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Abstract

Individuals often enter similar jobs via two different routes: internal mobility and external hiring. I examine how the differences between these routes affect subsequent outcomes in those jobs. Drawing on theories of specific skills and incomplete information, I propose that external hires will initially perform worse than workers entering the job from inside the firm and have higher exit rates, yet they will be paid more and have stronger observable indicators of ability as measured by experience and education. I use the same theories to argue that the exact nature of internal mobility (promotions, lateral transfers, or combined promotions and transfers) will also affect workers' outcomes. Analyses of personnel data from the U.S. investment banking arm of a financial services company from 2003 to 2009 confirm strong effects on pay, performance, and mobility of how workers enter jobs. I find that workers promoted into jobs have significantly better performance for the first two years than workers hired into similar jobs and lower rates of voluntary and involuntary exit. Nonetheless, the external hires are initially paid around 18 percent more than the promoted workers and have higher levels of experience and education. The hires are also promoted faster. I further find that workers who are promoted and transferred at the same time have worse performance than other internal movers.

Keywords: hiring, promotion, mobility, internal labor markets, firm-specific skills, careers

Workers' mobility has increased substantially in recent years as firms have moved away from an employment model that focused on lifetime employment and internal mobility and toward greater reliance on the external labor market to staff positions (Cappelli, 1999; Farber, 2008). An important consequence of these changes has been an alteration in the way that workers enter jobs. Higher-level jobs used to be almost entirely entered by promotions or internal transfers; now those jobs are often entered by external hiring as well (Royal and Althauser, 2003).

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Organizational and sociological approaches to employment have long observed that the processes that match individuals with jobs affect employment outcomes (Granovetter, 1981). Existing studies have taken two broad approaches to understanding such matching processes. One literature has studied the processes that govern mobility in ''internal labor markets'' within organizations (Doeringer and Piore, 1971; Althauser and Kalleberg, 1981; DiPrete, 1987; Dencker, 2009), documenting the importance of formal job ladders, administrative rules, and worker bargaining power in shaping movements within firms. A second literature has examined the nature of hiring processes in external labor markets, demonstrating, for example, that different job search methods are associated with different probabilities of receiving offers (Fernandez, Castilla, and Moore, 2000) and the importance of various signals of job quality in workers' decisions to search for and take new jobs (Halaby, 1988; Greve and Fujiwara-Greve, 2003). As workers increasingly use both internal and external mobility to access similar positions, though, it is increasingly important to directly compare internal mobility and external hiring in order to understand whether those different routes of entry into the job affect such subsequent outcomes as performance, pay, and mobility, or even the kinds of workers ending up in those jobs.

Such a comparison of the effects of internal and external mobility is of both practical and theoretical importance. If the route by which jobs are entered affects pay and performance, then the quality of the human capital that employers are able to acquire and the amount that they pay for that human capital is likely to depend on whether the workers involved are hired or developed internally. A clear comparison of the effects of hiring and internal mobility also has the potential to inform workers of the consequences of their career decisions. Comparing internal and external labor market processes can also provide us with a richer theoretical understanding of the trade-offs that characterize these pathways of workers' mobility and career development.

Although a number of studies have begun to explore differences between hiring and internal mobility, they have stopped well short of developing the detailed comparison of internal and external matching processes that would underpin a better understanding of these different mobility processes. Research based on tournament theory has predicted and found that external hires have faster subsequent promotion rates than workers promoted into the same job (Chan, 2006). A study of academic economists also indicated that lateral hires had stronger publication records than those hired internally (Oyer, 2007). In their study of a large financial services firm, Baker, Gibbs, and Holmstrom (1994a) showed that workers hired into higher organizational levels had more work experience and education than those promoted into those positions, but the authors made no attempt to control for characteristics of the job that might confound those comparisons. Within the specific context of chief executive officer (CEO) labor markets, Harris and Helfat (1997) found that the pay of externally hired CEOs was higher than that of CEOs promoted internally; however, their cross-firm design limited their ability to control for the nature of the hiring organization. Yet other work has shown how moving to other organizations affects workers' pay and performance (Brett and Stroh, 1997; Groysberg, Lee, and Nanda, 2008). Such work lacks a direct comparison with internal mobility, however, and cannot distinguish differences in the kinds of jobs entered from the effects of the matching process. With a few exceptions

(Rosenbaum, 1979; Baker, Gibbs, and Holmstrom, 1994a), there has also been little research on whether different routes to jobs within firms, such as promotions or lateral transfers, affect subsequent outcomes, despite reasons to believe that those different routes will result in different outcomes.

To formulate a more comprehensive theory about the differences between external hiring and internal mobility, it is useful to draw on two theories that are often used in the study of internal and external labor markets: theories of specific skills and incomplete information. Research on human resource systems and careers has noted that workers who move jobs within the firm (''internal movers'') differ from external hires in their levels of firm-specific skills (Sonnenfeld and Peiperl, 1988; Lepak and Snell, 1999), while internal labor market theory has explored the consequences of these specific skills for performance and career paths within firms (Althauser, 1989). The kinds of jobs that workers are moving from—either from within the same firm or from a different firm—should affect the specific skills that the workers bring to their new jobs and hence their performance. Theories of information and labor market matching emphasize the importance of information in finding a good match between the characteristics of the worker and the demands of the job (Granovetter, 1981; Halaby, 1988). Internal labor market theory has long observed that firms have better information about current employees than other workers, allowing them to better assess this match (Doeringer and Piore, 1971). Access to such information might affect both the characteristics of workers who enter jobs through hiring versus internal mobility and how much they are paid.

Integrating these two theories, I predict that external hiring will have two disadvantages for firms relative to internal mobility: external hires are likely to perform worse than internal movers but be paid more. Theories of firm-specific skills predict that external hires should have lower initial performance than internal movers. The effects of incomplete information can prevent employers from balancing this lower performance with lower pay for external hires; because employers are more uncertain about external hires' abilities, they may compensate by hiring workers with stronger observable indicators of ability than internal candidates. Because external hires know less about their potential fit with the job than do internal candidates, they may also demand more pay to make up for the risk of a poor fit. Although external hires should benefit from that higher pay, their lack of firm-specific skills and uncertain fit should create costs for them too, in the form of higher rates of voluntary and involuntary exit than internal movers.

I also develop predictions about the effects of different kinds of internal mobility. First, workers who move to positions that are more different from their prior jobs, such as workers who are simultaneously promoted and transferred laterally, should have fewer job-specific skills and perform worse. Second, lateral transfers should have more externally valuable experience and a worse potential fit than workers who are promoted, which may affect their pay. I tested these predictions using seven years of personnel data from a U.S. financial services institution, conducting a comprehensive comparison of outcomes for workers who enter similar jobs from inside and outside the firm. I examined the effects of external hiring versus internal mobility on workers' pay, performance, indicators of ability, and subsequent mobility. I do not address the costs incurred before the jobs are filled, such as the costs of training workers for potential promotions or forecasting the demand for skilled

workers, even though those costs may also shape decisions about hiring versus internal mobility (Cappelli, 2008). Instead, I examine the effects of different matching processes on what happens to workers after they enter their jobs.

EFFECTS OF EXTERNAL HIRING VERSUS INTERNAL MOBILITY

Workers can enter similar jobs—as defined by criteria such as functional roles, reporting relationships, and hierarchical rank—through either internal mobility or external hiring. Internal mobility itself can take a number of forms. Perhaps the most common type of internal mobility is promotion, defined as moves within an organization to a job that is in a higher administrative rank and usually associated with higher pay, status, responsibilities, and skill requirements (DiPrete and Soule, 1988; Spilerman and Lunde, 1991; Cohen, Broschak, and Haveman, 1998). Although scholars initially argued that promotions were triggered by the need to fill a previously defined vacancy (White, 1970; Stewman and Konda, 1983), more recent studies show that promotions often occur when individuals are judged to have the skills needed for the higher rank, regardless of whether there is a vacancy (Stewman and Yeh, 1991; Barnett and Miner, 1992). Studies also emphasize that such rank mobility can occur without a single, discrete change in the work that an individual is carrying out; although the promotion is defined by a discrete move across ranks, jobs' responsibilities often accrete more gradually over time.

Though a promotion may not entail an immediate change in work content, the different ranks usually carry different overall responsibilities and require the demonstration of different skills to enter them. Hence Pergamit and Veum's (1999) analysis of the National Longitudinal Survey of Youth found that over half of the workers who reported being promoted in the previous year either described those promotions as ''upgrade promotions'' (commonly understood as a reclassification of a job to a higher level (Barnett and Miner, 1992)) or said they continued to perform basically the same duties as before. Yet those same workers who reported little immediate change upon promotion had similar probabilities of receiving increased responsibilities during the following year compared with those who said that their promotion led into a higher-level job in a different section (Pergamit and Veum, 1999). Hence, although promotions may not always involve a step change in the tasks that a worker performs, they nonetheless represent entry into a different job.

A second form of internal mobility is lateral transfers, which occur when individuals remain within the same vertical rank but move to a different organizational unit or a different kind of job (Stewman, 1986). Although transfers also reflect organizational attempts to match workers to appropriate jobs, the circumstances that lead to such transfers are likely more diverse than the circumstances triggering promotions. In some cases, workers may be performing poorly in their current jobs, and their new role may be expected to suit them better. In other cases, a transfer may reflect a worker's desire for a role with improved rewards or advancement prospects. Transfers may also be used to broaden workers' skills in preparation for future positions. A third variant of internal mobility occurs when workers move vertically and horizontally at the same time, by being promoted while also transferring to a different organizational unit or a job outside the traditional line of progression. Stewman and Yeh (1991) defined such moves as ''vacancy promotions,'' because transfers across

units are more likely to be triggered by vacancies than by the acquisition of new skills, but I do not adopt this terminology. Whether there is a vacancy is not relevant to my theory development, which focuses on the change in the work the individual is doing.

External hiring occurs when workers enter the organization for the first time. Unlike internal mobility, external hiring is usually not classified based on the hierarchical job that hires came from, because of the frequent absence of data on those prior jobs and the conceptual difficulty of comparing hierarchical levels across firms. Hiring a worker for a higher level may happen when there is a specific vacancy to be filled, but it can also be triggered by the availability of an attractive candidate (Granovetter, 1974; Rosenbaum, 1990).

Because external and internal mobility often occur through different processes, they may not directly compete with one another for every move (Rosenbaum et al., 1990). Promotions may take place when a worker is believed to have reached a certain skill level without hiring being considered as an alternative. Opportunistic hiring may sometimes take place without considering whether to promote a current worker to the position. Instead, trade-offs take place over time; in particular, when the organization has promoted several workers in a particular area, it will have less need to hire workers with the skills to take on similar responsibilities. Over time, both hiring and promotion will be used as routes to fill similar jobs, even if they are not always considered simultaneously. Despite being substitutes, though, these routes may lead to different subsequent outcomes, due in part to differences in the skills that new hires and promoted workers will bring with them.

Specific Skills and Performance

Every job requires specific knowledge about the formal processes and informal routines used to do the work, about how to work with specific colleagues, the tools and technologies required on the job, and so on (Quinones, Ford, and Teachout, 1995). Although some of this knowledge may be acquired through formal training, much of it comes from on-the-job learning. As a consequence, workers who enter a position from a similar prior job are likely to have relevant job-specific knowledge. The more different workers' prior positions are from their new jobs, the less job-specific knowledge they will have and the worse they are likely to perform as a result.

