**Bottom 25%**	**Top 25%**	**Bottom 50%**	**Bottom 25%**
Posting	0.129*	-0.133**	-0.149*	0.110*	-0.151*	-0.177*	0.305	-0.720**	-0.572*
	[0.0548]	[0.0516]	[0.0634]	[0.0531]	[0.0595]	[0.0736]	[0.209]	[0.204]	[0.227]
Same Department	0.392**	-0.439**	-0.495**	0.453**	-0.524**	-0.570**	0.331**	-0.540**	-0.487**
	[0.0586]	[0.0531]	[0.0635]	[0.0667]	[0.0621]	[0.0762]	[0.0938]	[0.0914]	[0.102]
Same Function	0.295**	-0.155**	-0.152*	0.317**	-0.148*	-0.150*	0.192**	-0.141**	-0.120**
	[0.0591]	[0.0534]	[0.0644]	[0.0674]	[0.0621]	[0.0755]	[0.0378]	[0.0364]	[0.0405]
Promotion	0.242**	-0.0874	0.0152	0.251**	-0.0796	0.0205	0.088	0.083	0.108
	[0.0820]	[0.0718]	[0.0857]	[0.0910]	[0.0818]	[0.0987]	[0.0656]	[0.0627]	[0.0694]
Female	0.115*	-0.108*	-0.101	0.116*	-0.111*	-0.112+	0.0726*	-0.0670*	-0.0577+
	[0.0550]	[0.0511]	[0.0617]	[0.0588]	[0.0549]	[0.0666]	[0.0321]	[0.0311]	[0.0348]
Tenure	0.0534**	-0.0476**	-0.0524**	0.0554**	-0.0540**	-0.0626**	0.0319**	-0.0271**	-0.0300**
	[0.0148]	[0.0129]	[0.0153]	[0.0147]	[0.0135]	[0.0166]	[0.00787]	[0.00756]	[0.00859]
Tenure (sq)	-0.002**	0.0016**	0.0017**	-0.0019**	0.0017**	0.002**	-0.0011**	0.0008*	0.0009**
	[0.0006]	[0.0005]	[0.0006]	[0.0006]	[0.0006]	[0.0007]	[0.0003]	[0.0004]	[0.0004]
Age	-0.00767**	0.00663*	0.00684*	-0.0102**	0.00902**	0.00961**	-0.00379*	0.0023	0.00258
	[0.00291]	[0.00266]	[0.00324]	[0.00311]	[0.00287]	[0.00348]	[0.00175]	[0.00169]	[0.00187]
Peer Group Size	0.00003	-0.0002*	-0.0004**	0.0001	-0.0002*	-0.0005**	-0.000	-0.000	-0.0002**
	[6.87e-05]	[6.64e-05]	[8.65e-05]	[7.84e-05]	[7.62e-05]	[9.91e-05]	[4.27e-05]	[4.22e-05]	[4.95e-05]
Constant	-1.223*	0.0529	-0.973	-1.255*	0.0303	-1.061	-0.482	-0.0919	-0.838
	[0.524]	[0.508]	[0.599]	[0.595]	[0.596]	[0.706]	[0.426]	[0.491]	[0.586]
Observations	9289	9276	9262	8802	8790	8777	8925	8916	8885
R-squared									
Clustered s.e.	Y	Y	Y	N	N	N	Y	Y	Y
Manager Fixed Effects	N	N	N	Y	Y	Y	N	N	N

All analyses include dummies for job, function, level, state, and ethnicity.

+ p < .10; * p < .05; ** p < .01

Table 2.8: Turnover robustness checks

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
	Logit	Logit	Logit	Logit	IV Probit	IV Probit
Variables	**Turnover12**	**Turnover24**	**Turnover12**	**Turnover24**	**Turnover12**	**Turnover24**
Posting	-0.202*	-0.182*	-0.181+	-0.227*	-1.408*	-0.459
	[0.0986]	[0.0761]	[0.107]	[0.0908]	[0.637]	[1.163]
Same Dept	-0.0925	-0.259**	-0.0911	-0.281**	-0.635*	-0.37
	[0.0959]	[0.0738]	[0.108]	[0.0856]	[0.291]	[0.499]
Same Function	-0.0336	0.0874	-0.0136	0.0895	-0.0697	0.0811
	[0.0987]	[0.0671]	[0.115]	[0.0831]	[0.111]	[0.0855]
Promotion	-0.302**	0.0791	-0.310*	0.0323	-0.0374	0.157
	[0.116]	[0.0954]	[0.138]	[0.109]	[0.191]	[0.280]
Female	-0.236**	-0.148*	-0.237*	-0.154*	-0.245*	-0.157*
	[0.0871]	[0.0648]	[0.103]	[0.0741]	[0.0975]	[0.0664]
Tenure	-0.104**	-0.0828**	-0.112**	-0.0906**	-0.103**	-0.0782**
	[0.0223]	[0.0159]	[0.0285]	[0.0202]	[0.0262]	[0.0183]
Tenure (sq)	0.003**	0.002**	0.003**	0.0024**	0.0028**	0.002*
	[0.0009]	[0.0006]	[0.0011]	[0.0008]	[0.0011]	[0.0008]
Age	-0.0011	0.0114**	-0.0044	0.0108**	-0.0046	0.0108+
	[0.0052]	[0.0032]	[0.0056]	[0.0036]	[0.0054]	[0.006]
Constant	-6.111**	-2.416**	-6.63	-2.661**	-0.664	-2.26
	[0.757]	[0.594]	[702.3]	[0.698]	[0.795]	[1.420]
Observations	7451	5056	5299	4751	6415	4789
Clustered s.e.	Y	Y	N	N	Y	Y
Manager Fixed Effects	N	N	Y	Y	N	N

All analyses include dummies for job, function, level, state, and ethnicity.

