

**WITHIN OR WITHOUT? HOW FIRMS COMBINE INTERNAL AND EXTERNAL
LABOR MARKETS TO FILL JOBS**

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Acknowledgements:

We would like to thank Peter Cappelli, Adam Cobb, Olivier Chatain, Adam Grant, Vit Henisz, Katherine Klein, John-Paul MacDuffie, Lori Rosenkopf, the slump management discussion group, three anonymous reviewers and Gerry McNamara for their helpful suggestions. This research was supported in part by a grant from the Wharton Leadership Centre and by a Dorinda and Mark Winkelman Distinguished Scholar Award. Both authors contributed equally to this paper and are listed alphabetically.

ABSTRACT

We examine which jobs are more likely to be filled by internal mobility (specifically, promotions and lateral transfers) versus hiring. Building off the assumptions of transaction cost accounts of employment, we develop new theory that focuses on the interaction between the problems of evaluating and integrating external hires on the one hand and the incentive costs of failing to promote eligible workers on the other. These arguments lead us to predict how three specific characteristics of jobs – demands for firm-specific skills, performance variability, and supply of internal candidates – affect how those jobs are staffed.

Using seven years of personnel data spanning all jobs from the US offices of a large investment bank, we find that jobs with higher performance variability and a larger grade ratio of junior to senior workers are more likely to be filled by internal mobility. We also find evidence that the effects of performance variability are contingent on the grade ratio, only affecting staffing decisions when the firm does not face strong pressures to promote junior workers in order to maintain incentives. Contrary to expectations, we find no effect for firm-specific skills.

Recent years have seen a marked growth in external hiring into almost all kinds of jobs at all levels of organizations (Jacoby, 2005; Royal & Althausser, 2003). Earlier models of how firms staffed jobs were based on internal labor market theory, which studied how workers were promoted and transferred along and across job ladders within organizations (DiPrete, 1987; Stewman & Konda, 1983; Stewman & Yeh, 1991). Where hiring was considered at all, it was assumed to take place only into lower levels of the organization, or viewed as a residual category (Stewman, 1986). Yet hiring now competes with internal mobility to fill jobs at all levels within firms – such that scholars now depict firms’ employment practices as market oriented, and careers as boundaryless (Arthur & Rousseau, 1996; Cappelli, 1999). Understanding how firms combine internal and external labor markets, and specifically when they are more likely to fill jobs by external hiring and when they continue to fill them by internal mobility, is therefore important for understanding modern employment systems and careers.

Studying this question is particularly pressing given the different consequences that hiring and internal mobility hold, both for the capabilities that firms can and should build, and for the career outcomes of the workers involved. For example, internal mobility is best supported by training and evaluation systems, while external hiring relies on expertise in attracting, selecting and socializing new hires. The longer relationships fostered by internal mobility lead to unique organizational capabilities, as workers develop firm-specific skills (Chadwick & Dabu, 2009). Hiring, by contrast, helps firms to learn from workers’ prior employers (Rao & Drazin, 2002; Rosenkopf & Almeida, 2003) and even build relationships with them (Dokko & Rosenkopf, 2010; Somaya, Williamson, & Lorinkova, 2008). Internal mobility and external hiring also have different consequences for workers: studies show that firms select on different criteria when they fill the same jobs by promotion versus hiring (e.g. Baker, Gibbs,

& Holmstrom, 1994; Petersen & Saporta, 2004), and that hires earn substantially more than those promoted into similar jobs, despite often taking years to become as effective (Bidwell, 2011). Hence, while most firms fill jobs by both hiring and internal mobility, how they balance those forms of mobility matters.

Although much literature has separately explored the issues associated with hiring (e.g. Posthuma, Morgeson, & Campion, 2002; Schmidt & Hunter, 1998) and internal mobility (e.g. Stewman & Konda, 1983), much less research has examined when firms use one or the other to fill jobs. What work does exist has generally focused on organization-level influences, including such factors as industry dynamics (Haveman & Cohen, 1994), organizational growth (Wholey, 1985), and firms' distance from competitors, implementation of new technologies, and human resource practices (Bayo-Moriones & Ortan-Angel, 2006; Pfeffer & Cohen, 1984). A separate literature on CEO hiring has also explored the effects of firm performance and the presence of an heir apparent (Cannella & Lubatkin, 1993; Zhang & Rajagopalan, 2003). Much evidence, though, suggests that staffing decisions are usually made at the level of the job, as firms take varied approaches towards managing different jobs within the same organization (Huselid & Becker, 2011; Lepak & Shaw, 2008). All of the jobs within an organization may not, therefore, be equally permeable to the external labor market; rather, some jobs may be more likely to be filled by internal mobility while others are predominantly filled by hiring. Although an earlier literature explored which jobs were more likely to be linked by formal promotion ladders (Baron, Davis-Blake, & Bielby, 1986), prior research has not examined the attributes of jobs that affect how they are filled in practice. Since so much of the variation between hiring and internal mobility is likely to occur at the job level, we believe that there is a real need to understand the job-level determinants of the competition between internal and external mobility.

We develop a theoretical account of how firms balance their use of internal and external mobility by building off some of the underlying assumptions of transaction cost accounts of employment (Williamson, Wachter, & Harris, 1975). Williamson et al. argued that the efficiency of external labor markets was undermined by jobs' needs for firm-specific skills, and by the problems that information impactedness creates for evaluating potential hires. They also suggested that promotions played an important role in overcoming governance problems within organizations. Those arguments were used to explain the institutional arrangements surrounding employment, but not to examine which jobs would be filled by internal mobility (other than those at higher ranks).

Starting from the same set of assumptions, we develop a different set of arguments to predict when the problems of hiring will lead firms to rely on internal mobility. Williamson et al.'s arguments, and the associated literature on make-or-buy decisions (Carter & Hodgson, 2006; Mahoney, 2005), are based on differences in how market versus hierarchies solve *ex post* adaptation problems (Williamson, 1985, 1991). By contrast, the work done by both externally hired and internally moved workers is governed by the same hierarchical arrangements within the firm, and therefore faces identical *ex post* adaptation challenges. Hence, while decisions about whether to use contractors versus regular employees are amenable to the same analyses as make-or-buy questions (Bidwell, 2009; Masters & Miles, 2002; Mayer & Nickerson, 2005), issues of whether to fill jobs by hiring or internal mobility are not.

We argue instead that staffing decisions reflect the interaction of two different sets of factors: how the problems caused by firm-specific skills and information impactedness affect the firm's ability to find the best *ex ante* fit between the worker and job; and how the spillover effects of promoting a worker affects other workers' motivation. First, we suggest that jobs are

more likely to be filled by internal mobility when performance is dependent on firm-specific skills. While others have offered similar predictions (e.g. Lepak & Snell, 1999), recent studies suggest that firms often underestimate the importance of firm-specific skills (Groysberg, 2010) and earlier evidence on how firm-specific skills affected internal labor markets was very mixed (Althausser, 1989), making this an important argument to test.

We also examine the consequences of information impactedness for where firms will use internal mobility versus hiring. The unique nature of every individual worker, combined with the complexity of evaluating individuals' prior performance (Coff, 1997), complicates firms' ability to evaluate the quality of potential employees. We develop a new prediction about the kinds of jobs that are most likely to be filled internally as a consequence: those where there is more variability in the performance of incumbents.

We also propose that the effects of these task characteristics are shaped by the use of promotion as an incentive. Another difference between staffing decisions and make-or-buy problems is that staffing decisions involve workers, who, unlike other assets, care about the job that they are assigned to. As a consequence, scholars have noted how promotions serve as an important source of rewards as well as a way to fill jobs (Lazear & Rosen, 1981; Rosenbaum, 1979). Because failing to promote workers risks demotivating those in lower level jobs, we argue that firms face pressure to promote into jobs with high "grade ratios," where large numbers of junior workers are eligible to be promoted into a small number of senior positions. We also suggest that these incentive pressures can preempt consideration of a job's task characteristics altogether in jobs with high grade ratios. Whether task characteristics affect how jobs are filled will therefore depend on how those jobs fit into the broader career structure of the firm.

We test these arguments within the professional services industry, which is particularly human capital intensive. We use seven years of personnel data from an investment bank, covering all employees in over 200 different jobs, to explore the characteristics that make jobs more likely to be filled by hiring, promotion or lateral transfers.

This study contributes to the literatures on internal labor markets and worker mobility by outlining how modern organizations integrate external hiring and internal mobility. We extend transaction cost reasoning to the novel setting of staffing decisions, developing a theoretical framework that integrates the effects of mobility on both filling jobs and providing incentives. Particular contributions of our theory are to introduce performance variability as an important, job-level determinant of how jobs are filled, and to emphasize the importance of looking at the interactions among transaction characteristics (Macher & Richman, 2008; Mahoney, 2005). Empirically, we present the first job-level study of the determinants of hiring versus internal mobility, helping to explain when firms will continue to rely on internal labor markets, despite the overall growth in external hiring.

THEORY AND HYPOTHESES

Before developing our theory, it is useful to define a few terms that we will use. First, we define a “position” as the set of tasks carried out by a single individual in their normal work. Although each position in an organization may involve slightly different tasks, both organizations and the scholars who study them usually group positions into “jobs”. All of the positions within a job usually involve similar tasks, require similar skills, receive similar rewards and occupy similar positions within the organizational structure (DiPrete, 1987; Rosenfeld, 1992). Jobs therefore provide a useful level of analysis for exploring staffing decisions.

Hiring, promoting and transferring represent equivalent means by which organizations can fill jobs with employees. If an investment bank needs vice presidents doing corporate advisory work for energy companies, for example, it can get them by promoting associates, by hiring workers in from outside, or by transferring vice presidents from other areas. It should be noted these different forms of mobility may take place through very different processes. For example, hiring may or may not be triggered by the presence of a specific vacancy (Rosenbaum, 1990). The spur to promotion may often be a worker's achievement of a set of performance or seniority milestones rather than a newly discovered need for a senior worker (Pinfield, 1995). Nonetheless, each process has the same end of placing workers into jobs, meeting the organization's demands to place workers in a variety of different functions and levels. The different forms of mobility are also substitutes for one another: if demand for workers in a given job is met through internal mobility then hiring into that job becomes less likely, and vice-versa.