One form of transition that can require workers to learn a great deal of new knowledge is being hired into a new firm (Lepak and Snell, 1999). Prior research has emphasized that firm-specific skills—knowledge and abilities that can only be acquired and utilized while working in a specific firm (Becker, 1962)—are an important form of job knowledge. Meta-analyses of studies across many fields confirm strong effects of organizational tenure on job performance (Sturman, 2003), although this could partly reflect the attrition of poor performers. Though the importance of firm-specific skills may vary across different positions and organizations, research has found that even professional jobs that demand high levels of general skills, such as securities research, scientific research, and surgery, can require firm-specific skills (Allison and Long, 1990; Huckman and Pisano, 2006; Groysberg, Lee, and Nanda, 2008). Although such work depends on individual workers' skills and knowledge, it can also require

intense coordination with others in the organization, coordination that is facilitated by mutual learning (Groysberg, 2010).

Because internal movers have longer experience within the firm, they are likely to have already acquired important firm-specific skills that new hires will lack. There are good reasons to believe that external hires may have stronger qualifications than those promoted, but firm-specific skills may be important enough that new hires will still experience lower performance than internal movers; in some cases, hires' experience in other similar jobs may even be counter-productive (Dokko, Wilk, and Rothbard, 2009). Although those new hires will learn about the organization over time, they are likely to suffer an initial performance disadvantage when firm-specific skills are important:

Hypothesis 1a (H1a): External hires will have lower initial performance than internal movers.

Changes in the specific skills needed for different jobs may also lead to performance differences within the group of internal movers. Just as people moving from one firm to another need to learn about new technologies or build new relationships, so do people moving to new jobs within the same firm (Quinones, Ford, and Teachout, 1995; Gibbons and Waldman, 2006). When workers receive rank promotions, they are expected to take on new responsibilities over time. Transferred workers need to learn about their new work context. Though the effects of such changes in job-specific skills may often be less than the effects of moving to a new firm, they may nonetheless influence performance. I would therefore expect internal movers to have lower performance when they take on jobs that are more different from their previous work.

There is little theoretical basis for predicting whether promotions or transfers involve a greater change in job-specific skills, but mobility that entails both kinds of movement—promotions that are combined with a lateral transfer—likely requires a greater change in job-specific skills than would either move in isolation. Such a change in the job-specific skills demanded by their new versus old roles is likely to impede the performance of workers who are simultaneously transferred and promoted:

Hypothesis 1b (H1b): Workers who are promoted and transferred at the same time will have lower initial performance than other internal movers.

Incomplete Information and Workers' Characteristics

The second way in which workers' routes into their jobs may affect their employment outcomes is through those routes' effects on the information used in the matching process. All of the different processes that place individuals in jobs aim to create an effective match between the characteristics of the job and the skills and needs of the workers taking those jobs. Firms look for workers who will perform to an acceptable level in the job; workers seek jobs that will be a good fit for their abilities and provide rewards that they value. A key determinant of the parties' ability to form an effective match is the amount of information they can use to assess this match (Akerlof, 1970; Spence, 1973; Granovetter, 1981), but firms and workers often have highly incomplete

information about each other. Firms struggle to evaluate the true qualities of applicants (Schmidt and Hunter, 1998), and workers struggle to know which of the jobs available will best suit their preferences and abilities (Halaby, 1988). How the different routes into jobs affect the information available to workers and firms may therefore influence subsequent outcomes.

Problems of incomplete information shape the differences between internal and external mobility because workers and employers expect to know more about each other during internal moves than during external hiring (Waldman, 1984; Greenwald, 1986). Some correlates of performance, such as a worker's education and the jobs he or she has held, are ''externally observable,'' in that they can be observed by all potential employers (Spence, 1973; Granovetter, 1981). Other important correlates of performance are ''externally unobservable,'' though, in that they can only be assessed by the current employer. Examples of such externally unobservable information include details about how workers have performed in prior roles and how they would fit with the idiosyncratic demands of the job or the organization (Chatman, 1991; Edwards, 1991; O'Reilly, Chatman, and Caldwell, 1991).

Previous research has demonstrated the importance of externally unobservable information for employment outcomes. Gibbons and Katz (1991) found that laid-off workers had better employment prospects when their plant was shut down, suggesting that future employers were concerned that plants were otherwise able to identify and lay off weaker employees. Hiring studies have found that recruiters set great store on references from previous employers (Crain, 1984; Bills, 1999); given the difficulty of getting honest references (Miller and Rosenbaum, 1997), first-hand experience with the workers should be even more helpful. And though studies of hiring emphasize the low predictive power of interviews and other common selection devices (Arvey and Campion, 1982; Posthuma, Morgeson, and Campion, 2002), analyses of workers' performance ratings within firms demonstrate a high cross-period correlation (Sturman, Cheramie, and Cashen, 2005).

These differences in the information available during internal mobility versus external hiring are likely to shape how firms screen candidates from these different routes. The firm's challenge in staffing higher-level positions is to find workers whose overall skills and ability allow them to perform at an acceptable level. In choosing whether an internal candidate should be promoted to a higher level, the firm can assess the worker based on what it knows about both his or her externally observable and externally unobservable attributes. If the worker has the skills necessary to be effective at the higher level, then he or she will be promoted. The organization is similarly well placed to assess the externally unobservable attributes of potential transfers. We would therefore expect the pool of chosen internal candidates to be above average on both externally observable and unobservable attributes. In assessing external candidates, though, the firm lacks information about externally unobservable attributes. The hiring managers must assume that external candidates are, at best, average on those unobservable dimensions—although adverse selection theories suggest that those candidates may be below average on those unobservable dimensions, which is why they are seeking another job (Akerlof, 1970; Greenwald, 1986). We would therefore expect internal movers to have stronger externally unobservable attributes than external hires.

It is likely that firms will compensate for these differences in externally unobservable attributes by changing the way that they evaluate externally observable attributes. Given that many higher-level jobs require a minimum level of performance, firms may be reluctant to hire workers who are expected to fall below that performance threshold. One way to maintain performance above that threshold is to require that external hires have stronger observable indicators of ability than internal movers in similar positions. For example, a firm may be willing to promote an internal candidate with poor observable attributes, because its externally unobservable knowledge suggests that he or she will be successful in that role. The firm would not be willing to hire an external candidate with similarly low levels of externally unobservable attributes, because it could not have externally unobservable knowledge that the new hire would succeed.

Just as firms know less about external hires than they do about internal movers, external hires similarly know less about the firm. Given the difficulties of comparing jobs across organizations (Baron and Bielby, 1986), external hires may sometimes apply for and accept jobs for which they are overqualified. Though underqualified applicants are likely to be screened out by the employer, overqualified candidates may end up being hired. Because internal candidates are less likely to apply for jobs for which they are overqualified, such effects would also lead external candidates to have stronger observable indicators of ability than internal movers. Based on both of these arguments, I propose that:

Hypothesis 2a (H2a): External hires will have stronger externally observable indicators of ability, such as experience or education, than internal movers.

There are also grounds to expect differences in externally observable characteristics among the different kinds of internal movers. Specifically, the prior experience of lateral transfers should provide them with stronger observable indicators of ability than other movers. One of the externally observable indicators that employers most value is the record of specific jobs that an individual has held (Bills, 1990; O'Mahony and Bechky, 2006). By definition, lateral transfers are moving from a higher-ranked job than those promoted to similar jobs. The transfers therefore have more experience in higher-ranked jobs than do those who are promoted, experience that is valuable and externally observable.

In some cases, the processes by which transfers are selected may also shape their observable attributes. Some organizations may use lateral transfers to redeploy workers who do not fit in their current role. Decisions to redeploy poor performers could well reflect observable attributes: a poor performer with weak observable attributes may be terminated; when the worker has stronger observable attributes, the organization may be more likely to interpret poor performance as a lack of fit with the current position and transfer that worker elsewhere. Based on both of these arguments, I predict that:

Hypothesis 2b (H2b): Lateral transfers will have stronger observable indicators of ability, notably work experience, than other internal movers.

Incomplete Information and Pay

Differences in the information available during internal mobility versus external hiring may also affect how workers are paid. A simple view of labor markets suggests that workers entering the job via internal mobility should be paid more than external hires if they have higher performance. Yet considering the effects of incomplete information leads to the opposite prediction: that external hires should be paid more than internal movers.

In part, pay differences between external hires and internal movers should reflect the hypothesized differences in observable characteristics. External hires' stronger observable indicators of ability can help those workers find high-paying jobs in other organizations and will be rewarded in the labor market. Unobservable attributes do not help workers find jobs in other organizations, and employers will face less pressure to reward such attributes. If external hires have stronger observable indicators of ability, we would expect them to be better paid than internal movers.

The reduced information that external hires have about the firm and job may also affect their pay. Although firms may seek to give prospective hires a clear description of their job, internal movers are likely to have more direct knowledge about the nature of the job and how well they will fit with it. Internal candidates should also have a clearer understanding of how they fit the culture and values of the organization (Chatman, 1991) and should be a good fit for the organization; otherwise, they would have left the organization already (Schneider, Goldstein, and Smith, 1995). External hires lack this information and should assume that they will be, on average, a worse fit for the job and organization than internal movers. Such poor fit can lead to lower job satisfaction and higher turnover (Chatman, 1991; Edwards, 1991).

External hires' worse expected fit with the job and organization should make the job less attractive to them than to an internal mover. The pay that the employer needs to offer to persuade an external hire to take a job is therefore higher than the pay demanded by an internal mover to take a similar job. These considerations of fit and observable indicators of ability imply that:

Hypothesis 3a (H3a): External hires will be paid more than internal movers.

There may also be differences in the pay of different types of internal movers, based on these same factors of observable human capital and the relative attractiveness of the job. As noted above, transfers have valuable, externally observable experience in their current rank. That valuable experience should raise what other employers are prepared to pay them over time and consequently lead to pay raises from their current employer. People promoted into a position lack that externally observable experience and the associated pay raises. We would therefore expect that transfers' increased seniority within the higher rank will translate into higher pay.

The pay of transfers and promoted workers may also be shaped by the information that their mobility provides about their fit with the job and organization. As I have noted above, transfers can sometimes reflect mediocre prior job performance and an opportunity for a fresh start elsewhere in the organization. In such cases, transfers' expectations about their fit and potential performance are likely to be lower than promoted workers who have performed well in their

prior role. Those transfers may therefore need to be paid more to stay in the job. At the same time, the firm's decision to transfer workers rather than terminating them indicates that the firm continues to see some promise in them and may be willing to pay that premium to retain them. Based on both of these factors, I expect that:

Hypothesis 3b (H3b): The pay of lateral transfers will be higher than the pay of other internal movers.

Implications for Subsequent Mobility

The effects of specific skills and incomplete information are also likely to affect the subsequent mobility of external hires and internal movers through promotions and exit. Promotions and exit tend to occur disproportionately among workers near the tails of the performance distribution. Promotions occur among those workers who are able to demonstrate the skills necessary to be promoted to the next level. More rapid promotions occur among those who are performing well ahead of expectations. By contrast, involuntary exit (both for cause and as part of downsizing) tends to occur among workers performing well below the average.