+ p < .10; * p < .05; ** p < .01

Table 2.9: Subsequent advancement robustness checks

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
	Logit	Logit	Logit	Logit	IV Probit	IV Probit
Variables	**Promotion24**	**Promotion36**	**Promotion24**	**Promotion36**	**Promotion24**	**Promotion36**
Posting	-0.0949	0.128+	-0.15	0.351*	-1.599+	3.060+
	[0.0645]	[0.0733]	[0.138]	[0.165]	[0.833]	[1.649]
Same Dept	0.0402	0.0012	0.0417	-0.0216	-0.604+	1.067+
	[0.0651]	[0.0779]	[0.144]	[0.178]	[0.358]	[0.617]
Same Function	-0.217**	-0.0758	-0.278*	-0.0648	-0.291**	0.041
	[0.0610]	[0.0756]	[0.136]	[0.176]	[0.0767]	[0.120]
Promotion	-0.274**	-0.279**	-0.491**	-0.593**	0.095	-0.795*
	[0.0777]	[0.0892]	[0.172]	[0.210]	[0.207]	[0.319]
Female	-0.121*	-0.123+	-0.207+	-0.2	-0.120+	-0.114
	[0.0577]	[0.0666]	[0.124]	[0.147]	[0.0620]	[0.0836]
Tenure	-0.0039	0.0333+	-0.0063	0.0730+	0.0000	0.0188
	[0.0152]	[0.0187]	[0.0365]	[0.0437]	[0.0175]	[0.0231]
Tenure (sq)	0.000	-0.0015+	-0.0003	-0.0039+	-0.0004	-0.0004
	[0.00065]	[0.0008]	[0.0017]	[0.0021]	[0.0008]	[0.0011]
Age	-0.0144**	-0.0153**	-0.0300**	-0.0316*	-0.0187**	-0.0005
	[0.00319]	[0.00365]	[0.00714]	[0.0085]	[0.0048]	[0.0091]
Constant	0.061	0.596	0.14	0.726	1.448	-2.657
	[0.345]	[0.633]	[0.778]	[0.841]	[0.934]	[1.996]
Observations	5178	3302	4864	3052	4989	3134
Clustered s.e.	Y	Y	N	N	Y	Y
Manager Fixed Effects	N	N	Y	Y	N	N

All analyses include dummies for job, function, level, state, and ethnicity.

+ p < .10; * p < .05; ** p < .01

Table 2.10: Salary robustness checks

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
	OLS	OLS	OLS	OLS	2SLS	2SLS
Variables	**Salary (ln)**	**Salary (ln)**	**Salary (ln)**	**Salary (ln)**	**Salary (ln)**	**Salary (ln)**
Posting	0.0383**	0.0376**	0.0262**	0.0262**	0.0443**	0.0430**
	[0.00256]	[0.00272]	[0.00291]	[0.00307]	[0.0157]	[0.0154]
Same Dept	0.000872	0.00125	0.00118	0.000461	0.0039	0.00368
	[0.00270]	[0.00275]	[0.00339]	[0.00343]	[0.00732]	[0.00736]
Same Function	0.0166**	0.0152**	0.00968**	0.00949**	0.0169**	0.0155**
	[0.00264]	[0.00270]	[0.00298]	[0.00302]	[0.00305]	[0.00312]
Promotion	0.0960**	0.0865**	0.0862**	0.0806**	0.0935**	0.0819**
	[0.00874]	[0.00890]	[0.0113]	[0.0113]	[0.0129]	[0.0133]
Female	-0.0101**	-0.00912**	-0.00999**	-0.00744**	-0.0110**	-0.00958**
	[0.00230]	[0.00235]	[0.00248]	[0.00252]	[0.00235]	[0.00241]
Tenure	-0.0003	-0.0009	-0.0024**	-0.0028**	-0.0004	-0.001+
	[0.0006]	[0.0006]	[0.0006]	[0.0006]	[0.0006]	[0.0006]
Tenure (sq)	0.0000	0.0000	7.66e-05**	9.40e-05**	0.0000	0.0000
	[2.07e-05]	[2.09e-05]	[2.26e-05]	[2.23e-05]	[2.14e-05]	[2.22e-05]
Age	-0.0015+	-0.0016+	-0.0011	-0.0011	-0.0018*	-0.0018*
	[0.0008]	[0.0009]	[0.0009]	[0.001]	[0.0008]	[0.0008]
Last salary (ln)	0.851**	0.863**	0.766**	0.793**	0.858**	0.866**
	[0.00924]	[0.0089]	[0.0116]	[0.0117]	[0.00886]	[0.00908]
Last contr		0.0086**		0.00669*		0.00948**
		[0.00256]		[0.00274]		[0.00262]
Last comp		0.00354		0.00519		0.00243
		[0.00353]		[0.00391]		[0.00378]
Constant	1.561**	1.342**	2.511**	2.197**	1.406**	1.091**
	[0.117]	[0.101]	[0.146]	[0.155]	[0.120]	[0.104]
R-Squared	0.955	0.959	0.975	0.98	0.946	0.949
Observations	9292	8017	8802	7701	8923	7715
Clustered s.e.	Y	Y	Y	Y	Y	Y
Manager Fixed Effects	N	N	Y	Y	N	N

