Raids, Rewards, and Reputations in the Market for Managerial Talent

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Raids, Rewards, and Reputations in the Market for Managerial Talent

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We find that executives who jump to chief executive officer (CEO) positions at new employers come from firms that exhibit above-average stock price performance. This relationship is more pronounced for more senior executives. No such relationship exists for jumps to non-CEO positions. Stock options and restricted stock do not appear to significantly affect the likelihood of jumping ship, but the existence of an "heir apparent" on the management team increases the likelihood that executives will leave for non-CEO positions elsewhere. Hiring grants used to attract managers are correlated with the equity position forfeited at the prior employer and with the prior employer's performance.

The role of the managerial labor market as an incentive device has received substantial academic attention. If managers are concerned with their external career opportunities, they will tend to make decisions at their current employers that increase their appeal to others [e.g., Fama (1980), Holmström (1982)]. As the theoretical literature demonstrates, the effect of career concerns can be either value-increasing or value-decreasing from the current employer's perspective. For example, career concerns may encourage managers to work hard, but they may also lead to excessive risk aversion.

The empirical relevance of this literature depends on the nature of the demand for managerial talent: what do firms look for when attempting to hire a manager from outside the firm? A frequently mentioned possibility, which forms the basis of many theoretical models in this area, is the stock price of a manager's employer. If potential new employers view superior stock price performance as a signal of managerial ability, an executive should have an incentive to raise his current employer's stock price.

Assessing the empirical validity of the hypothesis that superior stock price performance does, in fact, increase the demand for an executive's services, is one of the principal goals of our study.

While executives may concern themselves with potential career prospects outside their firms, employers are often concerned with keeping their superior managers. This issue of executive retention has generated extensive discussions in the academic and popular press. Many of these discussions focus on the role of unvested options and restricted stock as "golden handcuffs" which serve to keep managers with their firms. Understanding executive retention, which can be viewed as part of the supply side of the interfirm market for managerial talent, is the second principal goal of our study.

To investigate these issues we construct two distinct samples of data on movements of top managers to new employers. The first sample (sample 1) is specifically constructed to examine the role of performance in the demand for managerial talent. Unfortunately this sample is not well suited to examining questions related to managerial retention. Consequently we construct a second sample (sample 2), which is better able to address retention issues. The results from both samples largely complement one another and, in our view, provide a fairly complete picture of the movement of executive talent across firms.

In sample 1 we identify every outside CEO hired by a set of 2,196 large publicly traded firms from 1990 to 1998. Using five-year buy-and-hold returns as our basic performance measure, we find that the prior employers of these executives exhibit, on average, superior stock price performance compared to a variety of benchmarks. This finding appears to be stronger for managers who jump immediately from their old employer to the new employer, and also for executives who were relatively more senior at their old employer. This evidence is broadly supportive of the hypothesis that superior firm performance enhances an executive's opportunities in the external labor market. It also suggests that higher-level managers are held more accountable for aggregate firm performance than are their more junior counterparts.

In sample 2 we examine 443 large publicly traded firms from 1993 to 1998 and identify all managerial departures where the executive immediately takes a job at another publicly traded firm. Confirming our results from the first sample, in logit models we find that superior five-year stock returns do increase the likelihood that an executive will jump to a CEO position at another employer. However, consistent with theoretical reasoning we develop below, we find that the likelihood of more lateral jumps, cases where executives jump to non-CEO positions at new firms, is not affected by firm performance. When we examine retention issues, we find no convincing evidence of a relationship between an executive's option and restricted stock position and the likelihood of jumping ship.

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Golden handcuffs do not appear to be very strong. However, we do find some evidence that internal promotion opportunities affect managerial retention. In particular, we find a significant relationship between the existence of an "heir apparent" and the likelihood that executives will jump to non-CEO positions elsewhere.

To complement these findings, we examine compensation contracts at the new employer for the outside CEO hires identified in sample 1. We find that these executives are typically awarded large initial hiring grants composed of stock options, restricted stock, and cash signing bonuses. The values of these grants (the "golden keys") are highly correlated with the values of the unvested option and restricted stock positions executives leave behind (the "golden handcuffs"). We present some evidence that the values of these hiring grants are also systematically related to firm performance at the old employer.

The rest of the article is organized as follows. In Section 1 we discuss the existing literature and motivate our analysis by presenting a simple model of the movement of managerial talent across firms. In Section 2 we describe our hypotheses and outline both our empirical design and the relative advantages and disadvantages of our two sampling procedures. The results from sample 1 concerning the performance of the prior employers of outside CEO hires are reported in Section 3. In Section 4 we present logit models predicting executive jumps in sample 2. Our results on compensation contracting are reported in Section 5. Section 6 concludes.

1. The Managerial Labor Market

1.1 Career concerns and labor market rewards

Following the original work of Fama (1980) and Holmström (1982), a large number of authors have examined the role of career concerns in managerial decisions and incentive contracting.[1] Theorists have hypothesized that concerns about labor market opportunities may affect capital investment, earnings manipulation, risk taking, capital structure, corporate control, and money management strategies. Several recent empirical studies provide evidence consistent with the hypothesis that managerial decisions are affected by reputational concerns in certain specialized labor markets.[2]

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[1] Incentive contracting in the presence of career concerns is addressed both theoretically and empirically by Gibbons and Murphy (1992). For related evidence see Bizjak, Brickley, and Coles (1993) and Gompers and Lerner (1999).

[2] Theoretical articles that examine the effect of career concerns on decision making include Narayanan (1985a, b), Holmström and Ricart i Costa (1987), Stein (1989), Scharfstein and Stein (1990), Boot (1992), Hirshleifer and Thakor (1992), and Bebchuk and Stole (1993). For empirical work, see Chevalier and Ellison (1999), Graham (1999), and Hong, Kubik, and Solomon (2000).

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While many of these theoretical studies assume that the labor market uses firm performance as an indicator of managerial ability, the empirical validity of this key assumption for corporate executives has not been thoroughly examined. In fact, despite considerable academic interest in career-concerns models and explanations for corporate behavior, we are aware of no published article in the finance/economics literature that has examined the mechanism governing the dynamics of voluntary job changes for active corporate executives. The most-related results in the literature concern the dynamics of the market for outside directorships; these articles find evidence that this market rewards managers from superior-performing firms [e.g., Kaplan and Reishus (1990) and Brickley, Linck, and Coles (1999)].[3]

In our view, an examination of the movement of executive talent across firms is an important complement to these studies of the market for directorships. While most outside directorships are awarded to very senior executives at or near retirement age, our study includes younger and more junior managers. These are precisely the managers for whom career concerns should be particularly important. In addition, much of our attention focuses on being hired as a CEO, a special position in terms of both compensation and prestige, and the career goal of many corporate executives (and Masters of Business Administration [MBA] students). Finally, because we examine active executives who can only work for one firm, our study is able to examine issues concerning executive retention and the allocation of managerial talent across firms, potentially yielding important insights that may help us better understand compensation contracting, organizational design, and corporate performance.[4]

1.2 Executive retention

When an executive leaves one firm to join another, it must be the case that the executive was offered the position and that he chose to accept. Thus there are both demand-side considerations (i.e., the executive is desirable to another employer) and supply-side considerations (i.e., the executive is willing to leave the current employer) that govern any observed set of job jumps. While much of the career-concerns literature focuses on the demand for managerial talent, anecdotal evidence suggests that firms are quite concerned with the supply side.[5] If managerial talent is an important input into profits, the ability to retain key managers will affect the quality of the management team, and, consequently, firm performance. Note that

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[3] See also Gilson (1989) and Canella, Fraser, and Lee (1995) on labor market opportunities following bankruptcy and Booth and Deli (1996) and Coles and Hoi (2003) for additional evidence on the market for directorships.

[4] Along these lines, recent work by Himmelberg and Hubbard (2000) and Oyer (2000) explores the role of labor market considerations in the structure of executive compensation contracts.

[5] See, for example, the April 9, 1998, *Wall Street Journal* article "Golden Heirs."

if firms are almost always successful at "locking in" their best managers, threats to depart to a new employer may not be very credible, in which case the outside labor market may not play a very important role in managerial incentives.

With regard to executive retention, Jackson and Lazear (1991) and Scholes (1991) discuss the role of unvested stock options as a device to lock managers into their current employers. Mehran and Yermack (1999) provide some empirical evidence supporting the hypothesis that options lock CEOs into their current employers.[6] For several reasons, we believe our study provides a particularly powerful test of the role of options and restricted stock in executive retention. First, we study executives below the CEO. As our data reveal, these executives are much more likely than CEOs to jump ship. Second, we have detailed data on actual job jumps rather than generic management turnover. Thus we are able to exclude many instances of firings, natural retirements, executives leaving with sold or spun-off divisions, etc. — cases that may contaminate other analyses. Finally, we are able to construct a precise measure of the value of the option and restricted stock package an executive forfeits by jumping ship.

In addition to the role of options in executive retention, one would expect that retention is also related to a manager's internal promotion opportunities at the current employer. Certainly firms spend a great deal of time on succession planning for exactly this reason.[7] In our investigation we specifically examine the role of internal promotion opportunities in executive retention.

1.3 A simple model of the managerial labor market

To motivate our empirical analysis, we present here a simple model where executives occasionally leave one firm to join another. The model borrows on Rosen's (1982) insight that efficiency considerations dictate that higher-ability managers should be assigned to jobs where the returns to ability are high; for example, positions with larger firms or more seniority. If firm performance is an indicator of managerial ability, then superior firm performance should lead to managers moving to improved positions in the managerial labor market. Since it is often difficult for senior executives below the CEO to move further up the corporate hierarchy without displacing other highly talented managers [i.e., as in Rosen (1982) there

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[6] There are several articles in the management literature that also examine compensation issues and management turnover [e.g., Bloom and Michel (2002), Hasenhuttl and Harrison (2000)]. Similar to most finance articles on turnover, these studies do not have precise data on managerial jumps to new employers.

[7] Bates, Jandik, and Lehn (2000) consider the role of promotion opportunities in the context of executive compensation. See Vancil (1987), Brickley, Coles, and Jarrell (1997), and Naveen (2000) on the succession planning process. The choice between inside and outside candidates for the CEO position has been examined by Parrino (1997) and Agrawal, Knoeber, and Tsoulouhas (2000).

are "slot constraints"], movement of talent will often be across firms.[8] Even high-ability CEOs will occasionally move if their talents can be more fully utilized at a new employer, say because the new employer is substantially larger than the current one. These *ability-matching* considerations generate our key empirical predictions.

Initially, at time $t = 0$, there are N managers indexed by $i \in \{1, 2, \ldots N\}$, where individual i is employed as a manager by current employer C_i. The individual's ability is represented by an unknown parameter θ_i. All parties have a common prior on θ_i which is distributed $N(\mu, \sigma_\theta^2)$. Profits of the individual's current employer, which we denote by π_i, have information content with regard to managerial ability. In particular, we assume that $\pi_i = \theta_i + \varepsilon_i$ where $\varepsilon_i \sim N(0, \sigma_\varepsilon^2)$. All model parameters are common knowledge and information is symmetric at all times.

At time $t = 1$, after profits are observed, a potential raider appears on the scene. The raider is interested in hiring a single manager among the set of managers working at other firms. Letting V be a parameter measuring the importance of a manager's current job, we assume that the manager's value to his current employer can be written as $V(\theta_i + m_{ic})$, where m_{ic} is represents the random quality of the match between the manager and his firm.[9] We expect V to be related to the size of the firm and the manager's position in the corporate hierarchy.[10] In a similar fashion, we define a manager's value to the raider as $W(\theta_i + m_{ir})$. For all i, we assume that initially $m_{ic} \sim N(0, \sigma_c^2)$, $m_{ir} \sim N(0, \sigma_r^2)$. At $t = 1$, immediately before the hiring decision is made, these match-specific parameters are revealed to all. Finally, we assume that ε_i, m_{ic}, and m_{ir} for $i \in \{1, 2, \ldots, N\}$ are all independent.