The arguments developed above suggest that external hires may be disproportionately represented in both tails of the performance distribution. Because employers are unable to screen hires based on their externally unobservable attributes, hires are likely to have worse average unobservable attributes than internal movers, but they will also have higher variance in those attributes. Although many hires will turn out to have poor externally unobservable attributes, others will have strong externally unobservable attributes. Because employers also require stronger observable attributes from hires, the hires that turn out to have strong unobservable attributes may be among the best performers, particularly as they begin to acquire firm-specific skills.

If promotions are disproportionately drawn from the upper tail of the performance distribution, then external hires may have higher overall promotion rates than internal movers. Chan (2006) found evidence of such faster subsequent promotion among external hires, although he attributed this effect to hires having higher overall ability, rather than their being overrepresented among higher performers. I predict that:

Hypothesis 4a (H4a): External hires will have a higher rate of subsequent promotion than internal movers.

In contrast to promotions, involuntary exit (both for cause and as part of downsizing) tends to occur among workers performing well below the average. External hires should also be well represented among those lowest performers. Their lack of firm-specific skills likely reduces their performance; the greater uncertainty about hires' externally unobservable attributes also increases the risk that they will turn out to be a poor match for their jobs (Halaby, 1988). I predict that:

Hypothesis 5a (H5a): External hires will have a higher rate of involuntary exit than internal movers.

Rates of promotion may also vary among the different kinds of internal movers. I argued that workers who are promoted and transferred at the same time may suffer lower performance than other internal movers because of their lack of job-specific skills. That poor performance should leave those workers who are simultaneously promoted and transferred underrepresented at the top of the performance distribution, and therefore less likely to be promoted:

Hypothesis 4b (H4b): Workers who are promoted and transferred at the same time will have slower rates of subsequent promotion than other internal movers.

Similarly, the lower performance of workers who are promoted and transferred at the same time should leave them well represented in the lower tail of performers. That low performance may make them vulnerable to higher rates of involuntary exit:

Hypothesis 5b (H5b): Workers who are promoted and transferred at the same time will have a higher rate of involuntary exit than other internal movers.

A further form of worker mobility is voluntary exit. Prior research suggests that such exit can be affected by a poor match between workers and their job or organization, as well as by underlying individual propensities to leave jobs (Blumen, Kogan, and McCarthy, 1995; Chatman, 1991; Edwards, 1991; Farber, 1994). As noted above, external hires know less about the organization than do internal candidates and are at greater risk of forming a poor match (Halaby, 1988). Given that external hires have already left at least one other organization, they may also have a higher average propensity to move to another firm, although such differences may be less marked in fields in which interorganizational mobility is common. Together, these factors lead me to predict:

Hypothesis 6 (H6): External hires will have a higher rate of voluntary exit than internal movers.

METHODS

I tested the hypotheses using personnel data from the U.S. investment banking arm of a financial services institution, which I call ''Croesus.'' Investment banking represents an interesting context in which to study the effects of internal versus external mobility. Organizational performance in this industry often depends on the skills of the workforce, increasing the importance of personnel decisions. Workers in banking are also notoriously mobile, making this a context in which organizations regularly engage in external hiring at all levels. Finally, the hypotheses developed above apply to jobs with high levels of firm-specific skills; Groysberg, Lee, and Nanda (2008) found that the performance of investment analysts who moved to a new firm fell substantially, suggesting that firm-specific skills are important in investment banking.

Croesus is organized into four different business units, comprising one support unit and three different revenue-producing units. Each business unit is then divided into divisions, with a median size of 450 workers; divisions are further subdivided into departments, with a median size of 100; and each department is itself composed of different groups, with a median size of 32.

I have data on all Croesus employees from the year 2003 to 2009. These employees include both investment professionals, such as research analysts, advisors, and traders, as well as ''back office'' staff such as lawyers, information technology workers, and administrators. The data consist of annual records for each worker, giving details of his or her job and compensation in that year, annual performance data, and demographic data.

Variables

Mobility variables. Internal mobility at Croesus took place through promotion to a higher rank or transfer to a different organizational unit. The employees at Croesus all occupied one of six different ranks, which were used across the organization and were central determinants of pay and responsibilities. Although titles vary across firms, the usual industry descriptions of these ranks (which I use here to preserve the anonymity of the site) are analyst/non-officer, associate, vice president (VP), director, managing director (MD), and senior executive.

Promotions across ranks usually occurred as individuals demonstrated the skills necessary to operate in the rank above and almost always occurred once a year as part of the annual personnel process. Nonetheless, workers in different ranks would usually be expected to carry out significantly different tasks. In investment banking jobs, for example, industry experts report that it is usual for analysts to work for associates in carrying out analyses. VPs provide direction for those overall analyses and interact with the clients. Directors oversee deals and sell new work, while MDs focus on managing client relationships and overall strategy. Within trading, progression through the ranks involves becoming directly involved in trading, managing larger portfolios of securities and more complex products, and ultimately managing a group and setting strategy. I identified promotions by a change in rank from one year to the next.

Lateral transfers are defined as moves across organizational units (divisions, departments, or groups) between one year and the next. Because different units generally focused on different topic areas, such moves involve changes in the kinds of work that transfers do. I avoided confusing transfers with reorganizations, in which an individual might be doing the same work but in a differently labelled or constituted organizational unit, by restricting transfers to transitions accompanied by fewer than 10 percent of the source unit's workers and by fewer than 10 percent of the destination unit's workers.

I used dummy variables to code internal entry into the job into three categories: *simple promotions* (not accompanied by transfers), *simple transfers* (not accompanied by promotions), and *combined promotions and transfers* (both promotion and transfer occur during the same year). Entering a job by external hiring is the excluded category in the analyses. I verified that those jobs were entered by hiring based on the hire date provided by Croesus. When external hires then move into new jobs within the organization, they are recoded as entering those subsequent jobs by internal mobility.

Indicators of observable ability. I measured indicators of observable ability with two variables that have been extensively used in labor economics: education and experience. Work experience provides workers with valuable work-related skills through on-the-job learning (Mincer, 1962). Education is also a commonly used indicator of ability, both because it provides workers with

useful knowledge and because it may signal cognitive ability (Spence, 1973). Although experience and education are weaker predictors of job performance than cognitive tests or structured interviews (Schmidt and Hunter, 1998), they are valuable proxies for underlying characteristics, are highly observable, and are well rewarded in the labor market as a consequence (Mincer, 1970; Dustmann and Meghir, 2005).

The original dataset provided details of workers' birthdates and their academic degrees. Education data were missing for around 3,300 of the 15,000 workers originally in the data. I was told that data were often missing due to failures by workers or administrators to fill in the field for education; it may also reflect some individuals lacking degrees. I dropped workers who lacked education data from the analysis.

I created dummy variables for the highest degree that a worker possessed (Bachelor's, Master's or Ph.D.). I then calculated experience using workers' ages. I assumed that workers had been working since age 18 if they had no degree and added 4 years to this age for a Bachelor's degree, 2 years for a Master's, and 4 for a Ph.D. (in the very few cases in which this resulted in negative experience, I reset it to zero).

Performance. I used three measures from Croesus's annual performance evaluations. *Contribution* was based on a 1–5 scale that assesses whether workers hit their performance targets for the year: 1 = ''Objectives significantly exceeded,'' 3 = ''Objectives met,'' and 5 = ''Objectives not met.'' Around 9 percent of ratings are a 1, 56 percent are a 2, 34 percent are a 3, 2 percent are a 4, and .03 percent are a 5. *Competence* assesses a worker's skills relative to the requirements of the job. It was measured on a 1–5 scale, with 10 percent of workers being awarded a 1 (the highest rating), 50 percent receiving a 2, 37 percent receiving a 3, 2 percent receiving a 4, and .05 percent receiving a 5. *Performance rank* is a forced ranking that is used to determine compensation and other personnel decisions and is intended to reflect both performance and overall value to the organization. Groups of managers rated many workers in the same rank to develop these rankings. The ranking splits workers into the top 10 percent, the next 20 percent, the next 60 percent (in 2009, this segment was itself split into a higher 40 percent and a lower 20 percent), and the bottom 10 percent. I converted this ranking into a 6-point scale, on which the 60-percent category corresponded to a 4, and the divided category in 2009 represented a 3 and a 5, respectively.

I reversed the scales for each of the three performance measures so that higher values indicate better performance. Although I could have combined these three measures to form a single aggregate measure of performance, I chose to keep them separate, both because Cronbach's alpha for a combined scale was marginal at .69 and because comparing these performance indicators can shed more light on the effects of mobility on performance.

Although subjective performance evaluations can be biased (Cascio, 1998: 65–66), many researchers argue that such subjective evaluations are among the most valid measures of performance. Subjective measures often correct for determinants of performance outside the control of the individual (Campbell et al., 1993) and can encompass a wide variety of behaviors and outputs relevant to the job (Medoff and Abraham, 1981). Meta-analyses have shown high test-retest reliability in performance evaluations (Sturman, Cheramie, and

Cashen, 2005), and supervisory ratings are among the most common dependent variables in studies of performance (Sturman, 2003).

Compensation. Croesus employees were paid a salary and an annual bonus that was based on both individual and firm performance. Bonuses represented 38 percent of pay, on average, and rose as high as 98 percent. I ran analyses on each pay component separately and on total compensation. I used the logarithm of each of these components because they are highly skewed (when individuals received zero bonus, I substituted a bonus of one dollar in order to calculate a log value).

Exit. I coded exits into voluntary and involuntary exits based on a coding provided by Croesus. From 2006 onward, all exits were coded as ''Employee Initiated,'' ''Croesus Initiated,'' or ''Neutral'' (I restricted analyses to years after 2005 and omitted the 9 neutral exits). Of 10,952 person-years analyzed, 1,135 ended in involuntary exit, and 1,118 ended in voluntary exit.

Controls. The goal of the study was to compare people being staffed in similar jobs through different routes. I therefore controlled for as many aspects of those jobs as possible. I included separate dummies for each of the six hierarchical ranks. I also used job titles and department and group names to create dummies for 13 different functions: administrator; human resources (HR); corporate management, marketing, legal, internal finance, operations, information technology (IT), research; sales; trading; advisory; and other banking roles. I also controlled for interactions between rank and function to allow the effect of rank to vary according to occupation. I controlled for the city that the job was in (88 percent of workers were in the greater New York area). Finally, I included dummies for workers' departments to provide even more fine-grained controls for the kinds of work people were doing (in some cases, analyses would not converge when controlling for departments; in those cases, I controlled for divisions).

A particular concern is that unobserved factors that make the firm more likely to hire from outside might be correlated with pay or performance. For example, we would expect more hiring in those areas that have higher turnover or require new skills that the organization lacks. Although highly detailed job-level dummies should control for fixed propensities of different kinds of jobs to involve more external hiring, they may not capture over-time variation in propensity to hire. I therefore also controlled for the proportion of new hires in the worker's group and the proportion of workers who left the worker's group, as measured both in the year that his or her job started and in the current year.

I included dummies for each year in the sample, reflecting changes in labor market conditions between 2002 and 2009. I also controlled for how long an individual had been in the job, measured in years. Although I had dates of entry for promotions and hires, I lacked these for transfers. I assumed the transfers entered their jobs in the middle of the year. Finally, I controlled for gender and ethnicity (Caucasian, Asian, and other).