All analyses include dummies for job, function, level, state, and ethnicity.
+ p < .10; * p < .05; ** p < .01

Table 2.11: Effect of external candidates

	Model 1 OLS	**Model 2** OLS	**Model 3** Logit	**Model 4** Logit	**Model 5** Logit	**Model 6** OLS	**Model 7** OLS
Variables	**Contribution**	**Competency**	**Top 25%**	**Bottom 50%**	**Bottom 25%**	**Salary (ln)**	**Salary (ln)**
External Candidates	-0.039	-0.0535	-0.0588	-0.192	-0.186	-0.00683	-0.00537
	[0.0441]	[0.0377]	[0.171]	[0.170]	[0.247]	[0.00762]	[0.00706]
Same Department	0.137**	0.104**	0.577**	-0.366+	-0.278	0.0155*	0.0220**
	[0.0493]	[0.0393]	[0.187]	[0.188]	[0.282]	[0.00786]	[0.00775]
Same Function	0.0165	0.0582	0.0209	0.0503	-0.420+	0.0226**	0.0161+
	[0.0449]	[0.0385]	[0.189]	[0.185]	[0.250]	[0.00855]	[0.00878]
Advancement	0.0173	0.0394	0.00756	0.0149	0.117	0.0187	0.0311
	[0.0686]	[0.0567]	[0.267]	[0.278]	[0.420]	[0.0408]	[0.0424]
Female	0.00303	0.0419	0.228	-0.195	-0.323	-0.0104	-0.00521
	[0.0426]	[0.0346]	[0.169]	[0.168]	[0.241]	[0.00800]	[0.00832]
Tenure	0.0481**	0.0519**	0.0541	-0.0403	-0.186**	-0.00389+	-0.0044**
	[0.0125]	[0.0114]	[0.0566]	[0.0438]	[0.0570]	[0.00224]	[0.00227]
Age	-0.00125	0.00112	-0.0105	-0.0085	-0.014	0.000266	0.00125
	[0.00258]	[0.00217]	[0.00947]	[0.00936]	[0.0135]	[0.00349]	[0.00345]
Peer Group Size			0.0006**	-0.0006**	-0.0011**		
			[0.0002]	[0.0002]	[0.0003]		
Constant	3.116**	2.265**	-2.869**	2.485+	0.991	1.568**	1.809**
	[0.301]	[0.156]	[1.385]	[1.332]	[1.934]	[0.405]	[0.522]
Observations	869	869	849	853	817	869	752
R-squared	0.168	0.178				0.955	0.96

Standard errors, in brackets, are clustered by individual. All analyses include dummies for job, function, level, state, and ethnicity.
+ p < .10; * p < .05; ** p < .01

Table 3.1: Descriptive statistics for key variables

Variable Name	Mean	S.D.
Advancement by Posting	0.04	0.19
Advancement by Sponsorship	0.03	0.17
Transfer	0.05	0.22
Firm exit	0.08	0.04
No move	0.8	0.33
Female	0.69	0.46
White	0.65	0.48
Black	0.17	0.38
Asian	0.03	0.17
Other	0.15	0.35
Salary (ln)	10.79	0.46
Age (years)	39.69	11.15
Quartile 1 (Top 25%)	0.16	0.37
Quartile 2	0.22	0.41
Quartile 3	0.26	0.44
Quartile 4 (Bottom 25%)	0.37	0.48
Contribution 4 (Exemplary)	0.05	0.21
Contribution 3 (Full)	0.45	0.5
Contribution 2 (Medium)	0.31	0.46
Contribution 1 (Low)	0.1	0.3
Firm Tenure (ln months)	3.18	1.17
Job Tenure (months)	18.99	12.86
Job Tier - Hourly	0.47	0.5
Job Tier - Independent Contributor	0.43	0.49
Job Tier - Managerial	0.08	0.28
Job Tier - Executive	0.01	0.11
Function - Sales	0.15	0.36
Function - Clinical	0.25	0.44
Function - Central Office	0.17	0.37
Function - Products	0.08	0.27
Function - Operations	0.35	0.48
Headquarters	0.31	0.46
Group Size (ln)	4.74	1.88
Group Female %	0.67	0.22
Female Supervisor	0.63	0.48