Where hiring, promoting and transferring differ is in the job that the worker moves from. In hiring, the worker comes from a prior job that was outside the organization (or from a spell out of work). Although the tasks and responsibilities of the new job may sometimes be similar to those of the old job, the context in which the work takes place, including the culture, processes and coworkers will be different, affecting how the new hires accomplish their work (Dokko, Wilk, & Rothbard, 2009; Huckman & Pisano, 2006). In internal mobility, the worker moves from a different job within the organization. Consistent with much prior work, we define promotions as moves from a job that was in a lower hierarchical rank within the same organization (e.g. Cohen, Broschak, & Haveman, 1998; Spilerman & Lunde, 1991). Hierarchical rank represents a central source of differences between jobs within organizations, being associated with higher rewards, status, responsibilities and skills demands. When workers are

promoted, they move into a job with substantially higher skills demands and task complexity¹. In transfers, workers move from a job that was at the same hierarchical level as the destination job, but in a different function or part of the organization, usually (but not always) involving different tasks, responsibilities or reporting relationships. All forms of mobility that we identify – hiring, promotions, lateral transfers – therefore involve a worker moving into a job different from the previous job in important respects.

Transaction Cost Economics and Worker Mobility

We develop theory about when firms will fill jobs by internal mobility versus hiring using some of the underlying assumptions of transaction cost accounts of employment. Transaction cost economics is best known for its application to the make-or-buy decision, where it explores how the problems of *ex post* adaptation affect firms' integration decisions (Williamson, 1985, 1991). Specifically, scholars argue that market governance is inefficient where relationship specific investments and uncertainty increase the risks of opportunism and costly haggling in supply transactions. An early paper (Williamson et al., 1975) applied a similar logic to understand the institutional arrangements surrounding employment, arguing that such structures as defined promotion ladders and grievance procedures helped to ward off the problems of opportunism and conflict within employment.

As we develop below, applying transaction cost arguments to the question of when firms should fill jobs by internal versus external mobility requires a very different logic from either make-or-buy analyses or attempts to explain the institutional structure of employment, since the arguments must shift from *ex post* adaptation to *ex ante* evaluation, and to the way that firm's

¹ In practice, the actual change in tasks associated with a promotion may take place over time, both before and after the promotion, in contrast to the instantaneous administrative recognition associated with a formal promotion (Pergamit & Veum, 1999). This gradual timing of changes in tasks does not change the fact that the new job is associated with greater overall responsibilities and higher skill demands.

promotion decisions often have spillover effects on the motivation of many workers.

Nonetheless, the underlying assumptions of Williamson et al.'s arguments provide a useful starting point for analyzing those staffing decisions, because of their focus on the limitations of external labor markets. To our knowledge, such work has not been done previously; indeed Williamson et al. assumed that hiring was generally restricted to entry level jobs.

Because these transaction cost accounts of employment focus on the problems of external labor markets, they allow us to predict when the firm will be most likely to favor internal mobility over external hiring. That said, our intent is not to argue that internal mobility is always superior to hiring. There are likely to be a number of other reasons why organizations may seek to hire externally, such as a desire to access new knowledge (Rosenkopf & Almeida, 2003) or a perception that internal workers lack key skills. Though likely very real, those effects are beyond the scope of our paper.

Firm-specific Skills and Mobility

The first reason that Williamson et al. (1975) identify for the failure of external labor markets is the importance of firm-specific skills for carrying out many jobs. Firm-specific skills are skills acquired through on-the-job learning in one organization that cannot be used in another organization (Becker, 1962). Recent studies confirm the value of firm-specific skills, as workers suffer performance declines when moving organizations (Groysberg, Lee, & Nanda, 2008; Huckman & Pisano, 2006). Although firm-specific skills may be valuable in many kinds of jobs, their importance is likely to be greater in some jobs than others, based on such attributes as the idiosyncrasies of the technology used or the extent of interdependence with others in the organization (Baron, Davis-Blake, & Bielby, 1986; Broschak, 2004; Davis-Blake & Uzzi, 1993).

Their prior experience in the firm should provide current employees with much higher levels of firm-specific skills than potential hires. Internal candidates should therefore be expected to perform better in jobs that require higher levels of firm-specific skills. As a consequence, we predict that firms will prefer to promote or transfer into jobs requiring higher levels of firm-specific skills, rather than hire.

H1: The odds of a job being filled by hiring relative to internal mobility (promotions and transfers) will decrease with the firm-specific skills the job requires.

Although such arguments about firm-specific skills have also been a mainstay of prior theory on how jobs are staffed (Bayo-Moriones & Ortan-Angel, 2006; Lepak & Snell, 1999), some scholars have argued that both workers and managers often under-estimate the barriers to transferring performance across organizational settings, attributing performance solely to general skills (Groysberg, 2010; Huckman & Pisano, 2006). Were that the case, the influence on firm-specific skills on actual staffing decisions could be more muted than current theory suggests.

Information Impactedness and Internal Staffing

A second set of market failures in Williamson et. al.'s (1975) analysis of employment are caused by "information impactedness", where "relevant information is known by some parties but cannot be costlessly discerned by or displayed for others" (Williamson, 1975, p. 31). Much of the analysis of the problems caused by information impactedness has focused on the difficulties of effectively evaluating workers' performance *ex post*, and its consequences, for example, for decisions to use contractors rather than employees (e.g. Masters & Miles, 2002; Williamson, 1981). Williamson et al. (1975) note, though, that information impactedness also affects assessments of workers' skills *ex ante*, as employers lack information on how candidates will perform in the job. We focus on the effects of such *ex ante* evaluations on staffing decisions.

Effectively filling a job requires managers to assess whether a candidate has the skills and abilities necessary to succeed in that job, yet providing such an assessment can be very difficult when engaging in external hiring, as employers know little about the potential hires, and the available selection techniques have limited predictive power (Sackett & Lievens, 2008; Schmidt & Hunter, 1998). In evaluating internal candidates, managers have access to all of the same information that they do in hiring and also to detailed information on how that worker has performed while at the firm. Often, managers have direct experience working with a candidate over long periods of time; managers that lack that direct experience can still access performance evaluations that are not available to other employers. Although those internal performance evaluations have their own limitations, the information that comes from prolonged observation of the candidate in their prior job substantially reduces the likelihood that the firm will place workers into jobs that they are unable to do (Gibbons & Katz, 1991; Williamson et al., 1975).

We propose that these differences in firms' ability to assess internal and external candidates will lead them to use internal mobility when staffing jobs which have higher performance variability. Consistent with prior research (Boudreau & Ramstad, 2007; Huselid & Becker, 2011; Jacobs, 1981), we define performance variability as the extent of differences in performance across different incumbents within a job. In some jobs, all workers tend to perform similarly, often because the worker's actions are dictated by technology, organizational regulations, or their interactions with others. In other jobs, though, the performance of different workers may vary much more, based on differences in those workers' ability to do the job.

We argue that managers need better information on candidates when filling a job in which the performance of different workers varies more. In jobs where most workers perform similarly, staffing mistakes will be less costly. As a consequence, the benefits of being able to

identify better workers for the job will be lower: even workers who turn out to be a poor fit for the job will still perform adequately. In jobs where performance variability is high, though, workers who turn out to be a poor fit will drag performance down much more. It is in those jobs where managers will particularly benefit from improved information, since it will allow them to successfully weed out those candidates who are likely to perform poorly. Moreover, because the managers focus on weeding out poor performers rather than reducing overall variance, such screening should not reduce the possibility of exceptional performance by internal candidates. Managers' improved ability to screen internal candidates will therefore raise the average performance of promoted and transferred workers, and do so more in jobs with high performance variability. We therefore believe that managers will place more emphasis on internal mobility in filling jobs with higher performance variability, even when comparing jobs of the same rank.

H2: The odds of a job being filled by hiring relative to internal mobility will decrease with the level of performance variability in the job.

These arguments lead to a very different perspective on uncertainty from traditional make-or-buy analyses. Those analyses view uncertainty as a determinant of integration decisions, because changes in the work required creates pressures for *ex post* adaptation (David & Han, 2004). As we have emphasized above, staffing decisions are not affected by these adaptation problems because the *ex post* governance arrangements are identical for hired, promoted and transferred workers. Uncertainty in job requirements should not therefore affect staffing decisions. Instead, uncertainty is a consequence of staffing decisions, not a determinant, since the performance of hires is more uncertain than that of workers entering the job from inside the firm. We argue that hiring is less common where that uncertainty could be more damaging, not where it is greatest.

Promotions as Incentives

A key difference between workers and other organizational assets is that workers care about what jobs they occupy (Coff, 1997) and are invested in the organization's staffing decisions. In particular, Williamson et al (1975) highlight how workers' preference to be in higher level, more rewarding jobs leads promotions to serve as an important reward in organizations (see also Dencker, 2009; Phillips, 2001). These incentive properties of promotions have a distinct set of implications for the kinds of jobs that will be more likely to be filled by internal mobility.

In particular, the effectiveness of promotions as incentives depends on workers' belief that they will be promoted if they perform well (Granovetter, 1998), and workers often assess that likelihood by looking at whether high performing workers around them are being promoted (Chan, 1996, 2006). A failure to fill jobs by promotion may therefore have negative spillover effects on the motivation of workers in lower level jobs, reducing their effort and increasing turnover. We draw on these arguments to develop new predictions about the kinds of jobs that are more likely to be filled by promotion.