Final Sample

I made a number of restrictions to the data. I dropped observations with missing education data, and with missing performance data, which occurred when workers had been hired too recently to assess or were terminated before the evaluation. I explored whether the missing education or performance data

might bias the results by rerunning analyses excluding these variables and using all data. The results were very similar to those using the restricted data set. I also excluded job spells in the lowest rank, which cannot be entered by promotion. I avoided sampling workers based on the length of their job spell by limiting the sample to jobs that began during or after 2002 and for which I could observe the beginning date. I excluded 99 workers who met my other criteria but appeared in the data set long after they were hired, either because they transferred from elsewhere in the parent company or because they entered Croesus as part of a merger.

The final data set contains information on 5,260 workers in 7,129 job spells. The median length of completed job spells was around two years for those that ended in promotion and around 1.5 years for those ending in transfers or exits.

RESULTS

Table 1 provides means, standard deviations, and correlations for the main dependent and independent variables. A year spent in a job is the unit of analysis. Of particular interest are the means for the different modes of job entry. Simple promotion is by far the most common mode of entry, representing 55 percent of the observed job years. The next most common entry mode is external hiring, with 32 percent of observations. Simple transfers represent only 10 percent of observations, while combined transfers and promotions were very rare at the firm, providing the means of entering only 3 percent of job years (statistics using job spells as the unit of analysis were very similar). Internal mobility therefore outweighs hiring at Croesus, but that mobility is overwhelmingly vertical and within the same organizational unit.

Performance

Table 2 presents analyses of each of the three performance measures. Because these are discrete, ordinal measures, I used ordered logit analyses. The unit of analysis is the job-year. I clustered the errors by individual to account for non-independence among the errors. The analyses did not converge fully when I controlled for departments and cities, so instead I controlled for divisions and whether the job was in the greater New York Area (ordinary least squares analyses produced very similar results when controlling for either division or department). Performance was scaled so that higher values always indicate better performance. I present models with and without interactions between mobility type and time in job and include tests for differences between internal movers.

Two broad patterns emerge from the models. First, the two most common forms of internal mobility—simple promotion and simple transfers—lead to significantly higher initial performance than external hiring. The main coefficients in the full models (2, 4, and 6) indicate predicted performance on beginning the job, while the main coefficients in the reduced models (1, 3, and 5) indicate average performance over the full period in the job. Workers who entered the job through simple promotions perform better than external hires on all measures and in all specifications. Simple transfers also outperform external hires initially in all specifications (main effects in models 2, 4, and 6) and over the full duration of the job using contribution, which is the performance measure most

Table 1. Summary Statistics for Key Variables*

Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9
1. Simple promotion	.55	.50									
2. Promotion/transfer	.03	.18	-.20								
3. Simple transfer	.10	.30	-.37	-.06							
4. Experience	14.82	6.90	-.12	-.07	.13						
5. Highest Bachelor's	.53	.50	.08	.03	.02	-.08					
6. Highest Master's	.37	.48	-.04	-.03	-.02	.02	-.81				
7. Highest Ph.D.	.08	.27	-.08	-.01	-.01	.02	-.31	-.23			
8. Ranked performance	3.74	1.35	.08	-.01	-.04	-.15	.03	-.03	.01		
9. Contribution	3.72	.65	.12	0	-.03	-.08	.01	0	-.01	.56	
10. Competence	3.71	.70	.07	.01	-.04	-.13	-.01	.01	.01	.52	.54
11. Log total compensation	12.56	.88	.03	-.04	-.05	.12	-.13	.11	.06	.18	.22
12. Log bonus	10.74	3.60	.05	0	-.04	-.04	-.06	.05	.05	.16	.2
13. Log salary	11.72	.26	-.19	-.07	.05	.43	-.19	.12	.15	.06	.05
14. Time in job	1.76	1.14	.13	-.01	-.15	.24	0	.01	-.01	.09	.08
15. Year	2007	1.76	-.02	.04	.08	.11	.02	-.01	-.02	.04	.01
16. Rank	3.02	.98	.06	-.04	.01	.41	-.12	.09	.09	.03	.08
17. Male	.77	.42	-.02	-.01	-.01	.01	-.04	.05	-.02	.02	0
18. White	.78	.41	.06	0	.02	.14	.09	-.09	-.02	.04	.04
19. Asian	.16	.37	-.05	0	-.03	-.14	-.1	.1	.02	-.03	-.02

Variable	10	11	12	13	14	15	16	17	18
11. Log total compensation	.24								
12. Log bonus	.2	.63							
13. Log salary	.02	.62	.21						
14. Time in job	.05	.09	-.05	.19					
15. Year	-.04	-.17	-.33	.18	.26				
16. Rank	.04	.68	.27	.81	.14	.03			
17. Male	.03	.22	.08	.17	-.01	-.05	.14		
18. White	.04	.13	.1	.11	.07	-.07	.2	.04	
19. Asian	-.02	-.11	-.08	-.07	-.06	.07	-.17	-.04	-.84

* Unit of analysis is a year spent in a job. Each observation contains pay in that year and most recent performance evaluation.

closely tied to objective results. The weaker effects for transfers in models 1 and 3 appear to reflect the lower numbers of simple transfers compared with simple promotions, rather than a rapid decay of their advantages. Initial differences between external hires and workers who entered the job through combined promotions and transfers are much weaker, only attaining a 10-percent significance level in model 6.

Second, I find evidence that the performance of workers entering the job through combined promotions and transfers is weaker than other internal movers'. I find significant differences between workers entering their jobs through simple promotions versus combined promotions and transfers in analyses of both ranked performance and contribution. It may be that workers who entered the job through combined promotions and transfers are seen as having the core skills required for their jobs but struggle to apply these skills in a new setting. I also find differences in ranked performance between workers entering their jobs through simple transfers versus combined promotions and

Table 2. Ordered Logit Analyses of Performance*

	Ranked performance		Competence		Contribution	
Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Time in job	.232•••	.387•••	0.163•••	0.233•••	0.198•••	0.408•••
	(.020)	(.038)	(0.019)	(0.036)	(0.019)	(0.038)
Group turnover proportion at entry	.019	-.087	-0.171	-0.22	-0.211	-0.355
	(.22)	(.214)	(0.205)	(0.206)	(0.237)	(0.234)
Group new hire proportion at entry	.325••	.243	0.480•••	0.440•••	0.497•••	0.384••
	(.154)	(.156)	(0.158)	(0.159)	(0.168)	(0.169)
Group new hire proportion	-.176	.036	-0.281••	-0.181	-0.344••	-0.058
	(.126)	(.132)	(0.132)	(0.139)	(0.135)	(0.140)
Group turnover proportion	-.346••	-.297•	0.007	0.032	0.087	0.165
	(.176)	(.175)	(.170)	(.170)	(.184)	(.182)
Experience	-.076•••	-.076•••	-.046•••	-.046•••	-.051•••	-.051•••
	(.004)	(.004)	(.004)	(.004)	(.004)	(.004)
Male	.109••	.109••	.034	.034	.005	.003
	(.052)	(.052)	(.055)	(.055)	(.055)	(.055)
Asian	.054	.057	.195•	.196•	.208•	.215•
	(.104)	(.105)	(.110)	(.110)	(.115)	(.116)
White	.267•••	.272•••	.304•••	.306•••	.305•••	.315•••
	(.096)	(.097)	(.099)	(.099)	(.105)	(.106)
Highest Bachelor's	-.165	-.18	-.318••	-.325••	-.352••	-.374•••
	(.154)	(.154)	(.144)	(.144)	(.140)	(.140)
Highest Master's	-.257•	-.271•	-.417•••	-.423•••	-.438•••	-.457•••
	(.156)	(.156)	(.147)	(.148)	(.143)	(.143)
Highest Ph.D.	-.187	-.194	-.17	-.174	-.397••	-.410••
	(.176)	(.176)	(.168)	(.169)	(.169)	(.169)
Simple promotion	.168•••	.509•••	.148•••	.308•••	.427•••	.893•••
	(.054)	(.072)	(.054)	(.077)	(.055)	(.077)
Promotion and transfer	-.122	.073	.071	.138	.182	.343•
	(.119)	(.156)	(.120)	(.188)	(.130)	(.180)
Simple transfer	.115	.386•••	.146•	.258••	.238•••	.612•••
	(.073)	(.096)	(.074)	(.100)	(.074)	(.099)
Simple prom. x Time in job		-.218•••		-.101••		-.297•••
		(.042)		(.041)		(.042)
Prom. and transfer x Time in job		-.125		-.041		-.094
		(.096)		(.117)		(.117)
Simple transfer x Time in job		-.191•••		-.076		-.265•••
		(.064)		(.063)		(.062)
Cut 1	-2.236•••	-2.011•••	-8.244•••	-8.145•••	-7.282•••	-6.993•••
	(.405)	(.412)	(.606)	(.610)	(.731)	(.735)
Cut 2	-1.771•••	-1.546•••	-4.249•••	-4.150•••	-2.887•••	-2.599•••
	(.405)	(.412)	(.445)	(.449)	(.445)	(.451)
Cut 3	.839••	1.070•••	-.706	-.605	.762•	1.064••
	(.405)	(.412)	(.441)	(.446)	(.442)	(.448)
Cut 4	1.184•••	1.416•••	2.049•••	2.150•••	3.906•••	4.217•••
	(.405)	(.413)	(.441)	(.446)	(.448)	(.455)
Cut 5	2.709•••	2.945•••				
	(.407)	(.414)				
Observations	14,515	14,515	14,515	14,515	14,515	14,515
Log pseudo-likelihood	-20254.1	-20231.1	-14255	-14250	-13436	-13398
Chi-squared	13335	13269	8909	8901	7934	7930
Degrees of freedom	123	126	122	125	122	125
Probability	.0000	.0000	.0000	.0000	.0000	.0000

(continued)

Table 2. (continued)

Variable	Ranked performance		Competence		Contribution	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Probability vs. prior model		.0000	.0000	.0979	.0000	.0000
P(simple prom. vs. prom. & transfer)	.01	.004	.50	.35	.05	.002
P(simple transfer vs. prom. & transfer)	.06	.05	.55	.53	.68	.14

•$p < .10$; ••$p < .05$; •••$p < .01$.

* Standard errors, in parentheses, are clustered by individual. All analyses also include dummies for rank, function, interactions between each rank and function, division, year, and greater New York area.

transfers. A lack of significant differences between these groups for the other measures may partly reflect a lack of statistical power, given the smaller number of workers in each of these categories.

These results offer support for H1a and H1b, which argued that internal movers would perform better than hires and that workers entering jobs through combined promotions and transfers would perform worse than other internal movers. Though most internal movers do perform significantly better than hires, the performance penalty suffered by workers entering the job through combined promotions and transfers is so large that it often renders their performance similar to external hires.

Interactions between entry modes and time in job suggest that the advantages received by workers entering the job through simple promotions and simple transfers versus new hires decline over time. The magnitudes of the interaction coefficients indicate that the performance of external hires remains significantly weaker than that of workers entering the job through simple promotions for more than two years for contribution and competence, and slightly less than two years for ranked performance. In supplementary analyses, I created dummies for each year in the job and interacted these with the mobility dummies (results available from the author). I found that the performance of promoted workers was better than new hires for the first two years, after which the performance of the two groups converged. The performance of new hires was never significantly better than promoted workers. I found similar results when I also examined the performance of the workers in their subsequent jobs.