n = 68,086 person-year observations

Table 3.2: Key variables by gender

	Female		**Male**	
# of observations	23012		10601	
Salary	**Mean**	**S.D.**	**Mean**	**S.D.**
Salary	55128	28487	75737	43239
Individual Characteristics	**Mean**	**S.D.**	**Mean**	**S.D.**
White	0.65	0.48	0.70	0.46
Black	0.18	0.38	0.11	0.31
Asian	0.02	0.15	0.05	0.21
Other	0.15	0.36	0.15	0.35
Age (years)	42.55	11.36	42.20	11.76
Quartile 1 (Top 25%)	0.21	0.41	0.20	0.40
Quartile 2	0.23	0.42	0.24	0.43
Quartile 3	0.26	0.44	0.25	0.43
Quartile 4 (Bottom 25%)	0.29	0.46	0.32	0.46
Contribution 4 (Exemplary)	0.05	0.22	0.06	0.24
Contribution 3 (Full)	0.40	0.49	0.40	0.49
Contribution 2 (Medium)	0.18	0.39	0.20	0.40
Contribution 1 (Low)	0.05	0.22	0.05	0.22
Firm Tenure (months)	68.35	73.24	64.58	65.48
Job Tenure (months)	20.04	16.20	20.52	16.23
Job Characteristics	**Mean**	**S.D.**	**Mean**	**S.D.**
Job Tier - Hourly	0.44	0.50	0.29	0.45
Job Tier - Ind Contributor	0.44	0.50	0.54	0.50
Job Tier - Managerial	0.10	0.30	0.11	0.32
Job Tier - Executive	0.02	0.14	0.06	0.24
Function - Sales	0.11	0.31	0.25	0.43
Function - Clinical	0.34	0.47	0.16	0.37
Function - Central Office	0.15	0.36	0.29	0.45
Function - Products	0.10	0.30	0.08	0.27
Function - Operations	0.30	0.46	0.22	0.42
Headquarters	0.26	0.44	0.37	0.48
Group Size (ln)	4.51	1.88	4.30	2.17
Job Female %	0.75	0.18	0.49	0.25
Department Female %	0.72	0.16	0.55	0.20
Female Supervisor	0.69	0.46	0.43	0.50

Table 3.3: Key variables by type of internal move

	Advancement by Posting		**Advancement by Sponsorship**		**Lateral Move**	
# of observations	2633		2002		3610	
Internal Move Characteristics	**Mean**	**S.D.**	**Mean**	**S.D.**	**Mean**	**S.D.**
Move in same department	0.63	0.48	0.92	0.27	0.78	0.41
Move in same function	0.54	0.50	0.77	0.42	0.68	0.47
Move in same state	0.96	0.19	0.99	0.11	0.98	0.15
Previous Salary	47684	22282	54319	30381	51393	29097
Starting Salary	55965	27394	64093	35055	51507	30125
% Change in pay	17.4%	22.9%	18.0%	15.4%	0.2%	3.5%
Candidate Characteristics *(at time of hire)*	**Mean**	**S.D.**	**Mean**	**S.D.**	**Mean**	**S.D.**
Female	0.65	0.48	0.60	0.49	0.71	0.45
White	0.71	0.45	0.71	0.45	0.68	0.47
Black	0.15	0.35	0.12	0.32	0.19	0.39
Asian	0.02	0.14	0.03	0.18	0.03	0.16
Other	0.12	0.33	0.14	0.34	0.10	0.31
Age (years)	34.84	8.73	35.87	9.55	38.93	10.80
Quartile 1 (Top 25%)	0.26	0.44	0.31	0.46	0.18	0.39
Quartile 2	0.26	0.44	0.26	0.44	0.24	0.42
Quartile 3	0.23	0.42	0.22	0.42	0.25	0.43
Quartile 4 (Bottom 25%)	0.26	0.44	0.22	0.42	0.34	0.47
Contribution 4 (Exemplary)	0.07	0.26	0.11	0.31	0.05	0.21
Contribution 3 (Full)	0.59	0.49	0.58	0.49	0.50	0.50
Contribution 2 (Medium)	0.21	0.41	0.18	0.39	0.31	0.46
Contribution 1 (Low)	0.03	0.17	0.04	0.21	0.07	0.25
Firm Tenure (months)	48.46	40.42	47.91	48.44	47.41	50.61
Job Tenure (months)	20.37	11.45	20.39	12.71	18.35	11.23
Job Characteristics *(previous job)*	**Mean**	**S.D.**	**Mean**	**S.D.**	**Mean**	**S.D.**
Job Tier - Hourly	0.49	0.50	0.38	0.49	0.51	0.50
Job Tier - Ind Contributor	0.38	0.49	0.49	0.50	0.38	0.48
Job Tier - Managerial	0.13	0.34	0.11	0.32	0.11	0.31
Job Tier - Executive	0.00	0.06	0.01	0.12	0.01	0.10
Function - Sales	0.11	0.31	0.22	0.41	0.08	0.27
Function - Clinical	0.18	0.38	0.15	0.36	0.29	0.45
Function - Central Office	0.16	0.36	0.25	0.43	0.14	0.34
Function - Products	0.14	0.35	0.11	0.32	0.09	0.28
Function - Operations	0.42	0.49	0.26	0.44	0.41	0.49
Headquarters	0.50	0.50	0.46	0.50	0.40	0.49
Group Size (ln)	4.30	1.79	3.88	2.01	4.32	1.83
Job Female %	0.70	0.19	0.62	0.23	0.71	0.20
Department Female %	0.74	0.17	0.60	0.22	0.72	0.19
Female Supervisor	0.64	0.48	0.57	0.50	0.67	0.47

Table 3.4: Overview of internal applications submitted during 2012

Summary Statistics	
Requisitions	4,324
Jobs	296
Open only to internal candidates (%)	37.0%
Internal Applicants	7,110
Internal Applications	33,933
External Applications	217,121

Furthest step in the hiring process for internal applicants		
Stage 1 - ATS Screening	2,868	8.5%
Stage 2 - Recruited Screening	20,219	59.6%
Stage 3 - Hiring Manager Resume Review	4,370	12.9%
Stage 4 - Hiring Manager Interview	4,045	11.9%
Stage 5 - Job Offer	174	0.5%
Stage 6 - Background Check	13	0.0%
Stage 7 - Hired	2,244	6.6%