When there are more workers who are eligible for promotion into a given job, the firm will pay greater motivational costs should it fill the job by external hiring instead. Workers in most organizations tend to be promoted along job ladders that consist of hierarchically linked jobs involving similar tasks and occupying a similar location within the formal organizational structure (Barnett & Miner, 1992; Baron et al., 1986). As a consequence, the proportion of workers eligible for promotion can be calculated from the ratio of workers in the lower level on the job ladder relative to the number of workers in the focal job, which Stewman and Konda (1983) refer to as the "grade ratio". While this ratio may fluctuate from year to year, its long run

average reflects the organization of work within the firm. Some tasks can be carried out by a few senior workers supported by many junior workers, leading to a high grade ratio. Other tasks require a much higher proportion of senior workers, leading to a lower grade ratio. The higher this grade ratio, the more workers who are likely to be eligible for promotion, and hence the greater the motivational costs that the firm will pay should it choose to pass them over and hire instead. As a consequence, we propose that:²

H3a: The odds of a job being entered by hiring relative to promotion will decrease as the grade ratio increases.

Internal transfers also reduce promotion prospects, suggesting that the grade ratio affects transfers in the same way as hiring.

H3b: The odds of a job being entered by transfer relative to promotion will decrease as the grade ratio increases.

Incentives to Promote and the Consideration of Task Characteristics

In addition to creating direct pressures to promote eligible workers, the use of promotions as incentives also has implications for when task characteristics are more versus less likely to affect staffing decisions. If firms face strong pressures to promote workers into jobs with a high grade ratio, they may see promotion as a necessary choice for filling those jobs. A high grade ratio may therefore obviate the consideration of task characteristics altogether: the organization would never choose to hire into those jobs because of the likelihood of demotivating the large numbers of workers in the lower levels that are eligible to be promoted into those jobs. Instead,

² The same prediction could also arise from a simpler argument about choice: where the firm has more internal candidates to choose from, it is more likely that one of them is better than potential hires. We assess evidence below in favor of our incentive-based argument over the choice-based argument. It could also be that the firm chooses to employ more people in the jobs that it prefers to promote out of. Such a strategy would be very expensive though, given the high cost of employing people who are not involved in productive work (Cappelli, 2008). We therefore anticipate that grade ratios reflect the nature of the work, rather than the development of a reserve of workers.

task characteristics may only be important where there is a low grade ratio. Under those conditions, the firm does not face strong pressures to promote, and will consider both hiring and internal mobility, examining the task characteristics of the job to assess whether hiring into the job is likely to be viable.

These arguments suggest that the spillover effects of promotion on motivation must be considered jointly with the problems of external hiring in order to understand how firms combine internal and external labor markets. When structural pressures to promote workers into a job are strong, there is likely to be little scope for hiring: any demands for hiring workers into the job are pre-empted by promotion. Needs for firm-specific skills or performance variability would have little effect on staffing decisions in such cases. Instead, it is only when the structural pressures to promote workers are weak that we would expect to see strong effects of demands for firm-specific skills and performance variability. Specifically:

H4a: The grade ratio moderates the relationship between need for firm-specific skills and how jobs are staffed: the positive relationship between the need for firm-specific skills and the use of internal mobility to fill jobs is stronger when the grade ratio is lower.

H4b: The grade ratio moderates the relationship between performance variability and how jobs are staffed: the positive relationship between performance variability and use of internal mobility to fill jobs is stronger when the grade ratio is lower.

DATA & METHODS

We test our hypotheses using annual personnel records from the US operations of a financial services firm, which we call FinServ. Investment banking represents a particularly appealing setting in which to explore how firms fill jobs. As in other professional services firms, human capital is a critical asset (Von Nordenflycht, 2010), making the filling of jobs an

important organizational task. In addition, workers in investment banking are notoriously mobile (Groysberg, 2010), making this a field in which jobs are regularly filled both by hiring and internal mobility. While using data from a single firm limits the confidence with which we can generalize our results it allows us to create detailed operationalizations of our key variables and control for many other aspects of the job, providing a more thorough analysis of mobility than would be possible in a cross-firm study. Our records cover all employees, from administrative staff to investment professionals, for the years 2003 to 2009.

Defining Jobs

Consistent with our theory and with previous research (Baron & Bielby, 1986; Baron et al., 1986), we grouped positions into jobs based on whether they were in similar functions and were located at the same rank within the same organizational unit. Because the job title data was not recorded in a systematic way, we classified the skill requirements and functional responsibilities of the different positions by mapping them to the corresponding O*Net occupational title, drawing on both FinServ job title data and information on organizational affiliations. O*Net and its predecessor, the Dictionary of Occupational Titles, have been used extensively in previous research (e.g. Baron & Bielby, 1986; Baron et al., 1986). We take advantage of its revision in 2009 to include occupational titles specific to the financial services industry (The National Center for O*NET Development, 2009), enabling us to match all of the positions at FinServ to 19 different O*Net occupations. The close correspondence between these O*Net classifications and the job titles used at FinServ gave us confidence in our matching. For example, the main titles of finance professionals at FinServ were based around Trading, Sales, Research Analysis and Corporate Advisory, each of which was matched to a unique O*Net title.

We identified a position's rank directly from the personnel records. Positions are organized into six different ranks corresponding to the following typical industry descriptions (used to preserve FinServ's anonymity): (1) Analyst, (2) Associate, (3) Vice President, (4) Director, (5) Managing Director, and (6) Senior Executive. All of these ranks could be directly entered by external hiring, and all but the bottom rank could be entered by promotion. Apart from the bottom rank (which was excluded from our analyses), no promotions could take place within a rank. It is important to emphasize that these rank distinctions represented highly important, salient transitions for workers, rather than representing minor changes in title. Pay and performance expectations varied substantially with rank, and interviews with industry experts emphasized that workers in these different ranks should expect to have different responsibilities. The relatively small number of ranks from top to bottom of the organization further emphasizes the significance of the gaps between the ranks.³

Organizational unit was identified from FinServ's 55 divisions, each organized around a particular product or service offered to clients (internal and external). Positions located within a division share a common location and focus on a common end product (Barnett & Miner, 1992; Dioringer & Priore, 1971), providing meaningful internal boundaries.

We combined all three criteria to identify 236 different jobs, defining jobs as those positions sharing the same O*Net title, rank, and division. The number of jobs present in a given year in our final dataset ranged from 159 to 185. The number of workers in a given job in a given year had a mean of 41 and a median of 29. Jobs with 5 or fewer workers accounted for 34% of all jobs, and those with 25 or more workers accounted for a further 26%. Just over 77% of

³ As an additional check, we analyzed data from a separate careers survey of MBA graduates. Each of those graduates was asked to list every job that they had worked in where they "should consider a job as having changed if you had a significant promotion to a new title or rank in the organization that involved significant changes to your job tasks, number of people managed, or compensation." Of the promotions recorded by the 43 graduates who had worked at FinServ, 86% involved a single rank, demonstrating the significance of those promotions to the workers.

promotions in our sample occurred along promotion ladders as defined by occupation, rank, and division, giving us confidence that we aggregated positions into jobs that accurately reflect divisions across the kinds of work people do within Finserv.

Mobility Variables

Our key dependent variable is a measure of whether a move into a new job occurred through promotion, transfer, or external hiring.

Promotion. Jobs were entered through promotion when a worker moved from a lower ranked position in the prior year. Almost all promotions happened as part of an annual personnel process at the beginning of the year. This regular approach to promotions is consistent with the fungible nature of work in professional services, where the departure of an individual can often be addressed in the short term by reassigning their work to their peers or to individuals from a lower rank even in the absence of a formal promotion. Even where workers are moved into a specific vacant role that is consistent with a higher rank, that promotion can be recognized during the next cycle. 54% of job entry in our data was by promotion.

Internal transfer. Jobs were entered through an internal transfer when a worker made a horizontal move from a job in the same vertical rank during the prior year, but in a different division or occupation. Those few moves across occupations or divisions that were accompanied by a change in rank were not classified as transfers, but as promotions instead, based on the argument that changes in rank are more significant than changes in divisions or occupations. 18% of job entry was by transfer.⁴

External hiring. Jobs were entered through external hiring when a worker entered the job from outside the organization. 28% of entry events occurred by hiring.

⁴ A prior paper (Bidwell, 2011) defined transfers only as moves across organizational units, and not also as moves across functions. We reran our analyses using this alternative definition and found very similar results.

Independent Variables

We calculated our job characteristics directly from the personnel data. Unless otherwise noted, our job characteristics, such as firm-specific skills and performance variability, were calculated as a single value for each job that was fixed across years, rather than as a time-varying measure. In order to avoid cross-year variations from confounding our measures, we first calculated the job characteristics for each job in each year, and then averaged the values across each year to yield a single, fixed value for the job. Our theory is based on the idea that jobs have different task characteristics and that different kinds of work require different proportions of junior versus senior workers. Since both of those characteristics of jobs should be relatively stable over time, it makes sense to treat them as fixed characteristics. Using yearly values would introduce larger measurement error, which we consider more problematic than any information we lose by considering these characteristics as stable over time. Intra-class correlations for our independent and control variables were highly significant and within the accepted range for organizational research (Bliese, 2000), providing reassurance that the characteristics were stable across years and that our measures captured meaningful differences across jobs.

Sensitivity to firm-specific skills. The tacit nature of firm-specific skills has presented an empirical challenge for organizational researchers (Althauser, 1989:152-153). We draw on recent empirical work that documents the effects of on-the-job learning on workers' performance to develop a more direct measure of firm-specific skills (Huckman & Pisano, 2006; Groysberg, Lee, & Nanda, 2008). At the job level, a job's sensitivity to firm-specific skills should most clearly manifest itself in the performance gap between promotees (who enter jobs possessing firm-specific skills) and external hires (who enter jobs lacking firm-specific skills). Jobs where promotees significantly outperform external hires are highly sensitive to firm-specific skills; jobs

where the performance gap is negligible or where external hires outperform promotees are insensitive to firm-specific skills. This measure is distinct from our outcome measure, which assesses how the job is entered, not how incumbents perform: we effectively test whether the jobs where promotees outperform hires are more likely to be filled by promotion.

