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Abstract

We study the market for CEOs of large publicly-traded US firms, analyze new CEOs' prior connections to the hiring firm, and explore how hiring choices are determined. Firms are hiring from a surprisingly small pool of candidates. More than 80% of new CEOs are insiders, defined as current or former employees or board members. Boards are already familiar with more than 90% of new CEOs, as they are either insiders or executives who directors have previously worked with. There are few reallocations of CEOs across firms – firms raid CEOs of other firms in only 3% of cases. Pay differences appear too small to explain these hiring choices. The evidence suggests that firm-specific human capital, asymmetric information, and other frictions have first-order effects on the assignment of CEOs to firms.

Keywords: CEO labor markets; CEO-firm matching; assignment models; CEO turnover, CEO compensation

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CEOs have first-order effects on firms, which makes an efficient assignment of CEOs to firms important. The CEO labor market, however, has been studied much less than, for example, CEO pay. As a result, it remains unclear how efficient CEO hiring is, and what model(s) best describe it.

Labor economics has shown that asymmetric information, firm-specific human capital, and search frictions are needed to explain the matching of rank-and-file workers to firms. Models with these features have found relatively little use in the CEO literature. Instead, several influential studies have made the case that the CEO labor market, and especially the evidence on CEO pay, is consistent with perfectly competitive and frictionless assignment models (Tervio 2008; Gabaix and Landier 2008; Edmans, Gabaix, and Landier 2009).

In these models, CEO skills are observable and perfectly portable across firms, so all firms hire from the same talent pool, with no preference for insiders. With perfect competition, CEO pay is fully determined by CEOs' and firms' outside options, with no role for bargaining. Assuming complementarity between CEO ability and firm scale, combined with increasing firm sizes, these models can rationalize the sharp rise in CEO pay since the 1970s (Gabaix, Landier, and Sauvagnat 2014).

In a separate but related literature, Murphy and Zabojnik (2004, 2007) and Frydman (2019) make the case that firms' managerial skill requirements have shifted from firm-specific to general skills. This improves managers' ability to switch firms and moves the CEO labor market closer to a common talent pool. Combined with evidence that CEOs have acquired more transferrable skills over time, this offers another explanation for rising CEO pay (Custodio, Ferreira, and Matos 2013).

Our paper documents actual CEO hiring patterns and compares them to the predictions of these (and other) theories. For all new CEOs in the S&P 500 from 1993 to 2012, we document whether they are insiders, their prior connections to the hiring firm, whether new CEOs were raided from other firms, and how hiring choices differ across firms. We focus on the largest publicly-traded companies as they face the fewest frictions in the managerial labor market and, because of their range of activities, are likely to require CEOs with general skills.

Our results show that firms hire from a surprisingly small pool of candidates, and that the vast majority of new CEOs have close prior links to the hiring firm. Seventy-two percent of new CEOs are promoted internally, and 8.4% are former executives or current or former board members. Thus, 80.4% of CEO hires are insiders, and only 19.6% are new to the firm. There are

slightly fewer outsiders in later than in earlier years, so the previously documented trend to more outside hiring appears to have ended.¹

We next show that a majority of the 19.6% outsiders are already known to the hiring firm's board. Fifty-three percent have previously worked with at least one of the hiring firm's directors, compared to only 13% of a matched sample of alternative candidates. Thus, more than 90% of new CEOs are from the hiring firm's current executives, former executives, board members, or co-workers of its directors. This evidence is hard to reconcile with models of the labor market in which abilities are easily observable, CEOs are chosen for general skills, and CEOs move freely across firms.

Our second set of results reveals where firms find the 19.6% outsider hires. The most striking result is the rarity of CEO raids: only 3.2% of new CEOs are poached from the CEO position at another firm. Contrary to expectations, large firms rarely poach successful CEOs of smaller firms, and smaller firms almost never raid CEOs of larger firms. When firms poach CEOs, it is typically from firms that are three to four times smaller. This suggests severe frictions in the reallocation of CEO talent across firms. Instead of raided CEOs, most outsider hires are below-CEO executives at other (typically much larger) firms (55%) or unattached, i.e., individuals not currently in an executive position (31%).

We next analyze how hiring choices differ across firms. Most notably, larger firms are even more likely to promote internally than smaller ones. A top-quintile S&P 500 firm by firm value has a 91% probability of hiring an insider, compared to 75% for a bottom-quintile firm. If firm size and general managerial ability are complementary, as in Tervio (2008) and Gabaix and Landier (2008), we would expect the opposite pattern, with the largest firms most eager to search the external market for high-ability CEOs.

Consistent with prior studies, firms with low stock returns and bad operating performance are more likely to hire outsiders, but even for them insiders remain the most frequent choice.² For example, firms with bottom quintile 1-year industry-adjusted stock returns choose outsiders in 29% of cases, compared to 13% for firm with returns in the top quintile. However, former executives and board members are also most often chosen by firms with low stock returns, low

¹ The reallocation of future CEOs across firms does not occur a few years before the appointment. The average pre-promotion tenure of insiders is almost 17 years, with a median of 15 years and a 25th percentile of 7 years.

² For evidence that bad performance is associated with more external CEO successions see, among others, Parrino (1997), Huson, Parrino, and Starks (2001), and Fee and Hadlock (2003).

operating performance, and high leverage. Hence, many apparently troubled firms turn to former employees and directors (rather than to outsiders) for help.

Our final set of results explores whether differences in CEO pay might explain firms' hiring choices. Outsiders are more expensive than internal promotions, consistent with outsiders having more transferrable human capital, receiving a premium for the risk of a bad match, or being compensated for frictions in changing jobs or locations. However, the pay differences are small compared to the scale of S&P 500 firms: in the first full year, outsiders receive on average \$1.5 million more than internal promotions. The differences between raided CEOs, raided other executives, and unattached hires are even smaller. If, as the prior literature suggests, differences between CEOs have large effects on firm value, these pay differentials appear too small to explain firms' preference for internal promotions or their reluctance to raid other firms' CEOs.³

The patterns we document change our understanding of the CEO labor market. The most striking result is that firms hire CEOs they are already familiar with – the firm's current or former executives, current or former board members, or managers its directors have worked with – more than 90% of the time. This suggests that the CEO labor market is not well described by fully competitive assignment models in which skills are observable and all firms choose from the same talent pool. Instead, the effective candidate pool differs across firms and, for each individual firm, is much smaller than the overall market.⁴

Another surprising finding is the rarity of CEO raids. If CEO ability is gradually revealed over time (Hermalin and Weisbach 1998, 2017; Pan, Wang, and Weisbach 2015), firms that benefit more from CEO ability – e.g., large firms – should poach well-performing CEOs from firms that benefit less. In the opposite direction, small firms should raid CEOs of larger firms whose performance is just short of those firms' retention thresholds. Such reallocations should also occur after technological and other shocks to firms' CEO skill requirements. The fact that CEO raids rarely happen reduces CEOs' career incentives and raises questions about how efficiently the labor market reallocates talent.

³ Using different approaches Bertrand and Schoar (2003), Chang, Dasgupta, and Hilary (2010), Salas (2010), Donatiello, Larcker, and Tayan (2018), Bandiera, Prat, Hansen, and Sadun (2020), Bennedsen, Pérez-González, and Wolfenzon (2020), and Jenter, Matveyev, and Roth (2021) document large CEO effects, while Fee, Hadlock, and Pierce (2013) find none.

⁴ The idea of a unified CEO talent pool has previously been challenged by Cremers and Grinstein (2014) and Yonker (2017), who provide evidence of segmentation by industry and geography, respectively.

Many of this paper's results can be explained by a combination of firm-specific human capital and asymmetric learning about CEO ability. With firm-specific human capital, executives have valuable firm-specific skills or knowledge that do not transfer to other companies (Becker 1962). With asymmetric learning, executives' employers learn (and therefore know) more about their executives' abilities than outsiders (Waldman 1984; Greenwald 1986).

Both mechanisms predict a strong preference for hiring insiders. Both make raiding other firms' executives unattractive, as the hiring firm effectively pays for any lost firm-specific human capital and exposes itself to adverse selection. Both also explain why firms raid CEOs of much smaller firms, but below-CEO executives of larger firms: if ability and scale are complementary, raiding executives who already run large operations causes larger losses of firm-specific human capital and more severe adverse selection problems.

Explaining our findings requires both firm-specific human capital and asymmetric learning. Firm-specific human capital alone cannot explain why, conditional on hiring an outsider, firms tend to hire executives their directors have worked with. Asymmetric learning can explain this result – having worked together might provide inside knowledge of an executive's ability, thus reducing adverse selection. Alternatively, the executive might have learned about the directors, increasing the executive's willingness to join their firm.