Table 3.4 cont'd: Overview of internal applications submitted during 2012

	All Internal Applicants		**Qualified Applicants** (passed initial screenings)	
Variables	**Mean**	**S.D.**	**Mean**	**S.D.**
Female	0.74	0.44	0.71	0.45
White	0.58	0.49	0.64	0.48
Black	0.31	0.46	0.24	0.43
Asian	0.02	0.14	0.02	0.15
Other	0.09	0.28	0.09	0.29
Age	38.04	9.89	38.54	9.81
Salary	44397	18846	49229	22425
Quartile 1 (Top 25%)	0.20	0.40	0.24	0.42
Quartile 2	0.24	0.43	0.25	0.43
Quartile 3	0.30	0.46	0.28	0.45
Quartile 4 (Bottom 25%)	0.26	0.44	0.24	0.43
Contribution 4 (Exemplary)	0.05	0.21	0.06	0.23
Contribution 3 (Full)	0.54	0.50	0.59	0.49
Contribution 2 (Medium)	0.35	0.48	0.30	0.46
Contribution 1 (Low)	0.07	0.26	0.05	0.23
Firm Tenure (ln months)	3.79	0.88	3.92	0.83
Job Tenure (months)	21.24	12.60	21.56	12.56
Potential Advancement	4.14	2.22	4.72	2.16
Job Similarity	0.79	0.41	0.73	0.44
Job Tier - Hourly	0.62	0.48	0.51	0.50
Job Tier - Ind Contributor	0.27	0.45	0.36	0.48
Job Tier - Managerial	0.10	0.30	0.13	0.33
Job Tier - Executive	0.00	0.06	0.01	0.08
HQ	0.66	0.47	0.57	0.49
Group Size (ln)	7.23	1.64	6.97	1.69
Group Female %	0.73	0.16	0.72	0.17
Female Supervisor	0.69	0.46	0.67	0.47

Table 3.5: Gender and advancement through posting versus sponsorship

VARIABLES	**Advancement via Posting**		No Move		Lateral Move		Exit	
Base category	*Advancement via Sponsorship*							
	β	**se**	β	se	β	se	β	se
Female	**0.193****	**[0.0625]**	0.400**	[0.0470]	0.439**	[0.0608]	0.273	[0.194]
Ethnicity = Black	**0.199***	**[0.0911]**	0.479**	[0.0719]	0.485**	[0.0852]	0.573*	[0.241]
Ethnicity = Asian	**-0.490***	**[0.192]**	0.223+	[0.126]	-0.00854	[0.167]	-1.277	[1.014]
Ethnicity = Other	**-0.0972**	**[0.0906]**	0.245**	[0.0691]	-0.181*	[0.0914]	0.226	[0.255]
Age (years)	**-0.0194****	**[0.00346]**	0.0457**	[.00255]	0.0317**	[0.00306]	0.0462**	[0.00813]
Perf Quart 1 (Top 25%)	**-0.230****	**[0.0859]**	-0.869**	[.0652]	-0.618**	[0.0830]	-0.771*	[0.311]
Perf Quart 2	**-0.0333**	**[0.0866]**	-0.340**	[0.0664]	-0.218**	[0.0818]	-0.421	[0.296]
Perf Quart 4 (Bottom 25%)	**0.158+**	**[0.0894]**	0.363**	[0.0692]	0.306**	[0.0827]	0.711**	[0.244]
Firm Tenure (ln months)	**0.255****	**[0.0339]**	-0.186**	[0.0279]	0.0882**	[0.0322]	-0.478**	[0.107]
Job Tenure (months)	**-0.0127****	**[0.00297]**	0.0121**	[.00232]	-0.0133**	[0.00292]	0.0130+	[0.00788]
Female% (Job)								
Female% (Department)								
Work Group Size								
Job Tier = Hourly								
Job Tier = Ind Cont								
Job Tier = Executive								
Functional = Clinical								
Functional = Central Off								
Functional = Products								
Functional = Operations								
HQ								
Female Supervisor								
Constant	**0.49**	**[0.300]**	3.946**	[0.235]	-0.0459	[0.268]	-18.21**	[0.762]
Observations	68,086							
Log pseudolikelihood	-33156.498							
Degrees of freedom	56							

Robust standard errors in brackets; All observations clustered by individual worker; Includes year dummies
+ p < .10; * p < .05; ** p < .01