We measure sensitivity to firm-specific skills by subtracting the average performance rating of workers hired into a given job from those promoted into the same job (we restrict our measure of internal workers to promotees because of concerns that transfers could exhibit different performance, and that our measure could therefore be sensitive to the ratio of transfers to promotees in a job. An alternative measure using transfers gave similar results). The performance rating was subjective, based on whether the employee had met his or her goals for the year, and measured on a 1-5 scale. We calculated average differences between promotees and hires in each year in each job, then averaged across all years to calculate our measure (the ICC(1) across all years was 0.24).⁵

A number of analyses bolstered our confidence that this measure captures firm-specific skills. First, we found that the performance measure was systematically higher for promotees than hires, as we would expect. Second, the difference between hires and promotees declined over time, consistent with learning by hires (we also confirmed that this improved performance reflected within-individual improvement rather than attrition of weaker hires). Although the subjective nature of the performance measure raises concerns about supervisory bias, we found that promotee-hire differences were smaller for more subjective measures (e.g. assessments of competence versus results achieved), suggesting that the improved ratings of promotees reflected

⁵ Our measure required that FinServ both promoted and hired into a given job. For the 23 jobs which were entered exclusively by promotion or hiring, we regressed our measure on all observable job characteristics and the characteristics of individuals within those jobs and then used those values to impute a value for sensitivity to firm-specific skills. We include these jobs in our analyses. Omitting these jobs did not substantively affect any of our results.

real accomplishments rather than supervisory favoritism. We lack data on the identity of the raters for each evaluation which would have allowed us to also extract rater effects, but the absence of this data should seriously compromise the analyses.

Performance variability. We measured the performance variability of incumbents in each job based on two measures: the subjective rating of employee performance; and annual bonus. The strength of the rating is that it is closely tied to actual performance, whereas its weakness is that its range is highly restricted. Bonuses were an important part of compensation throughout FinServ, and were offered in all jobs. Bonuses were individualized, and meant to reflect performance in the prior year. The strength of the bonus measure is that it provides a more holistic view of an employee's value to the firm and has a much greater range than ratings, allowing for greater variability. Given their associated strengths and weakness, we take the conservative approach of using both measures in our analyses.⁶ We used the natural logarithm of bonuses because of their strong positive skew. Where individuals did not receive an annual bonus, we substituted a value of one dollar to allow us to calculate a log value.

For both measures, we calculated the standard deviation of outcomes for workers in a given job in a given year, then averaged across all years to create the final measure for that job (bonus ICC(1)=.23; contribution rating ICC(1)=.33). In order to reduce concerns of reverse causality, we calculate this measure based only on the variability in performance ratings and bonuses among those who had been promoted into the job, excluding external hires. On average, external hires receive lower ratings and higher bonuses than promotees. Jobs with more hires

⁶ While the bonus measure is a strong second measure of performance variability, it was not a suitable second measure of firm-specific skills. In Bidwell (2011), we show strong consistent differences in the performance ratings of promotees and hires. Conversely, compensation is often tied to how an individual enters a job, with external hires making more than promotees, independent of performance, for both salary and bonus.

should therefore have more overall variability on these outcomes. Restricting our measure to promotees avoids this problem.

Grade ratio. The grade ratio was calculated as the number of workers in the job located one rank below the focal job, in the same division with the same O*Net title, divided by the number of workers in the focal job. We averaged this measure across all years, reflecting our argument that this ratio represents a structural feature of organizations (ICC(1)=.64).

Control Variables

An important concern with non-experimental research such as this is the potential for omitted variables to create spurious correlations between the independent and dependent variables. 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 our data, though, is its level of detail which allows us to control for many of the most important potential omitted variables.

Compensation & Rating. It is possible that the overall level of bonuses in a job could be related to bonus variability. We therefore include the logarithm of a job's average annual bonus (ICC(1)=.34)⁷. Similarly, because both performance variability and firm-specific skills are measured using the performance data, we control for the average performance rating on the job (we average ratings for every worker who had been promoted into the job, in each year that they were in that job; ICC(1)=.47) to avoid concerns that differences in mean ratings across jobs could be confounded with our independent variables.

Job size. The logarithm of the number of employees in a job at the beginning of each year is included to account for any potential scale effects affecting staffing decisions.

⁷ We also controlled for average salary in some analyses. However, because it was highly correlated with hierarchical rank ($r=.92$), and did not affect our results, we do not include it in the analyses here.

Exits & Growth in Jobs Demanded. We also control for exit and growth, the two primary mechanisms which generate vacancies and trigger mobility within and across organizations (Stewman & Konda, 1983). To account for exits, we control for the average promotion, transfer, and turnover⁸ rates out of each job by taking the total number of exits by each type for the prior year⁹ and dividing this by job size. Growth in jobs demanded is calculated as percentage change in the number of incumbents on the last day of the current year compared to the previous year.

Reorganization. While the sample of jobs was very stable, there was some internal reorganization. An average of only 71 employees changed jobs each year as a result of a reorganization, which we defined as the movement of 10% or more of the employees in a given job to a different FinServ division. A dummy variable indicates whether a job was involved in a reorganization during the previous year.

External labor market conditions. Hiring may depend in part on the firm's ability to find qualified workers from outside the organization. In addition to including year dummies to account for yearly fluctuations in the external labor market, we also include annual measures of unemployment by O*Net occupation (Trevor, 2001) provided by the Bureau of Labor Statistics.

Rank and Location. We include dummy variables for hierarchical rank, because of concerns that rank may be correlated with performance variability or the structural supply of promotes. Because Rank 1 was dropped from our data, Rank 2 serves as the (omitted) comparison variable. 89% of jobs are located in the tri-state (New York, New Jersey,

⁸ We group voluntary and involuntary turnover because our data do not distinguish between the two for the first four years of our data. We also excluded layoffs, as they generally represent an attempt to permanently shrink the number of workers in a given job, while other turnover generally leads the organization to replace exiting workers.

⁹ We used data from the prior year because promotions usually occur at the beginning of the year, and because using the prior year's data helps to mitigate problems of reverse causality, particularly with turnover (e.g. new hires may have particularly high exit rates). Analyses using exits in the current year and found very similar results.

Connecticut) area. We include a dummy variable to account for the fact that moves into these jobs are less likely to require a worker to move their residence when moving to a new job¹⁰.

We also ran a number of models where we included controls for the demographic make up of jobs immediately below the focal job on the job ladder. Prior research suggests that substantial promotions are less likely to happen out of jobs with more women and ethnic minorities in them (Barnett, Baron, & Stuart, 2000; Strang & Baron, 1990). Although we found evidence that hiring was more common into jobs when there was a greater proportion of ethnic minorities lower on the job ladder, including these controls had no effect on our main results. We do not, therefore, include them in our analyses.

ANALYSIS AND RESULTS

We use a multinomial logit model to examine the determinants of how a job is entered. Entry can occur through three different routes: hiring, promotion or transfer. Each move into a new job represents a mobility event, and serves as our 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 partly a theoretical question (Long & Freese, 2006); we assume that all three options are available to the organization, and it does not make a hierarchical decision to use one rather than another. We also carried out Hausman and Small-Hsiao tests, which examine whether results are significantly different if alternatives are dropped from the analysis (Long & Freese,

¹⁰ The firm has workers in 19 states in addition to a variety of work-at-home arrangements. Though the main results are substantively similar, we chose not to report models including dummies for individual states, as the high percentage of workers in the tri-state area left us with few observations in many cells in our multinomial logit models, making it difficult to interpret the results by state.

2006). Those analyses were unable to reject the null hypothesis that IIA holds, supporting the use of multinomial logit. We cluster errors by job to account for non-independence within each job.

We restrict our analysis to non-entry level jobs because we are interested in jobs that can be filled through internal mobility and hiring. Our sample contains 7,749 position-year observations of 5,773 workers in 236 jobs. The events are made up of 4,222 promotions, 2,132 external hires and 1,395 internal transfers. For easy interpretation of our results, hiring is the base category in our analysis; the coefficients on promotion and transfer indicate whether the various independent variables raise the probability of entry by either route relative to hiring.

Descriptive Statistics

Table 1 provides means, standard deviations and correlations for the main dependent and independent variables in the analysis, with position-year as the unit of analysis. Of particular interest are the correlations between the two measures of performance variability ($r = .43$), which indicate that rating and bonus variability pick up different aspects of performance. The variance inflation factors for our two measures of performance variability (1.37 and 2.36), as well as those for the rest of our variables, were all below the commonly used cutoff of 10, assuring us that multicollinearity is not a concern (Allison, 1999).

The minimal correlations between the grade ratio, firm-specific skills and performance variability also suggest that numbers of lower level positions do not reflect a desire by the firm to subsequently promote people into jobs with those characteristics.

Main Effects

Our main analyses are presented in Table 2. Model 1 is a baseline model containing only control variables. Model 2 then tests Hypothesis 1, that jobs with higher needs for firm-specific

skills are more likely to be entered by internal mobility. We find no support for the hypothesis: Neither the coefficient on promotion nor transfer in Model 2 is significantly different from zero.

Models 3 and 4 demonstrate support for Hypothesis 2, that jobs with higher performance variability are more likely to be entered by internal mobility. In Model 3, we find that bonus variability has a significant, positive coefficient for likelihood of promotions and a marginally significant coefficient for likelihood of transfers. Model 4 likewise shows a significant positive effect of ratings variability for likelihood of promotion relative to hiring, but no significant effect on transfers. As noted above, our variability measures exclude the performance of hires, ruling out reverse causality. For robustness, we also controlled for the standard deviation of the time promotees had been in the job, in case higher promotion rates had a causal effect on performance variability. Our results were unchanged. We omit this variable from our main analyses, as it is as much an outcome of promotion rates as a cause.

Model 5 demonstrates a positive and significant coefficient for grade ratio for likelihood of promotion, supporting Hypothesis 3a, that a higher ratio of workers on the next-lowest rung on the job ladder to job incumbents is associated with increased odds of the job being filled by promotion. Hypothesis 3b predicted that the odds of a job being entered by transfer relative to promotion would decrease as the grade ratio increases. Supplementary analysis showed the coefficients on promotion versus transfer to be significantly different ($p < .01$), supporting H3b.