Asymmetric learning by itself can arguably not explain the sheer dominance of insider hiring. Typical non-executive directors have decades of experience across multiple firms and, as a result, are personally acquainted with many more top executives in other firms than in the one hiring the CEO. Large firms also routinely use executive search consultants to research candidates' skills.⁵ Thus, boards should have no trouble identifying high-ability executives outside the firm. The fact that more than 80% of new CEOs are nevertheless insiders suggests that boards seek firm-specific skills or knowledge.

Besides firm-specific human capital and asymmetric learning, the literature suggests several other reasons for why firms might prefer internal CEO candidates. These include promotion tournaments, agency problems between shareholders and directors, contractual frictions (such as golden handcuffs and non-compete agreements), and behavioral biases. We discuss the extent to which these mechanisms can explain our evidence in the next section.

⁵ Kaplan, Klebanov and Sorensen (2012) and Kaplan and Sorensen (2020) provide details of executive assessments by ghSMART, a company that grades candidates for top management positions on thirty personality characteristics.

The literature on CEO-firm matching has focused on firms' demand for executive talent.⁶ Several of our results indicate the importance of talent supply, and specifically the importance of top executives' reluctance to switch firms. For example, in a typical CEO raid, the hiring firm is four times larger than the raided one. This suggests that poaching a CEO requires offering the top job at a much larger firm. In the same vein, conditional on hiring an outsider, firms that raid CEOs tend to be large and relatively well performing, while firms that hire unemployed executives are smaller and badly performing, with firms that raid below-CEO executives in between. Hence, executives appear to compare firm sizes and performance and only accept offers that are large improvements on their current job. This makes poaching successful CEOs of large firms difficult.

Finally, our results also affect our understanding of CEO compensation. In standard assignment models, the level of pay must meet both the CEO's and the firm's outside options, and any surplus created by the match is split according to their relative bargaining strength.⁷ If the managerial labor market is perfectly competitive, the surplus is zero. Instead, our evidence indicates that the outside options of both firms and CEOs are limited. Firms' effective candidate pool is small, and incumbent CEOs rarely move to other firms. This suggests that the CEO labor market is imperfectly competitive and that match surpluses, due to firm-specific human capital or other factors, exist.

While the size of these match surpluses is difficult to estimate, the dominance of insider appointments and the lack of CEO raids, especially by large firms, is informative. Rosen (1982), Tervio (2008), and Gabaix and Landier (2008) show that small differences in general skills can lead to large differences in CEO pay if skills and firm scale are complementary. In equilibrium, CEOs with greater general skills are matched to larger firms and receive much higher pay. In reality, especially large firms promote internally, which indicates that the value of matching with an insider dwarfs the value of greater general skills, even for the largest firms.

This raises the possibility that the rapid rise in CEO pay since the 1970s might be due to growing rents from firm-specific skills or asymmetric information, or due to CEOs capturing a larger share of these rents. Both firm-specific and general skills are likely to be complementary to

⁶ Exceptions are Focke, Maug, and Niessen-Ruenzi (2017), who show that CEOs accept lower pay when working for a more prestigious company, and Yonker (2017), who shows that CEOs accept lower pay and are less likely to leave when working for firms in their home state.

⁷ See, for example, Tinbergen (1956), Sattinger (1975, 1979), and Rosen (1981, 1982). Stole and Zwiebel (1996) model the intra-firm bargaining between firms and employees with hold-up power.

firm scale. In fact, given the complexity of large firms, the value of firm-specific knowledge (such as understanding a firm's culture and politics) might increase faster with growing firm sizes than the value of general skills.

Our results complement several literatures. We show that the trend to more external CEO hiring since the 1970s, documented by Huson, Parrino, and Starks (2001), Murphy and Zbojnik (2007), Frydman (2019), and Graham, Kim, and Kim (2020), has plateaued.⁸ Murphy and Zbojnik (2007) report 15% external hires in the 1970s, 17% in the 1980s, and 26.5% in the 1990s. We observe 28% external hires from 1993 to 2012, with no trend over this period, of whom 30% (or 8.4% of all hires) are former executives or board members.

Few papers have examined the mobility of CEOs across firms. Hayes and Schaefer (1999) show that firms whose CEOs are raided suffer large negative announcement returns. This supports Lazear's (1986) prediction that raided managers are of high ability. Fee and Hadlock (2003) show that raided CEOs tend to be hired from firms with above-average stock price performance. Consistent with our data, there are few raids of incumbent CEOs in their 1990-98 sample. In Graham, Kim, and Kim (2020), CEO moves to new firms increase over time but remain rare: during 1950-85, 1.2% of departing CEOs become CEO of another public firm within two years, which rises to 2.9% during 1986-2011. Taking the perspective of the hiring firm, we show that 3.2% of CEO hires from 1993-2012 are raids of CEOs.⁹

Finally, our results speak to the literature on CEO career concerns. Fama (1980) and Holmstrom (1999) show that, if executives' performance affects their job opportunities, a well-functioning labor market improves incentives and alleviates agency problems. This has spurred a sizeable literature on the effects of top executives' career concerns.¹⁰

Our evidence suggests that the external job opportunities of top executives, and especially those of CEOs, are limited. Most CEO positions are filled by insiders, and even well-performing

⁸ Other studies that report the percentage of external CEO hires for specific periods and subsets of US public firms include Denis and Denis (1995; 22% external hires), Borokhovich, Parrino, and Trapani (1996, 19%), Parrino (1997; 15%), Huson, Parrino, and Starks (2001; 19%), Fee and Hadlock (2003; 27%), Zhang and Rajagopalan (2003; 39%), Agrawal, Knoeber, and Tsoulouhas (2006; 18%), Naveen (2006; 21%), Eisfeldt and Kuhnen (2013; 30%), and Cremers and Grinstein (2014, 30%).

⁹ Several other studies report low frequencies of CEO raids in their summary statistics or sample descriptions. See, for example, Vancil (1987), Weisbach (1988), Gibbons and Murphy (1992), Faulkender and Yang (2010), Gao, Luo, and Tang (2015), Colak and Korkeamäki (2017), Fee, Hadlock, and Pierce (2018), Jochem, Ladika, and Sautner (2018), Cziraki and Groen-Xu (2020), and Choi, Cicero, and Mobbs (2021).

¹⁰ See, for example, Holmstrom and Ricart i Costa (1986), Gibbons and Murphy (1992), Fee and Hadlock (2003, 2004), Giannetti (2011), Colak and Korkeamäki (2017), and Coles, Li, and Wang (2018).

CEOs are rarely poached by other firms. This is not to say that CEO career opportunities are completely absent – 5.7% of new CEOs in our sample are former CEOs of other firms, in addition to the 3.2% raided CEOs. The vast majority of CEOs, however, do not obtain another CEO job.

The next section briefly reviews the CEO selection and compensation literature. Section 2 describes our data and provides summary statistics. Section 3 describes the main CEO hiring patterns, Section 4 examines the determinants of firms' hiring choices, and Section 5 analyzes the pay of different types of CEO hires. Section 6 summarizes and concludes.

1. Conceptual background

Assignment models have long been used to analyze the allocation of workers to jobs and their equilibrium pay (Tinbergen 1956, Sattinger 1975, 1979; Rosen 1981, 1982).¹¹ More recently, Gabaix and Landier (2008) and Tervio (2008) have applied perfectly competitive and frictionless assignment models to CEOs.¹² In their models, CEO skills are perfectly observable and fully portable across firms. As there are no frictions, the equilibrium assignment of CEOs to firms maximizes aggregate output. With perfectly competitive markets, CEO pay is fully determined by CEOs' and firms' outside options, with no role for bargaining. Specifically, CEO pay is determined by how much the CEO could earn in the next best job, and by how the CEO's productivity compares to that of the next best manager.

Assignment models highlight two mechanisms that might explain the sharp rise in CEO pay since the 1970s. Firstly, the difference between CEOs' contributions to firm value and that of the next best candidate might have increased, perhaps because CEO talent has become more productive. Secondly, CEOs' outside opportunities might have improved, perhaps because CEO skills have become more portable.¹³

Gabaix and Landier (2008) and Tervio (2008) use the first channel to explain rising CEO pay. In their models, as in Rosen (1982), the productivity of CEO talent increases with firm size. In equilibrium, more talented CEOs match with larger firms and, because talent and size interact,

¹¹ This section borrows heavily from the literature survey by Edmans, Gabaix, and Jenter (2017).