When the raider is making her hiring decision, she considers the N possible managers employed at other firms and attempts to hire the manager who will yield the raider the highest net-of-wage expected surplus. To keep things simple, we assume the raider makes a take-it-or-leave-it offer to whichever manager she decides to hire.[11] The manager can choose to

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[8] To use a sports analogy, when a team is winning, this may reflect well on the entire coaching staff. If the head coach is not leaving, the main option for an assistant coach to move up in the labor market is to take a head coaching position elsewhere. See Lazear (1986) for a model of job assignments across firms in an environment with asymmetric information. For models of job assignments within firms as ability is learned over time, see Murphy (1986) and Gibbons and Waldman (1999).

[9] These types of random matching considerations are emphasized in the labor economics literature on employee turnover [e.g., Jovanovic (1979)]. Note that our specification of the manager's value to an employer is similar in form to the specification of Gibbons and Waldman (1999).

[10] There is a great deal of empirical work indicating that executive compensation rises with both firm size [e.g., Murphy (1985), Kostiuk (1989), Schaefer (1998), and Baker and Hall (1998)] and rank in the corporate hierarchy [e.g., Murphy (1985), Leonard (1990), Baker, Gibbs, and Holmström (1994), and Gibbs (1995)]. Presumably, higher wages are used to attract managers of greater talent.

[11] As should be clear from the subsequent analysis, this offer structure is not essential to the main results regarding when job switches occur. In general, the division of surplus in wage negotiations in thin labor markets is difficult to characterize. See McLaughlin (1994).

accept the offer or, alternatively, he can propose a wage to his current employer. Let $\hat{\theta}_i$ denote the expected ability of manager i at the time the raider makes her decision. Since the current employer will always be willing to pay up to $V(\hat{\theta}_i + m_{ic})$ to retain the manager, the raider will have to offer this sum to acquire manager i's services. Consequently the surplus to the raider for hiring manager i will be $[W(\hat{\theta}_i + m_{ir})] - [V(\hat{\theta}_i + m_{ic})]$. The raider's problem then is to choose i to solve the following optimization problem:[12]

$$\max_{i \in \{1,2,\ldots,N\}} [W(\hat{\theta}_i + m_{ir})] - [V(\hat{\theta}_i + m_{ic})]. \tag{1}$$

Our goal is to consider the likelihood that a given manager is chosen by the raider at $t = 1$. Since the raider observes the profit level of manager i's firm, the raider will form an estimate of the manager's ability using standard Bayesian updating. As is well known [e.g., DeGroot (1970)], this estimate is given by

$$\hat{\theta}(\pi_i) = \frac{\sigma_\varepsilon^2 \mu_i + \sigma_\theta^2 \pi_i}{\sigma_\varepsilon^2 + \sigma_\theta^2}. \tag{2}$$

Now consider a given manager i. This manager will be successfully hired by the raider at $t = 1$ if hiring him yields a greater surplus than the raider's optimal choice among all other candidates. Mathematically this will occur when

$$[W(\hat{\theta}(\pi_i) + m_{ir})] - [V(\hat{\theta}(\pi_i) + m_{ic})] > \max_{j \neq i}[W(\hat{\theta}(\pi_j) + m_{jr})]$$
$$- [V(\hat{\theta}(\pi_j) + m_{jc})]. \tag{3}$$

From manager i's perspective, the right-hand side can be viewed as a random variable that is independent of π_i. Viewing the right-hand side as the raider's best alternative opportunity, we will denote this random variable by $\tilde{A}$. Making this substitution and rearranging yields the equivalent inequality

$$(W - V)\hat{\theta}(\pi_i) > \tilde{A} + (Vm_{ic}) - (Wm_{ir}). \tag{4}$$

Since the right-hand side of this inequality is a random variable independent of π_i, and since it is clear from Equation (2) that $d\hat{\theta}/d\pi_i > 0$, it is immediate that the probability that manager i chosen will be increasing in π_i as long as $W - V > 0$. Formally we can state the following proposition.

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[12] For simplicity, we ignore the condition that the objective function must be nonnegative, in which case the raider will choose not to hire. As should be clear from the analysis, explicit inclusion of this condition does not change the results we summarize in the proposition below.

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Proposition 1. *The relationship between P_i, the probability manager i is chosen by the raider, and observed profits π_i can be characterized as follows*:

   (i)   If $W - V > 0$, then $(dP_i/d\pi_i) > 0$.

   (ii) If $W - V = 0$, then $(dP_i/d\pi_i) = 0$.

   (iii) If $W - V < 0$, then $(dP_i/d\pi_i) < 0$.

The logic behind this proposition is quite intuitive. If $W-V$ is positive, the returns to ability are higher at the raiding firm than with the current employer. For example, if the raider is a larger firm or the position in the raiding firm has more responsibility than the position at the current firm, we would expect this condition to hold. When this condition holds, it is more likely that a high-profit manager will be successfully raided, because the gain from reemploying a high-ability manager's talents to a position where they can be more heavily used is relatively large. In contrast, when $W-V = 0$, the current employer and the raiding firm both place the same value on managerial ability, and consequently there is no gain or loss from transferring a high-ability worker from one firm to another. Finally, when $W-V$ is negative, ability is relatively more highly valued at the current employer, and thus positive inferences about ability arising from high profits make it less attractive, ceteris paribus, for the manager to move across firms.

It is likely that there are some factors that we have excluded from our model that may lock a manager into his existing employer. For example, the presence of a large stock option portfolio could make hiring the manager very costly. Alternatively, if the manager believes he will soon be promoted at the old firm, the present value of future expected wages if he stays could be high, thus making it again difficult to attract the manager. These intuitive considerations that may lock managers into their existing employers can easily be incorporated into our modeling framework. Assume the manager gives up B in lost benefits at the old firm if he accepts the raider's offer. Assuming the raider must compensate the manager for these lost benefits,[13] Equation (4) above – describing when manager i is successfully raided – will change to:

$$(W - V)\hat{\theta}(\pi_i) > \tilde{A} + (Vm_{ic}) - (Wm_{ir}) + B. \qquad (5)$$

Inspection of this inequality immediately implies that $(dP_i/dB) < 0$. In words, this just says that it is less likely that the raider will choose an employee who is locked into his old employer via an attractive option

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[13] In the case of large stock option and restricted stock positions, it is possible that the current employer will not try hard to keep her manager because departure allows the firm to cancel a large liability. For simplicity, we do not explicitly model the role of options and restricted stock in the wage strategy of the current employer.

package or an expected promotion. Inspecting Equation (5), note that when $W - V$ is large relative to B, it is unlikely that the benefits represented by B will be empirically important, since ability-matching considerations will largely govern the hiring process. When $W - V$ is small or negligible, there is more scope for these other factors measured by B to become empirically relevant.

2. Hypothesis Development and Empirical Strategies

2.1 Hypothesis development
2.1.1 The managerial ability hypothesis.
When firm performance is used by the labor market to assess managerial ability, our model predicts that we should observe a positive relationship between firm performance and the likelihood that a manager moves to a superior position at another firm. We will refer to this possibility as the "managerial ability hypothesis". A related implication that emerges from our model is that we should expect to find no apparent relationship between firm performance and the likelihood of lateral or downward moves to new employers.

In a related study, Hayes and Schaefer (1999) report some relevant evidence. They find that when executives leave their employers to accept high-level positions elsewhere, the average market reaction to the job change is negative for the firms the executives leave and positive for the firms they join. This evidence supports the hypothesis that executives perceived to have superior ability tend to be the ones that are raided by other firms. However, these results do not address the question of whether firm performance is used by the labor market as a signal of managerial ability — a key assumption in many of the career-concerns models discussed above.

In our tests of the managerial ability hypothesis, we use stock return data to construct our basic measures of firm performance. Certainly the internal reward structure of firms is heavily oriented toward rewarding managers based on firm stock performance via the use of stock options [e.g., Hall and Liebman (1998)]. However, stock returns may be a noisy measure of managerial ability [e.g., Rosen (1992)], and thus it is not immediately clear that the labor market will use this data as an indicator of managerial ability. In some of our analysis we experiment with other measures of firm performance based on accounting metrics.

To further examine whether the labor market uses firm performance as an indicator of managerial ability, in our analysis below we examine differences between higher-ranked executives and lower-ranked executives. If aggregate firm performance contains more information about the abilities of more highly ranked executives, then we expect to observe a stronger relationship between firm performance and labor market

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rewards for these individuals. Presumably for lower-ranked executives, the labor market would less heavily weigh stock returns and more heavily weigh other variables (e.g., divisional performance, analyst's reports, etc.).[14]

2.1.2 The training grounds hypothesis. An alternative to the managerial ability hypothesis is the hypothesis that managers from superior-performing firms may be desirable job candidates because they have developed valuable management skills (i.e., human capital) as a result of the superior performance of their firms. Put another way, you may hire a manager not because he was responsible for a winning performance, but rather because he has learned "how to win." This hypothesis, which we refer to as the "training grounds hypothesis", has implications that are similar to the managerial ability hypothesis in that both predict that managers will have an incentive to raise firm performance to enhance external labor market opportunities. However, the training grounds hypothesis does not imply any clear relationship between an executive's rank with his firm and the performance-outside opportunity mechanism.

2.1.3 The job-lock hypothesis. As discussed above, there are several potential factors that may make managers reluctant to leave their old employers, including stock options, restricted stock, internal promotion opportunities, and firm-specific human capital. We refer to the idea that these factors decrease the likelihood of a manager leaving his employer as the "job-lock hypothesis". The role of an executive's option and restricted stock portfolio is particularly important, since typically the value of this portfolio will be correlated with a firm's stock price. Thus, while executives from firms that perform well may be highly desired in the labor market, they also may be locked into their current employers. Consequently, in some of our empirical models where we do not have option and restricted stock data, the effect of performance will pick up a combination of these two opposing effects, thus biasing us against finding support for the managerial ability hypothesis.

In models where we do have precise data on variables related to potential job lock, we can directly examine this hypothesis and, more specifically, we can identify which factors are empirically relevant in attaching managers to their firms. We suspect that these factors may be more important for smaller or more lateral job changes, since if a manager is offered a large promotion in the labor market, it is unlikely that these

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[14] Aggarwal and Samwick (1999b) offer some related arguments and examine empirically the relative degree to which executive compensation is tied to stock returns for different members of the top management team. See also Fee and Hadlock (2002) on the role of stock returns in the involuntary turnover behavior of managers across the corporate hierarchy.

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concerns will be large enough to keep him with his current employer. In contrast, for more lateral movements, these factors could be large enough to keep the manager from moving.

2.2 Empirical strategies

To conduct our investigation, we need to identify a sample of executives who switch employers. One approach is to follow a fixed set of firms and identify all instances where a firm hires an individual from another firm (i.e., entry into a set of firms). An alternative approach is to follow a fixed set of firms and identify all instances where an executive departs to join another firm (i.e., exit from a set of firms). Without knowing much about the interfirm market for managerial talent, it is difficult to assess a priori which approach will identify a more informative dataset with regards to the questions at hand. To be comprehensive, we create two distinct samples based on the two approaches. Our hope is that the sample characteristics we uncover will not only be useful for exploring the validity of our hypotheses, but that they will also be of general interest to researchers concerned with the managerial labor market.

Our first sampling procedure examines a fixed sample of large firms over the 1990–1998 period and identifies all instances where these firms hire an outside CEO. We expect that cases where an outsider is hired as CEO will almost always represent an instance where a manager is promoted in the labor market. There are a couple of significant advantages to this first sampling procedure. One advantage is that we are able to construct a very large sample of outside CEO hires, whereas the second procedure results in a smaller set of CEO hires (but also a significant number of non-CEO hires). A second advantage is that this procedure allows us to use precise data on the exact timing and circumstances of the job change to create timely and sophisticated performance benchmarks. Finally, this sampling procedure allows us to study instances where unranked executives, that is, executives not among the five highest paid at the old employer, take CEO positions elsewhere. This feature of sample 1 allows us to present a more powerful examination of the role of seniority in the corporate hierarchy on labor market opportunities.