We ran additional analyses (available from the authors) in order to estimate effect sizes. Going from one standard deviation below the mean to one standard deviation above the mean in bonus variability or contribution variability was associated with an increase in the rate of promotion of 11%, while a similar change in the structural supply ratio was associated with an increase in the rate of promotion of 28%. In contrast, similar changes in bonus variability,

contribution variability and the structural supply ratio were associated with decreases in the rate of hiring of 20%, 12% and 8%. The results show mixed effects for transfers. A similar change in bonus variability was associated with a 3% increase in the rate of transfers, while similar changes in contribution variability and the structural supply ratio were associated with decreases of 11% and 22% in the rate of transfers.

Interaction effects

Models 6 through 8 introduce interaction effects to test Hypotheses 4a and 4b, which predicted that job characteristics would be more strongly associated with the balance between external mobility and hiring when there is a lower structural supply ratio. We find no support for H4a. There is no significant interaction for promotions and the effect is in the opposite direction to that predicted for transfers. These results are consistent with the lack of a direct effect of firm-specific skills.

We do find some support for H4b, consistent with our stronger baseline effects for performance variability. We find significant negative coefficients for the interaction of the structural supply ratio with bonus variability for both promotions and transfers. We do not find a significant interaction between structural supply ratio and ratings variability, though. The weaker effects using ratings variability may reflect the much lower variability in performance ratings relative to bonuses. It appears that the effects of performance variability are moderated, at least in part, by the supply of promotes within the organization. Model 10 is a saturated model, and the results are consistent with the prior analyses.

To gain additional insight into the interaction effects we mapped the effects of job characteristics at one standard deviation above and below the mean of the grade ratio (results available from the authors). We found the effects of bonus variability to be insignificant at high

grade ratios, further reinforcing support for our argument that it is only when the firm does not face strong structural pressures to promote that the task characteristics of the job matter.

Effects of Controls

A number of our control variables also help shed light on how firms fill jobs. For example, we find that job growth is associated with reduced promotion relative to hiring, while promotion out of the job is associated with increased promotion. One explanation for these contrasting effects is that the creation of vacancies initially creates opportunities for workers at lower levels, reinforcing the incentive power of promotions, while a substantial growth in jobs overwhelms the potential supply of promotes, leading the organization to rely on the external market instead. We also find that job growth is associated with increased internal transfers, perhaps reflecting the firm drawing upon a broader pool of workers in the face of strong demand.

Our controls also provide some insight into how inadequate existing skills and a desire to change strategic direction might affect the desirability of external hiring. We find no effect of average performance rating on hiring, even though the firm might prefer to hire into jobs where workers currently perform poorly. We find some evidence that reorganizations are associated increased hiring, which may be driven by changes in strategic direction, although the results are not consistent across models.

We also find that a higher occupational unemployment rate is associated with increased promotion. It may be that occupational unemployment increases the supply of promotes as well as external hires – when unemployment is high, workers will be less likely to quit, preferring to stay and seek promotion.

Supplementary Analysis

We also ran the multinomial logit models including the workers who remained in the same job as the year before (we call this option “no change”). Including these workers allows us to examine the determinants of the overall rates of promotion, hiring and transfers into jobs, rather than simply their rates relative to one another. The results of this analysis are presented in Table 3, and are very similar to those in Table 2

Of particular interest is the effect of the grade ratio on entry into the job. We find that a high grade ratio is associated with increased promotion relative to jobs continuing to be filled by incumbents, but not with decreased hiring. An alternative explanation for the effects of the grade ratio is that the best candidate for the job is more likely to be found internally when there are more potential promotes to choose from. If that were the case, though, we would expect to see that a high grade ratio would reduce the rate of hiring, as the firm substitutes promotes for hires. Instead, we simply see that an increase in the structural supply ratio accelerates promotion, consistent with our arguments that the supply of promotes creates strong pressures on the organization to promote into higher level jobs.

DISCUSSION

This research advances our understanding of how firms combine internal and external labor markets, now that firms increasingly use hiring to fill jobs at all levels. Starting with the underlying assumptions of transaction cost theories of employment, we develop new predictions about when firms will continue to rely on internal staffing to fill jobs, and when they will use external hiring instead. Where applications of transaction cost economics to make-or-buy decisions revolve around the challenges of *ex post* governance, we argue that staffing decisions are driven instead by the problems of *ex ante* evaluation and the spillover effects of promotion

decisions on motivation. Our study makes an empirical contribution by providing the first job-level analysis of how different jobs are filled. We also contribute theoretically to our understanding of how modern firms combine internal and external labor markets.

We proposed a theoretical model in which the competition between hiring and internal mobility is shaped by the interaction of two sets of factors: how jobs' task characteristics determine whether hiring can achieve a good fit between job and worker; and how the use of promotions as a reward creates pressures to fill jobs by promotion. We developed the implications of this model to provide a richer set of predictions than those found in earlier research. Consistent with prior work (Bayo-Moriones & Ortan-Angel, 2006; Lepak & Snell, 1999), our model proposed that the balance between internal mobility and external hiring would reflect jobs' needs for firm-specific skills. We did not find support for this argument, however. It is possible that this finding reflects shortcomings in our measure, despite our using a direct measure of differences in performance of promotes and hires, and despite strong consistency in our measure across years which suggests that it tracks genuine cross-job differences. A different explanation for this finding could instead be that managers systematically underestimate the challenges faced by new hires, as proposed by other scholars (e.g. Groysberg, 2010; Huckman & Pisano, 2006). Research on the fundamental attribution error (Ross, 1977) suggests that many cultures systematically overweight individual ability and underweight contextual factors in rating individual performance. Such biases could lead managers to underestimate the challenges that new entrants face in transferring their performance to a new firm.

We also introduced a new job characteristic, variability in on-the-job performance, into our understanding of mobility processes. We argued that the increased importance of selecting the right people for jobs with higher performance variability would make those jobs more likely

to be filled by internal mobility. Our analyses supported this argument, finding that jobs with higher performance variability were more likely to be staffed by internal mobility. In addition to building our understanding of staffing processes, this finding also contributes to research on strategic human resource management which suggests that performance variability shapes the strategic importance of jobs (Boudreau & Ramstad, 2005; Huselid & Becker, 2011). To our knowledge, this is the first study to directly show a correlation between performance variability and how jobs are managed.

We also proposed that the use of promotions as a reward within organizations shapes the effects on staffing of other task characteristics. We argued that the incentive effects of promotions would shape which jobs were filled by promotion, as firms experienced more pressure to promote into jobs which had more positions directly below them on the job ladder. Our analyses confirmed that jobs with higher grade ratios were indeed more likely to be filled by promotion. We also found evidence that these effects reflect incentive pressures rather than the presence of more workers to choose from, because the grade ratio is associated with increased promotion into a job relative to keeping the same people in the job, but not with reduced hiring. We then argued that the same incentive effects also moderate the effects of task characteristics, as a high supply of potential promotes can obviate the consideration of task characteristics altogether. We accordingly found a weaker relationship between performance variability and the balance between promotion and hiring when there was a higher grade ratio.

A further contribution of the study is to raise questions about the role of lateral transfers. Our theory suggested that task characteristics should have similar effects on promotion and transfers, since both kinds of mobility take place from within the firm. We were not able to support our hypotheses regarding transfers, however. In addition to a lack of results for firm-

specific skills, we also found no effects of performance variability on the rates of transfer into jobs versus hiring. One explanation for this finding is that information is partially asymmetric within organizations as well as across them. Where transfers come from substantially different jobs, managers may be much less confident about transfers' subsequent performance than they are about promotees'. The results may also reflect idiosyncrasies in how transfers are used within organizations. If the motivation behind transferring workers is largely to find a different position for a struggling worker or to provide broader experience, transfers might not respond to task characteristics in the way that promotions do. We also find that structural pressures to promote decrease the odds of an internal transfer. More research is needed if we are to fully understand the role of lateral transfers in modern internal labor markets.

Beyond our immediate goal of understanding how firms combine internal and external labor markets to meet their needs for human capital, this paper contributes to a number of broader debates. For example, our study has implications for research on strategic human capital which has explored how staffing strategies shape organizational capabilities (Almeida, Dokko, & Rosenkopf, 2003; Campbell, Coff, & Kryscynski, 2012; Chadwick & Dabu, 2009). By highlighting the relationship between job characteristics and how jobs are staffed, our research suggest that the development of firm-specific capabilities is likely to be more common where jobs have high levels of performance variability and there is a strong structural supply of promotes, while external learning is more common when performance variability and supply of promotes is low. Our study also suggests that organizations could benefit from focusing on their ability to develop and evaluate workers in jobs with variable performance or where there are large numbers of junior workers, because this is where internal mobility is most likely to occur. Capabilities around attraction and selection may be more valuable for other jobs. These findings

also offer a potential explanation for why firms find it so hard to transfer the experience and performance of star workers across organizations (Dokko & Rosenkopf 2010: p.677; Groysberg et al. 2008). The jobs where stars are likely to be most valuable – those jobs where performance is more variable – are precisely those jobs that are most likely to be filled by promotion. If firms are less likely to emphasize selection and on-boarding in those jobs where promotion is the most common mode of entry (Miles & Snow, 1984; Knoke & Kalleberg, 1994), then star workers may be poorly served by the HR practices in the job they are entering.

Just as important, we believe, are the implications of our study for understanding modern careers (Arthur & Rousseau, 1996). Both promotions and hiring provide critical means for workers to advance in income and status (Baker et al., 1994; Bernhardt, Morris, Handcock, & Scott, 2001), and much research has explored the determinants of each of these processes (Bamberger, Admati-Dvir, & Harel, 1995; Schaubroeck & Simon, 2002; Trevor, 2001). Very little research, though, has explored the factors that shape the opportunities for mobility by one of these processes versus the other. Our findings suggest that workers are likely to have more difficulty moving across firms into jobs where there tend to be larger numbers of junior workers for each senior worker, or where incumbents demonstrate highly variable performance. Chances for promotion, by contrast will be higher into jobs with more variable performance, because of reduced competition from external hiring.