¹² Edmans, Gabaix, and Landier (2009), Baranchuk, MacDonald, and Yang (2011), Edmans and Gabaix (2011), Eisfeldt and Kuhnen (2013), Bandiera, Guiso, Prat, and Sadun (2015), Gayle, Golan, and Miller (2015), Jung and Subramanian (2017), and Pan (2017) provide extensions to unobserved effort choice, endogenous firm size distributions, managerial risk aversion, multi-dimensional CEO skills, nonpecuniary job benefits, human capital accumulation, fixed costs of terminations, and imperfectly competitive product markets.

¹³ A third possibility is that the levels of effort or risk associated with the equilibrium contracts might have increased.

receive disproportionately higher pay. As firms become larger, CEO talent becomes more valuable and CEO pay rises. Based on a calibration of their model, Gabaix and Landier (2008) and Gabaix, Landier, and Sauvagnat (2014) argue that the growth of the median S&P 500 firm can explain the rise of CEO pay between 1980 and 2011.

In both Gabaix and Landier (2008) and Tervio (2008), CEO talent is observable, unidimensional, and transferrable across firms, so firms hire from a unified talent pool. There is no reason for firms to prefer insiders or candidates they are already familiar with.¹⁴ Moreover, while both models are static, in a dynamic setting their assumptions would imply frequent reallocations of CEOs across firms. For example, whenever a CEO retires, the affected firm should raid the CEO of the next smaller firm, which should in turn raid the CEO of the next smaller firm, and so on. These predictions are at odds with the evidence in this paper, which shows that current and former insiders dominate CEO hiring, while raids of incumbent CEOs are rare.

The second explanation for the rise in CEO pay is an improvement in CEOs' outside options resulting from a shift in firms' demand from firm-specific to general, and therefore portable, managerial skills (Murphy and Zabojnik 2004, 2007; Frydman 2019). Such a shift might intensify the competition for talent, increase CEOs' bargaining power, and raise the price of general skills. By facilitating the movement of executives across firms, it should also bring the CEO labor market closer to the frictionless and competitive models of Gabaix and Landier (2008) and Tervio (2008).

The evidence is consistent with an increase in the importance of general managerial ability. Since the 1970s, the percentage of externally-hired CEOs has increased, top executives have worked in more firms and sectors, their functional experiences have become more diverse, and the fraction of CEOs with an MBA has risen (Murphy and Zabojnik 2004, 2007; Frydman 2019). In the cross-section, pay is higher for CEOs with generalist rather than specialist skills (Custodio, Ferreira, and Matos 2013; Falato, Li, and Milbourn 2015).

Our evidence does not refute an increasing role (or market price) for general skills. However, it suggests that other mechanisms, such as firm-specific human capital or asymmetric learning, play the decisive role in matching CEOs to firms. Hiring externally would allow firms to

¹⁴ Pan (2017) estimates an assignment model in which CEOs' skills and firms' skill requirements are multi-dimensional. This might result in a preference for hiring insiders if insiders are more likely to offer the specific combination of (general) skills a firm requires (see also Lazear (2009)).

access a much larger talent pool and maximize their new CEOs' general skills. Yet, most firms choose insiders, likely because they have acquired firm-specific skills, knowledge, contacts, and experiences that outsiders lack (Becker 1962, 1993; Jovanovic 1979; Hashimoto 1981), or because raiding other firms' executives exposes the raider to adverse selection (Waldman 1984; Greenwald 1986).¹⁵

Besides firm-specific human capital and asymmetric learning, the prior literature suggests several other reasons for why firms might prefer internal candidates. Firstly, a bias towards insiders can motivate lower-ranked managers to compete for the CEO position (Lazear and Rosen 1981; Rosen 1986; Chan 1996).¹⁶ While likely a contributing factor, it is unlikely that promotion tournaments are the main reason for the dominance of insiders in CEO hiring. Many firms curtail promotion tournaments by identifying an heir apparent long before the promotion (Vancil 1987, Cannella and Shen 2001, Naveen 2006), possibly because tournaments can induce noncooperation and even sabotage within the management team (Lazear 1989, Chen 2003). Biasing the selection process also lowers the expected quality of the CEO (Chan 1996), and tournaments cannot explain why firms, when hiring externally, tend to hire their own non-executive directors or their directors' coworkers.

Secondly, contractual frictions might make external hires expensive. Unvested options, restricted stock, and other unvested pay components increase the cost of raiding executives. The prior literature, however, finds no evidence that unvested pay reduces raids by large public firms, which appear willing to compensate their new hires for any losses (Fee and Hadlock 2003; Balsam and Miharjo 2007). Similarly, non-compete agreements create barriers against executives moving to other firms (Marx, Strumsky, and Fleming 2009; Garmaise 2011; Kini, Williams, and Yin 2020). Our own analysis, however, finds an insignificant correlation (of the wrong sign) between the enforceability of non-compete agreements and internal promotions, which dominate even in states in which non-competes are effectively void.

Finally, firms' preference for insiders might be the result of agency problems or behavioral biases. CEOs might advocate for an internal successor, out of loyalty to their team or to protect

¹⁵ Asymmetric learning by employers about their own employees has been studied by, among others, Ricart i Costa (1988), Gibbons and Katz (1991), Bernhardt and Scoones (1993), Bernhardt (1995), Pinkston (2009), and Friedrich (2020).

¹⁶ For empirical evidence on CEO succession tournaments and their effects see Agrawal, Knoeber, and Tsoulouhas (2006), Kale, Reis, and Venkateswaran (2009), Kini and Williams (2012) and Burns, Minnick, and Starks (2017).

their legacy. Directors can expect more blame for a bad hire than credit for a great one, which might cause them to prefer familiar candidates. Boards might face constraints on CEO pay that prevent them from poaching other firms' executives, even if doing so would increase firm value.¹⁷ Alternatively, directors might be biased and make systematic mistakes, with status-quo bias, familiarity bias, and ambiguity aversion likely to create a preference for insiders, even if outsiders are the better choice (Fox and Tversky 1995; Zajac and Westphal 1996; Guenzel and Malmendier, 2020).

While it is likely that both agency problems and behavioral biases contribute to directors' preference for insiders, they are unlikely to be the main cause. The pervasiveness of such hires suggests that they are done by both firms with good and bad corporate governance. Large firms, usually associated with better governance, are even more likely to promote internally than smaller ones. Our own analysis finds no relationship between the presence of large shareholders and firms' tendency to hire insiders. Moreover, shareholder objections to new CEOs are rare, suggesting that institutional investors do not view standard hiring practices as the result of governance problems or mistakes.

2. Sample selection, data collection, and variable definitions

Our main sample consists of all new CEO appointments by S&P 500 firms during 1993 to 2012. The sample construction starts with the ExecuComp database, which we correct for mistakes and supplement with hand-collected data from a variety of sources. There are 1,385 CEO appointments, from which we exclude 129 CEOs who are no longer in office after 12 months, as they are likely to be interim CEOs.¹⁸

We collect information on the date of the appointment, the name of the old and the new CEO, whether the new CEO was an employee of the firm, and when the new CEO joined the firm. For external appointments, we use ExecuComp, BoardEx, nndb.com, Crunchbase, Bloomberg, and LinkedIn to obtain information on the last job of the new CEO, and whether they had previously been an executive or a director of the hiring firm. We also search LexisNexis and Factiva for press releases and media coverage of CEO transitions.

¹⁷ In Edmans, Gosling, and Jenter (2021), directors report that constraints imposed by investors and stakeholders prevent them from offering what they believe to be value-maximizing CEO pay.

¹⁸ This definition of interim CEOs follows Cremers and Grinstein (2014).

We classify all new CEOs into three types based on whether they are insiders or outsiders. Current employees of the firm are “internal promotions.” To account for succession processes in which an executive joins a firm and is promoted to CEO soon thereafter, we follow Parrino (1997) and require that internal promotions must have been with the firm for at least 12 months. Former employees and current or former board members are labeled as “external insiders.”¹⁹ All other new CEOs are classified as “outsiders.”

We further sort outsiders into three groups based on their employment at the time of the hiring: unattached managers, raided other executives, and raided CEOs. Unattached managers are not employed in an executive position at the time of their hiring. They might be unemployed, retired, working for a non-profit or the government, or running their own (usually consulting) business. Raided executives are executives, CEO or other, at another firm when hired as CEO. We require the hiring to be immediate or with almost no delay, and we ensure, based on firms’ announcements and other sources, that the cause of the move was the employment offer by the hiring firm. We exclude moves caused by the old firm being acquired, as well as cases in which there is any indication the executive was dismissed by the old firm. For CEO raids, we require the executive to have been the old firm’s top executive, and for that firm to not be a subsidiary.²⁰

We collect additional information on the employment history of all external hires, including the most recent employer, the start and end dates of the employment, and the most recent job title. We record whether the previous employer was a private or foreign firm, and whether the executive left as the result of an acquisition. We identify the highest position held in the executive’s career, ranking CEOs highest, and permanent positions above interim ones. We mostly ignore firms founded by the executive, as these firms are typically tiny and cease to operate after the executive leaves.²¹ We also record whether the new CEO was ever an executive or a non-executive director in the same 2-digit SIC industry as the hiring firm. Finally, for unattached managers, we calculate the length of time since they were last employed.