Our second sampling procedure is to follow all executives listed in the corporate proxy statements for a set of large firms from 1993 to 1998 and to identify all instances where these executives take jobs at new public employers. We then run logit models to predict when these job changes will occur. While this sampling procedure results in fewer job changes where an individual takes a CEO job at a new employer, it does allow us to contrast jumps to the CEO position with jumps to non-CEO positions. To the extent that the former are promotions in the labor market and the latter are not, our theory makes testable predictions about differences in the role of firm performance in predicting these two types of job changes.

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The second major advantage of sample 2 is that we have precise data on individual and firm characteristics for both the executives who jump to new employers and those who do not. This allows us to precisely examine the role of variables related to firm-specific human capital, executive stock options, and internal promotion opportunities. Thus, while our ability to examine the demand side of the managerial labor market may be somewhat weaker in the second sample, we are able to look at supply-side issues, on which the first sample is silent.

3. Analysis of a Sample of Outside CEO Hires: Sample 1

3.1 Sample selection

Our goal is to identify all outside CEO hires chosen by a set of large publicly traded firms. We choose this set by examining all nonfinancial, nonutility U.S. firms listed on both Compustat and the Center for Research in Security Prices (CRSP) over the 1990–1998 period. We then retain in the sample all firms ranked in the top 1,000 at the start of the fiscal year based on book assets, sales, or market value of equity. We eliminate all observations where the firm was not publicly traded as of the end of the fiscal year. The above procedures yield a final sample that consists of 2,196 firms representing 11,092 firm-years over the 1990–1998 period.

For the resulting sample, we identify every instance of a change in the firm's CEO by searching through the following sources: Standard and Poor's (S&P's) *Register of Corporations*, the Compact Disclosure database, corporate proxy and 10K statements, and news searches on the Dow Jones Interactive database.[15] There are 1,200 CEO changes in the sample. For approximately 95% of the CEO changes we were able to find news articles detailing the change.

Using our data sources, we categorize each CEO change into one of four categories: inside hires, interim hires, corporate control hires, and outside hires. We define an inside hire to be any new CEO who is employed by the firm for at least one year prior to the announcement of the appointment. Former employees and consultants hired by a firm are also considered inside hires. Interim hires are cases where a noninsider is assigned the title interim CEO and the individual keeps the CEO title for less than one year. Corporate control hires include all cases where the new CEO is an affiliate of an existing blockholder of the firm, and also cases where an affiliate of a party that was acquiring a block of shares is appointed as CEO. We categorize these corporate control hires

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[15] If there was no CEO, we assumed that the individual with the title Chairman and President was the CEO. In the few remaining cases with no clear CEO, we assigned the CEO title to the individual with the highest base salary.

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Table 1
Summary statistics for a set of outside CEO hires: sample 1

Number of CEO changes	1200
Number of CEO changes where new hire is an insider	772
Number of CEO changes where new hire is an interim hire	25
Number of CEO changes where new hire is a corporate control hire	85
Number of CEO changes where new hire is an outside hire	318
Number outside hires where executive comes from a foreign firm/nonprofit/government job	31
Number of outside hires where executive comes from private U.S. firm/consulting job	73
Number of outside hires where executive comes from another public U.S. firm	214
Number of raided outside public hires	153
Number of nonraided outside public hires	61
Mean one-year industry-adjusted stock returns of hiring firm—inside CEO hires	0.74%
Mean one-year industry-adjusted stock returns of hiring firms — outside public CEO hires	−20.92%
Percent of outside hires from same two-digit SIC industry, hiring firm performance above median	25.49%
Percent of outside hires from same two-digit SIC industry, hiring firm performance below median	27.18%
Percent of outside hires from same two-digit industry, hiring firm performance above or below median	26.34%
Mean age of outside CEO hires (years)	50.95
Mean tenure of outside CEO hires (years)	11.50
Percentage of outside hires where RANK = 1 at old employer	22.73%
Percentage of outside hires where RANK = 2 at old employer	19.19%
Percentage of outside hires where RANK = 3, 4, or 5 at old employer	25.76%
Percentage of outside hires where executive was unranked at old employer	32.32%

The set of CEO changes is derived from the set of all U.S. firms from January 1, 1990 to December 31, 1998, that were not in the financial services or regulated gas and electric utility industries and that were ranked in the top 1000 in either sales, book assets, or market value of equity at the start of the fiscal year. Inside hires are individuals who worked for the firm for at least 12 months before becoming CEO or who were former employees or consultants for the firm. Interim hires are noninsider hires who joined the firm as an interim CEO and kept the CEO title for less than one year. Corporate control hires are noninsiders who were affiliated with a new or existing blockholder in the firm. All other hires are considered outside CEO hires. Executives who were with a different public firm within 12 months of their being hired are considered to have come from that firm. Raided outside hires are cases where the individual leaves his old employer to immediately join the new firm. The stock returns figures for inside (outside public) CEO hires are derived from the stock returns in the fiscal year prior to the CEO change less the value-weighted two-digit industry return over that same period for the set of firms hiring an inside CEO (an outside CEO from another public U.S. firm). Figures on hiring from the same industry are for the set of 214 outside public CEO hires where we have data on the industry of the prior employer and the new employer. The determination of whether hiring firm performance was above or below the median is based on the median one-year industry-adjusted stock returns of firms hiring outside public CEOs. Age is the age of the executive as of the date he is hired by the new firm. The tenure variable is the number of years the executive worked at the old employer before his departure, rounded to the nearest whole number. RANK is the rank of the individual at the old employer based on his annual compensation during the last full fiscal year of service. All figures for raids, age, tenure, and rank are calculated over the set of 214 outside hires where the executive comes from another public U.S. employer.

separately from outside hires, because these are clearly not the arm's-length labor market transactions that we are interested in examining more closely.

All hires that are not in one of the aforementioned three categories are defined to be outside hires. These are cases where the new CEO is an outsider hired by the firm within 12 months of the date that he assumes the CEO title. The number of each type of CEO hire is reported in Table 1. As

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is apparent from the table, the frequency of outside hires is fairly high in our sample (318 of 1,200 total hires, or 26.5%). This is consistent with the findings of Parrino (1997) and Huson, Parrino, and Starks (2001), which indicate that the incidence of hiring outside CEOs has been increasing over time.

3.2 Details concerning outside CEO hires

For each of the 318 outside hires, we collect information on the employment history of the executive. If the individual worked for a public firm within 12 months of joining the new firm, we define the previous employer to be this public firm. If the individual did not work for a public firm within the 12-month period preceding the hiring date, we define the previous employer to be the private firm or institution employing the individual at the time of the hire. Many of the hires from private institutions were consultants who did have some prior experience working at public firms.

According to the above criteria, 214 of the outside hires in the sample were hires from public U.S. firms, while the remaining 104 were from private firms/consulting jobs, foreign firms, and nonprofit institutions. For each of the 214 individuals hired from public U.S. firms, we determine whether or not the executive jumped immediately from the old firm to the new firm. We create the variable RAID, which takes a value of one for these immediate jumps and a value of zero if there is an interim period during which the executive is between jobs. We refer to the outside hires where RAID = 1 as raided executives. As we report in Table 1, 153 (71.5%) of the 214 outside hires were raids.

While our main focus is on the performance of the prior employers of these outside CEO hires, in light of the existing literature on outside hiring [e.g., Parrino (1997)], it is interesting to briefly consider here the hiring firm's performance and propensity to hire from within the same industry. As we report in Table 1, the average one-year industry-adjusted stock returns in the fiscal year prior to the CEO change for firms that hire outsiders from other public U.S. firms is quite poor (mean −20.92%). This figure is significantly different from the corresponding 0.74% figure for inside hires (p-value < 0.01). Similar inferences can be made if we compare medians rather than means. Thus, as others have reported, it appears that poor performance tends to cause firms to hire outsiders. Our figures indicate that interindustry hiring is common when firms do hire outsiders. Approximately one-quarter (26.34%) of the outside CEO hires from other public firms come from a firm with the same two-digit SIC code, implying that the majority actually come from other industries. As the figures indicate, the propensity to hire from a different two-digit

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industry when a firm hires an outsider does not appear to depend on the hiring firm's performance.[16]

We identify some basic information concerning the individual and his job history at the previous employer.[17] First, we create a tenure variable that measures the number of years the individual worked at the previous employer at the time of departure. We also create a rank variable that is an individual's rank in the previous organization as measured by his compensation in the last proxy statement preceding departure using data from the Compact Disclosure CDs. Finally, we record the title and age of the individual at the time of departure. Summary statistics for some of these variables are reported in Table 1. RANK = 1 executives typically held the CEO title while RANK = 2 executives often held the president and/or the chief operating officer and/or the vice chairman position. The job titles of the unranked executives tended to be similar to executives of ranks 3–5 (e.g., senior vice president or executive vice president).

3.3 Characteristics of old job versus new job
An implicit assumption in our experimental design is that the outside CEO appointments in our sample can be viewed as rewards in the managerial labor market. To investigate the validity of this assumption for this sample, we collect compensation data for each executive at the old and new employer. We create the variable Old Salary (New Salary), which is set equal to the executive's base salary at his prior (new) employer.[18] As we report in Table 2, the mean (median) level of New Salary is substantially higher than the mean (median) level of Old Salary. Furthermore, the mean (median) ratio of New Salary to Old Salary is 1.50 (1.42), and in 84.7% of all cases this ratio is positive. For raided executives ranked in the top five at their previous employer, this ratio is positive for 92.7% of the observations. Clearly the fact that the overwhelming majority of the

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[16] Industry codes are notoriously imprecise, so it is likely that many of these hires from outside the two-digit industry are individuals who actually worked for firms that were not too dissimilar from the new employer. In unreported results, we examined whether firm performance affected the desired traits in an outside executive by dividing the outside hires into two groups based on whether the performance of the hiring firm was above or below the median. We found no significant differences between the two groups in the old employer's firm size or performance or in the executive's rank at his prior employer.

[17] For 18 of the 61 nonraids and 11 of the 153 raids we find evidence that the executive departed from his old employer for corporate control-related reasons (i.e., the employer was acquired, the assets the executive was managing were sold, etc.). If a firm or division was acquired and the executive stayed with the acquirer for less than one year and then immediately jumped from the acquirer to the new firm, we code RAID as one. In these cases we treat the acquired firm rather than the acquirer as the old employer in coding all of the other variables.

[18] If old salary data were not reported because the executive was not in the proxy statement, we set the Old Salary variable equal to the salary of the fifth highest paid individual. For proxy data prior to December 1992, salary and bonus were generally combined into a single cash compensation figure. Based on summary statistics for the other observations, in these cases we set Old Salary equal to 0.6 times cash compensation.