This convergence in performance between new hires and internal movers most likely reflects the acquisition of firm-specific skills by new hires. I confirmed that this performance convergence was not due to attrition among the weaker hires by conducting individual fixed effects analyses (not reported here). The fixed-effects analyses produced interaction effects similar to the cross-sectional analysis, suggesting that hires' performance improvement is due to within-individual learning. A Heckman analysis, correcting for sample attrition using interactions between year and function as an instrument, gave very similar results to OLS and was not able to disconfirm the hypothesis that the selection and performance equations were independent.

Among the controls, I find higher performance ranks for men and white employees. Men do not have higher competence or contribution ratings,

Table 3. Multinominial Logit Analysis of the Determinants of Mode of Job Entry (N = 7346)*

	Model 1			Model 2		
Variable	Simple promotion	Simple transfer	Promotion and transfer	Simple promotion	Simple transfer	Promotion and transfer
Group turnover proportion at job entry	9.863•••	12.00•••	9.395•••	9.659•••	12.03•••	9.127•••
	(.371)	(1.529)	(.589)	(.373)	(1.586)	(.595)
Group new hire proportion at job entry	-7.158•••	.715	-3.826•••	-7.050•••	.987	-3.742•••
	(.281)	(1.180)	(.549)	(.283)	(1.201)	(.546)
White				.143	-.257	.281
				(.134)	(.804)	(.290)
Asian				-.014	-.572	-.0743
				(.148)	(.920)	(.320)
Male				-.134•	-.111	-.362••
				(.079)	(.484)	(.160)
Experience				-.054•••	.034	-.079•••
				(.006)	(.030)	(.014)
Highest Bachelor's				-.745•••	-.614	.077
				(.246)	(1.157)	(.660)
Highest Master's				-1.247•••	-.858	-.368
				(.249)	(1.177)	(.666)
Highest Ph.D.				-1.689•••	-.692	-.905
				(.273)	(1.226)	(.724)
Log likelihood	-4678			-4338		
Chi-squared	2364			3316		
Degrees of freedom	324			345		
Probability	.0000			.0000		
Probability versus prior model (likelihood ratio)				.0000		

•$p < .10$; ••$p < .05$; •••$p < .01$.

* Standard errors are in parentheses. All analyses include dummies for rank, function, division, year, and city. The base case is entry by hiring. Also includes job spells for which performance data were missing.

though. I also find that workers with less education and experience perform better. These results likely reflect selection effects: holding the position constant, workers who reach that position at an earlier age and with less education are likely to have higher innate ability, which shows up as higher performance.

Characteristics of External Hires versus Promoted Workers

I tested for differences in workers' observable indicators of ability using a multinomial logit analysis, in which the dependent variable was mode of job entry and the unit of analysis was the job spell. Because this analysis did not draw on performance data, I was also able to include spells for which performance data were missing. The results are shown in table 3. This analysis cannot distinguish the determinants of selection into these jobs, because there is no information on the applicant pool from which the workers were picked (Fernandez and Sosa, 2005). In the absence of data on the applicant pools, however, these analyses can at least determine whether the characteristics of successful candidates for hiring and internal moves are consistent with my theory. Because external hiring is the excluded category, coefficients represent differences between the characteristics of internal movers and external hires. To achieve

convergence, I controlled only for division rather than department. Chi-squared tests also indicated very poor fit for models including interactions between rank and function, so I excluded these interactions from the models. I also excluded controls for hiring and turnover at the current date, as I only included one observation per job spell.

Consistent with H2a, external hires are significantly more experienced than promoted workers (both simple and combined). External hires are also better educated than workers entering the job through simple promotions, being more likely to have completed every level of education. The large sizes of the standard errors on the education coefficients for simple transfers and combined transfers and promotions prevent us from making inferences about these differences. As predicted by H2b, transfers have more experience than workers entering the job through simple promotions ($p < .013$). There are no significant differences between the experience of transfers and external hires. I experimented with dropping workers from the second-lowest rank, in case the results reflected recruitment directly out of graduate programs at that level, and the results were robust to this exclusion.

Among the other worker characteristics, men are more likely to enter the job by external hiring than promotion, although the coefficient for simple promotions is only marginally significant ($p < .10$).

Pay

Table 4 analyzes the determinants of compensation. Because I was concerned that pay would be more sensitive to the nature of the job than other outcomes, and because ordinary least squares does not present convergence problems in the presence of multiple controls, I used additional controls for all interactions between rank and division (I also experimented with controlling for group, but this had little effect on the estimates). Because workers who had been at Croesus less than a year would likely receive a lower bonus, I controlled for the number of days in that year since the worker was hired (maximum value of 365) and whether he or she was terminated during the year. I also controlled for performance and general human capital, although the results were very similar when these controls were excluded. Table 4 examines the determinants of log salary, log bonus, and log total compensation.

The results provide substantial support for H3a. All internal movers received significantly lower salaries than external hires (models 1 and 2). Internal movers also received lower total compensation than external hires when looking across all observations (model 5), although simple transfers did not have lower total compensation in their first year (model 6). The lack of a significant coefficient on simple transfers, however, may be a statistical artefact. Although the interaction between simple transfers and time in job is non-significant, interpretation of the coefficients suggests that simple transfers would have lower pay than external hires in all years except their first one. Workers entering their jobs through both simple promotions and combined promotions and transfers also receive lower initial bonuses than external hires (model 4).

The results also support H3b. Simple transfers have significantly higher salaries and total compensation than other internal movers (models 1, 2, 5, and 6). They also have higher initial bonuses (main effect in model 4).

Table 4. OLS Regressions of Determinants of Pay (N = 14,515)*

	Log Salary		Log Bonus		Log Total Compensation	
Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Full time	1.042•••	1.048•••	1.181•	1.234••	1.065•••	1.076•••
	(.145)	(.145)	(.621)	(.624)	(.182)	(.183)
Terminated during year	.0118	.0106	-9.680•••	-9.685•••	-.367•••	-.368•••
	(.0171)	(.0171)	(.237)	(.236)	(.0611)	(.0609)
Days since hiring (max 365)	-.0002•••	-.00005	.0009	.0014•	.0001	.0002•
	(.00003)	(.00003)	(.0006)	(.0007)	(.0001)	(.0001)
Group turnover proportion at entry	-.0128	-.0053	-.0317	-.001	-.0153	-.0077
	(.0130)	(.0129)	(.241)	(.241)	(.0471)	(.0466)
Group hiring proportion at entry	.0166•	.0188•	-.152	-.144	.0303	.032
	(.0101)	(.0100)	(.167)	(.167)	(.0326)	(.0325)
Group hiring proportion	.0227•••	.013	.428••	.396••	.0709••	.0634•
	(.0084)	(.0083)	(.197)	(.199)	(.032)	(.0326)
Group turnover proportion	.0282•••	.0265•••	-.339	-.344	-.0957••	-.0971••
	(.0097)	(.0096)	(.258)	(.257)	(.0412)	(.0410)
Time in job	.0162•••	-.001	-.0387	-.0839	.0358•••	.0243••
	(.0011)	(.0022)	(.0239)	(.0552)	(.00455)	(.0113)
Experience	.0027•••	.0027•••	-.0095••	-.0096••	-.0024•••	-.0024•••
	(.0003)	(.0003)	(.0038)	(.0038)	(.0008)	(.0008)
Male	.0176•••	.0175•••	-.0391	-.0403	.0711•••	.0708•••
	(.0037)	(.0037)	(.0436)	(.0436)	(.01)	(.01)
Asian	.0076	.0076	.0154	.0166	-.0102	-.0099
	(.0064)	(.0064)	(.0908)	(.0906)	(.0183)	(.0181)
White	-.0026	-.0028	.0324	.0332	-.0360••	-.0358••
	(.0059)	(.0059)	(.0808)	(.0806)	(.0171)	(.0170)
Highest Bachelor's	.0090	.0096	-.217	-.219•	-.0521•	-.0527•
	(.0116)	(.0117)	(.132)	(.132)	(.0273)	(.0274)
Highest Master's	.0259••	.0262••	-.197	-.201	-.0427	-.0436
	(.0116)	(.0116)	(.134)	(.134)	(.0280)	(.0281)
Highest Ph.D.	.0577•••	.0573•••	-.114	-.122	.0051	.0034
	(.0127)	(.0127)	(.149)	(.149)	(.0317)	(.0318)
Contribution	-.0009	-.0005	.233•••	.234•••	.0756•••	.0758•••
	(.002)	(.002)	(.0397)	(.0396)	(.0077)	(.0077)
Competence	.007•••	.0066•••	.114•••	.113•••	.0484•••	.0482•••
	(.0017)	(.0017)	(.0360)	(.0360)	(.0064)	(.0063)
Ranked performance	.0091•••	.0093•••	.356•••	.357•••	.0783•••	.0785•••
	(.001)	(.001)	(.0181)	(.0181)	(.0034)	(.0034)
Simple promotion	-.113•••	-.161•••	-.137••	-.294••	-.129•••	-.167•••
	(.0035)	(.0057)	(.0533)	(.121)	(.0116)	(.0234)
Promotion and transfer	-.113•••	-.171•••	-.108	-.423••	-.176•••	-.264•••
	(.0073)	(.0115)	(.103)	(.215)	(.0214)	(.0403)
Simple transfer	-.0376•••	-.0619•••	-.0488	.0493	-.0552•••	-.0384
	(.0049)	(.0071)	(.075)	(.143)	(.0148)	(.0267)
Simple promotion x Time in job		.0233•••		.0769		.0184
		(.0025)		(.0605)		(.0123)
Promotion and transfer x Time in job		.0305•••		.178		.0498•••
		(.0049)		(.111)		(.0192)
Simple transfer x Time in job		.0079••		-.108		-.0211
		(.0035)		(.085)		(.0147)
R-squared	.863	.865	.69	.691	.845	.845
Probability vs. prior model (Wald)		.0000		.0213		.0002
P (simple prom. vs. simple trans.)	.0000	.0000	.21	.0018	.0000	.0000
P (prom. & trans. vs. simple trans.)	.0000	.0000	.60	.022	.0000	.0000

•$p < .10$; ••$p < .05$; •••$p < .01$.

* Standard errors, in parentheses, are clustered by individual. Includes controls for city, year, rank, function, department, all interactions between rank and function, and all interactions between rank and division.

The overall magnitudes of the effects are also large. Initially, workers entering their jobs through simple promotions receive salaries and total compensation that are around 15 percent lower than external hires. The interaction coefficient with time in job suggests that the salaries of simple promotions would only catch up with external hires after seven years—a longer time span than almost anyone is present within the data—and that their total compensation would never converge with external hires'.

Among the controls, measures of group hiring and turnover have positive effects on pay. Results also show positive effects of indicators of ability (experience, Master's and Ph.D.s) on salary, but negative effects on bonus, consistent with their effects on performance. When I dropped job-level controls (not reported here), I found positive, significant effects of experience and education on all components of pay.

I explored whether the higher pay of external hires might reflect labor market conditions. Baker, Gibbs, and Holmstrom (1994b) found that the pay of continuing workers within a firm responded less to market forces than the pay of new hires. Rapid increases in market pay during the period of the study might then have affected the wage differential. The very high correlation between year of entry and mode of entry prevented me from simply controlling for when workers entered the firm. Instead, I compared trends in the pay given to new hires versus continuing workers (results available from the author) and found that continuing workers' compensation actually varied more from year to year than did the compensation of new hires. This analysis suggests that external labor market changes do not drive the pay premium.