Because there are only 40 CEO raids by S&P 500 firms during our sample period, we assemble a supplementary dataset of all CEO raids by publicly traded US firms we can find. By

¹⁹ This includes comeback CEOs (Fahlenbrach, Minton, and Pan 2011) as well as non-executive directors who have never been an employee of the firm (Hoitash and Mkrtychyan 2018).

²⁰ We do not count CEO positions at firms founded by the executive. This is to exclude cases in which Jane Smith leaves an executive position, founds and runs “Smith Consultants,” and is then hired as CEO of an S&P 500 firm. We verify that none of these firms are large enough to warrant reclassification of the hire as “raided CEO.”

²¹ We make an exception if the firm continues to operate at significant scale or is later acquired.

searching press releases and news articles on Factiva and LexisNexis from 1993 to 2012, we are able to identify another 78 CEO raids by firms outside the S&P 500. We use this extended sample of CEO raids in our analyses in Section 4.

Table 1 presents summary statistics for the firms and CEOs in the main sample. Financial statement data is from Compustat and stock return data from the Center for Research in Security Prices. The descriptive statistics for accounting variables exclude financial firms (SIC codes 6000-6999).

By design, the firms in our sample are large, with average (median) market valuations of \$26 billion (\$11 billion), and complex, with an average and median number of four operating divisions. Firms appointing CEOs are even larger than the average S&P 500 firm (shown in the second-to-last column) and have worse performance, which we measure as industry-adjusted stock returns, ROA, sales growth, and the market-to-book ratio. This confirms the standard result that CEO turnover becomes more frequent after bad firm performance.²²

Departing CEOs, shown in Panel B, are older and have longer tenures than the average CEO in the S&P 500. The average (median) departing CEO has an equity stake of 1.4% (0.5%) in the firm, vested options worth \$17.2m (\$2.9m), unvested options worth \$4.7m (\$0.3m), and \$3.9m (\$0) of unvested stock. Newly hired CEOs, shown in Panel C, are younger and more likely to be female than the average S&P 500 CEO.

3. Insiders vs. outsiders

This section analyzes all new CEO hires by S&P 500 firms from 1993 to 2012, documents whether they are insiders, their prior connections to the hiring firm, their previous jobs, and whether outside hires were raided from other firms. We find that insiders dominate CEO successions, and that raids of incumbent CEOs are surprisingly rare.

3.1 Internal promotions, external insiders, or outsiders

We first document how close new CEOs were to the hiring firm before their appointment. Table 2 classifies all new CEOs from 1993 to 2012 as either internal promotions or external hires,

²² See, among many others, Coughlan and Schmidt (1985), Warner, Watts, and Wruck (1988), Weisbach (1988), Jensen and Murphy (1990), Kim (1996), Denis, Denis, and Sarin (1997), Parrino (1997), Murphy (1999), Huson, Parrino, and Starks (2001), Kaplan and Minton (2012), and Jenter and Lewellen (2021).

defined as anyone who has not been with the firm for at least one year before becoming CEO. Seventy-two percent of the 1,256 new CEO appointments are internal promotions, while only 28% are external hires. Hence, firms' own executives dominate CEO successions.

A closer look at the external hires reveals that insiders play an even greater role. Table 2 reports whether external hires have previously worked for the hiring firm, either as an executive or as a board member. Almost one-third have: 27% of external hires are current or former board members, while 15% are former executives. There is considerable overlap, as most of the former executives are also board members. Taking this into account, 30% of the external CEO hires are "external insiders", defined as former executives or current or former board members of the hiring firm. Thus, genuine outsiders make up only 19.6% of CEO appointments.

Importantly, the reallocation of future CEOs across firms does not occur a few years before the appointment. As shown in Panel C of Table 1, the average (median) pre-promotion tenure of internally promoted CEOs is almost 17 (15) years, with a 25th percentile of 7 years. More than 84% have been with the firm for at least 5 years (untabulated). Thus, firms tend to promote executives who have been insiders for many years.²³ As a result, junior and mid-level executives recruited years earlier are the main pool from which CEOs are selected. Unless firms are able to identify CEO talent many years in advance, this makes mismatches likely. It also underscores the importance of junior recruiting and internal executive development for future CEO quality.

The result that more than 80% of new CEOs are insiders is especially surprising given our focus on S&P 500 firms. We expect these large and complex firms to require CEOs with general skills and to be attractive to external talent. To examine the effect of firm size further, Panels B and C of Table 2 rank our firms each year by book assets and report results for firms above and below the median. Unexpectedly, the percentages of new CEOs who are current employees or any type of insider are higher for larger (76% and 83%) than for smaller firms (68% and 78%).

If firm size and general managerial ability were complementary and (observable) general ability the focus of firms' hiring decisions, as in Tervio (2008) and Gabaix and Landier (2008), we would expect the opposite pattern: the largest firms should be most eager to search externally for highly-skilled CEOs. On the other hand, the value of firm-specific skills might also increase with

²³ Murphy and Zbojnik (2007) report an average tenure of internally promoted CEOs of more than 20 years, while Cremers and Grinstein (2014) observe that 93% have been with the firm for at least 5 years.

firm size, and larger firms have a deeper pool of insiders to choose from. Whatever the mechanism, our results reject the hypothesis that all firms choose CEOs from the same talent pool.

3.1.1 Is the importance of outsiders increasing?

Several studies have reported an increase in external CEO hiring (e.g., Huson, Parrino, and Starks 2001; Graham, Kim, and Kim 2020), which others have attributed to an increase in firms' demand for general managerial skills (Murphy and Zabochnik 2004, 2007; Frydman 2019). To assess whether this increase in external hiring continues in our sample, Table 3 reports CEO hiring patterns for 1993-1999, 2000-2006, and 2007-2012.

There is no evidence that insiders' dominance has decreased during our sample period. The percentage of internal promotions dips from 74% in 93-99 to 70% in 00-06, but recovers back to 74% in 07-12. The percentage of genuine outsiders, i.e., appointees who are neither former nor current executives nor board members, rises from 18.7% in 93-99 to 21.0% in 00-06, before falling to 18.6% in 07-12. Thus, the percentage of new CEOs who are insiders is slightly higher towards the end than at the start of our sample, suggesting that the previously observed trend to more outsider hiring has ended.²⁴

3.1.2 Prior connections between boards and new CEOs

The results so far show that more than 80% of new CEOs are insiders. There are at least two explanations. One is a need for firm-specific knowledge, such as familiarity with the firm's processes and technology, which can only be gained by working for the firm. Alternatively, directors of hiring firms might have a preference for candidates they are familiar with. This preference might be efficient, if it improves the board's information about candidates, or it might be inefficient, if it is due to agency problems or behavioral biases.

If directors have a preference for candidates they are familiar with, even those hires who are outsiders might not have been chosen from the overall labor market, but from the smaller set of personal acquaintances of the hiring firm's board. To examine whether directors' acquaintances are favored in CEO hiring, Table 4 documents the professional and other connections between new CEOs and the hiring firm's board.

²⁴ This is consistent with Graham, Kim, and Kim (2020), who observe a decline in top executive mobility in the US after 2000.

We restrict the analysis to outsiders, i.e., to those 19.6% of new CEOs who are neither current nor former insiders. Using data from BoardEx, we define a connection as having contemporaneously worked at the same firm, served on the same board, attended the same school, or been a member of a club, organization, or charity at any time before the CEO appointment. To assess whether there are unusually many connections between directors and the CEOs they hire, we match each new CEO to an alternative executive the firm could have chosen instead. The alternative candidate is a new CEO hired or promoted by a similar firm (based on industry and size) within ± 2 years of the focal CEO's hiring. The matching algorithm is described in the Appendix. Because BoardEx's and our sample period only partially overlap, we observe connections for only 130 of the 246 outsider hires in our sample.

Table 4 shows a striking difference in board connections between actually hired CEOs and alternative candidates. Fifty-three percent of newly hired outsiders have previously worked with at least one of the hiring firm's directors. The corresponding number for other new CEOs hired by similar firms in the same period is only 13%. Hence, familiarity between directors and CEO candidates appears to play an important role in hiring decisions. The relevant connections are through employment or board service, as new CEOs and directors do not have unusually many educational or social ties.