Table 3.5 cont'd: Gender and advancement through posting versus sponsorship

	Model 2 - Multinomial Logit								Model 3 - Logit	
VARIABLES	**Advancement via Posting**		No Move		Lateral Move		Exit		**Adv. via Posting**	
Base category	*Advancement via Sponsorship*								*Adv.via Sponsorship*	
	β	**se**	β	se	β	se	β	se	β	se
Female	**-0.188***	**[0.075]**	0.0767	[0.058]	-0.0146	[0.073]	-0.173	[0.203]	**-0.186***	**[0.077]**
Ethnicity = Black	**-0.0427**	**[0.093]**	0.269**	[0.072]	0.261**	[0.086]	0.257	[0.246]	**0.00722**	**[0.104]**
Ethnicity = Asian	**-0.326+**	**[0.192]**	0.256*	[0.127]	0.0851	[0.167]	-0.478	[0.743]	**-0.0878**	**[0.236]**
Ethnicity = Other	**-0.0568**	**[0.095]**	0.132+	[0.073]	-0.316**	[0.095]	0.0493	[0.251]	**-0.142**	**[0.109]**
Age (years)	**-0.013****	**[0.004]**	0.0455**	[0.003]	0.0358**	[0.003]	0.0504**	[0.008]	**-0.0199****	**[0.004]**
Perf Quart 1	**-0.222***	**[0.087]**	-0.839**	[0.066]	-0.644**	[0.084]	-0.777**	[0.294]	**-0.420****	**[0.099]**
Perf Quart 2	**-0.0116**	**[0.087]**	-0.323**	[0.067]	-0.211*	[0.082]	-0.484+	[0.289]	**-0.0665**	**[0.1]**
Perf Quart 4	**0.208***	**[0.09]**	0.414**	[0.07]	0.385**	[0.083]	0.772**	[0.233]	**0.269***	**[0.107]**
Firm Tenure	**0.275****	**[0.034]**	-0.0509+	[0.028]	0.167**	[0.032]	-0.282**	[0.101]	**0.339****	**[0.06]**
Job Tenure	**-0.012****	**[0.003]**	0.0079**	[0.002]	-0.0126**	[0.003]	0.00675	[0.008]	**-0.0091***	**[0.004]**
Female% (Job)	**1.089****	**[0.164]**	0.430**	[0.117]	0.580**	[0.152]	0.249	[0.505]	**-**	**-**
Female% (Dept)	**-**	**-**	-	-	-	-	-	-	**1.384****	**[0.485]**
Work Group Size	**0.111****	**[0.017]**	0.184**	[0.012]	0.0386*	[0.016]	0.169**	[0.054]	**0.127****	**[0.03]**
Job Tier = Hourly	**-0.133**	**[0.113]**	-0.111	[0.087]	0.162	[0.107]	0.321	[0.386]	**-**	**-**
Job Tier = Ind Cont	**-0.228***	**[0.100]**	-0.0087	[0.079]	-0.0693	[0.01]	-0.00598	[0.374]	**-**	**-**
Job Tier = Executive	**-0.809***	**[0.369]**	1.024**	[0.199]	0.436+	[0.248]	2.393**	[0.526]	**-**	**-**
Function = Clinical	**0.728****	**[0.115]**	1.109**	[0.082]	1.736**	[0.113]	1.135**	[0.337]	**-**	**-**
Function = Cnrt Off	**0.326****	**[0.113]**	0.774**	[0.075]	0.830**	[0.113]	0.458	[0.383]	**-**	**-**
Function = Products	**0.648****	**[0.124]**	0.497**	[0.09]	0.861**	[0.128]	0.431	[0.434]	**-**	**-**
Function = Ops	**0.864****	**[0.107]**	1.144**	[0.076]	1.509**	[0.111]	1.340**	[0.341]	**-**	**-**
HQ	**0.0209**	**[0.07]**	-0.652**	[0.054]	-0.286**	[0.067]	-0.858**	[0.223]	**0.0493**	**[0.093]**
Female Supervisor	**-0.0565**	**[0.066]**	-0.102*	[0.049]	-0.011	[0.062]	-0.19	[0.199]	**-0.189***	**[0.08]**
Constant	**-0.998****	**[0.343]**	2.459**	[0.265]	-1.598**	[0.315]	-18.99**	[0.652]	**-0.66**	**[0.975]**
Observations	68,086								4,432	
Log pseudolikelihood	-3285.834								-2597.6087	
Degrees of freedom	99								216	

Robust standard errors in brackets; All observations clustered by individual worker; Includes year dummies
+ p < .10; * p < .05; ** p < .01

Table 3.6: Gender and likelihood of submitting an internal application

	Logit Monthly observations				Logit Annual observations				Negative Binomial Regression Annual observations			
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
VARIABLES	**Submitted an Application**		**Submitted an Application**		**Submitted an Application**		**Submitted an Appilcation**		**# of Applications**		**# of Applications**	
	β	se	β	se	β	se	β	se	β	se	β	se
Female	0.23**	[0.06]	-0.12*	[0.06]	0.27**	[0.06]	-0.26**	[0.07]	0.26**	[0.05]	-0.09*	[0.05]
Ethnicity = Black	0.66**	[0.06]	0.44**	[0.07]	0.63**	[0.07]	0.3**	[0.08]	0.53**	[0.06]	0.32**	[0.05]
Ethnicity = Asian	-0.48**	[0.14]	-0.03	[0.14]	-0.42*	[0.18]	0.11	[0.19]	-0.48**	[0.13]	0.07	[0.11]
Ethnicity = Other	-0.19*	[0.07]	0.12	[0.08]	-0.1	[0.08]	0.23*	[0.10]	-0.18*	[0.07]	-0.15*	[0.06]
Age (years)	-0.03	[0.00]	-0.02**	[0.00]	-0.03**	[0.00]	-0.03**	[0.00]	-0.03**	[0.00]	-0.02**	[0.00]
Perf Quart 1	0.09	[0.07]	0.07	[0.07]	0.17*	[0.08]	0.14	[0.09]	0.13+	[0.07]	0.02	[0.05]
Perf Quart 2	-0.02	[0.07]	-0.00	[0.07]	0.06	[0.07]	0.06	[0.08]	0.01	[0.06]	-0.05	[0.05]
Perf Quart 4	-0.08	[0.07]	0.07	[0.08]	-0.09	[0.08]	0.07	[0.09]	-0.08	[0.06]	-0.07	[0.05]
Firm Tenure	-0.00**	[0.00]	-0.00**	[0.01]	-0.00	[0.00]	-0.00	[0.00]	-0.00**	[0.00]	-0.00**	[0.00]
Job Tenure	0.00	[0.00]	0.00	[0.00]	0.01**	[0.00]	0.01**	[0.00]	0.00*	[0.00]	-0.00	[0.00]
Work Group Size			0.17**	[0.03]			0.31**	[0.03]			0.00	[0.02]
Female Supervisor			-0.04	[0.06]			-0.01	[0.07]			-0.00	[0.04]
Constant	-1.14**	[0.12]	-2.1*	[1.02]	-0.82**	[0.13]	-1.53**	[0.43]	-1.17**	[0.11]	-0.38	[0.59]
Ln alpha									1.23**	[0.03]	0.28**	[0.05]
Observations	64,563		64,563		11,437		11,437		11,437		11,437	
Clustered by id	Yes		Yes		No		No		No		No	
Job Fixed Effects?	No		Yes		No		Yes		No		Yes	
Log likelihood	-21279		-19100		-4617		-3822		-11154		-9853	
Degrees of freedom	10		202		10		202		10		202	