Limitations and Future Research

Some caution is necessary in generalizing these findings, as the data come from a single organization in the financial services sector. Examining personnel decisions within firms requires tradeoffs between depth and generalizability, since providing detailed job level analyses usually requires detailed data from inside a firm, which is difficult to obtain from multiple sites.

Given these challenges, it is not surprising that the majority of studies on mobility within organizations rely on data from a single organization (e.g. Baker et al., 1994; Barnett & Miner, 1992; Dencker, 2009; Petersen & Saporta, 2004), as has much work on transaction cost economics (e.g. Mayer & Nickerson, 2005; Walker & Poppo, 1991). Our discussions with Finserv did not reveal any reason to believe that their staffing practices would be different from other professional services organizations. We also reviewed comments on Finserv posted on Glassdoor.com, a career website on which current and former employees post comments on their experiences working within an organization, and compared them to 12 peer firms in financial services, law and consulting that had similar positions in Vault.com industry rankings. Among the nearly 250 posts on the hiring and internal mobility practices of these firms, we found that comments about the jobs available to external candidates or the opportunities for promotion and internal transfers were remarkably consistent both within and across these organizations, suggesting that there is nothing particularly unique about FinServ's staffing approach. Nonetheless, it is important that other work should extend our analyses to other organizations.

One particular area for further study is how the similarities between the jobs workers are promoted to shape differences between promotion and hiring. In the firm that we studied, promotions would almost always lead into jobs that involve similar kinds of tasks to the prior job, albeit with higher skills demands and greater responsibilities (it is likely that most external hires enter from similar positions in different firms as well). Pergamit & Veum (1999) note that such continuity is also very common in promotions. It is possible, though, that where promotion involved movement into a substantially different job, as when workers go from being shop-floor workers to being supervisors, the differences between the determinants of promotion versus

hiring would be smaller. Other work might also explore whether jobs are filled in different ways where performance is more easily observed externally, such as in academia.

Another important avenue for future research is to compare the selectivity of hiring into different positions by looking at the numbers and quality of applications received. Our theory has focused on the firm's choice about how to fill jobs, and we have controlled for the availability of external applicants using data on unemployment rates. More detailed analyses of the supply of internal versus external candidates would be valuable in future work. Other work might also explore how the reasons for staffing a job might affect how it is filled. For example, is hiring more likely to be used when vacancies occur because of turnover or the decision to grow a particular area? Although we can look at these effects at the job level, we lack information on individual vacancies. It may be that such data would shed further light on staffing processes. It would also be valuable to explore the use of quasi-experimental or instrumental variable designs to address potential omitted variable problems in this study. We were not able to identify strong instrumental variables within our data, instead using controls to address the main alternative explanations for our findings. The identification of appropriate instruments in future studies would further strengthen our confidence in empirical work in this area.

Because transaction cost theories tend to focus on the limitations of external markets, we have also said less in this paper about when firms will have a preference to go out and hire externally. Other work suggests, for example, that firms may prefer to hire externally when they need external knowledge to innovate or catch up with rivals (Rosenkopf & Almeida, 2003). Studies based on CEO labor markets also suggest that firms may have a greater preference for external hiring when performance has been poor (Boeker & Goodstein, 1993; Cannella & Lubatkin, 1993; Zhang & Rajagopalan, 2004). It is also important to explore other possible

influences on staffing decisions, such as the relative influence of different functional areas (Carpenter & Wade, 2002), or the availability of funds, given the high costs of hiring (Bidwell, 2011). These various factors fell outside our theoretical framework and could not be measured in our data. Nonetheless, they represent promising areas for further research on this subject.

Table 1 Summary Statistics and Correlations^{abc}

Variable	Mean	s.d.	VIF	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
1 Hire	0.28	0.45		1.00																		
2 Promote	0.54	0.50		-0.68	1.00																	
3 Transfer	0.18	0.38		-0.28	-0.51	1.00																
4 Firm-specific skills	0.12	0.22	1.27	-0.01	0.06	-0.07	1.00															
5 Bonus variability	3.32	1.38	2.36	-0.07	0.12	-0.07	0.03	1.00														
6 Contribution var.	0.57	0.18	1.37	-0.07	0.12	-0.07	-0.03	0.43	1.00													
7 Grade ratio	1.58	1.09	1.26	-0.03	0.06	-0.05	0.16	0.07	-0.09	1.00												
8 Job size	3.15	1.12	1.86	0.01	0.11	-0.16	0.09	0.36	0.27	0.00	1.00											
9 Job growth	0.36	1.77	1.19	0.06	-0.11	0.08	-0.08	-0.02	-0.04	-0.03	-0.33	1.00										
10 Avg. contribution	2.22	0.22	1.45	0.06	-0.04	-0.02	-0.35	0.02	-0.01	-0.09	0.16	-0.07	1.00									
11 Bonus	9.00	1.76	1.90	-0.12	0.07	0.04	-0.04	-0.21	0.09	-0.20	-0.17	-0.06	-0.28	1.00								
12 Reorganization	0.21	0.41	1.11	0.02	-0.08	0.08	-0.05	0.17	0.00	0.10	0.16	-0.02	-0.04	-0.04	1.00							
13 Promotion rate	0.11	0.07	2.46	-0.04	0.08	-0.05	0.09	0.32	0.21	-0.24	0.18	-0.03	-0.06	-0.04	0.06	1.00						
14 Transfer rate	0.06	0.06	1.50	-0.01	-0.10	0.14	-0.02	-0.31	-0.25	0.11	-0.44	0.02	-0.06	0.16	0.01	-0.20	1.00					
15 Exit rate	0.09	0.09	1.35	-0.06	0.06	-0.01	0.01	0.18	0.08	0.04	0.12	-0.03	0.04	-0.15	0.07	0.09	-0.09	1.00				
16 Occ unemployment	3.64	2.20	1.35	-0.16	0.14	0.00	-0.04	0.08	0.03	-0.10	0.06	-0.06	0.00	0.07	-0.02	0.08	-0.06	0.23	1.00			
17 Tristate	0.89	0.32	1.03	0.04	-0.05	0.02	0.00	-0.11	-0.11	0.03	-0.11	-0.02	0.00	0.03	0.00	-0.05	0.06	-0.03	-0.07	1.00		
18 Rank	2.94	0.96	3.40	-0.10	0.04	0.06	-0.11	-0.06	0.03	-0.04	-0.26	0.02	-0.25	0.57	-0.07	-0.51	0.02	-0.11	0.07	0.00	1.00	
19 Year	2007	1.57	1.69	-0.10	0.07	0.02	-0.01	0.02	-0.04	0.08	0.14	-0.10	-0.03	-0.14	0.08	-0.05	-0.09	0.46	0.45	-0.01	0.01	

^a $r > .10$ are significant at the .01 level; $r \leq -.10$ are significant at the .01 level

^b Unit of analysis is the job-year.

^c $n = 7,749$

Table 2 Multinomial Logistic Analysis of How Positions Are Entered^a

Variables	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7		Model 8		Model 9	
	Prom	Trans	Prom	Trans	Prom	Trans	Prom	Trans	Prom	Trans	Prom	Trans	Prom	Trans	Prom	Trans	Prom	Trans
Job size	-.03 (.06)	-.29** (.07)	-.03 (.06)	-.28** (.07)	-.12† (.07)	-.33** (.07)	-.07 (.06)	-.3** (.07)	-.04 (.06)	-.3** (.07)	-.11† (.06)	-.35** (.07)	-.12† (.06)	-.33** (.07)	-.13** (.06)	-.33** (.07)	-.12† (.07)	-.35** (.07)
Job growth	-.17** (.06)	-.01 (.03)	-.16* (.07)	-.01 (.03)	-.18** (.07)	-.01 (.02)	-.17** (.07)	-.01 (.03)	-.17* (.07)	-.01 (.03)	-.17* (.08)	-.03 (.02)	-.19* (.08)	-.02 (.02)	-.18* (.07)	-.02 (.02)	-.18* (.08)	-.03 (.02)
Average rating	-.22 (.31)	.11 (.33)	-.06 (.33)	.01 (.38)	-.22 (.28)	.11 (.33)	-.23 (.3)	.12 (.33)	-.02 (.31)	.14 (.32)	.09 (.29)	-.03 (.36)	-.1 (.29)	-.13 (.35)	.08 (.29)	.01 (.36)	-.02 (.29)	-.14 (.35)
Bonus	.12** (.04)	.07 (.05)	.12** (.04)	.07 (.05)	.19** (.04)	.11* (.05)	.11** (.04)	.07 (.05)	.13** (.04)	.06 (.04)	.17** (.04)	.11* (.05)	.18** (.04)	.1* (.05)	.18** (.04)	.1* (.05)	.17** (.04)	.11* (.05)
Reorganization	-.17 (.12)	.52** (.17)	-.16 (.12)	.5** (.17)	-.26* (.11)	.49** (.17)	-.16 (.11)	.53** (.17)	-.25* (.12)	.52** (.17)	-.25* (.11)	.44** (.16)	-.26* (.11)	.49** (.16)	-.27* (.11)	.47** (.16)	-.24* (.11)	.46** (.16)
Promotion out rate	3.0** (1.0)	2.66* (1.17)	3.12** (.99)	2.56* (1.19)	0.953 (1.09)	1.658 (1.25)	2.33* (.92)	2.34* (1.17)	4.15** (.94)	2.38* (1.21)	2.33* (1.0)	0.486 (1.24)	2.14* (.96)	.97 (1.29)	2.22* (.96)	0.953 (1.26)	2.43* (.96)	0.527 (1.25)
Transfer out rate	-.97 (.97)	2.82** (.84)	-.91 (.96)	2.89** (.87)	-.95 (.91)	2.78** (.83)	-.7 (.94)	2.92** (.85)	-1.23 (.92)	2.96** (.85)	-.85 (.82)	2.9** (.9)	-1.04 (.85)	2.99** (.87)	-.93 (.85)	3.03** (.86)	-.89 (.8)	2.84** (.9)
Exit rate	1.25** (.48)	.31 (.59)	1.21* (.48)	.3 (.6)	0.674 (.48)	.03 (.6)	1.05* (.47)	.23 (.6)	1.15* (.48)	.25 (.6)	0.58 (.47)	.03 (.61)	0.64 (.46)	.0 (.6)	0.6 (.47)	-.01 (.61)	0.57 (.46)	.01 (.6)
Occ unemployment	.09* (.04)	.04 (.04)	.09* (.04)	.04 (.04)	.08* (.04)	.03 (.04)	.09* (.04)	.04 (.04)	0.12** (.04)	.03 (.05)	.11** (.04)	.03 (.04)	.1** (.03)	.02 (.04)	.11** (.04)	.02 (.05)	.1** (.03)	.02 (.04)
Tristate	-.29* (.12)	-.12 (.18)	-.29* (.12)	-.12 (.18)	-.26* (.12)	-.11 (.18)	-.26* (.12)	-.1 (.18)	-.3* (.12)	-.12 (.18)	-.26* (.12)	-.1 (.18)	-.26* (.12)	-.1 (.18)	-.26* (.12)	-.1 (.18)	-.26* (.12)	-.11 (.18)
Firm-specific skills			.36 (.29)	-.21 (.3)							.34 (.3)	-.22 (.31)	.28 (.3)	-.18 (.3)	.29 (.3)	-.18 (.3)	.34 (.29)	-.22 (.3)
Bonus variance					.22** (.05)	.09† (.05)					.14** (.05)	.11* (.05)	.14** (.05)	.09† (.05)	.15** (.05)	.1† (.05)	.13** (.05)	.1* (.05)
Contribution var.							.95** (.28)	.36 (.34)			.62** (.24)	-.01 (.34)	.65** (.23)	.08 (.33)	.61* (.24)	.05 (.34)	.67** (.23)	.03 (.33)
Grade ratio									.23** (.07)	-.08 (.08)			.2** (.05)	-.15* (.07)	.15** (.05)	-.14 (.09)	.19** (.06)	-.12 (.09)
Grade ratio x Firm-specific skills											-.32 (.27)	.6* (.28)					-.29 (.28)	.61* (.28)
Supply ratio x Bonus variance													-.11** (.04)	-.12* (.05)			-.13** (.05)	-.1* (.05)
Grade ratio x Contribution var.															.12 (.23)	-.12 (.3)	.3 (.26)	.09 (.29)
Constant	-.15 (.86)	-1.81† (1.01)	-.55 (.93)	-1.563 (1.12)	-.18 (.79)	-1.79† (1.01)	.08 (.86)	-1.77† (1.02)	-.96 (.85)	-1.74† (.98)	-1.06 (.86)	-1.314 (1.03)	-.56 (.85)	-1.03 (1.01)	-1.03 (.84)	-1.429 (1.04)	-.73 (.85)	-0.989 (1.0)
Observations	7749		7749		7749		7749		7749		7749		7749		7749		7749	
-2 LL; d.f.	14431; 36		14415; 38		14362; 38		14399; 38		14329; 38		14216; 46		14237; 46		14259; 46		14188; 50	
Chi-square test			p<.01 ^b		p<.01 ^b		p<.01 ^b		p<.01 ^b		p<.01 ^c		p<.01 ^c		p<.01 ^c		p<.01 ^c	