Hiring directors' co-workers who have never been employed by the firm cannot be explained by firm-specific human capital. It is, however, consistent with asymmetric learning. Having worked together can give directors visibility of an executive's abilities and cultural fit, reducing adverse selection. Alternatively, having worked together might give a candidate useful information about a firm's directors, making the candidate more willing to join. It is also possible that directors are biased, with familiarity bias and ambiguity aversion creating a preference for acquaintances. In all these cases, the familiarity between directors and candidates increases the (perceived) value of the match.

The importance of professional networks in CEO hiring is underexplored. Several studies show that networks facilitate job searches by rank-and-file employees and young managers.²⁵ There is also evidence that networks play a role in the selection of new directors (Adams and

²⁵ See, for example, Rees (1966), Corcoran, Datcher, and Duncan (1980), Granovetter (1995), Kasinitz and Rosenberg (1996), Bayer, Ross, and Topa, (2008), Kramarz and Skans (2014), Hacamo and Kleiner (2021), and the review by Ioannides and Datcher Loury (2004).

Ferreira 2009; Agarwal, Qian, Reeb, and Sing 2016; Cai, Nguyen, and Walkling 2019) and that connections between directors and CEOs are correlated with higher CEO pay (Hwang and Kim 2009; Kramarz and Thesmar 2013, Balsam, Kwack, and Lee 2017), less CEO turnover (Hwang and Kim 2009; Nguyen 2012, Balsam et al. 2017), and lower firm values (Fracassi and Tate 2012). Our results add evidence that executives' connections to directors increase their chances of being hired as CEO.²⁶

Alternatively, it is also possible that shared work histories between directors and CEO candidates indicate an unobserved executive characteristic relevant to hiring, such as knowledge of a specific technology or type of firm. If this were the case, the evidence in this section would reinforce the conclusion that specific, rather than general, knowledge is important in selecting CEOs. In either case, the evidence is hard to reconcile with models in which CEOs are chosen for their observable general managerial skills and move freely across firms.

3.2 Where do firms find external CEO hires?

To better understand the challenges firms face when hiring externally, we next examine the backgrounds of the 352 external CEO hires. External hires come from one of three sources: current CEOs of other firms (“raided CEOs”), below-CEO executives of other firms (“raided other executives”), and managers who are not currently in an executive role (“unattached managers”). The results, shown separately for genuine outsiders (Panel A) and former executives and board members (Panel B), are in Table 5.

The most surprising result is the rarity of CEO raids. Only 3.2% of new CEOs are poached from the CEO position at another firm: 2.8% outsiders (Panel A) and 0.4% former executives or board members (Panel B).²⁷ Hence, when choosing a new CEO, firms tend to ignore the most obvious source of established CEO talent.

This result rejects predictions of several standard models, which imply frequent reallocations of CEOs across firms. If CEOs with greater general skills match frictionlessly with larger firms (as in Tervio 2008 or Gabaix and Landier 2008), any change in firms' size ranking should cause CEOs to switch firms. Similar reallocations should occur after technological and

²⁶ In contemporaneous work, Wang (2021) finds consistent evidence that both internal and external candidates' connections to directors increase their probability of becoming CEO.

²⁷ Consistent with the prior section, 70% of raided outsider CEOs have previously worked with at least one of the hiring firm's directors.

other shocks to firms' CEO skill requirements. On-the-job learning about CEO ability (as in Hermalin and Weisbach 1998) should allow successful CEOs to move to larger firms and force less successful ones to smaller firms. In fact, without frictions, each CEO departure should trigger a cascade of CEO moves, as each affected firm raids the CEO of the next smaller firm.

There are several potential explanations for the lack of CEO mobility. CEOs might be loyal to their employer. Uncertainty about match quality might make risk averse CEOs reluctant to switch firms. Incumbent CEOs might be penalized for interviewing with other firms. Moving costs might be high for CEOs with working spouses or school-age children. Whatever the explanation, CEOs' apparent immobility limits firms' and CEOs' outside options and CEO's career concerns.

If outsider hires are not CEOs of other firms, who are they? Panel A shows that most are below-CEO executives at other firms (55% of outsider hires and 11% of all hires). This suggests that firm-specific human capital alone does not explain the lack of CEO raids – raids of below-CEO executives are more than three times as frequent. Instead, other frictions appear to make CEO raids difficult.

The remaining 31% of outsider hires (and 6% of all CEO hires) are unattached managers, i.e., outsiders not currently in an executive position. Hiring unattached managers should be relatively easy, as they give up neither firm-specific human capital nor a good match and have no concerns about upsetting their employer. On the other hand, most skilled executives are likely to be employed, limiting the supply of unattached talent. This might explain why, among outsider hires, less than one-third are unattached.

Panel B tabulates the sources of the 106 “external insiders,” i.e., former employees or board members. Most are unattached at the time they are hired (78%), with below-CEO raids (17%) and CEO raids (5%) making up the rest. The high percentage of unattached executives indicates that their skills are not in demand by other firms, suggesting that they are hired because of their close connection to the hiring firm. Their lack of labor market appeal is also evident in the average (median) length of time since their last executive position (Panel C): 29 (26) months for unattached managers who are “external insiders”, compared to only 14 (9) months for those who are outsiders to the hiring firm.

To better understand what human capital firms acquire when hiring outsiders, Table 6 tabulates separately the professional backgrounds of the 169 raided and 77 unattached executives. Besides 35 CEO raids, most raids target presidents, segment and division leaders, and vice

presidents of operating units. Hence, firms tend to poach senior executives with direct responsibility for business operations. The backgrounds of unattached hires, shown on the right, show a similar preference for operating experience. This is consistent with operational, rather than staff roles (such as finance, accounting, or human resources) preparing executives for the CEO position.

Table 6 also shows substantial demand for prior CEO experience: 21% of raids target CEOs, and 60% of unattached outsiders have previously been a CEO. The pattern is similar when hiring former executives or board members (untabulated): 25% are former CEOs of the hiring firm, 32% have been the CEO of another firm, and 5% are raided from current CEO jobs, for a total of 62% with prior CEO experience. This again indicates that raiding CEOs is difficult – firms instead fill most of their demand for CEO experience by hiring ex-CEOs.²⁸

Finally, Panel C of Table 6 shows that most of the hired outsiders have prior experience in the hiring firm's 2-digit SIC industry. Among raided hires, 43% have worked as an executive and 52% as an executive or director in the same industry. Among unattached hires, 53% have industry experience as executives and 58% as executives or directors. Given the difficulties of assigning large firms to SIC industries (see, e.g., Hoberg and Phillips 2016), these numbers likely understate the percentage of CEO hires with same-industry experience. Thus, consistent with Parrino (1997) and Cremers and Grinstein (2014), also industry-specific human capital appears to be important when hiring CEOs, further reducing firms' effective talent pool.

In summary, this section has shown that CEO raids are rare: only 3.2% of new CEOs are poached from the CEO position at another firm. Instead, most outsider hires are below-CEO executives at other firms or unattached, and many have prior CEO experience. The reason(s) for firms' reluctance to poach CEOs, or for CEOs' reluctance to switch firms, are unknown and an important topic for further research. It is especially surprising given our focus on S&P 500 firms, which should be able to hire the successful CEOs of many smaller firms.

3.3 The prior firms of raided executives

The previous section has shown that only 15% of new hires are raided from other firms – 3.2% through CEO raids and 12.2% through below-CEO raids. Given the importance of talent

²⁸ A significant part of the supply of ex-CEOs is due to prior acquisitions. Among outsider hires who are former (but not current) CEOs, 38% of unattached and 50% of raided executives lost their CEO job after their firm was acquired.

reallocation in many theories of the executive labor market and for CEOs' career concerns, an interesting question is why raids are not more frequent. As a first step, this section examines what types of firms new CEOs are raided from.

The top panel of Table 7 shows that almost 80% of executive raids target publicly-listed US firms. Between 15 and 18 percent of raided hires are from unlisted US firms, and less than 5% from foreign firms. This suggests further restrictions on the effective candidate pool: most CEO candidates are already at listed US firms, with few executives of private firms and almost no foreigners included. Whether this is because boards are unfamiliar with private-firm or foreign executives, or because these executives lack (or have been unable to demonstrate) the skills required to run an S&P 500 firm is an open question.

Because there are only 40 CEO raids in our sample, we also report results from an extended dataset where the hiring firms are not restricted to the S&P 500.²⁹ Searching press releases and news reports from 1993-2012 for CEO raids by public US firms increases their number to 118. Results from this extended sample, reported in the two right-most columns, are similar to those from the S&P 500.