+ p < .10; * p < .05; ** p < .01; Robust standard errors in brackets

Table 3.7: Likelihood of receiving an offer having submitted an application

	Model 1 Fixed Effects Logit **All Applicants**		Model 2 Fixed Effects Logit **All Applicants**		Model 3 Conditional Logit **All Applicants**		Model 4 Conditional Logit **All Applicants**	
VARIABLES	**Received Offer**		**Received Offer**		**Received Offer**		**Received Offer**	
	β	se	β	se	β	se	β	se
Female	-0.099	[0.0604]	-0.0699	[0.0639]	-0.099	[0.135]	-0.0699	[0.131]
Ethnicity = Black	-0.651**	[0.0689]	-0.491**	[0.0724]	-0.651**	[0.110]	-0.491**	[0.103]
Ethnicity = Asian	-0.459*	[0.181]	-0.570**	[0.191]	-0.459*	[0.225]	-0.570**	[0.215]
Ethnicity = Other	-0.331**	[0.105]	-0.258*	[0.111]	-0.331+	[0.184]	-0.258	[0.175]
Age (years)	-0.0265**	[0.00307]	-0.0286**	[0.00326]	-0.0265	[0.0163]	-0.0286+	[0.0158]
Perf Quart 1 (Top 25%)	0.527**	[0.0701]	0.591**	[0.0744]	0.527**	[0.142]	0.591**	[0.153]
Perf Quart 2	0.260**	[0.0701]	0.289**	[0.0742]	0.260*	[0.132]	0.289*	[0.139]
Perf Quart 4 (Bottom 25%)	-0.0845	[0.0743]	-0.0895	[0.0784]	-0.0845	[0.157]	-0.0895	[0.162]
Firm Tenure (ln months)	0.00460**	[0.000498]	0.00353**	[0.000547]	0.786	[0.724]	0.701	[0.664]
Job Tenure (months)	-0.00442*	[0.00211]	0.000929	[0.00221]	1.175	[0.754]	1.103	[0.704]
Same Function			0.376**	[0.0859]			0.376+	[0.225]
Job Similarity			0.512**	[0.0337]			0.512**	[0.126]
Same Pod			1.014**	[0.0708]			1.014**	[0.139]
Same State			0.660**	[0.105]			0.66	[0.467]
Potential Advancement			-0.0912	[0.0946]			-0.0912	[0.447]
Observations	20,694		20,694		20,694		20,694	
# Groups (Requisitions)	1,697		1,697		1,697		1,697	
Errors clustered by worker	No		No		Yes		Yes	
Log likelihood	-4023.3499		-3586.1031					
Degrees of freedom	10		15					

+ p < .10; * p < .05; ** p < .01; Robust standard errors in brackets

Table 3.7 cont'd: Likelihood of receiving an offer having submitted an application

	Model 5 Fixed Effects Logit **Qualified Applicants**		Model 6 Fixed Effects Logit **Qualified Applicants**		Model 7 Conditional Logit **Qualified Applicants**		Model 8 Conditional Logit **Qualified Applicants**	
VARIABLES	**Received Offer**		**Received Offer**		**Received Offer**		**Received Offer**	
	β	se	β	se	β	se	β	se
Female	-0.0172	[0.0766]	0.00937	[0.0791]	-0.0172	[0.128]	0.00937	[0.131]
Ethnicity = Black	-0.433**	[0.0880]	-0.361**	[0.0903]	-0.433**	[0.124]	-0.361**	[0.120]
Ethnicity = Asian	-0.448+	[0.243]	-0.523*	[0.247]	-0.448+	[0.266]	-0.523*	[0.253]
Ethnicity = Other	-0.355**	[0.136]	-0.352*	[0.140]	-0.355+	[0.190]	-0.352+	[0.190]
Age (years)	-0.0336**	[0.00407]	-0.0347**	[0.00418]	-0.0336+	[0.0183]	-0.0347+	[0.0178]
Perf Quart 1	0.366**	[0.0903]	0.422**	[0.0931]	0.366*	[0.151]	0.422*	[0.165]
Perf Quart 2	0.148+	[0.0893]	0.168+	[0.0916]	0.148	[0.137]	0.168	[0.140]
Perf Quart 4	-0.069	[0.0944]	-0.0795	[0.0974]	-0.069	[0.167]	-0.0795	[0.168]
Firm Tenure	0.00291**	[0.000675]	0.00226**	[0.000709]	0.418	[0.773]	0.385	[0.790]
Job Tenure	-0.00541*	[0.00270]	-0.00186	[0.00277]	0.858	[0.819]	0.833	[0.833]
Same Function			0.287**	[0.110]			0.287	[0.269]
Job Similarity			0.292**	[0.0435]			0.292*	[0.136]
Same Pod			0.627**	[0.0921]			0.627**	[0.178]
Same State			0.506**	[0.140]			0.506	[0.560]
Potential Advancement			-0.0952	[0.119]			-0.0952	[0.493]
Observations	6,935		6,935		6,935		6,935	
# Groups (Requisitions)	1,179		1,179		1,179		1,179	
Errors clustered by worker	No		No		Yes		Yes	
Log likelihood	-2083.534		-1982.6794					
Degrees of freedom	10		15					