Notes: Controls for rank and year are included, but not shown; ** p<0.01, * p<0.05, † p<0.10 (two-tailed)

^a Standard errors are in parentheses and are clustered by job (n=236 jobs); ^b Compared to Model 1; ^c Compared to model with all IVs (not shown)

Table 3 Multinomial Logistic Analysis of How Positions Are Entered, Including Workers Remaining in the Same Job as the Year Before (selected models)^a

Variables	Full Multinomial Logits with "No Change" as Base Case			Full Multinomial Logits with "No Change" as Base Case		
	Model 1: Main Effects			Model 2: Main Effects & Interactions		
	<i>Promote</i>	<i>Hire</i>	<i>Transfer</i>	<i>Promote</i>	<i>Hire</i>	<i>Transfer</i>
Job size	-.11**	-.04	-.38**	-.1**	-.04	-.39**
	.03	.07	.07	.03	.07	.07
Job growth	.19†	.27*	.25†	.19†	.26*	.24†
	.1	.13	.13	.1	.13	.13
Average rating	-.27*	-.4	-.35	-.23†	-.34	-.39
	.13	.25	.26	.14	.24	.26
Bonus	.05**	-.13**	-.02	.05*	-.12**	-.01
	.02	.03	.04	.02	.03	.04
Reorganization	-.12*	.16	.6**	-.11*	.14	.57**
	.05	.12	.14	.05	.12	.13
Promotion out rate	2.85**	.47	1.55	3.03**	.28	.94
	.55	.94	.99	.53	.93	.95
Transfer out rate	-.03	.4	3.44**	-.025	.39	3.32**
	.53	.77	.79	.55	.78	.77
Exit rate	.65*	.13	.27	.62*	.12	.31
	.28	.43	.63	.28	.43	.62
Occ unemployment	0.02	-.09**	-.06†	0.02	-.08**	-.06†
	.02	.03	.03	.02	.03	.03
Tristate	-.01	.3**	.15	-.01	.31**	.16
	.06	.11	.15	.06	.11	.15
Rank 3	-.2**	.01	-.02	-.18*	.04	-.07
	.08	.14	.17	.08	.14	.16
Rank 4	-.15	-.37*	-.1	-.11	-.35†	-.14
	.09	.18	.19	.09	.18	.18
Rank 5	-.32*	-.76*	-.1	-.29†	-.71*	-.14
	.15	.31	.28	.16	.31	.28
Firm-specific skills	.1	-.22	-.41†	0.15	-.22	-.46†
	.12	.24	.25	.11	.24	.24
Bonus variance	.15**	.01	.09*	.14**	.02	.11**
	.02	.04	.05	.02	.04	.04
Contribution var.	0.23	-.3	-.37	.24†	-.32	-.44
	.15	.2	.29	.14	.2	.28
Supply ratio	.16**	.01	-.09	.2**	.01	-.15*
	.03	.05	.08	.04	.06	.07
Supply ratio x Firm-specific skills				-.25*	.12	.59**
				.12	.22	.17
Supply ratio x Bonus variance				-.01	.08*	.02
				.02	.04	.03
Supply ratio x Contribution var.				.14	-.1	-.13
				.12	.22	.19
Constant	-1.37**	-.08	-1.57*	-1.45**	-.24	-1.46*
	.39	.68	.7	.41	.66	.69
Observations	23114	23114	23114	23114	23114	23114

Note: Controls for year are included, but not shown; ** p<0.01, * p<0.05, † p<0.10 (two-tailed)

^a Standard errors are in parentheses and are clustered by job (n=244 jobs)

REFERENCES

- Almeida, P., Dokko, G., & Rosenkopf, L. 2003. Startup size and the mechanisms of external learning: increasing opportunity and decreasing ability? *Research Policy*, 32: 301-315.
- Althausser, R. P. 1989. Internal Labor Markets. *Annual Review of Sociology*, 15: 143-161.
- Arthur, M. B., & Rousseau, D. M. 1996. *The boundaryless career : a new employment principle for a new organizational era*. New York: Oxford University Press.
- Baker, G., Gibbs, M., & Holmstrom, B. 1994. The Internal Economics of the Firm: Evidence from Personnel Data. *The Quarterly Journal of Economics*, 109(4): 881-919.
- Bamberger, P., Admati-Dvir, M., & Harel, G. 1995. Gender-Based Wage and Promotion Discrimination in Israeli High-Technology Firms: Do Unions Make a Difference? *The Academy of Management Journal*, 38(6): 1744-1761.
- Barnett, W. P., Baron, J. N., & Stuart, T. E. 2000. Avenues of Attainment: Occupational Demography and Organizational Careers in the California Civil Service. *The American Journal of Sociology*, 106(1): 88-144.
- Barnett, W. P., & Miner, A. S. 1992. Standing on the Shoulders of Others: Career Interdependence in Job Mobility. *Administrative Science Quarterly*, 37(2): 262-281.
- Baron, J. N., Davis-Blake, A., & Bielby, W. T. 1986. The Structure of Opportunity: How Promotion Ladders Vary Within and Among Organizations. *Administrative Science Quarterly*, 31(2): 248-273.
- Bayo-Moriones, A., & Ortañ-Ángel, P. 2006. Internal Promotion versus External Recruitment in Industrial Plants in Spain. *Industrial and Labor Relations Review*, 59(3): 451-470.
- Bernhardt, A., Morris, M., Handcock, M. S., & Scott, M. A. 2001. *Divergent paths: economic mobility in the new American labor market*. New York: Russell Sage Foundation.
- Bidwell, M. J. 2009. Do Peripheral Workers Do Peripheral Work? Comparing the Use of Highly Skilled Contractors and Regular Employees. *Industrial & Labor Relations Review*, 62(2): 200-225.
- Bidwell, M. J. 2011. Paying More to Get Less: Specific Skills, Incomplete Information and the Effects of External Hiring versus Internal Mobility. *Administrative Science Quarterly*, 56(3): 369-407.
- Bliese, P. D. 2000. Within-group agreement, non-independence and reliability: Implications for data aggregation and analysis. In K. Klein, & S. W. Kozlowski (Eds.), *Multilevel theory, research, and methods in organizations*: 349-381. San Francisco: Jossey Bass.
- Boeker, W., & Goodstein, J. 1993. Performance and Successor Choice: The Moderating Effects of Governance and Ownership. *The Academy of Management Journal*, 36(1): 172-186.
- Boudreau, J. W., & Ramstad, P. M. 2005. Talentship and the New Paradigm for Human Resource Management: From Professional Practices to Strategic Talent Decision Science. *Human Resource Planning*, 28(2): 17-26.
- Boudreau, J. W., & Ramstad, P. M. 2007. *Beyond HR: The New Science of Human Capital*. Cambridge, MA: Harvard Business School Press.
- Campbell, B. A., Coff, R., & Kryscynski, D. 2012. Rethinking Sustained Advantage from Human Capital. *Academy of Management Review*.
- Cannella, A. A., Jr., & Lubatkin, M. 1993. Succession as a Sociopolitical Process: Internal Impediments to Outsider Selection. *The Academy of Management Journal*, 36(4): 763-793.