The second important result in Table 7 is that CEOs are poached from very different firms than below-CEO executives, especially in terms of firm size. CEO raids target smaller firms, both in absolute and relative terms: the firm value (book assets) of the median prior firm is only 28% (24%) of that of the hiring firm. Raids of below-CEO executives, on the other hand, target larger firms: the firm value (book assets) of the median prior firm is 434% (423%) of that of the hiring firm.

These size differences are an indicator of the challenges firms face when raiding executives. If raiding CEOs were costless, we would expect frequent moves of CEOs between almost similar firms. Instead, CEO moves are rare, and when they occur are to much larger firms. This suggests large costs of poaching CEOs, so that large benefits (e.g., a more talented executive running a much larger firm) are required to compensate.

Firms raiding below-CEO executives from much larger companies indicates that such raids are easier. Many of the raided executives are heads of segments or divisions (see Section 3.2) and move to a smaller firm for their first CEO job. The executive benefits by obtaining a CEO position,

²⁹ See Section 2 for more information about the data collection for this extended sample of CEO raids.

and the hiring firm benefits by bringing in expertise from larger firms that often have better processes, structures, or technologies.³⁰

Both firm-specific human capital and asymmetric learning about CEO ability can explain why firms raid CEOs of much smaller but division heads of larger firms. If ability and scale are complementary, raiding executives who run larger operations causes larger losses of firm-specific human capital and worse adverse selection problems. Consequently, when choosing whom to raid, we expect firms to trade off the candidates' expected ability against the costs of adverse selection and of paying for lost firm-specific human capital.

Table 7 also shows that the prior firms of raided CEOs are mediocre performers in terms of 3-year stock returns, market-to-book ratios, and ROA, while the prior firms of raided other executives outperform on these metrics. That below-CEO executives are being poached from well-performing firms has previously been shown by Fee and Hadlock (2003). The observation that CEOs are raided from worse performers is new.

One explanation is that even S&P 500 firms find it difficult to lure away other firms' CEOs. If CEOs view switching firms as costly, they will only accept offers that are large improvements on their current position. This would explain why CEO moves are rare, are to much larger (and presumably more attractive) firms, and are by CEOs with relatively mediocre recent performance (who are likely less enamored by their current match). It does, however, raise the question why hiring firms do not offer even higher compensation to attract successful CEOs.

4. What determines firms' hiring choices?

We next examine the determinants of firms' CEO hiring choices. Firms have a choice between promoting internally or hiring externally and, when hiring externally, between external insiders or true outsiders. Moreover, when hiring outsiders, firms can poach a CEO or a below-CEO executive, or they can hire an unattached manager.

4.1 Insiders vs. outsiders

We begin by analyzing firms' choice between promoting internally, hiring an external insider, and hiring a true outsider. Table 8 shows that both firm size and performance are important

³⁰ Bloom and Van Reenen (2007) and Bloom, Brynjolfsson, Foster, Jarmin, Patnaik, Saporta-Eksten, and Van Reenen (2019) show a strong positive correlation between firm size and the sophistication of management practices.

determinants of this choice. Panel A reports firm characteristics by type of hire, while Panel B reports hiring frequencies for the top and bottom quintile of firms sorted by their characteristics.

Larger firms are much more likely to promote internally than smaller ones. Firms promoting internally have an average firm value of 27bn, significantly larger than firms hiring external insiders at 21bn and firms hiring outsiders at 16bn (Panel A). Firms with firm value in the largest quintile promote internally in 83% of cases, while firms in the smallest quintile do so in only 65% of cases (Panel B). The difference is made up by hiring outsiders, who are 9% in the largest quintile but 25% in the smallest one.

The small number of outsider hires among the largest firms challenges our understanding of the CEO labor market. If, as in Gabaix and Landier (2008) and Tervio (2008), the value of general skills increases with firm size, the largest firms should be most eager to search externally for the most able CEOs. In reality, the largest firms are most likely to promote internally. One explanation is that the value of firm-specific skills may also increase with firm size. In fact, given the complexity of large firms, the need for firm-specific skills might rise faster with size than the need for general skills. If so, the rise in CEO pay since the 1970s might be due to growing returns to firm-specific (rather than general) human capital.

Table 8 also shows that better performing firms are more likely to promote internally, consistent with Datta and Guthrie (1994) and Parrino (1997). Internal promotions are associated with higher industry-adjusted stock returns, market-to-book ratios, ROA, and sales growth than hiring external insiders or outsiders (Panel A). Firms with industry-adjusted stock returns (ROA) in the top quintile promote internally in 82% (76%) of cases, while firms in the bottom quintile do so in only 55% (60%) of cases (Panel B). However, even among firms with bottom quintile performance, the majority of CEO hires are internal promotions, and fewer than 30% are outsiders.

Another interesting observation is that hiring external insiders – i.e., former executives or board members – is associated with even lower stock returns, ROA, and market-to-book ratios than hiring outsiders. These hires are also associated with the prior CEO leaving early in tenure and at an unusually low age, suggesting performance-induced turnovers. Hence, when bad performance causes firms to not promote internally, they frequently turn to former executives or directors for help. This again suggests that firm-specific human capital or asymmetric learning are important.

These univariate results are confirmed by multivariate regressions in Table 9. The first regression estimates a linear probability model of an indicator for internal promotions on firm characteristics. The second regression estimates a multinomial logit model with three choices – internal promotions, hiring an external insider, or hiring an outsider – on the same characteristics.³¹

The coefficient estimates confirm that internal promotions are significantly positively related to firm size and industry-adjusted stock returns, and insignificantly positively to ROA and sales growth. Internal promotions are also significantly positively correlated with industry stock returns and capital expenditures, and negatively with R&D intensity. Consistent with the univariate results, the largest effects are from industry-adjusted stock returns (a 9.4 percentage point increase in internal promotions for a one standard deviation change) and from firm size (a 4.9 percentage point increase).

Panel A of Table A1 in the Online Appendix adds the enforceability of non-compete agreements at the state level from Garmaise (2011) to the Table 9 regressions. Against expectations, the enforceability index is negatively correlated with internal promotions and insignificant. This suggests that non-compete agreements are not the reason for firms' preference for internal promotions. Even for hires for which the enforceability index is in the bottom 40% of our sample (Garmaise index ≤ 3 of 12), only 20% of new CEOs are outsiders (untabulated).

Panel B of Table A1 adds blockholder ownership, defined as the percentage of equity held by shareholders with stakes of at least 5 percent, to the Table 9 regressions.³² Because of missing data, this reduces the number of observations by about one-third. Blockholder ownership is insignificantly negatively correlated with internal promotions in both the linear probability and the multinomial logit model. Using instead an indicator for “at least one 10-percent blockholder” yields insignificant positive correlations with internal promotions in both models (untabulated). Hence, there is no evidence that large shareholders oppose internal promotions or favor outsiders. This speaks against agency problems as the main reason for firms' tendency to hire insiders.

³¹Because of partially missing data, we omit the number of operating segments from the regressions. Including it yields insignificant positive correlations with internal promotions in both the linear probability and the multinomial logit model, and a small but significant negative correlation with hiring outsiders in the multinomial logit model. This is consistent with a mildly stronger preference for insiders in more complex firms.

³² The blockholder data is available for 1996-2012 and was collected following the approach in Dlugosz, Fahlenbrach, Gompers, and Metrick (2006). We are grateful to Rudi Fahlenbrach and Jasmin Gider for making their data available.

4.2 Raiding executives vs. hiring unattached managers

Conditional on hiring an outsider, firms have a choice between raiding another firm's CEO, raiding a below-CEO executive, and hiring an unattached manager. Table 10 examines the firm characteristics associated with these choices. Panel A reports average firm characteristics by source of outsider hire, while Panel B sorts firms into terciles based on their characteristics and reports hiring choices for the top and bottom tercile.³³

Even though raiding below-CEO executives is the most frequent choice across the board, larger firms are relatively more likely to raid a CEO, while smaller firms are relatively more likely to raid a below-CEO executive or hire an unattached manager. Firms raiding CEOs have an average firm value of 26bn, compared to 18bn for firms raiding below-CEO executives and 11bn for firms hiring unattached managers (Panel A). Firms with value in the top tercile raid CEOs for 23% of their outsider hires, while firms in the bottom tercile do so in only 4% of cases (Panel B).

Table 10 also shows that, conditional on hiring an outsider, unattached managers are more frequently chosen by firms with low stock returns, low ROA, low sales growth, low market-to-book, and high leverage. For example, firms with bottom-tercile industry-adjusted stock returns choose unattached managers for 38% of their outsider hires, while firms in the top tercile do so in only 26% of cases. This is consistent with badly-performing firms finding it difficult to hire away other firms' executives. Better-performing firms, on the other hand, more frequently raid executives, with larger firms poaching both CEOs and other executives and smaller firms focusing on below-CEO executives.