+ p < .10; * p < .05; ** p < .01; Robust standard errors in brackets

Table 3.8: Attributes of internal applications

			All Applicants		Qualified Applicants		
Model #	Dependent Variables	Model Type	β (female)	se	β (female)	se	Includes Req Fixed Effects
1	Ranked in Top 10% of perfomance cohort	logit	0.28**	[0.06]	0.34**	[0.1]	Yes
2	Ranked in Top 25% of perfomance cohort	logit	0.32**	[0.04]	0.39**	[0.07]	Yes
3	Ranked in Top 50% of performance cohort	logit	0.4**	[0.03]	0.45**	[0.06]	Yes
4	Ranked in Bottom 50% of performance cohort	logit	-0.4**	[0.03]	-0.45**	[0.06]	Yes
5	Ranked in Bottom 25% of performance cohort	logit	-0.2**	[0.03]	-0.26**	[0.06]	Yes
6	Ranked in Bottom 10% of performance cohort	logit	-0.4**	[0.05]	-0.35**	[0.09	Yes
7	Contribution Score in current job	OLS	0.04**	[0.01]	0.07**	[0.02]	Yes
8	Competency Score in current job	OLS	0.07**	[0.01]	0.09**	[0.01]	Yes
9	Combined Score in current job	OLS	0.05**	[0.01]	0.08**	[0.01]	Yes
10	Age	OLS	0.6**	[0.13]	1.44**	[0.24]	Yes
11	Job tenure	OLS	0.09+	[0.17]	0.68*	[0.33]	Yes
12	Firm tenure	OLS	11.16**	[0.7]	16.37**	[1.35]	Yes
13	Applying for a different job (overall similarity)	OLS	-0.13**	[0.02]	-0.06	[0.04]	Yes
14	Applying for a job requiring different skills	OLS	-0.07**	[0.01]	-0.03	[0.02]	Yes
15	Applying for a job in a different function	logit	-0.02	[0.04]	0.01	[0.07]	Yes
16	Applying for an advancement opportunity	logit	0.17**	[0.05]	0.22**	[0.08	Yes
17	Submitted multiple applications	logit	0.2**	[0.04]	0.19**	[0.06]	No

+ p < .10; * p < .05; ** p < .01; Robust standard errors in brackets

Table 3.9: Starting salary

	Model 1		Model 2		Model 3	
	OLS		OLS		OLS	
VARIABLES	**Salary(ln)**		**Salary(ln)**		**Salary(ln)**	
	β	se	β	se	β	se
Female	-0.011**	[0.00]	-0.011**	[0.00]	-0.018**	[0.00]
Ethnicity = Black	0.005	[0.00]	0.004	[0.00]	0.004	[0.00]
Ethnicity = Asian	0.049**	[0.01]	0.049**	[0.01]	0.050**	[0.01]
Ethnicity = Other	-0.033**	[0.01]	-0.032**	[0.01]	-0.032**	[0.01]
Age (years)	0.002**	[0.00]	0.002**	[0.00]	0.002**	[0.00]
Perf Quart 1	0.029**	[0.01]	0.031**	[0.01]	0.031**	[0.01]
Perf Quart 2	0.018**	[0.00]	0.018**	[0.00]	0.018**	[0.00]
Perf Quart 4	0.002	[0.01]	0.002	[0.01]	0.002	[0.01]
Firm Tenure	0.007**	[0.00]	0.006**	[0.00]	0.006**	[0.00]
Job Tenure	0.001**	[0.00]	0.001**	[0.00]	0.001**	[0.00]
Posting			0.022**	[0.00]	0.010*	[0.00]
Advancement			-0.008+	[0.00]	-0.008+	[0.00]
Same Function			0.003	[0.00]	0.003	[0.00]
Same Pod			-0.005	[0.00]	-0.005	[0.00]
Female*Posting					0.018**	[0.01]
Constant	10.75**	[0.04]	10.75**	[0.04]	10.75**	[0.04]
New job controls	Yes		Yes		Yes	
Prev job controls	Yes		Yes		Yes	
Year controls	Yes		Yes		Yes	
Observations	9189		9189		9189	
R-squared	0.932		0.933		0.933	
Adjusted R-squared	0.927		0.928		0.928	

Robust standard errors in brackets; All observations clustered by individual worker; Includes year dummies

+ p < .10; * p < .05; ** p < .01

Table 3.10: Starting salary interaction terms

DV = Salary (ln)		
Detailed Interaction Terms	β	se
Male Posting v. Male Sponsorship	0.00957*	[0.005]
Female Posting v. Female Sponsorship	0.0276**	[0.003]
Female Sponsorship v. Male Sponsorship	-0.0182**	[0.005]
Female Posting v. Male Posting	-0.000161	[0.004]

Includes all variable in Model 2, Table 3.9; Robust standard errors in brackets

+ $p < 0.1$; * $p<0.05$; ** $p<0.01$

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