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Table 2
Characteristics of old and new positions for 214 outside CEO hires: sample 1

	Mean	Median	Number of observations
Old salary	469.74	424.08	190
New Salary	646.85	600.00	193
(New Salary/Old Salary) all observations	1.50	1.42	176
(New Salary/Old Salary) only non-upper bound observations	1.50	1.44	119
Potential value forfeited by voluntarily departing from old employer (FORFEIT)	4469.72	2354.73	97
Value of initial hiring grant at new employer	6913.56	3848.95	205
(Value of initial hiring grant/FORFEIT)	4.10	1.80	91
Book assets of new employer – new assets	3392.52	901.83	214
Book assets of old employer – old assets	23884.91	5824.69	212
(New assets/old assets) for RANK = 1 executives	4.51	2.72	43
(New assets/old assets) for RANK = 2 executives	0.48	0.29	38
(New assets/old assets) for RANK = 3 executives	0.31	0.21	20
(New assets/Old assets) for RANK = 4 executives	0.24	0.16	26
(New assets/Old assets) for RANK = 5 executives	0.54	0.11	5
(New assets/Old assets) for unranked executives	0.12	0.06	64

All compensation related figures are reported in thousands of 1998 dollars. Old Salary is the base salary for the last available full fiscal year proxy statement preceding the executive's departure. For proxy statements prior to December 1992, base salary is calculated as 0.6 multiplied by annual cash compensation. The FORFEIT variable is an estimate (details in appendix) of the loss in value an executive would experience on his option and restricted stock portfolio if he voluntarily left the firm at the end of the performance measurement period. Note that the executives who do not jump from one employer to another (i.e., the nonraids) are unlikely to forfeit this full amount. New Salary is the base salary of the executive at the new firm as reported in the employment agreement proxy statement of the new firm or, when this is unavailable, the executive's base salary during his first full fiscal year in office. The initial hiring grant at the new employer is the value of all options, restricted stock, and signing bonuses received by the executive when he joins the new firm. Upper bound observations are cases where compensation data at the old firm is not reported because the individual is not one of the five-highest paid. In these cases, we use the salary of the fifth-highest paid individual for the old salary variable. The FORFEIT variable is set to missing for these upper-bound observations. The assets figures are taken from the Compustat book value of assets in the fiscal year preceding the job change, and are adjusted to millions of 1998 dollars using the CPI. The rank at the old firm is measured by the manager's compensation at his previous employer in his last full fiscal year of service.

job movements in our sample result in substantial raises helps confirm our implicit assumption.

We also report in Table 2 data on the estimated value of the option and restricted stock position the executive would forfeit by departing voluntarily from his old employer (FORFEIT) and the value of the hiring grant (i.e., signing bonuses, option grants, restricted stock grants) used to attract the executive to his new employer. The FORFEIT variable includes the value of restricted stock plus a Black–Scholes estimate of the value of unvested options. In addition, it includes the difference between the Black–Scholes estimated value of the vested options and the value upon immediate exercise, since immediate exercise is frequently forced upon voluntary departure. All option portfolio values are calculated using a variant of the Core and Guay (1998) methodology as detailed in the appendix.[19] As the

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[19] Note that option and restricted stock figures are generally only available for executives ranked in the top five. In a few cases where the proxy statement was unavailable, we used either (1) data from S&P's

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data reveal, our sample executives have a great deal to lose by voluntarily leaving their old employer, but they typically are awarded an even more attractive package at the new firm. Later in the article we examine the variation in these hiring packages.

While the compensation data strongly suggest that our sample executives are moving to superior jobs, it is interesting to also examine the relative sizes of the old and new employers. As we report in Table 2, the ratio of the book assets of the new employer to those of the old employer for executives with a rank of one (which almost always corresponds to the CEO) has a median of 2.72. Thus it appears that CEOs are willing to join a new firm as CEO only when the new firm is substantially larger than their current employer. In stark contrast, for executives with a rank of two, this same ratio has a median of only 0.29. Thus it appears that a CEO typically needs to be offered a job at a firm almost three times as large to attract him, while an executive one step below the CEO is typically willing to go to a firm less than a one-third of his old employer's size. Consistent with the difference between the top executive and the number two executive, the median ratio of the size of the new firm to the old firm declines monotonically with rank, reaching a low of 0.06 for executives not ranked in the top five.

3.4 Performance measurement

One of the main goals of our study is to examine the stock price performance of the previous employers of executives who are hired as outsiders. Since we expect that potential employers will look back over a fairly long period in assessing a manager's potential for their firm, we choose to use a five-year buy-and-hold stock return to construct our basic performance measure, which we call BHR5.[20] We use recent developments in the literature to construct appropriate benchmarks for these five-year return measures. In order to avoid the statistical problems arising from the skewness in the distribution of these returns as reported by Barber and Lyon (1997) and Kothari and Warner (1997), we use a modified version of the procedures suggested by Lyon, Barber, and Tsai (1999).

We calculate BHR5 over a 60-month performance measure period preceding the departure from the prior employer. The end of this performance measurement period is the last month end preceding End Date by at least one full month, where End Date is the announcement date of the

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ExecuComp database or (2) data from the proxy statement in the year prior to the executive's last full fiscal year of service.

[20] Theoretically we would expect potential employers to look at performance over an executive's entire career, perhaps weighing recent performance more heavily. However, given the varied job histories and tenures of our sample executives, constructing a simple performance measure over a period longer than five years is not practical.

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executive's departure from his old employer. For corporate control-related departures, we set End Date equal to the earliest announcement date concerning the control activity.[21] We set BHR5 to missing for observations without 60 full months of data.

For each sample observation we create two benchmark-matching portfolios starting from the universe of all U.S. firms with ordinary shares covered by both Compustat and CRSP and with nonmissing returns over the entire 60-month period.[22] To construct the first benchmark portfolio, which we refer to as the size/book-to-market portfolio, we compute size and book-to-market deciles at the start of the performance measurement period for the set of all NYSE firms that meet the preceding criteria. All firms with non missing returns data, including AMEX and Nasdaq firms, that are in the same size decile and book-to-market decile as the sample observation compose the observation's matching size/book-to-market portfolio.

Since potential employers may often be intent on hiring from a certain industry, for each observation we create a second benchmark based on firms in the same two-digit SIC industry. From this set we choose firms in the same NYSE size quintile and book-to-market half (i.e., above or below the median) to form what we refer to as the matching industry portfolio. Our size and book-to-market cutoff points are necessarily broader in creating this portfolio, since the industry requirement is quite restrictive. Indeed, the average number of firms in the matching size/book-to-market portfolios is 24, while it is only 9 for the matching industry portfolios.

3.5 Performance comparisons

In this section we examine whether the prior employers of our sample of outside CEO hires exhibited superior abnormal performance. In comparing the performance of our sample observations with the benchmark portfolios, we follow the suggestion of Barber and Lyon (1997) and Lyon, Barber and Tsai (1999) and measure each observation's benchmark return as the equally weighted average of the BHR5s of the firms composing the benchmark portfolio for the observation. All of our comparisons are based on skewness-adjusted *t*-statistics with significance levels

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[21] We are conservative in our choice of End Date in the case of acquisitions in the sense that we attribute none of the acquisition-related stock returns, which are typically positive, to the executive. Note that the results we report below in Tables 3 and 4 are qualitatively unaffected if we exclude corporate control-related departures.

[22] Our benchmark procedure is highly influenced by the Fama and French (1992) findings concerning the role of size and book-to-market in stock returns. While our restriction to firms with nonmissing data may be problematic in a test of market efficiency, it is completely natural in the context of our study. In particular, it restricts our attention to comparing firms where the CEO labor market had similar performance data available (a five-year return) for all sample observations and benchmark firms.

Table 3
Five-year returns (BHR5) of prior employer preceding CEO appointment: sample 1

Which observations	All (1)	Nonraids (2)	Raids (3)	Low-rank raids (4)	High-rank raids (5)
Mean BHR5	119.73%	94.83%	127.37%	109.63%	160.82%***
Mean (BHR5 – market return)	24.33%***	1.36%	31.38%***	14.59%	63.05%***
(*t*-statistic in parentheses)	(2.79)	(0.13)	(3.20%)	(1.21)	(3.98)
Mean (BHR5 – size/book mean return)	20.42%*	−8.91%	29.40%***	6.13%	73.19%***
(*t*-statistic in parentheses)	(1.98)	(−0.34)	(2.67)	(0.45)	(4.83)
Mean (BHR5 – industry mean return)	18.26%*	−1.90%	23.77%**	8.15%	53.11%***
(*t*-statistic in parentheses)	(1.95)	(−0.01)	(2.47)	(0.68)	(3.63)
Fraction of observations where	0.602**	0.467	0.642***	0.516	0.882***
BHR5 exceeds size/book median return (*p*-value in parentheses)	(0.027)	(0.856)	(0.006)	(0.901)	(0.000)
Fraction of observations where BHR5	0.562	0.462	0.589*	0.500	0.758***
exceeds industry median return (*p*-value in parentheses)	(0.203)	(0.845)	(0.100)	(1.00)	(0.005)
Number of observations with valid market return benchmark	132	31	101	66	35
Number of observations with size/book portfolio benchmark	128	30	98	64	34
Number of observation with industry portfolio benchmark	121	26	95	62	33

BHR5 is a firm's buy-and-hold return over the five-year performance measurement period that precedes the executive's departure. The market return is the five-year value-weighted CRSP return over the same measurement period. The size/book mean (median) return is the equally weighted average (median) of the BHR5s of firms in the same size and book-to-market deciles as the sample observation as of the start of the performance measurement period. The industry mean (median) return is the equally weighted average (median) of the BHR5s of firms in the same two-digit industry, size quintile, and book-to-market half. Reported *t*-statistics are skewness-adjusted *t*-statistics calculated using the Lyon, Barber, and Tsai (1999) methodology, and all significance levels for these *t*-statistics are calculated according the bootstrap procedure outlined by those authors. Reported *p*-values are from a two-sided binomial test to determine whether the probability that the sample BHR5s exceed their matching portfolio median is greater than 0.5. The sample "All" denotes all outside CEO hires where the executive had a tenure of more than four years at his prior employer. Raids are cases where the individual jumped immediately from a prior public employer to the new position. Low-rank (high-rank) executives are those ranked below (in) the top three at the prior employer based on their compensation in their last full fiscal year of service. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively, for a two-sided test.

calculated using the bootstrap procedure recommended by Lyon, Barber, and Tsai (1999).

In Table 3 we report returns figures for our sample observations and benchmark portfolios. Since a manager with a short tenure at the prior employer is unlikely to be held responsible for performance that occurred before he joined the firm, all calculations are restricted to the observations where the executive had a tenure of more than four years at the previous employer.[23] As we report in the first row of column 1, Table 3, the mean

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[23] This restriction implicitly assumes that the benchmark firms have an executive with a tenure of more than four years. Since most executives stay with their firm a long time, this implicit assumption should usually hold. While tenure data are expensive to collect, for the observations where our results are most pronounced (i.e., the high-rank raid observations) we created a small benchmark portfolio where, by construction, the tenure restriction was met for the benchmark firms. The results using this benchmark were quite similar in character to what we report in the Table 3. These results, which were included in an earlier draft, are available from the authors upon request.

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BHR5 for the entire sample is 119.73%. Moving down to the second row of column 1, the prior employers of our sample of outside CEO hires outperform the market as a whole by an average of 24.33% over the five-year performance measurement period, a figure that is significant at the 1% level. Furthermore, as we report in the subsequent two rows, these firms as a group outperform both their matching size/book-to-market and industry portfolios by approximately 20% on average, and in both cases this performance significantly exceeds the benchmark at the 10% level. Finally, the figure in row 5 (row 6) of column 1 indicates that the fraction of sample firm BHR5s exceeding the median of the matching size/book-to-market (industry) portfolio is significantly different from 0.5 at the 5% (21%) level. Taken as a whole, this evidence indicates that the overall sample exhibits above-normal performance measured against a variety of benchmarks.

The figures in column 1 of Table 3 include both raids (i.e., immediate jumps from the old employer to the new) and nonraids. However, there are reasons to believe that the performance of the raided executives represents a cleaner test of the theory. In particular, it is likely that the demand side and supply side of the market for an executive's services will be significantly altered by the fact that an executive has separated from his prior employer (our model assumes all outside hires are raids). As we report in columns 2 and 3 of Table 3, there are in fact substantial differences between the raided and nonraided executives. The performance of the prior employers of the nonraided executives is not significantly different from the benchmarks, while the prior employers of the raided executives exhibit mean performance significantly above all three benchmarks at the 5% level or better. Similarly the performance of these employers significantly exceeds the size/book-to-market and industry portfolio medians at the 1% and 10% levels, respectively, using a simple binomial test. This evidence suggests that raided executives come from firms with positive abnormal performance, while nonraided executives do not.[24]

As discussed earlier, there is some variation in our sample in the rank of executives at their prior employer. One might suspect that individuals closer to the top of an organization would be held relatively more accountable for firm performance. To investigate, we divide the sample of raided executives into "high-rank" raids and "low-rank" raids, where high-rank

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[24] Formal tests that the performance of the raided executives (column 3 observations) relative to the benchmarks exceeds that of the nonraided executives (column 2 observations) relative to the benchmarks are in almost all cases significant at the 20% level using a two-tailed test (exact significance level depends on the benchmark used and whether we test for differences in means or medians). While these tests are highly suggestive, the small sample size of nonraided executives renders these tests of limited power. As we report below, formal tests between the high-rank raid observations and all other observations reveal that almost all of the superior performance in the overall sample is driven by the high-rank subsample of raided executives.