Subsequent Mobility

I analyzed the determinants of subsequent promotions and exits at Croesus using Cox event history models. The time that an individual is in a specific job is treated as a unique case, during which the worker remains at risk of promotion or exit. I treated promotion, exit, and transfers as competing risks; for each analysis, exits from the data for any cause other than the focal one were classified as censored events (Allison, 1984). I also used slightly different samples for analysis of terminations versus promotions. For the promotion analyses, I dropped observations that were not at risk of promotion because they were in the top two ranks (I never observed promotion out of those ranks) or in the final year of the data. For the exit analyses, I dropped data from before 2006 because of problems with Croesus's coding in prior years. The exit analyses also used performance data from the year prior to termination, because workers did not receive performance rankings in the year of their termination. I also included dummies for division but not department in the exit analyses. Analyses using department dummies gave similar results but were less stable. The models are presented in table 5. For each outcome, I present models with and without performance variables. Analyses that excluded salary and demographic variables showed somewhat stronger effects of the mobility variables.

Consistent with H4a, I find that external hires are promoted more rapidly than workers who had entered the job through simple promotions. I find no support for H4b, that workers entering the job through combined promotions and transfers have even slower rates of promotion; instead, their rates are slightly higher than those of workers entering through simple promotions. I also

Table 5. Cox Analysis of Hazard Rates of Mobility*

	Promotion		Involuntary Exit		Voluntary Exit	
Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Full time	-.794	-1.104	-.097	-.332	-1.344•••	-1.302•••
	(1.421)	(1.482)	(.290)	(.288)	(.235)	(.230)
Group turnover proportion	-.133	.33	3.609•••	3.424•••	2.973•••	2.853•••
	(.356)	(.362)	(.133)	(.136)	(.156)	(.156)
Group turnover proportion at entry	-1.615•••	-1.502•••	1.303•••	1.447•••	.580•••	.682•••
	(.318)	(.345)	(.199)	(.199)	(.214)	(.213)
Group hiring proportion	.402	.389	-1.937•••	-1.904•••	-.459	-.463
	(.291)	(.300)	(.400)	(.399)	(.298)	(.298)
Group hiring proportion at entry	-.274	-.154	-.922•••	-1.132•••	.286	.27
	(.242)	(.252)	(.262)	(.269)	(.232)	(.233)
Experience	-.089•••	-.042•••	.0365•••	.0222•••	-.037•••	-.051•••
	(.007)	(.007)	(.0051)	(.005)	(.007)	(.007)
Male	.233•••	.159••	-.011	.008	.179••	.179••
	(.078)	(.08)	(.077)	(.078)	(.081)	(.081)
Asian	.149	.309••	.065	.062	.012	.042
	(.148)	(.151)	(.141)	(.139)	(.143)	(.143)
White	.322••	.283••	-.251••	-.247••	-.13	-.076
	(.134)	(.138)	(.126)	(.126)	(.131)	(.131)
Highest Bachelor's	-.796•••	-.661•••	.055	.067	.202	.164
	(.224)	(.233)	(.202)	(.204)	(.302)	(.302)
Highest Master's	-.726•••	-.489••	.222	.174	.064	-.026
	(.225)	(.233)	(.206)	(.208)	(.304)	(.304)
Highest Ph.D.	-.669•••	-.414	.254	.188	-.038	-.139
	(.249)	(.256)	(.238)	(.240)	(.328)	(.329)
Log salary	3.729•••	2.296•••	-.574•	-.017	1.263•••	1.644•••
	(.316)	(.327)	(.296)	(.308)	(.306)	(.313)
Simple promotion	-.459•••	-.653•••	-.464•••	-.181••	-.190••	-.0631
	(.077)	(.08)	(.088)	(.091)	(.087)	(.088)
Promotion and transfer	-.297•	-.330•	-.846•••	-.533•••	-.462•••	-.326••
	(.175)	(.179)	(.205)	(.206)	(.174)	(.174)
Simple transfer	1.463•••	1.464•••	.284•••	.173	-.108	-.233••
	(.112)	(.116)	(.104)	(.107)	(.123)	(.126)
Ranked performance		.584•••		-.179•••		-.209•••
		(.034)		(.033)		(.033)
Contribution		-.041		-.481•••		-.01
		(.065)		(.065)		(.063)
Competence		.269•••		-.341•••		-.132••
		(.058)		(.058)		(.056)
Observations	10,751	10,751	10,952	10,952	10,952	10,952
Log likelihood	-10226	-9857	-7610	-7435	-8001	-7953
Chi-squared	1728	2466	1850	2200	1391	1488
Degrees of freedom	638	641	148	151	148	151
Probability vs. prior model (LR test)	.0000	.0000	.0000	.0000	.0000	.0000
P(simple prom. vs. prom. & trans.)	.34	.06	.06	.08	.09	.11
P(simple trans. vs. prom. & trans.)	.000	.000	.000	.001	.48	.16

•$p < .10$; ••$p < .05$; •••$p < .01$.

* Standard errors, clustered by individual, are in parentheses. Exit analyses only contain years 2006–2009. Promotions and transfers are treated as censored events. All analyses also include controls for city, year, rank, function, and all interactions between rank and function. Promotion analyses control for department; exit analyses control for division.

find that simple transfers have the highest promotion rates. This result may reflect the experience that such transfers have already accrued in their rank. If transfers can demonstrate performance in their new job, their experience may allow them to be promoted more rapidly than others.

In developing H4a, I argued that new hires would have higher performance variance than internal movers. I tested this assumption by exploring the distribution of performance scores for hires versus internal movers. I found that hires were much more likely than internal movers to receive below median performance ratings, but only slightly less likely to receive the highest performance category relative to the median. These results confirmed that hires' lower average performance reflected a disproportionate likelihood of their being poor performers, rather than uniformly lower performance across the distribution. I was not able to find evidence, though, that hires were actually overrepresented at the top of the performance distribution. This may in part reflect the relatively crude nature of the performance measures.

Results also show strong support for H5a and H6. External hires have higher involuntary and voluntary exit rates than workers entering the job through either simple promotions or combined promotions and transfers. External hires have around a 61 percent higher hazard rate of involuntary exit than workers entering through simple promotions, and a 21 percent higher hazard rate of voluntary exit (models 3 and 5). Performance explains a substantial amount of the effect of job entry on all forms of exit and fully mediates the effects of simple promotion on voluntary exit rates. This finding suggests that the increased voluntary exit of hires reflects problems of firm-specific skills and fit, rather than a higher fixed propensity to turn over.

Results show no significant support for H5b; in fact, involuntary exit rates for workers entering the job through combined promotions and transfers are significantly lower than those of other internal movers. By contrast, involuntary exit rates for simple transfers are significantly higher than those for workers entering the job by simple promotions ($p < .000$ in model 3) and higher than external hires before performance controls. It is possible that this higher exit rate reflects the process by which individuals became transfers. In supplementary analyses, I found that transfers had previously had much lower performance evaluations than those remaining in their jobs. Such a history of poor performance likely leaves transfers vulnerable to involuntary exits.

One concern is that some voluntary exits may reflect workers being counselled to leave. Croesus coded the reasons for voluntary exits into 23 categories. Of the reasons given, those most likely to reflect signals from management were the roughly 25 percent of exits that occurred because of dissatisfaction with career development or promotion opportunities. I conducted a robustness check by dropping these exits and rerunning the analyses. I found the same results. I also reran the analyses using a competing risk regression model, which assumes that the observations that fail from a competing risk would never fail from the focal cause (Fine and Gray, 1999). The results were somewhat weaker, reflecting the increased representation of external hires in all classes of failure, but continued to support the hypotheses.

Supplementary Analysis: Source of Hires

Although this paper focuses on differences between external hires and internal movers, analyses can shed further light on the underlying mechanisms by

examining the effects of different sources of hires. For example, I argued that new hires are paid more because they and the firm have less information about each other. Workers hired through sources that can provide more reliable information to each party should then receive lower pay than other hires. In particular, we would expect that workers brought in through employee referrals would have the most information about their potential match with the job, because internal contacts are more likely to provide applicants with rich information about the proposed job, and firms and applicants may be more likely to trust that information (Fernandez, Castilla, and Moore, 2000; Castilla, 2005). A corollary of the above arguments is therefore that workers hired through employee referrals should have lower pay. Looking at the source of hire can also shed light on the influence of adverse selection. There is a concern that new hires may often be those workers who were unsuccessful in their previous jobs and may even have been laid off. We might therefore expect that workers hired through unsolicited applications are more likely to perform poorly than those hired through a headhunter, who are more likely to be poached from current jobs.

The data provided by Croesus included the referral source for the hire of each worker (although these data were missing for 848 workers). Of the workers with source-of hire data, 785 were referred by an employee, 624 were intermediated hires, through an employment agency or executive search firm, 407 were hired following unsolicited applications, 64 were hired through an Internet application, 50 came from temporary jobs, and 18 were former employees. I dropped the 33 workers who entered through mergers or mass hires of business and categories with fewer than 15 workers to simplify the analysis. I analyzed determinants of performance and pay for these external hires using the same specifications as the comparisons of external hires and internal movers, but restricting the analyses to external hires for whom I had hiring-source data.

Performance analyses are reported in table 6. The first model shows performance relative to employee referrals, while the second model compares employee referrals and all other hires. The results show that intermediated hires performed worse than either employee referrals or unsolicited hires. This is the opposite of what adverse selection might predict, because intermediated hires are among the least likely to have been already looking for a job due to poor performance. Instead, the result raises the possibility that Croesus may place too much trust in its intermediaries, underestimating the challenges that their candidates will face. Employee referrals have significantly higher-ranked performance than other hires, but differences are not significant for other measures. I also find that former employees are rated lower on competence than other workers. This result suggests that firm-specific skills may decay during time spent away from the organization.

Table 7 analyzes the effects of different hiring routes on how workers were paid. For each measure, I again present results relative to employee referrals (the first two models) and relative to all other categories (the third model). The results show that employee referrals received less total compensation than other hires. The differences versus intermediated hires are particularly significant. Results for salary and bonus are weaker, although intermediated hires receive significantly more salary than employee referrals in model 2.