- Cappelli, P. 1999. *The new deal at work : managing the market-driven workforce*. Boston: Harvard Business School Press.
- Cappelli, P. 2008. *Talent on demand : managing talent in an age of uncertainty*. Boston, Mass.: Harvard Business Press.
- Carpenter, M. A., & Wade, J. B. 2002. Microlevel Opportunity Structures as Determinants of Non-CEO Executive Pay. *The Academy of Management Journal*, 45(6): 1085-1103.
- Carter, R., & Hodgson, G. M. 2006. The Impact of Empirical Tests of Transaction Cost Economics on the Debate on the Nature of the Firm. *Strategic Management Journal*, 27(5): 461-476.
- Chadwick, C., & Dabu, A. 2009. Human Resources, Human Resource Management, and the Competitive Advantage of Firms: Toward a More Comprehensive Model of Causal Linkages. *Organization Science*, 20(1): 253-272.
- Chan, W. 1996. External Recruitment versus Internal Promotion. *Journal of Labor Economics*, 14(4): 555-570.
- Chan, W. 2006. External Recruitment and Intrafirm Mobility. *Economic Inquiry*, 44(1): 169-184.
- Coff, R. W. 1997. Human Assets and Management Dilemmas: Coping with Hazards on the Road to Resource-Based Theory. *The Academy of Management Review*, 22(2): 374-402.
- Cohen, L. E., Broschak, J. P., & Haveman, H. A. 1998. And Then There were More? The Effect of Organizational Sex Composition on the Hiring and Promotion of Managers. *American Sociological Review*, 63(5): 711-727.
- David, R. J., & Han, S. K. 2004. A systematic assessment of the empirical support for transaction cost economics. *Strategic Management Journal*, 25(1): 39-58.
- Dencker, J. C. 2009. Relative Bargaining Power, Corporate Restructuring, and Managerial Incentives. *Administrative Science Quarterly*, 54(3): 453-485.
- DiPrete, T. A. 1987. Horizontal and Vertical Mobility in Organizations. *Administrative Science Quarterly*, 32(3): 422-444.
- Dokko, G., Wilk, S. L., & Rothbard, N. P. 2009. Unpacking prior experience: how career history affects job performance. *Organization Science*, 20(1): 51-68.
- Gibbons, R., & Katz, L. F. 1991. Layoffs and Lemons. *Journal of Labor Economics*, 9(4): 351-380.
- Greene, W. H. 2003. *Econometric analysis* (5th ed.). Upper Saddle River, NJ: Prentice Hall.
- Groysberg, B. 2010. *Chasing Stars: The myth of talent and the portability of performance*. Princeton, NJ: Princeton University Press.
- Hamilton, B. H., & Nickerson, J. A. 2003. Correcting for Endogeneity in Strategic Management Research. *Strategic Organization*, 1(1): 51-78.
- Huckman, R. S., & Pisano, G. P. 2006. The Firm Specificity of Individual Performance: Evidence from Cardiac Surgery. *Management Science*, Vol. 52: 473-488: INFORMS: Institute for Operations Research.
- Huselid, M. A., & Becker, B. E. 2011. Bridging Micro and Macro Domains: Workforce Differentiation and Strategic Human Resource Management. *Journal of Management*, 37(2): 421-428.
- Jacobs, D. 1981. Toward a Theory of Mobility and Behavior in Organizations: An Inquiry Into the Consequences of Some Relationships Between Individual Performance and Organizational Success. *American Journal of Sociology*, 87(3): 684-707.

- Jacoby, S. M. 2005. *The embedded corporation: Corporate governance and employment relations in Japan and the United States*. Princeton, NJ: Princeton University Press.
- Lazear, E. P., & Rosen, S. 1981. Rank-Order Tournaments as Optimum Labor Contracts. *The Journal of Political Economy*, 89(5): 841-864.
- Lepak, D. P., & Shaw, J. D. 2008. Strategic HRM in North America: a look to the future. *International Journal of Human Resource Management*, 19(8): 1486-1489.
- Lepak, D. P., & Snell, S. A. 1999. The Human Resource Architecture: Toward a Theory of Human Capital Allocation and Development. *The Academy of Management Review*, 24(1): 31-48.
- Macher, J. T., & Richman, B. D. 2008. Transaction Cost Economics: An Assessment of Empirical Research in the Social Sciences, *Business and Politics*, Vol. 10.
- Mahoney, J. T. 2005. *Economic foundations of strategy*. Thousand Oaks, CA: Sage.
- Masters, J. K., & Miles, G. 2002. Predicting the Use of External Labor Arrangements: A Test of the Transaction Costs Perspective. *The Academy of Management Journal*, 45(2): 431-442.
- Mayer, K. J., & Nickerson, J. A. 2005. Antecedents and Performance Implications of Contracting for Knowledge Workers: Evidence from Information Technology Services. *Organization Science*, 16(3): 225-242.
- Pergamit, M. R., & Veum, J. R. 1999. What is a Promotion? *Industrial and Labor Relations Review*, 52(4): 581-601.
- Petersen, T., & Saporta, I. 2004. The Opportunity Structure for Discrimination. *American Journal of Sociology*, 109(4): 852-901.
- Pfeffer, J., & Cohen, Y. 1984. Determinants of Internal Labor-Markets in Organizations. *Administrative Science Quarterly*, 29(4): 550-572.
- Phillips, D. J. 2001. The Promotion Paradox: Organizational Mortality and Employee Promotion Chances in Silicon Valley Law Firms, 1946-1996. *The American Journal of Sociology*, 106(4): 1058-1098.
- Pinfield, L. T. 1995. *The operation of internal labor markets: Staffing practices and vacancy chains*: Springer.
- Posthuma, R. A., Morgeson, F. P., & Campion, M. A. 2002. Beyond employment interview validity: a comprehensive narrative review of recent research and trends over time. *Personnel Psychology*, 55: 1-80.
- Rosenbaum, J. E. 1979. Tournament Mobility: Career Patterns in a Corporation. *Administrative Science Quarterly*, 24(2): 220-241.
- Rosenbaum, J. E. 1990. Structural Models of Organizational Careers: a Critical Review and New Directions. In R. L. Breiger (Ed.), *Social Mobility and Social Structure*: 272-307. Cambridge: Cambridge University Press.
- Rosenfeld, R. A. 1992. Job Mobility and Career Processes. *Annual Review of Sociology*, 18: 39-61.
- Rosenkopf, L., & Almeida, P. 2003. Overcoming Local Search through Alliances and Mobility. *Management Science*, 49(6): 751-766.
- Ross, L. 1977. The intuitive psychologist and his shortcomings: Distortions in the attribution process. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology*, Vol. 10: 174-221. New York, NY: Academic Press.
- Royal, C., & Althaus, R. P. 2003. The Labor Markets of Knowledge Workers: Investment Bankers' Careers in the Wake of Corporate Restructuring. *Work and Occupations*, 30(2): 214-233.

- Sackett, P. R., & Lievens, F. 2008. Personnel Selection. *Annual Review of Psychology*, 59(1): 419-450.
- Schaubroeck, J., & Simon, S. K. L. 2002. How Similarity to Peers and Supervisor Influences Organizational Advancement in Different Cultures. *The Academy of Management Journal*, 45(6): 1120-1136.
- Schmidt, F. L., & Hunter, J. E. 1998. The validity and utility of selection methods in personnel psychology: Practical and theoretical. *Psychological Bulletin*, 124(2): 262.
- Spilerman, S., & Lunde, T. 1991. Features of Educational Attainment and Job Promotion Prospects. *The American Journal of Sociology*, 97(3): 689-720.
- Stewman, S. 1986. Demographic Models of Internal Labor Markets. *Administrative Science Quarterly*, 31(2): 212-247.
- Stewman, S., & Konda, S. L. 1983. Careers and Organizational Labor Markets: Demographic Models of Organizational Behavior. *The American Journal of Sociology*, 88(4): 637-685.
- Stewman, S., & Yeh, K. S. 1991. Structural Pathways and Switching Mechanisms for Individual Careers. *Research in Social Stratification and Mobility*, 10: 133-168.
- Strang, D., & Baron, J. N. 1990. Categorical Imperatives: The Structure of Job Titles in California State Agencies. *American Sociological Review*, 55(4): 479-495.
- Trevor, C. O. 2001. Interactions among actual ease-of-movement determinants and job satisfaction in the prediction of voluntary turnover, *Academy of Management Journal*, Vol. 44: 621-638: Academy of Management.
- Von Nordenflycht, A. 2010. What is a professional service firm? Toward a theory and taxonomy of knowledge intensive firms. *Academy of Management Review*, 35(1): 155-174.
- Walker, G., & Poppo, L. 1991. Profit Centers, Single-Source Suppliers, and Transaction Costs. *Administrative Science Quarterly*, 36(1): 66-87.
- Williamson, O. E. 1981. The Economics of Organization: The Transaction Cost Approach. *American Journal of Sociology*, 87(3): 548-577.
- Williamson, O. E. 1985. *The Economic Institutions of Capitalism*. New York: Free Press.
- Williamson, O. E. 1991. Comparative Economic Organization: The Analysis of Discrete Structural Alternatives. *Administrative Science Quarterly*, 36(2): 269-296.
- Williamson, O. E., Wachter, M. L., & Harris, J. E. 1975. Understanding the Employment Relation: The Analysis of Idiosyncratic Exchange. *The Bell Journal of Economics*, 6(1): 250-278.
- Zhang, Y., & Rajagopalan, N. 2003. Explaining New CEO Origin: Firm versus Industry Antecedents. *The Academy of Management Journal*, 46(3): 327-338.
- Zhang, Y., & Rajagopalan, N. 2004. When the Known Devil Is Better than an Unknown God: An Empirical Study of the Antecedents and Consequences of Relay CEO Successions. *The Academy of Management Journal*, 47(4): 483-500.

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