These univariate results are confirmed in Table 11 using a multinomial logit model that relates the same three choices – CEO raids, below-CEO raids, hiring unattached managers – to firm characteristics. CEO raids are significantly positively related to firm size, sales growth, and capital expenditures, and insignificantly positively to industry-adjusted stock returns. Below-CEO raids are significantly positively correlated with industry returns and insignificantly positively with ROA, sales growth, and investment into R&D and physical capital. Unattached hires, on the other hand, are significantly negatively related to industry returns, significantly positively to leverage, and insignificantly negatively to firm value, industry-adjusted stock returns, ROA, sales growth,

³³ We sort firms into terciles rather than quintiles (used in Table 8) because of the small number of outsider hires.

and investment into R&D and physical capital. Hence, with the exception of the market-to-book ratio, hiring unemployed managers is associated with signs of bad firm performance.

The evidence in this and the prior sections suggests that both executives' reluctance to switch firms and the attractiveness of the hiring firm are important factors in the CEO labor market. The few CEO raids that occur are almost all done by large and relatively well-performing firms, at least compared to other firms hiring outsiders, and target much smaller and relatively badly-performing firms (see Section 3.3). Better firm and industry performance are associated with more CEO and below-CEO raids, while worse performance predicts unattached hires. Hence, smaller and badly performing firms, which are most likely to hire outsiders and presumably most in need of talent, appear least able to attract executives from other firms.

5. CEO pay

One potential explanation for firms' preference for internal promotions over hiring outsiders is differences in CEO pay. There are several reasons why outsiders, and especially outsiders employed by other firms, might be more expensive. First, outsiders are presumably hired because of their general (and therefore transferrable) skills, which are prized by the managerial labor market (Murphy and Zabojnik 2007; Custodio, Ferreira, and Matos 2013; Falato, Li, and Milbourn 2015). Second, outsiders are likely to be uncertain about their fit with the new firm, which increases their risk and necessitates paying a risk premium (Peters and Wagner 2014; Carter, Franco, and Tuna 2019). Third, loyalty to the current employer, and contractual or other frictions (such as unvested equity or the need to move a family) are likely to make outsiders more costly.

Panel A of Table 12 compares initial compensation levels of new CEOs who have been promoted internally, external insiders, and outsiders. Because most new CEOs do not start on the first day of a fiscal year, their first reported CEO pay is for a partial year. We therefore report compensation levels for both the fiscal year in which the new CEO starts and the subsequent year.

During the hiring year, outsiders are paid substantially more than external insiders and internal promotions. Average pay for outsiders is 14.0 million, compared to 11.6 million for external insiders and 8.7 million for internal promotions (all in 2012 dollars). These numbers might, however, be misleading as there are also large firm size differences between these categories (see Section 4.1). We therefore also report abnormal pay, calculated as the residual from a regression of total pay on firm size, year fixed effects, industry fixed effects, and the interaction

of firm size and industry fixed effects, estimated using all CEOs in ExecuComp. This reduces the differences, with mean abnormal pay of 5.3 million for outsiders, 3.4 million for external insiders, and 0.5 million for internal promotions.

These pay differences are consistent with outsiders having more transferrable human capital, with outsiders receiving a premium for accepting the risk of a bad match, and with outsiders being compensated for frictions in changing jobs and locations. Consistent with front-loaded risk premia and compensation for moving costs, the pay differences decline sharply in the subsequent fiscal year: mean abnormal pay falls to 1.7 million for outsiders, 1.4 million for external insiders, and 0.2 million for internal promotions.

These pay differences appear moderate, and it is an open question to what extent they can explain firms' preference for internal promotions. As a percentage of firm value, CEO pay in S&P 500 firms is small – average pay in the first full year is 0.12% of firm value for outsiders, 0.10% for external insiders, and 0.07% for internal promotions. If, as the prior literature suggests, differences in CEO types have large effects on firm performance and value, these pay differences appear too small to justify choosing an insider over a significantly more skilled outsider.

Conditional on hiring an outsider, firms have a choice between raiding CEOs, raiding below-CEO executives, and hiring unattached managers. Panel B of Table 12 examines whether these choices might be explained by differences in CEO pay. Pay and abnormal pay in the hiring year is highest for raided below-CEO executives, consistent with firms having to pay a premium to lure them from their (usually much larger and better-performing) prior employers. Perhaps surprisingly, raided CEOs are not especially expensive, with hiring-year pay and abnormal pay that is lower than that of other raided executives and similar to that of unattached executives. After the hiring year, abnormal pay is similar for all three categories of outsiders. In the first full year as CEO, average abnormal pay is 1.5 million for raided CEOs, 1.7 million for other raided executives, and 1.8 million for unattached managers. Hence, differences in required pay levels do not offer an obvious explanation for why firms rarely poach CEOs.

These univariate results are confirmed in multivariate analyses in Table 13. We regress the log of CEO pay in the first full year on indicators for the different types of CEO hires and controls for firm size, performance, other firm characteristics, year fixed effects, industry fixed effects, and interactions between firm size and industry fixed effects. All firm characteristics are measured before the new CEO's arrival. The results confirm that outsiders are paid more than internal

promotions, but also that the pay differences between raided CEOs, raided other executives, and unattached hires are moderate. The estimated pay premia for outsiders are larger when controls for firm performance are included. This is because outsiders are typically hired into badly performing firms, in which internal promotions are paid relatively little. Interestingly, there is no evidence that badly performing firms pay a premium to attract CEOs, as new CEO pay is positively correlated with pre-hiring industry-adjusted stock returns, sales growth, and market-to-book.

6. Conclusion

Large public firms hire CEOs from a surprisingly small pool of candidates. More than 80% of new CEOs of S&P 500 firms from 1993 to 2012 are current or former employees or board members. More than 90% of new CEOs are executives firms are already familiar with – either insiders or executives its directors have worked with. This is hard to reconcile with models of the labor market in which abilities are easily observable, CEOs are chosen for general skills, and executives transfer freely across firms.

There are few moves of incumbent CEOs across firms – firms raid other firms' CEOs for only 3% of new hires. Large firms rarely poach successful CEOs of smaller firms, and smaller firms almost never raid CEOs of larger ones. CEOs appear to be reluctant to switch firms and only willing to do so if the new firm is much larger and better performing. This reduces their career concerns and hampers the reallocation of CEO talent. Either future CEOs are assigned optimally to firms already many years before obtaining the top job, or our evidence suggests serious inefficiencies in the CEO labor market.

Many of this paper's results can be explained by a combination of firm-specific human capital and asymmetric learning about CEO ability. Both imply a preference for hiring insiders, and both make raiding other firms' executives unattractive, as the hiring firm pays for lost firm-specific human capital and exposes itself to adverse selection. As a result, the effective candidate pool differs across firms and, for each individual firm, is much smaller than the overall market.

Our results also affect our interpretation of the rapid rise in CEO pay since the 1970s. The limited outside options of both firms and CEOs suggest an imperfectly competitive labor market with potentially large match surpluses. Hence, the rapid rise in CEO pay since the 1970s might be due to growing rents from firm-specific skills or asymmetric information, or due to CEOs capturing a growing share of these rents.

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Appendix: Alternative candidates to examine CEO-board connections

Using the algorithm of Engelberg, Gao, and Parsons (2013), we are able to find 138 of the 246 outsider hires in our sample in BoardEx. To match these 138 CEO hires to alternative candidates the firm could have hired, we start with all new CEO appointments in our sample (i) within plus or minus two years of the focal CEO's hiring, (ii) at firms within plus or minus 30% of the firm value of the focal firm (where firm value is defined as book assets minus book value of equity plus market value of equity), (iii) in the same 4-digit SIC industry. Of the alternative candidates in this set, we choose the observation closest in firm size.

If the first match is not in BoardEx, we consider the next closest match in terms of firm size. We repeat this until we find a match. If there are no matches that satisfy criteria (i)-(iii), we relax the industry constraint (iii) and look in the same 3-digit, 2-digit, and 1-digit SIC industry, as needed. If there are no matches in the same 1-digit industry, we select the alternative candidate that satisfies (i) and (ii) and is closest in size. In eight cases there are no alternative candidates that satisfy (i) and (ii), and we drop these eight CEO hires from the analysis. Finally, in 15 cases the algorithm initially matches the same control CEO to two or more focal CEOs. In such cases, we assign an alternate control CEOs to ensure that no control CEO appears more than once. When reassigning control CEOs, we aim to maximize the overall match quality on industry and size. This procedure yields 130 matched pairs.