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raids are executives with a rank of one, two, or three at the prior employer and low-rank raids are all others.[25]

As we report in columns 4 and 5 of Table 3, the differences in these two groups are substantial. The prior employers of the low-rank raided executives appear to outperform the benchmark portfolios by a small and statistically insignificant amount. In contrast, the prior employers of high-rank raided executives significantly outperform all of the benchmarks. The mean BHR5 for these cases is 161.82%, which exceeds the market, size/book-to-market, and industry portfolios by 63.05%, 73.19%, and 53.11%, respectively. All of these differences from the benchmarks are significant at the 1% level. Similarly the fraction of high-rank raid observations with performance above the median of the size/book-to-market portfolio and above the median of the industry matching portfolio are both significantly different from 0.5 at the 1% level.

To formally test for differences between the high-rank raid observations and the other groups, we use simple *t*-tests and Wilcoxon rank-sum tests to calculate *p*-values for the differences across columns in the means and medians of the performance statistics reported in Table 3 (results omitted from the table for brevity). In all cases the performance of the high-rank raid observations relative to the benchmarks exceeds that of the nonraid observations of column 2 and the low-rank raid observations of column 4 at the 5% level or better, except in one case where the difference is significant at the 10% level. Thus it appears that the superior performance of the prior employers of our outside CEO hires is largely a reflection of the extremely strong performance of high-ranked individuals who directly jump from the old employer to the new firm. This evidence is broadly consistent with the predictions of the managerial ability hypothesis.

3.6 Conditional logit analysis

The preceding analysis establishes that the average performance of the prior employers of our sample of outside CEO hires was above normal. Any probability model where performance increases the likelihood of getting an outside CEO job should generate this finding. However, the results in the previous section leave unanswered the exact magnitude and form of the relationship between performance and the likelihood of taking an outside CEO position.

To investigate these issues, in this section we present results from a specific probability model. Our empirical approach here is to use the

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[25] In a compensation context, Aggarwal and Samwick (1999b) make similar arguments based on job responsibilities (general corporate versus specific/divisional responsibilities). When we group our observations in this way, we find that performance is relatively more important for the general responsibility group. However, these differences are generally less pronounced than for our categorizations based on rank. The results are similar to what we report, but statistically weaker, if we group executives into those ranked in the top five and those outside of the top five.

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conditional logit model of McFadden (1973) [see Maddala (1983) and Greene (1993)]. This model groups observations by cells, which in this case is composed of a sample observation and its matching industry portfolio observations, and estimates a model predicting which observation in each cell will be chosen.[26] Essentially this modeling approach assumes that the hiring firm is choosing among the set of executives in a certain industry and then assesses whether they tend to pick executives from the best-performing firms within that industry. The dependent variable in these models assumes a value of one for the observation corresponding to the employer of the firm supplying the outside CEO. The dependent variable is assigned a value of zero for all observations corresponding to the firms in the matching industry portfolios.

We use two performance measures in our conditional logit regressions. The first is a winsorized version of the five-year buy-and-hold return, where we set any BHR5 above (below) the 99th (1st) percentile equal to the 99th (1st) percentile level.[27] The second measure, which we call PCTILE, ranges from zero to one and reflects the percentile ranking of the BHR5 of the observation within its cell.[28] This variable, which is much less influenced by outliers, can be a very conservative measure of firm performance, since it will often map large variations in returns into small variations in PCTILE.

We present the conditional logit results in Table 4. Given our earlier findings, we restrict attention in this table to raids. As is evident from row 1 (row 4), there is a positive and highly significant relationship between BHR5 (PCTILE) and the likelihood of obtaining an outside CEO position. As we report in rows 2 and 5, when we restrict attention to high-rank raids, the coefficients on the performance variables grow in magnitude and remain highly significant. To formally test whether the sensitivity of taking an outside CEO job to firm performance varies by rank, in row 3

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[26] While the industry cell grouping is more intuitive to us in this context, the results with grouping based on size/book-to-market portfolios are very similar to what we report. The conditional logit model assumes a single opening occurs and makes inferences based on who is chosen. This contrasts with traditional logit models, used below for sample 2, which do not condition on an opening and, implicitly, assume openings are either constant over time or arrive randomly over time in a way that is uncorrelated with the explanatory variables.

[27] When we run the regressions in Table 4 without this winsorizing procedure, there are two large outliers in the matching portfolios that appear to heavily influence the coefficients, and consequently the results are less significant than what we report in the first two rows of the table. This suggests a possibly nonlinear relationship, and thus we also experimented with quadratic specifications where a firm's (nonwinsorized) BHR5 and its squared value were both included in the models of rows 1 and 2 of Table 4. In both cases the BHR5 coefficient was positive and highly significant, while the squared term was negative and more marginally significant. The inflection point of the relationship occurred at roughly the 98th percentile BHR5 cutoff, indicating a positive relationship over the vast majority of the relevant range.

[28] Our exact procedure is to assign to each observation a value for PCTILE that is set equal to the number of observations in the same cell with performance below the sample observation divided by the number of observations in the cell minus one. Thus the lowest BHR5 in a cell always is assigned a PCTILE of 0, the highest is assigned a PCTILE of 1, and the mean PCTILE in each cell is always 0.5.

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Table 4
Conditional logit regressions predicting outside CEO appointments : sample 1

	Which observation	BHR5	BHR5* high rank	PCTILE	PCTILE* high rank	Implied probability decile 1	Implied probability decile 5	Implied probability decile 10	Number of observations
(1)	All raids	0.31*** (0.12)				0.059	0.087	0.208	876
(2)	High-rank raids	0.51*** (0.16)				0.039	0.073	0.310	322
(3)	All raids	0.10 (0.17)	0.41* (0.23)						876
(4)	All raids			0.98*** (0.30)		0.058	0.090	0.156	876
(5)	High-rank raids			2.07*** (0.60)		0.029	0.072	0.228	322
(6)	All raids			0.52 (0.35)	1.55** (0.69)				876

Each row in the table present results from a conditional logit regression where each cell contains the performance of a firm where an executive obtained an outside CEO position along with the firms that comprise that observation's matching industry portfolio. The dependent variable takes a value of one for the outside CEO observations and zero for the matching observations. We restrict attention to executives with a tenure of more than four years at their prior employer who were raided in the sense that they jumped immediately from a prior public employer to the new position. Low-rank (high-rank) executives are those ranked below (in) the top three at the prior employer based on their compensation in their last full fiscal year of service. Asymptotic standard errors are reported under the coefficient estimates. BHR5 is the firm's five-year buy-and-hold return calculated over the performance measurement period and winsorized (in this table only) according to the procedures outlined in the text. PCTILE is a firm's BHR5 ordinal percentile rank which varies between zero and one and is set equal to the number of observations in the same cell with performance below a given observation divided by the number of observations in the cell minus one. The implied probabilities are calculated for an assumed cell with 10 firms (i.e., assuming that an executive from 1 of the 10 firms gets an outside CEO job at a specific point in time). The number of observations in each cell varies depending on how many industry matches we find for each outside CEO observation, but the overall sample mean cell size is 10. In rows 1–3, the implied probabilities are calculated at the mean BHR5 for the indicated decile, where deciles are calculated from the entire sample of 1105. In rows 4–6, the implied probabilities are calculated for firms with a performance that places them last (worst perform), sixth (medium perform), and first (top perform) within the cell of 10. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively, for a two-sided test.

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we interact the BHR5 performance measure with a high-rank dummy variable, and similarly in row 6 for the PCTILE performance metric. The interaction term is positive and significant at the 10% level in row 3 ($t = 1.78$) and 5% level in row 6 ($t = 2.25$). This helps to confirm our earlier observation that the relationship between firm performance and labor market opportunities is stronger for a firm's more senior executives.

To gauge the magnitude of these effects, we report in Table 4 some implied probabilities for cells of 10 firms. As we report in row 2 of the table, for high-ranked executives at firms with the first decile performance level (BHR5 = −52%), the implied probability is 0.039, while in the tenth decile (BHR = 354%) the implied probability is 0.310. Similarly the results in row 5 imply that for high-ranking executives in a cell of 10 firms, the worst-performing (i.e., lowest BHR) firm's high-ranked executive has a 0.029 probability of obtaining the outside CEO job, whereas for the top performer in the cell this probability jumps to 0.228. While this analysis conditions on the existence of a job opening, it clearly indicates that the relative chances of getting an outside job when one appears are highly dependent on a firm's relative performance.

4. Management Departures from a Fixed Sample of Firms

4.1 Sample construction and summary statistics

As discussed in Section 2, our second empirical approach is to follow a fixed sample of firms over time and examine all instances where a top executive departs from his employer to join a new public firm in an executive capacity. Given the detailed individual data available in S&P's ExecuComp database, we choose this second sample from the set of S&P 500 firms. Specifically we study all executives in the S&P 500 listed in the compensation summary of the firm's proxy statement and who are in office as of the start of the fiscal year (i.e., end of the previous fiscal year).[29] We then examine whether the executive departs during the subsequent fiscal year, with a sample period including fiscal years 1993–1998. We exclude all financial firms, regulated utilities, and fiscal years beginning prior to December 1992.

For the remaining sample of 10,354 observations, we determine all instances where an executive was listed in the proxy of the firm at the start of one fiscal year and not listed in the subsequent proxy statement. We then search the Dow Jones Interactive database to determine the

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[29] It appears that all of the start-of-fiscal 1993 (end-of-fiscal 1992) data in ExecuComp concerning managerial identities and compensation is backfilled from the start-of-fiscal 1994 (end-of-fiscal 1993) proxy statement. To circumvent this problem, we fill in the identities of some start-of-fiscal 1993 managers by using data from the Compact Disclosure CDs. For executives who leave office during fiscal 1993, we hand-collect compensation variables from the firm's actual proxy statement. We believe our data procedures eliminate all backfilling problems associated with the ExecuComp database.

executive's fate. In almost all cases we are able to find specific details on the manager's departure. We refer to cases where a manager departs to join a new publicly traded firm as an executive "jump" and we collect detailed information on the identity of the new employer and the position the executive takes.[30] We do not include in our set of jumps any job changes that are related to corporate control activity (e.g., mergers, spin-offs, asset sales, joint venture creations) or the small number of cases where news articles or severance details in the proxy statement indicate that the job change arose from pressure by the old employer.

As we report in Table 5, our final sample includes 128 executive jumps. Of these, 49 are cases where an executive takes a CEO position elsewhere and 79 are cases where an executive takes a non-CEO position elsewhere. Not surprisingly, given the prestige of being CEO of a large firm, instances where CEOs jump to new employers are relatively rare. When they do jump, they tend to take CEO jobs at even larger firms. Of the six CEO jumps, five took CEO jobs at larger firms, while one took a number two position at a firm more than 16 times larger than his old employer. In contrast to CEOs, the typical non-CEO who jumps to a CEO position at a new employer goes to a significantly smaller firm. As we report in Table 5, the median (mean) ratio of new-firm assets to old-firm assets is 0.14 (0.35) for these types of jumps, indicating that non-CEOs are typically willing to go to firms much smaller than their old employer in order to obtain the CEO title. These findings are similar in character to the results we reported above for sample 1.