Table 6. Ordered Logit Analyses of Performance by Hiring Source (N = 3,792)*

	Ranked Performance		Competence		Contribution	
Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Experience	-.078•••	-.076•••	-.039•••	-.038•••	-.052•••	-.049•••
	(.008)	(.008)	(.008)	(.008)	(.008)	(.008)
Male	-.036	-.026	-.132	-.117	-.145	-.119
	(.097)	(.097)	(.101)	(.1)	(.101)	(.101)
Asian	.124	.119	.259	.241	.449••	.432••
	(.149)	(.151)	(.174)	(.172)	(.176)	(.176)
White	.458•••	.466•••	.490•••	.477•••	.496•••	.499•••
	(.137)	(.139)	(.156)	(.154)	(.156)	(.156)
Highest Bachelor's	-.285	-.283	-.306	-.315	-.953•••	-.979•••
	(.255)	(.252)	(.308)	(.310)	(.294)	(.300)
Highest Master's	-.382	-.387	-.395	-.417	-1.002•••	-1.041•••
	(.259)	(.257)	(.311)	(.314)	(.297)	(.303)
Highest Ph.D.	-.558•	-.555•	-.251	-.266	-.959•••	-.994•••
	(.290)	(.288)	(.339)	(.341)	(.335)	(.341)
Time in job	.401•••	.393•••	.279•••	.263•••	.454•••	.431•••
	(.041)	(.041)	(.042)	(.041)	(.043)	(.0419)
Former employee	-.575		-.962••		-.675	
	(.663)		(.485)		(.552)	
Internet application	-.219		-.445••		-.101	
	(.221)		(.209)		(.201)	
Temporary	.274		-.02		.411	
	(.306)		(.24)		(.338)	
Unsolicited	-.011		.095		.298••	
	(.113)		(.117)		(.116)	
Intermediated	-.340•••		-.204••		-.274•••	
	(.092)		(.097)		(.099)	
Employee referral		.200••		.122		.052
		(.081)		(.085)		(.086)
Cut 1	-.559	-.561	-8.441•••	-7.829•••	-6.405•••	-6.373•••
	(.865)	(.905)	(1.033)	(1.051)	(1.463)	(1.562)
Cut 2	-.162	-.165	-4.913•••	-4.302•••	-2.091••	-2.061•
	(.865)	(.907)	(.866)	(.884)	(1.055)	(1.189)
Cut3	2.565•••	2.551•••	-1.246	-.645	1.829•	1.836
	(.868)	(.908)	(.863)	(.883)	(1.054)	(1.187)
Cut 4	2.941•••	2.927•••	1.534•	2.126••	5.236•••	5.219•••
	(.868)	(.907)	(.864)	(.885)	(1.060)	(1.192)
Cut 5	4.497•••	4.480•••				
	(.871)	(.910)				
Log pseudo likelihood	-5121	-5131	-3646	-3655	-3307	-3327
Chi-squared	3616	3725	2831	2811	2539	2518
Degrees of Freedom	105	101	103	100	103	100
Probability	.0000	.0000	.0000	.0000	.0000	.0000

•$p < .10$; ••$p < .05$; •••$p < .01$.

* Standard errors, clustered by individual, are in parentheses. All analyses include dummies for rank, function, interactions between rank and function, division, year, and greater New York area. Only hires included.

Although the findings are not consistent across all components of pay, the results for total compensation are consistent with an effect of information on external hires' pay premium. When external hires have access to information through internal contacts at the organization, they accept the job for less total

Table 7. OLS Regressions of Compensation by Hiring Source (N = 3,792)*

	Log Salary			Log Bonus			Log Total Comp.		
Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Experience	.002•••	.003•••	.003•••	-.041•••	-.013	-.0132•	-.009•••	-.0006	-.0009
	(.0004)	(.0004)	(.0004)	(.008)	(.008)	(.008)	(.00166)	(.001)	(.0014)
Male	.013••	.013••	.012••	-.16	-.17•	-.17•	.05•••	.062•••	.06•••
	(.006)	(.006)	(.006)	(.1)	(.09)	(.094)	(.02)	(.016)	(.016)
Asian	.002	-.00008	-.00007	-.04	-.11	-.10	.005	-.017	-.018
	(.01)	(.01)	(.01)	(.18)	(.17)	(.17)	(.03)	(.026)	(.026)
White	.006	.002	.002	.004	-.17	-.17	.01	-.02	-.022
	(.009)	(.009)	(.009)	(.16)	(.15)	(.15)	(.03)	(.02)	(.023)
Time in job	.001	-.0008	-.0003	-.006	-.11	-.10	.03••	.003	.004
	(.002)	(.002)	(.002)	(.07)	(.07)	(.07)	(.01)	(.013)	(.012)
Group turnover proportion at entry	.03	.027	.03	-.027	-.18	-.23	-.038	-.13	-.14
	(.03)	(.028)	(.03)	(.62)	(.54)	(.54)	(.14)	(.13)	(.13)
Group hire proportion at entry	-.03	-.029	-.03•	-.14	-.05	.015	.047	.07	.074
	(.02)	(.018)	(.018)	(.40)	(.36)	(.36)	(.088)	(.09)	(.091)
Group hire proportion	.015	.014	.012	.80••	.78••	.80••	.049	.08	.081
	(.013)	(.013)	(.013)	(.35)	(.34)	(.34)	(.053)	(.05)	(.052)
Group turnover proportion	.036••	.035••	.035••	.77	.68	.69	-.034	-.16•	-.16•
	(.018)	(.018)	(.018)	(.53)	(.52)	(.52)	(.077)	(.085)	(.085)
Full time	.79•••	.77•••	.77•••	1.35	.74	.75	.81•••	.80•••	.81•••
	(.24)	(.23)	(.23)	(1.48)	(1.35)	(1.35)	(.20)	(.20)	(.20)
Terminated during year	-.061••	-.017	.037•••	-14.53•••	-12.85•••	-13.13•••	-2.39•••	-2.08•••	-2.17•••
	(.028)	(.027)	(.013)	(.49)	(.67)	(.55)	(.093)	(.14)	(.14)
Days since hiring (max 365)	-.00002	-.00006•	-.00006•	.003•••	.0015•	.0015•	.0008•••	.0004••	.0004••
	(.00004)	(.00004)	(.00004)	(.0009)	(.0009)	(.0009)	(.0002)	(.0002)	(.0002)
Contribution		.002	.0013		.13	.12		.056•••	.054•••
		(.003)	(.003)		(.089)	(.09)		(.016)	(.016)
Competence		.01•••	.0098•••		.15••	.14••		.049•••	.050•••
		(.003)	(.003)		(.07)	(.07)		(.012)	(.012)
Ranked performance		.009•••	.009•••		.46•••	.46•••		.087•••	.087•••
		(.0016)	(.002)		(.04)	(.04)		(.007)	(.007)
Highest Bachelor's	-.02	-.017	-.016	-.3	-.18	-.18	-.20•••	-.14•••	-.14•••
	(.016)	(.015)	(.015)	(.4)	(.36)	(.36)	(.05)	(.037)	(.038)
Highest Master's	-.004	.0005	.001	-.40	-.22	-.22	-.18•••	-.11•••	-.11•••
	(.016)	(.015)	(.015)	(.40)	(.36)	(.36)	(.05)	(.038)	(.04)
Highest Ph.D.	.02	.028•	.028•	-.48	-.25	-.25	-.13••	-.062	-.063
	(.017)	(.017)	(.017)	(.43)	(.38)	(.38)	(.05)	(.046)	(.046)
Former employee	.06•••	.064••		-.19	-.16		-.12••	-.037	
	(.026)	(.025)		(.46)	(.40)		(.06)	(.05)	
Internet	-.001	.0017		.28	.37		-.021	.04	
	(.012)	(.012)		(.24)	(.24)		(.036)	(.03)	
Temporary	-.0009	-.001		.20	.15		-.008	-.026	
	(.017)	(.016)		(.21)	(.18)		(.037)	(.043)	
Unsolicited	.001	.0005		.053	.047		.036	.03	
	(.006)	(.006)		(.13)	(.12)		(.028)	(.02)	
Intermediated	.009	.011••		.023	.14		.05••	.062•••	
	(.005)	(.005)		(.11)	(.098)		(.02)	(.021)	
Employee referral			-.0077•			-.11			-.044••
			(.0045)			(.08)			(.018)
R-squared	.89	.895	.894	.701	.73	.729	.796	.87	.87

•$p < .10$; ••$p < .05$; •••$p < .01$.

* Standard errors, clustered by individual, are in parentheses. Includes controls for city, year, all interactions between rank and function, all interactions between rank and department, and division. Only hires included.

compensation. This finding is also interesting in its own right: some studies have suggested that workers hired through their personal networks receive higher pay than others, although other work has questioned these results (see Mouw, 2003, for a detailed discussion). I find that referrals actually receive lower pay, once the nature of the job is held constant.

It is also interesting to note that the total pay for unsolicited hires is not significantly different from intermediated hires ($p < .18$ in model 8), although there are differences in salary. I would expect that unsolicited hires were less happy in their current jobs than intermediated hires, given that unsolicited hires made the initial move to contact Croesus (Lee and Mitchell, 1994). It is possible that some of those unsolicited hires were even laid off. Negotiation theory suggests that workers' pay is shaped in part by the value of their alternatives (Bazerman and Neale, 1992); we would therefore expect that unsolicited hires would receive lower pay than intermediated hires, but the observed differences are very small.

DISCUSSION

As firms increasingly use both external hiring and internal mobility to staff higher-level jobs, we need to understand whether these different forms of worker mobility lead to different employment outcomes. To do so, this paper bridges theories of internal and external labor market matching, arguing that the routes by which workers enter jobs affects both the specific skills that workers bring with them and the information available to match those workers to jobs. Results show that external hires have worse performance than internal movers while being paid substantially more. Compared with workers entering a job through simple promotion, the most common form of internal mobility, external hires receive significantly lower performance evaluations for their first two years in the job yet are initially paid around 18 percent more. Hires also have much higher rates of exit from the job but, if they stay, faster subsequent promotion.

The results also showed that employment outcomes depend on how individuals move within the organization, as the nature of the prior job shapes the resources that workers bring to their new position. Workers who are simultaneously promoted and transferred have lower performance than other kinds of internal movers, consistent with the gap between the specific skills that they bring with them and those that they need for their new job. Lateral transfers have higher experience and pay than other internal movers as well as higher rates of subsequent promotion and exit. Those effects likely reflect the transfers' accrued experience at a higher organizational rank, as well as the selection of poorly performing workers for transfers. These results advance our knowledge of how hiring competes with internal mobility, as well as the consequences of different mobility paths within the labor market.

Performance, Skills, and Mobility

The results demonstrate that how workers enter their jobs affects their subsequent performance. Both new hires and those who are simultaneously promoted and transferred initially perform significantly worse than other workers. New hires' performance converges with that of internal movers over three

years, suggesting that the new hires are not systematically less able than those promoted to the job. Instead, the evidence suggests that hires and workers who are simultaneously promoted and transferred must learn new specific skills before they can perform as well as the other internal movers, who already have those skills.

The performance gap between hires and internal movers is particularly interesting given the differences in their observable characteristics: hires have more experience and education yet still perform worse than workers entering the job through simple promotions and simple transfers. That lower initial performance underlines the importance of both firm-specific skills and unobservable attributes in shaping performance, even in a setting in which interfirm mobility is very common.

One concern in interpreting the performance results is that the measures could be affected by supervisory bias. Although I lack objective performance data, there is variation in how the performance measures reflect objective outcomes. Although competence measures are largely subjective, contribution tracks the more concrete achievement of objectives. As table 2 revealed, results were actually *stronger* for the more objective contribution measure than for the competence or performance rank measures. Similarly, performance in some jobs is based on clearly measurable outcomes; in particular, traders and salespeople have clearly measurable performance in terms of profit and revenue. Supplementary analyses showed that performance differences between workers entering jobs through promotions and external hires were slightly greater for traders and salespeople, not weaker as we would expect if differences were driven by subjective biases. These results suggest that supervisory biases may actually minimize differences between internal movers and external hires. Those biases may reflect an escalation of commitment following a manager's decision to hire a worker (Schoorman, 1988) and are consistent with evidence that objective performance measures are more sensitive to organizational tenure than subjective measures (Sturman, 2003).