In Table 5 we also report some interesting figures for jumps from non-CEO positions to non-CEO positions. Within this set of jumps, we find that when individuals maintain their top-five status (i.e., are listed in the proxy statement) at the new employer, the hiring firm is frequently smaller than the old employer. The median ratio of new-firm assets to old-firm assets for these observations is only 0.45 (mean 1.88), and for 69% of these observations the new firm's assets are smaller than those of the old employer. This evidence suggests that jumps to non-CEO positions are more often lateral moves or worse, rather than large labor market promotions. When managers jump to non-top-five positions at a new employer, they typically go to firms that are larger than their old employer. Presumably this increase in firm size partially compensates the manager for the fact that he is moving into a more junior position (i.e., giving up his top-five status).

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[30] To ensure we did not miss any jumps to public firms, for the first 300 observations we also checked whether a sample manager's name shows up in the executive officer listing of any other firm in the Compact Disclosure CDs. These CDs cover virtually all publicly traded U.S. firms. In no instance did we find a case of a manager showing up at a new public firm via this procedure while not showing up from our Dow Jones search procedure. Note that Dow Jones Interactive includes literally hundreds of newspapers, news wires, and trade publications.

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Table 5
Summary statistics for fixed sample of firms: sample 2

Variable	Number/mean	Median
Total observations	10,354	
Number of observations where turnover occurs	1213	
Number of observations where manager jumps to new public firm	128	
Number of observations where manager jumps to CEO job at public firm	49	
Number of observations where manager jumps to non-CEO job at public firm	79	
Number of CEO to CEO jumps	5	
Number of CEO to non-CEO jumps	1	
Number of non-CEO to CEO jumps	44	
Number of non-CEO to non-CEO jumps	78	
(New firm size/old firm size) for CEO to CEO jumps	4.43	2.88
(New firm size/old firm size) for non-CEO to CEO jumps	0.35	0.14
(New firm size/old firm size) for non-CEO to non-CEO/top five jumps	1.88	0.45
(New firm size/old firm size) for non-CEO to non-CEO/non-top five jumps	5.49	2.13
(Old Salary/New Salary) for jumps to CEO positions	1.39	1.39
(Old Salary/New Salary) for jumps to non-CEO positions	1.06	1.07
Number of managers listed in proxy statement	4.93	5.00
Age of manager	53.67	54.00
Tenure of manager	18.18	18.00
Book assets of employer	9730.12	3815.37
FORFEIT	3701.81	1312.30
Five-year buy-and-hold return	232%	189%

The sample is composed of all executives from 1993 to 1998 working for an S&P 500 firm at the start of the fiscal year and listed in the compensation table of the proxy statement. Financial firms and regulated utilities are excluded (SIC codes of 6000–7000 and 4910–4949), as are all fiscal years beginning prior to December 1992. All observations where the firm experiences a control change are excluded. All observations where a manager departs from the firm for exogenous reasons (asset sale, spinoff, health problems, death, scandal) are also excluded. All other cases where a management departure occurs during the fiscal year are referred to as management turnover. The age, tenure, book assets, options, and returns figures are calculated over the entire sample of observations. Age is the age of the executive at the start of the fiscal year, tenure is years employed by the firm at the start of the fiscal year, book assets is the assets of the employer at the start of the fiscal year in millions of 1997 dollars. The *FORFEIT* variable is an estimate (details in appendix) of the loss in value an executive would experience on his option and restricted stock portfolio if he left the firm at the start of the fiscal year in thousands of 1997 dollars. All salary ratios are derived from base salary figures adjusted for inflation and also for the annual growth in salaries in the S&P 500 over the relevant time period. The firm size ratios are derived from inflation-adjusted book assets figures.

To further understand the nature of our sample job jumps, we construct a salary ratio based on an executive's base salary at his new employer divided by his old base salary. We adjust the old salary by the annual inflation rate in overall executive salaries for S&P 500 firms. Consequently this ratio reflects the ratio of the individual's new pay to an estimate of what their old pay would have been had they not departed. As we report in Table 5, there is a large difference in this ratio between jumps to CEO positions and jumps to non-CEO positions. Executives who jump to CEO positions typically receive new base salaries around 39% larger than their old salary, while executives who jump to non-CEO positions see average

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raises in the 6–7% range. Taking into account the large non pecuniary benefits executives are likely to attach to the CEO position, the differences in the change in total (i.e., pecuniary and non pecuniary) compensation are likely even larger.

In view of this evidence, it appears that jumps to CEO positions are likely to reflect a significant promotion in the labor market where an executive is moving into a capacity where he will have an increased level of marginal productivity (i.e., in the language of our model, $W > V$). In contrast, jumps to non-CEO positions look more like lateral moves in the labor market (i.e., $W \approx V$ in the context of our model). Surely some of these moves are promotions and some are demotions, but on balance there is no strong evidence that jumps in this category reflect a major change in a manager's marginal productivity. In light of this evidence, in our analysis below we examine separately models predicting jumps to CEO positions and models predicting jumps to non-CEO positions. As the results indicate, the mechanism governing these two types of job changes do, in fact, differ significantly.

We include in Table 5 summary statistics concerning an executive's age, tenure, option/restricted stock position, and his employer's five-year buy-and-hold return.[31] We suspect that managers near retirement age are quite unlikely to jump to a new firm, since few firms would hire a high-level executive who is only a few years from retirement. This suspicion is confirmed by the data. While the overall sample median (mean) age is 54.00 (53.67), the corresponding figure for the sample of jumpers is 51.00 (50.27). In addition, managers $\geqslant 60$ years old are less than half as likely as younger managers to jump to a new firm. Based on these observations, in our logit models below we restrict attention to the relatively younger managers.[32]

Similar to sample 1, we construct the variable FORFEIT for this sample to measure the potential loss on options and restricted stock from departing voluntarily. As the figures in Table 5 indicate, the typical sample executive has a lot to lose by departing voluntarily (median $3.82 million, mean $9.73 million). However, in unreported results where we conduct simple univariate tests between the no-turnover observations and the individuals who jump, we find no significant differences in the mean and median levels of FORFEIT. We examine this issue further in the multivariate analysis below.

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[31] The age and tenure data are derived from news articles, proxy and 10K statements, and Dun and Bradstreet's reference books. Option/restricted stock data are from ExecuComp and proxy statements. Returns are from CRSP.

[32] All of our main findings in Table 6 hold if we include managers ≥ 60 years old. As one would expect, including these observations increases the magnitude and statistical significance of the age coefficients.

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4.2 Empirical models of job jumps

We now turn to estimating logit models predicting executive jumps in sample 2. As with sample 1, our principal concern with respect to the demand for managerial talent is whether firm performance increases the likelihood that an executive moves to a new employer. Since jumps to CEO positions are relatively more likely to reflect promotions in the managerial labor market, the theoretical framework developed earlier predicts that performance should be a relatively more important predictor of these types of jumps. With respect to supply-side issues, we include a number of variables related to age, tenure, rank, and firm size, since these may affect an individual's propensity to leave his employer. Of particular interest on the supply side is the effect of options/restricted stock in keeping managers from jumping ship. Later we also examine the role of internal promotion opportunities.

As in our earlier analysis, our basic performance metric is based on a firm's five-year buy-and-hold stock return, which we measure as of the period ending at the start of the observation year. We industry-adjust these returns by subtracting the compounded five-year monthly value-weighted return for all other firms in the same four-digit industry. Because of concerns about large outliers, we winsorize these industry-adjusted returns at the 1st and 99th percentiles. Alternatively, in many specifications we convert the industry-adjusted returns into a uniform distribution by assigning to each observation its percentile ranking from 1 (worst performance in sample) to 100 (best performance in sample).

In columns 1 and 2 of Table 6 we present results from our baseline logit model for jumps to the CEO position, where column 1 uses industry-adjusted returns as the performance metric and column 2 uses industry-adjusted return percentiles. In both cases the coefficient on performance is positive and significant at the 1% level ($t = 2.61$ and $t = 3.37$, respectively). These results are highly consistent with our earlier findings and suggest a positive relationship between firm performance and large external labor market rewards. In the corresponding columns predicting non-CEO jumps (columns 5 and 6), the role of performance is small and insignificant. These insignificant coefficients are consistent with our hypothesis that more lateral labor market moves are not typically related to managerial ability. Formal tests for differences in the sensitivity of jumping to firm performance between CEO jumps and non-CEO jumps are in all cases significant.[33]

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[33] In particular, when we run multinomial logit models on the entire sample where the dependent variable can take on three values indicating either (a) no jump, (b) a jump to a CEO position, or (c) a jump to a non-CEO position, we find that in all of the specifications corresponding to those of Table 6, the performance coefficient for the CEO jumps exceeds the coefficient for the non-CEO jumps at the 5% level or better.

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Table 6
Logit models predicting managerial jumps: sample 2

	Jumps to CEO positions				Jumps to Non-CEO positions			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Industry-adjusted 5-year return	0.194*** (0.074)				-0.097 (0.092)			
Industry-adjusted 5-year return percentile		0.021*** (0.006)	0.021*** (0.007)	0.020*** (0.007)		0.0002 (0.0042)	-0.0016 (0.0043)	-0.0012 (0.0043)
FORFEIT	-0.030 (0.028)	-0.031 (0.028)	-0.006 (0.032)	-0.011 (0.029)	-0.037 (0.036)	-0.049 (0.037)	-0.056 (0.041)	-0.054 (0.044)
Age	-0.019 (0.030)	-0.022 (0.030)	-0.029 (0.033)	-0.018 (0.032)	-0.051** (0.022)	-0.050** (0.022)	-0.050** (0.022)	-0.048** (0.022)
Tenure	-0.026* (0.015)	-0.027* (0.015)	-0.022 (0.017)	-0.024 (0.017)	-0.064*** (0.014)	-0.065*** (0.014)	-0.068*** (0.015)	-0.066*** (0.015)
Rank	-0.494*** (0.158)	-0.501*** (0.159)	-0.500*** (0.165)	-0.603*** (0.173)	0.008 (0.110)	-0.001 (0.110)	-0.006 (0.113)	-0.109 (0.121)
CEO dummy variable	-1.304** (0.577)	-1.318** (0.577)			-2.16** (1.05)	-2.14** (1.05)		
Log (assets)	0.482*** (0.123)	0.462*** (0.125)	0.466*** (0.140)	0.457*** (0.134)	0.242** (0.100)	0.248** (0.101)	0.259** (0.106)	0.216** (0.106)
Year	-0.091 (0.092)	-0.080 (0.093)	-0.105 (0.101)	-0.056 (0.102)	-0.005 (0.072)	0.002 (0.072)	-0.007 (0.074)	0.003 (0.074)
Age of firm's CEO			-0.012 (0.029)				0.018 (0.018)	
Ownership of firm's CEO			-0.160 (0.165)				0.011 (0.032)	
Firm's CEO is founder dummy variable			-0.725 (1.10)				0.076 (0.455)	
Heir-apparent dummy variable				-0.028 (0.403)				0.654*** (0.254)

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Table 6
(Continued)

	Jumps to CEO positions				Jumps to Non-CEO positions			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Intercept	2.37	0.54	3.89	-1.48	-2.58	-3.22	-3.59	-2.87
	(8.81)	(8.87)	(9.75)	(9.67)	(6.85)	(6.88)	(7.16)	(7.09)
Log likelihood	-251.96	-248.35	-209.20	-201.96	-376.21	-376.84	-358.03	-346.53
Number of observations	7048	7048	5762	5218	7077	7077	5794	5250

The sample is derived from executives in the S&P 500 from 1993 to 1998 as described in the note to the previous table. These regressions only include executives under the age of 60 as of the start of the fiscal year. In columns 1–4 (5–8), the dependent variable takes a value of one if an executive leaves the firm to take a CEO position (non-CEO position) at another publicly traded firm during the fiscal year. The dependent variable is set equal to zero for all observations with no management turnover and missing for all remaining types of management turnover. Asymptotic standard errors are reported under the coefficient estimates. All independent variables are measured as of the start of the fiscal year under consideration. The industry-adjusted 5-year return is a firm's five-year buy-and-hold return less the value-weighted industry compounded monthly return over the same period. This return is winsorized so that all observations below the first percentile are assigned a value equal to the first percentile, and similarly for observations above the 99th percentile. The industry-adjusted 5-year return percentile is constructed by assigning to each sample industry-adjusted return an integer corresponding to its percentile rank from 1 (lowest) to 100 (highest). The rank of an executive is set equal to one for the CEO. Other executives are assigned a rank from two to five based on their salary and bonus in the previous year, with lower numbers corresponding to the more highly paid executives. The CEO dummy variable takes a value of one for CEOs and zero otherwise. The ownership of a firm's CEO is the percentage of common stock held by the CEO. The heir-apparent variable is a dummy variable taking a value of one if the firm employs a non-CEO executive with the title of president and/or chief operating officer. The regressions in columns 3, 4, 7, and 8 exclude all CEOs and the regressions in columns 4 and 8 also exclude all heirs apparent. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively, for a two-sided test.

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Turning to the FORFEIT variable, the reported coefficients in all columns of Table 6 are insignificant, although they are of the expected negative sign. In unreported results, we also experimented with running logit models predicting all jumps (i.e., both jumps to CEO positions and jumps to non-CEO positions). In these specifications the coefficient on FORFEIT remains insignificant. Thus we are unable to find any convincing evidence that there is a relationship between what an executive forfeits by leaving and the likelihood of jumping; golden handcuffs do not appear to be very strong. This finding may surprise many, in light of the popular belief that options are an effective device to retain managerial talent. Our results in Section 5 indicate that new employers are willing to compensate outside hires with initial hiring grants that fully compensate them for what they leave behind. This would suggest that the willingness of executives to jump ship should be unrelated to what they forfeit, but the cost to the raider should be significantly elevated for executives who will forfeit large positions. However, our results in Table 6 suggest that these elevated costs do not affect the willingness of raiders to hire these individuals.

In addition to the performance and FORFEIT variables, the coefficients on some of the other control variables in Table 6 are also of interest. The negative coefficients on the tenure variable suggest that longer-tenure employees are less likely to jump ship, particularly in the case of jumps to non-CEO positions. This finding is consistent with the notion that firm-specific human capital is developed over time [e.g., Becker (1964)]. The negative coefficients on the CEO dummy variable confirm our earlier observation that CEOs are particularly unlikely to jump ship. However, the negative coefficient on the rank variable in columns 1 and 2 suggests that executives close to the CEO, with a rank of say two or three, are more likely than more junior managers with ranks of four or five to depart elsewhere to become a CEO.[34]

The coefficient on firm size is positive and significant in all specifications. This may suggest that managers of large firms are more highly desired in the labor market, perhaps because a high-level position in a big firm is a relatively more credible signal of managerial quality, or alternatively because there are more opportunities to develop managerial expertise in a large enterprise. Finally, the insignificant coefficient on the year variable indicates that there is no secular trend in jump rates over the sample time period.

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[34] The rank variable is set equal to one for CEOs. All non-CEOs are assigned a rank based on their cash compensation (salary plus bonus), with higher-compensation individuals receiving lower ranks. Thus the highest-paid individual after the CEO is assigned a rank of two, the next-highest paid is assigned a rank of three, and so on. In the rare instance when a firm reports data for more than five executives, we assign a rank of five to all executives with pay below the fifth highest. Typically in these cases there are two or more executives who are approximately tied for fifth-highest paid.

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4.3 Promotion opportunities and the likelihood of jumping ship

While we find little evidence that options and restricted stock play a significant role in attaching managers to their employers, it is possible that other dimensions of the executive's current employment situation do affect his propensity to jump ship. Since retaining managerial talent is an important issue for many firms, understanding the circumstances that lead managers to look elsewhere for employment may be of considerable practical interest. To investigate, we consider here the possibility that managers are more likely to jump ship if their internal promotion opportunities are relatively bleak. Certainly an individual with very good internal prospects, for example, a manager who knows he will shortly be promoted to CEO, will not typically depart for a job at a smaller firm.

To study this issue, we examine the relationship between jumping ship and several variables that may measure internal promotion opportunities. For individuals under the CEO, we expect that their internal promotion opportunities will be particularly good when a CEO is old, since the CEO is likely to retire shortly, while opportunities may be particularly bad if the CEO has a large ownership stake or is a founder, since this could indicate that the CEO is fairly entrenched in his position. However, when we add variables related to the CEO's age, ownership, and founder status to the specifications in columns 3 and 7 of Table 6, the coefficients are all small and insignificant (results not reported in tables).[35] It is possible that these variables are poor proxies for internal promotion opportunities, or alternatively it may be that promotion opportunities do not affect the likelihood of leaving.[36]

One reason that CEO characteristics may not measure internal promotion opportunities is that many firms pick a so-called "heir apparent" several years before the CEO steps down [e.g., Vancil (1987)]. Once these individuals are picked, they are likely to eventually assume the CEO position [e.g., Canella and Shen (2001)], and thus other managers' prospects for ascending to the CEO rank are poor. To investigate, similar to Naveen (2000), we identify as an heir apparent any individual who is not CEO but who does have the title of president and/or chief operating officer. An heir apparent is present for 38% of our sample observations.

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[35] We identify the CEO from the historical CEO and historical title fields in ExecuComp. For firms with no designated CEO, we assume the individual with the highest salary plus bonus is the CEO. For the first sample year, we use job title data from both ExecuComp and Compact Disclosure. Founder status is determined by examining the *Forbes* compensation surveys and biographical sketches in proxy statements, reference books, and news searches.

[36] In unreported results, we experiment with a dummy variable indicating whether a CEO was older than 60, rather than the CEO's age. We also experiment with the use of a dummy variable indicating whether an executive was older than the CEO, since this may indicate that an individual has little chance of promotion since he will reach retirement age before the CEO. Neither of these variables was ever significant.

We include in Table 6 estimates for logit models that include an heir-apparent dummy variable run on the sample of all executives except the CEO and the heir apparent. The estimated coefficient on the heir-apparent variable is small and insignificant for jumps to CEO positions (column 4), but positive and highly significant ($t = 2.57$) for jumps to non-CEO positions (column 8). Given our discussion above concerning the jumps to CEO versus non-CEO positions, this evidence appears consistent with the hypothesis that internal promotion opportunities affect the likelihood of moving laterally, but not necessarily up, in the external managerial labor market. A reasonable explanation for the difference between lateral moves and larger jumps is that larger jumps may be primarily demand-side driven — if a publicly traded firm wants you as a CEO they will get you — while lateral moves may be more supply-side driven — if your internal prospects are poor, you start looking around. This explanation is consistent with our model which suggested that for large moves in the labor market (i.e., when $W-V$ is large), ability-matching considerations are likely to dominate other factors in the movement of talent across firms.

4.4 Robustness and extensions of main findings
Our principal findings from sample 2 reported above are (1) there exists a positive relationship between performance and the likelihood of a large external labor market promotion (i.e., a jump to a CEO job), (2) there is no such relationship for more lateral job moves (i.e., jumps to non-CEO positions), (3) there exists no significant relationship between options/restricted stock positions and the likelihood of jumping ship, and (4) there exists a positive relationship between the presence of an heir apparent and the likelihood that a non-heir apparent jumps ship laterally to a non-CEO position elsewhere. We briefly discuss here some robustness checks and extensions of these findings.[37]

With respect to performance measurement, we experiment with using nonwinsorized returns and with using market-adjusted returns rather than industry-adjusted returns. The results with these modifications are similar to what we report above. To determine whether stock returns or accounting returns are a superior performance metric, we experiment with using accounting returns variables in place of the stock returns variables in the specifications of columns 1 and 5 of Table 6. Specifically we experiment

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[37] In addition to the robustness checks below, we also experiment with estimating standard errors that are robust to correlations in the error terms of executives working for the same firm in the same year using the robust cluster estimator in the Stata 6.0 statistical package, where we cluster by firm-year [see Rogers (1993) and Wooldridge (2002) on cluster analysis]. All of the significance levels on the performance variables are unaltered when we use this estimator. The standard errors on the FORFEIT variable are slightly smaller with this modification, resulting in small increases in t-statistics. In two of the eight columns these t-statistics become marginally significant at the 10% level (p-values of approximately 8.5% in the specifications of columns 6 and 7 of Table 6).

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with using both raw and winsorized versions of (1) a five-year average industry-adjusted ROA variable, (2) a one-year industry-adjusted ROA variable, and (3) a five-year industry-adjusted change-in-ROA variable. In all cases the coefficients on the accounting performance variables are insignificant. Thus we find no evidence here that the managerial labor market uses accounting returns to assess managerial ability.[38]

With respect to our FORFEIT variable, because of concerns about large outliers heavily influencing our findings, we experiment with using winsorized and percentile versions of this variable in place of the raw variable. Even with these modifications, the variable remains insignificant in all specifications of Table 6. We also experiment with including in FORFEIT only the value of restricted stock plus the unvested portion of the option portfolio, but again this has no meaningful effect on the results. Finally, following Mehran and Yermack (1999), we experiment with using measures of "excess compensation" in place of FORFEIT, where excess compensation is defined as the residual from a regression predicting compensation based on individual and firm characteristics. In all cases this variable is insignificant. Thus we are unable to uncover any convincing evidence that the structure of an executive's existing compensation contract may keep him from jumping ship.

Before concluding our discussion of these results, we highlight here a couple of differences between our treatment of sample 1 and sample 2. In the models of Table 6 we do not impose the restriction that all observations must be for managers with a tenure of more than four years. Since our first sample only considers performance issues, we impose this restriction because it ensures the manager worked for the firm over the entire performance measurement period, and thus it hopefully increases the signal-to-noise ratio of the performance metric. With the second sample we want to include as many observations as possible, so as to increase our power to detect the effect of other variables (i.e., FORFEIT and the promotion opportunity variables) on the likelihood of jumping. However, to check the robustness of our findings, we have rerun the results in Table 6 with the tenure greater than four restriction, and the results are qualitatively unchanged.

In our study of sample 1, we find an important role for rank in the relationship between taking an outside CEO job and firm performance. We investigate this issue for our second sample by modifying the specifications in columns 1 and 2 of Table 6 to allow the performance variable to have a separate slope for higher-ranked managers (ranks of 1, 2, 3) and lower-ranked managers (ranks of 4 and 5). In these regressions (results not

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[38] We also reexamine the sample 1 results for the conditional logit models in rows 1 and 2 of Table 4 where we use these accounting variables in place of the stock return measures. In all cases the coefficient on accounting performance is insignificant.

reported) the coefficient on performance for higher-ranked managers is positive and highly significant. The coefficient for lower-ranked managers is smaller in magnitude and insignificant in the case of industry-adjusted returns, and just barely significant at the 10% level in the case of industry-adjusted return percentiles ($t = 1.647$). However, the coefficients on performance for the lower-ranked managers are sufficiently imprecise (i.e., have large standard errors) that formal tests for differences in these performance sensitivities are not statistically significant. Thus, while these results are broadly consistent with our findings concerning rank from sample 1, they are less conclusive. These weaker results are not surprising since sample 2, by design, exhibits much less heterogeneity in managerial ranks.

5. Compensation Contracting Around Job Changes

As discussed above, the executives in both samples who jump to CEO jobs tend to experience large wage increases. In addition, our earlier analysis of compensation data for executives in sample 1 revealed that executives are typically awarded large initial hiring grants of options, restricted stock, and cash signing bonuses. In assembling the data, several news articles and proxy statements indicated that large hiring grants were needed to attract executives that were considered of superior quality. To further investigate, in this section we examine the determinants of the compensation packages used to attract outside CEOs to the new employer. In particular, we are interested in whether superior performance affects the size of this package. This finding would suggest that performance affects not only the likelihood of obtaining an outside CEO job, but also the size of the reward associated with the job. A separate question of independent interest is assessing the extent to which hiring grants compensate raided executives for what they forfeit at their prior employer. Our approach is to regress variables measuring the compensation package at the new employer against a variety of explanatory variables. Since the initial hiring grants are so large in magnitude, most of our focus is on explaining the variation in these grants. However, for completeness we also examine the variation base salaries at the new employer.