The findings showing that external hires perform worse than internal movers run contrary to predictions based on tournament theory. Chan (1996) suggested that firms' reluctance to weaken internal incentives by substituting hiring for promotion would lead them to hire only workers who were expected to perform substantially better than the workers they would promote. The higher observable human capital and faster rates of promotion of external hires observed in other studies has been used to support this theory (Baker, Gibbs, and Holmstrom, 1994a; Chan, 2006; Oyer, 2007). Though I replicated the prior results about promotion rates and observable human capital, I found that hires have a significantly lower average performance than workers promoted into the job. This result suggests that the stronger observable human capital and faster promotion of external hires reflect the need to compensate for their lower and less certain unobservable skills, not their higher overall ability.

The results also show that the performance effects of internal mobility depend on the nature of that mobility. The overwhelming majority of internal moves in my sample, both simple promotions and simple transfers, resulted in higher initial performance than hiring. The superior performance of simple transfers compared with external hires suggests that the performance advantages of workers who entered jobs through simple promotions are not a consequence of their remaining in exactly the same job: simple transfers have

performance similar to promoted workers, despite moving to a different part of the organization. This strong performance of simple transfers is particularly noteworthy, given that those transfers usually followed poor performance in a prior role.

I did find, though, that the 5 percent of internal moves that combined promotions and transfers led to performance that was little better than external hires. One interpretation of the performance similarities between hires and workers entering the job by combined promotions and transfers is that the kinds of skills that we think of as firm-specific are highly job-specific too. Radical job moves inside the organization may be as disruptive to working relationships and critical job knowledge as moves to another firm. An alternative interpretation is that internal moves to very different jobs require workers to develop different skills from external hires. If new hires usually come from similar roles in other organizations, they may experience less change in much of their work content than do the workers entering jobs by combined promotions and transfers. It may be that the need to learn the content of a new kind of job has similar consequences for performance as the loss of firm-specific skills.

The two hypotheses that were not supported were H4b and H5b, which suggested that workers entering their jobs through combined promotions and transfers would have lower rates of promotion and higher rates of involuntary exit than other internal movers. The lack of support for those hypotheses may reflect managers' recognition of the difficulties involved in making such complex moves and their forbearance during personnel decisions.

Incomplete Information, Workers' Characteristics, and Pay

The results also demonstrate how differences between hiring and internal mobility can affect the characteristics of workers entering jobs through those routes and their subsequent pay. The findings are consistent with two pathways through which incomplete information affects hires' pay: external hires have stronger observable indicators of ability, which should raise the wages that they command; there is also evidence that external hires' poorer expected fit with their jobs may increase their pay. Farber and Gibbons (1996) argued that pay differentials due to indicators of human capital should be constant over time, as those indicators reflect differences in workers' value to employers. That external hires' salary premium declines over time therefore suggests that this premium may not be due solely to their higher externally observable indicators of ability. External hires' higher turnover and termination rates also provide strong evidence of their poorer fit with their jobs, suggesting that they should demand higher wages than those who were promoted. The fact that employees' referrals received lower total compensation than other hires is also consistent with workers demanding less pay when they know more about the job, although results for salary and bonus were not significant.

These findings on hires' compensation extend Harris and Helfat's (1997) research on CEO labor markets. Their cross-firm study found that externally hired CEOs were paid more than internally promoted CEOs. I show that this phenomenon holds for workers being hired into similar jobs within the same organization and that it occurs despite a large performance gap between the external hires and promoted workers. I also shed new light on the mechanism behind this effect. While Harris and Helfat suggest that the pay premium for

external CEOs reflects demands for scarce specialist skills and the need to compensate hires for a loss of firm-specific skills, I provide evidence that the pay premium also reflects a need for hires to have stronger general observable attributes and the risk that they may be a poor fit for their new job.

I also found that levels of observable characteristics and pay varied systematically across different kinds of internal movers. In particular, transfers had significantly more experience than did those promoted, as well as higher pay, promotion, and involuntary exit rates. These differences between transfers and promoted workers likely reflect the increased time that transfers have spent in the higher levels of the firm, experience that translates into higher pay and improved prospects for promotion. It is possible that some of these results could also reflect the specific way that transfers were used in this organization: supplementary analyses confirmed that lateral transfers usually followed poor performance in a prior role, suggesting that the transfers provided a second chance to those who were struggling in their existing positions. Such use of transfers to find improved fit would explain the increased rate of both promotions and exits for transfers: when transfers do well in a new position, they appear to be promoted rapidly; when they struggle, they are swiftly terminated. These findings raise the question, though, of why the organization gives transfers a second chance, given the costs of doing so. My other findings suggest an answer: though transfers were more expensive than promoted workers, they had both higher performance and lower costs than the external hires who were their potential replacements.

Implications for Theory and Future Research

The findings of this paper could be developed in a number of ways. First, future research should explore how the results from this single site generalize elsewhere. One important influence on the generalizability of the results is likely to be the demands for firm-specific skills in different jobs and organizations, especially because an untested corollary of my arguments is that performance differences between hires and promoted workers will increase as demands for firm-specific skills increase. Although workers in investment banking are notoriously mobile, prior work has indicated that firm-specific skills are important in this setting (Groysberg, Lee, and Nanda, 2008). Performance differences between hires and promoted workers should be lower in settings with fewer demands for firm-specific skills.

Similarly, the effects of promotion versus hiring should depend in part on the nature of promotion. At Croesus, almost all promotions involve some measure of continuity with the prior job. Evidence from other studies suggests that such rank promotions are the norm in the broader labor market (Pergamit and Veum, 1999). The results of this study should therefore generalize to other settings, particularly those involving professional work in which responsibilities accrete gradually. Performance differences between hires and promoted workers should be lower in settings in which promotions involve greater changes in task content.

I conducted a partial exploration of how the findings might generalize by exploring their applicability across occupations and organizations. I carried out separate analyses on the investment professionals (traders, salespeople, research analysts, and investment bankers) versus support staff at Croesus to

check that the findings were not being driven by a particular occupational group. For the core findings of pay and performance I found consistent, significant results in each of these two groups, with the one exception of total compensation for simple transfers, which was higher among support staff. Second, I replicated the analyses in two other firms: an investment bank and a publishing company, although the less detailed data provided by these firms did not enable me to conduct all of the analyses here. In both cases, I found the same effects of paying more for external hires while giving them lower performance ratings.

Future research should address when firms choose to fill jobs through hiring versus internal mobility. In part, such research could address concerns about the endogeneity of staffing decisions, which might bias the results of this paper if factors that correlated with decisions to hire also correlate with pay or performance. I dealt with this issue in part by using very detailed controls for different jobs, including the levels of hiring and turnover in each group. These controls allowed me to hold constant a wide variety of measurable characteristics of the job, comparing workers who are hired and promoted into very similar jobs. A natural experiment or valid instrumental variable would provide a more robust approach to assessing causality. Although I was not able to find such an instrument in this study, the use of one would contribute to this research in the future.

A better understanding of the reasons for hiring would also be particularly interesting, given the high costs and poor performance of new hires documented here. It is possible that hiring reflects the difficulties of staffing all jobs by promotion (Cappelli, 2008), perhaps because the work requires relatively low ratios of junior workers to senior workers or because demands for particular kinds of workers are growing very rapidly. Alternatively, the firm might be prepared to accept poorer average performance from external hires if they receive disproportionate benefits from those few hires that turn out to have very high performance. Evidence from supplementary analyses (not reported here) suggests that firms are not hiring to find a few ''stars,'' though, as hiring was less likely in positions with more variation in individual performance, which are also the positions for which stars should be most valuable.

It would also be valuable to gather data on the jobs that external hires had come from, to establish whether their jobs had been at the same rank as the one that they entered at Croesus and whether they had been working in the same area as their new job. The similar experience of transfers and new hires suggests that external hires may be coming from similar levels in other organizations. My interviews also suggested that the organization was more likely to hire from a parallel level: experience at a similar level was an important indicator of ability to the firm; while Croesus might be willing to let an internal candidate learn the skills needed to operate in a new rank or area, external hires would be expected to have demonstrated relevant experience already.

A further important area for future study is the application of these ideas to gender and racial differences within organizations. I explored how problems of incomplete information led to differences between hires and internal movers in the achieved characteristics of experience and education. Much other research has explored how ascriptive characteristics such as race and gender are also used as indicators in hiring (Phelps, 1972; Heilman, 1980; Petersen and Saporta, 2004). Gender in particular may play an important role in employers'

inferences when jobs correspond to gender stereotypes (Cejka and Eagly, 1999), as is the case in investment banking (Groysberg, 2010). Gender and race differ substantially from experience and education, in that they do not relate directly to workers' productivity. Nonetheless, when employers use such characteristics as indicators of ability, we might expect to see gender and racial differences in how workers enter jobs. I found some evidence that women are more likely to enter jobs through promotion rather than external hiring, consistent with the findings of Petersen and Saporta (2004) (but see Gorman and Kmec, 2009). Given the absence of data on both internal and external applicant pools (Fernandez and Sosa, 2005), however, these results should be interpreted with caution. To the extent that women are less likely to reach higher-level jobs through external hiring, though, the results of this study have implications for overall gender inequality, because hires are better paid than internal movers. Further exploration of the way that indicators such as race and gender are used in promotion versus hiring decisions could therefore form a valuable extension to this research.

The findings of this study contribute to internal labor market theory by showing how the allocation of jobs and rewards in organizations is affected by hiring into higher levels. A central focus of internal labor market theory has always been to explain the patterns of pay and mobility in organizations (Stewman, 1986; Osterman, 1987; Althauser, 1989), yet this literature's focus on internal mobility has precluded detailed analysis of how external labor markets penetrate these structures. I contribute to this literature by showing that outcomes and mobility in internal labor markets can vary substantially based on whether workers were hired, promoted, or transferred into their current jobs. Such a finding is particularly important as firms become more open to external hiring.

The study also has implications for research on interorganizational careers (Arthur and Rousseau, 1996; Brett and Stroh, 1997). Building on Granovetter (1981), I show that how workers arrive in a position has important consequences for their careers, driving both their pay and future prospects. The results emphasize that cross-firm moves represent a double-edged sword for workers: holding the nature of the job constant, those who enter a job from outside receive higher pay but face a higher risk of termination. The results also provide a window into when people choose to build inter- or intraorganizational careers by showing how workers with stronger indicators of observable ability are better able to reach higher-level jobs externally.

Perhaps most importantly, the paper provides unique evidence on the value to firms of internal labor market structures. Results show that internal mobility allows the firm to staff higher-level jobs with workers who have better performance but are paid less. These results provide further insight into the effects of turnover on organizational performance (Glebbeek and Bax, 2004; Shaw, Gupta, and Delery, 2005) by specifying some of the costs of external hiring. They also contribute to debates on the functions of internal labor markets (Doeringer and Piore, 1971; Jacoby, 1985; Althauser, 1989; Cappelli, 2000) by providing unique evidence that workers promoted into jobs via the internal labor market do in fact have higher levels of firm-specific skills. The paper also identifies a novel benefit of internal labor markets: lowering wage costs by reducing the uncertainty that firms and workers face in the matching process. By detailing the strong advantages of internal mobility over external hires, these findings

help to explain the continued resilience of internal labor markets in the face of pressures for worker mobility.

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