Using compensation data for the outside CEO hires in sample 1, in column 1 of Table 7 we regress the value of the initial hiring grant on the prior employer's five-year buy-and-hold return (BHR5). The coefficient on the return variable is positive and highly significant ($t = 3.04$). This preliminary regression suggests that superior performance is associated with a more valuable hiring grant. An important omitted variable in this regression, which is correlated with stock returns, is the value of an executive's option and restricted stock position at his old employer (i.e., the variable FORFEIT).

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Table 7
The determinants of CEO compensation packages at the new employer

	Hiring grant (1)	Hiring grant (2)	Hiring grant (3)	New salary (4)	New salary (5)
BHR5	2,188.71***	1,896.40***	1,797.01***	41.96	26.15
	(720.39)	(543.26)	(437.51)	(29.95)	(32.49)
FORFEIT		0.854***	0.581***		0.0084*
		(0.237)	(0.186)		(0.0044)
Old Salary			13.28***		1.20***
			(4.83)		(0.22)
Year			1,332.96*		−66.01*
			(743.64)		(35.21)
Age			160.06		14.27
			(202.10)		(9.53)
Constant	4,861.99***	2,994.48*	−5,448.96**	604.79***	240.96**
	(1,099.11)	(1,515.22)	(2,075.87)	(34.96)	(93.35)
R^2	0.0953	0.5786	0.7563	0.0315	0.7443
Number of observations	126	34	34	119	33

The observations for these regressions are derived from the set of outside CEOs identified in sample 1. All estimates are ordinary least squares estimates with White robust standard errors reported in parentheses under the estimated coefficients. The dependent variable in columns 1–3 is the value of the initial hiring grant at the new employer composed of options, restricted stock, and signing bonuses. The dependent variable in columns 4 and 5 is the base salary of the executive at the new firm as reported in the employment agreement proxy statement of the new firm or, when this is unavailable, the executive's base salary during his first full fiscal year in office. All monetary variables are calculated in thousands of 1998 dollars. In all columns the sample is restricted to executives with a tenure at the prior employer of greater than four years. BHR5 is the prior employer's five-year buy-and-hold return. The FORFEIT variable is an estimate (details in appendix) of the loss in value an executive would experience on his option and restricted stock portfolio if he left the firm at the end of the performance measurement period. This variable is set to missing for all non-raided executives, for all executives who leave their prior employer following a corporate control event, and for all executives for whom option and restricted stock data is not reported. Consequently, regressions that include this variable have much smaller sample sizes. Old salary is the base salary for the last available full fiscal year proxy statement preceding the executive's departure. Year is defined to be the fiscal year pertaining to the new hiring grant minus 1990. The age variable is the executive's age when he was initially hired minus 51 (the sample median). *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively, for a two-sided test.

In column 2 of Table 7 we add the variable FORFEIT to the hiring grant regression. Despite the much smaller sample size, the coefficient on firm performance remains positive and highly significant ($t = 3.49$).[39] The estimated coefficient implies that when a firm's five-year return increases by 100%, the observed hiring grant will increase by $1,896,400. As expected, the coefficient of 0.85 on the forfeited equity position is also positive and highly significant ($t = 3.12$). This coefficient is not significantly different from one, suggesting that new employers fully compensate raided executives for each dollar they forfeit when they leave their old employer. In column 3 we add other variables to the regression that may be important. One of these variables is the executive's old salary, as we expect that more highly paid executives may demand larger hiring grants.

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[39] Since it is not clear what an executive forfeits in the nonraided cases or for acquisition-related departures, we exclude these observations from the regressions in Table 7 that include FORFEIT. For data availability reasons, FORFEIT is missing for all unranked executives and for observations prior to the end of 1992, when proxy disclosure requirements were enhanced.

We also add variables for the executive's age and a year trend. As we report in column 3, the coefficients on firm performance and the forfeited equity position remain highly significant with these added controls. As expected, the coefficient on the executive's old salary is also positive and significant.[40]

The results in columns 1–3 of Table 7 indicate that superior stock returns do lead to larger hiring grants. In addition, the results provide strong evidence that initial hiring grants are increasing in the value of the position the executive forfeits when he leaves his old employer. Since high stock returns tend to raise the value of the forfeited portfolio, both of these findings reinforce one another and illustrate that executives from more successful firms will tend be more richly compensated when they are raided.[41]

In columns 4 and 5 we present results where the executive's new base salary is the dependent variable. The coefficient on firm performance is positive but insignificant in both columns. Thus we find no strong evidence that new base salaries are affected by performance at the prior employer. The only explanatory variables that are highly significant in this regression are the executive's base salary at the old employer and the constant. The coefficient on the old salary variable of 1.20 is not significantly different from 1.0. This estimate, along with the estimate on the constant of 240.96, suggests that executives who are hired as outside CEOs receive a new base salary that is approximately equal to their old base salary plus $240.960. Given the results in columns 4 and 5, it appears that there is little systematic variation in the size of the increase in an executive's base salary when he joins a firm as an outside CEO, although on average this increase is large and positive.

6. Conclusion

Using two samples of large publicly traded firms from the 1990s, we study the managerial labor market by examining executives who switch employers. Concerning the demand for managerial talent, we find

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[40] In an earlier draft we reported results for specifications that include both a firm's own performance and benchmark measures of performance (i.e., industry returns or market returns). The theoretical literature on relative performance evaluation suggests that the coefficient on the benchmark measure should be negative, although empirical support for this hypothesis is fairly weak [see Gibbons and Murphy (1990) and Aggarwal and Samwick (1999a)]. In these specifications the benchmark performance measures were insignificant and inclusion of these benchmarks did not materially affect the other coefficients.

[41] As a robustness check, we estimate the model in column 3 using median regression (i.e., minimum absolute deviation) methods. The coefficient on the return variable BHR5 remains significant at the 5% level. When we use winsorized returns, the coefficient on the return variable remains highly significant. However, when we use the percentile performance variable (PCTILE) rather than BHR5, the estimated coefficient on performance is insignificant. This lack of significance is not surprising since the PCTILE variable displays much less variation than the BHR5 measure, particularly in these regressions where we have sampled on a set of observations where performance is concentrated in the upper percentile ranges.

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substantial evidence that superior stock price performance increases the likelihood that an executive will obtain a CEO position elsewhere. Since our data suggest that these positions are typically large promotions in the labor market, this finding is highly consistent with the hypothesis that superior stock price performance increases an executive's external labor market opportunities. The empirical relationship between firm performance and labor market opportunities appears to be significantly more pronounced for a firm's more senior executives. When we examine the hiring grants used to attract managers to CEO positions at new employers, we find that these grants are correlated with the option/restricted stock position the manager forfeits at his prior employer and with the prior employer's performance. Finally, when we look at moves to non-CEO positions, which the data suggest are much more likely to be lateral moves, we find no relationship between performance and the likelihood of jumping to these positions.

On the supply side, we find no convincing evidence of a significant relationship between an executive's stock option and restricted stock portfolio and the likelihood that the individual jumps to a new employer. However, we do find some evidence that internal promotion opportunities affect managerial retention. In particular, we find a significant relationship between the existence of an heir apparent and the likelihood that an executive will jump to a non-CEO position elsewhere.

Our results concerning firm performance and labor market opportunities are consistent with the idea advanced by Fama (1980) that the labor market can function as an incentive device. More generally, our findings provide empirical support for a key assumption underlying many career concerns models that superior performance is rewarded in the market for executive talent. The weak relationship between performance and labor market opportunities for a firm's more junior executives (i.e., those below the top three) is consistent with the notion that stock price performance is a more informative performance measure for executives who are more senior in the corporate hierarchy. It is interesting that the external labor market does not appear to reward lower-ranked executives based on stock price performance, while internally firms do tend to base rewards on this metric via their heavy use of option compensation. This raises the interesting question as to what metrics the labor market uses in evaluating more junior managerial personnel at other firms that they are considering raiding. This is an important issue if, as we suspect, (1) this set of more junior executives has a significant (aggregate) impact on corporate value, and (2) their incentives are significantly affected by career concerns.

Our findings on options and restricted stock suggest that the commonly described role of these devices as "golden handcuffs" is more of a myth than a reality. One explanation is that getting the right person for the job may be so important to the hiring firm that compensating an executive for

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what he leaves behind is of little consequence. However, options and restricted stock do not even seem to play a significant role in the more lateral jumps to non-CEO positions, suggesting that this may not be the whole story.

Finally, our results concerning internal promotion opportunities are consistent with the general notion that the internal structure of the firm can have a measurable effect on executive retention. While in some sense this is perhaps not surprising, in another sense this is an important finding in that it confirms that issues concerning succession planning, organizational structure, and the composition of the management team can play a significant role in the retention of managerial human capital. As Zingales (2000) and Rajan and Zingales (2000) have emphasized, human capital is becoming an increasingly important determinant of firm value. Certainly our results suggest that more work concerning the retention of talent is warranted and may prove fruitful.

Appendix: Option Value Calculations

Several of the variables used in Sections 3–5 include an option-based component. All option values in the article are calculated using the continuous dividend yield version of the Black–Scholes option pricing formula. When an option grant's time to maturity is not reported, we assume the option has a 10-year life. When strike prices are not reported, we assume the grant was made at-the-money [see Kole (1997) for a description of typical stock option plans]. Dividend yields are calculated as the total cash dividends paid over the last full fiscal year prior to the grant date divided by total market value of equity as of the end of the fiscal year. Since we are concerned about using unsustainably high dividend yields as inputs into the Black–Scholes formula, we assume that if the past-year dividend yield exceeds the 95th percentile of all Compustat firms, the appropriate anticipated future dividend yield for the Black–Scholes formula is equal to the Compustat 95th percentile level. Stock return volatility for the sample firms is calculated as the annualized standard deviation of monthly returns for the 36 months preceding the grant date. Again, because of concerns about unsustainable values, we replace this volatility measure with the CRSP 95th percentile (5th percentile) if the past volatility exceeds (falls short of) this level. We use as the risk-free rate the market yield on 10-year-maturity Treasury bonds in the month of the grant date as reported on the Federal Reserve Board's website.

The FORFEIT variable at the old employer is calculated at the end of the performance measurement period for sample 1 and at the start of the observation year for sample 2. We value the option component of this position using the Black–Scholes formula. For the vested option position we include in FORFEIT the difference between the value upon immediate exercise and the Black–Scholes value. For the unvested option position we include the entire Black–Scholes value. The strike price and time to maturity of the executive's option position is inferred from a modified Core and Guay (1998) procedure described below. All other parameters are calculated according to the procedure outlined above.

The Core and Guay (1998) algorithm uses the available data on the most recent option grant, the total number of vested and unvested options, and the profits from immediate exercise to infer the strike price and maturities of an executive's option portfolio. Following Core and Guay (1998), we assume unvested options have a time to maturity of one year less than the maturity of any options granted in the most recent fiscal year, or nine years when no grant was made. Vested options are assumed to have a time to maturity of three years

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less than the unvested options. Following Core and Guay (1998), we infer the average "moneyness" of the unvested (vested) option portfolio by dividing the profits from immediate exercise by the number of unvested (vested) options outstanding. Core and Guay (1998) suggest subtracting this average "moneyness" figure from the end-of-fiscal-year stock price to approximate the average strike price of the unvested option portfolio. We follow this procedure whenever the profits from immediate exercise are positive. In cases when these profits would be zero, the Core and Guay (1998) procedure implicitly assumes that all the options are exactly at the money as of the end of the fiscal year. In order to avoid over-estimating the portfolio value after observed stock price declines, in these cases we use as our estimate of the strike price for unvested options (vested options) the stock price one year (four years) previous to the fiscal year end inferred by using CRSP ex-dividend stock returns.

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