Table 1: Characteristics of hiring firms

This table shows descriptive statistics for all CEO hiring firms in the S&P 500 from 1993-2012. There are 1,256 (non-interim) CEO appointments. Panel A shows firm characteristics, Panels B and C show characteristics of old and new CEOs, respectively. All dollar values in Panel A (B) are in millions (thousands) of 2012 dollars. *Firm value* is book assets minus book value of equity plus market value of equity, where book value of equity is shareholders' equity plus deferred taxes plus balance sheet tax credits minus book value of preferred stock. *Number of segments* is the number of operating segments reported by the firm. *12m industry-adjusted returns* are average monthly stock returns net of the value-weighted 3-digit SIC industry return. *12m industry returns* are average monthly value-weighted 3-digit SIC industry returns. Returns of hiring firms are measured up to the month preceding the CEO hiring; returns of all S&P 500 firms are measured to the end of the fiscal year. *ROA* (Return on assets) is operating cash flow divided by book assets. *Sales growth* is the year-on-year growth rate of sales. *M/B* (market-to-book) is firm value divided by book assets. *Leverage* is total debt divided by book assets. *Ownership stake* is the CEO's percentage equity ownership and includes vested options. All accounting variables are measured at the end of the fiscal year preceding the CEO hiring, are winsorized at the 1% level, and exclude financial firms (SIC codes 6000-6999).

Panel A: Firm characteristics								
	Mean	Median	Std.	25 th pctl.	75 th pctl.	Obs.	S&P 500 Mean	Diff. T-stat.
Firm value	25,679	10,972	45,255	468	293,488	1,053	24,971	0.49
Book assets	18,077	7,879	30,925	479	223,277	1,065	13,956	4.22***
Number of segments	4.03	4.00	2.64	2.00	5.00	1,118	3.80	2.78***
12m ind.-adj. return	-0.27	-0.12	2.99	-19.94	24.52	1,189	0.48	-8.31***
12m industry return	0.54	0.74	2.90	-0.54	1.97	1,192	0.84	-3.34***
ROA	0.04	0.05	0.09	-0.35	0.27	1,065	0.06	-5.2***
Sales growth	0.07	0.05	0.20	-0.45	1.02	1,065	0.11	-5.67***
M/B	1.99	1.52	1.47	0.82	10.15	1,060	2.22	-4.79***
R&D/Assets	0.03	0.00	0.04	0.00	0.21	1,065	0.02	2.76***
CapEx/Assets	0.06	0.05	0.04	0.00	0.20	1,057	0.05	7.68***
Leverage	0.25	0.25	0.15	0.00	0.68	1,060	0.19	11.4***
Panel B: Old CEO								
Age	60	61	7	35	83	1,170	56.06	17.8***
Tenure	8.2	6.0	7.0	0.0	47.0	1,155	6.5	7.62***
Female	0.01	0.00	0.10	0.00	1.00	1,188	0.01	-0.68
Ownership stake (%)	1.42	0.49	2.94	0.01	18.00	1,098	1.94	-4.32***
Vested options	17,224	2,891	38,763	0.00	258,289	1,187	16,621	0.49
Unvested options	4,723	341	12,822	0.00	96,443	1,187	7,360	-1.78*
Unvested shares	3,890	0	9,884	0.00	71,278	1,187	5,533	-2.39**
Panel C: New CEO								
Age	53	54	6	35	74	1,140	56.06	-14.0***
Female	0.03	0.00	0.16	0.00	1.00	1,141	0.01	3.24***
Tenure (internal)	16.6	15.0	10.8	7.0	26.0	906	-	-

Table 2: CEO hires in S&P 500 firms 1993-2012

This table classifies 1,256 CEO appointments in S&P 500 firms from 1993 to 2012. *Internal promotions* are employed by the firm at least one year before the CEO appointment, while *external hires* are not. Among external hires, *former executives* used to work at the firm but do not at the time of the appointment. *Board members* are current or former directors of the firm. *Outsiders* are neither former nor current executives or board members of the hiring firm. Panel A shows results for the entire sample, while Panels B and C show only firms of above- or below-median size, respectively. Size is measured using book assets and firms are ranked each year.

Panel A: All firms (1,256 CEO hires)				
Internal promotion	External hire			
72%	28%			
	Former executive	Board member	Former executive or board member	Outsider
As % of all hires	4.1%	7.5%	8.4%	19.6%
As % of external hires	14.5%	26.8%	29.9%	70.1%

Panel B: Above median size (623 CEO hires)				
Internal promotion	External hire			
76%	24%			
	Former executive	Board member	Former executive or board member	Outsider
As % of all hires	3.7%	6.6%	7.5%	16.7%
As % of external hires	15.2%	27.2%	31.1%	68.9%

Panel C: Below median size (633 CEO hires)				
Internal promotion	External hire			
68%	32%			
	Former executive	Board member	Former executive or board member	Outsider
As % of all hires	4.4%	8.4%	9.2%	22.4%
As % of external hires	14.0%	26.5%	29.0%	71.0%

Table 3: Changes in CEO hiring over time

This table classifies CEO appointments in S&P 500 firms in 1993-99 (Panel A), 2000-06 (Panel B), and 2007-12 (Panel C). *Internal promotions* are employed by the firm at least one year before the CEO appointment, while *external hires* are not. Among external hires, *former executives* used to work at the firm but do not at the time of the appointment. *Board members* are current or former directors of the firm. *Outsiders* are neither former nor current executives or board members of the hiring firm.

Panel A: 1993-1999 (418 CEO hires)				
Internal promotion	External hire			
74%	26%			
	Former executive	Board member	Former executive or board member	Outsider
As % of all hires	4.1%	6.7%	7.7%	18.7%
As % of external hires	15.5%	25.5%	29.1%	70.9%

Panel B: 2000-2006 (515 CEO hires)				
Internal promotion	External hire			
70%	30%			
	Former executive	Board member	Former executive or board member	Outsider
As % of all hires	5.4%	8.2%	9.3%	21.0%
As % of external hires	17.9%	26.9%	30.8%	69.2%

Panel C: 2007-2012 (323 CEO hires)				
Internal promotion	External hire			
74%	26%			
	Former executive	Board member	Former executive or board member	Outsider
As % of all hires	1.9%	7.4%	7.7%	18.6%
As % of external hires	7.1%	28.2%	29.4%	70.6%

Table 4: Prior connections between boards and CEOs

This table shows professional and other connections between directors and new CEOs using data from BoardEx. Only outsiders, i.e., new hires who are neither current nor former insiders, are included in the analysis. A connection between a director and a new CEO is defined as having contemporaneously worked at the same firm, served on the same board, attended the same school, or been a member of a club, organization, or charity at any time before the CEO appointment. For comparison, each CEO hire is matched with an alternative candidate, who is a new CEO hired or promoted by a similar firm (based on industry and size) within plus or minus two years of the focal CEO's hiring. The matching algorithm is described in the Appendix. Because our sample period only partially overlaps with the period covered by BoardEx, we observe connections for only 130 of the 246 outsider hires in our sample.

Connections between directors and new CEO hires				
	CEO hires		Alternative candidates	
	Number	%	Number	%
Connections through shared employment or board service:				
Board connection	69	53.1	17	13.1
No board connection	61	46.9	113	86.9
All connections:				
Board connection	71	54.6	22	16.9
No board connection	59	45.4	108	83.1
Total	130		130	

Table 5: Sources of external CEO hires

This table examines how firms hire external CEOs. A *raided CEO* is employed by a different firm as CEO at the time of the hiring and the cause of the CEO’s move is the job offer by the new firm. A *raided other executive* is employed by a different firm at the time of the hiring in an executive position, but not as CEO. An *unattached manager* is not employed as an executive at the time of the hiring, and her last known employment was with a different company. Panel A reports results for *outsiders*, defined as neither former nor current executives nor board members of the hiring firm. Panel B reports results for *external insiders*, who are former executives or current or former board members of the hiring firm. Panel C reports summary statistics for the length of time since the last executive position of unattached hires.

Panel A: Outsiders (246 hires)						
All outsiders	19.6%					
	Raided CEO	Raided other executive	Unattached manager			
As a % of all hires	2.8%	10.7%	6.1%			
As a % of outsiders	14.2%	54.5%	31.3%			

Panel B: External insiders (106 hires)						
All external insiders	8.4%					
	Raided CEO	Raided other executive	Unattached manager			
As a % of all hires	0.4%	1.5%	6.5%			
As a % of external insiders	4.8%	17.1%	78.1%			

Panel C: Time since last executive position for unattached managers						
	Mean	Median	SD	P10	P90	Obs.
Time since last position (months)						
... for outsiders	13.6	8.5	13.4	2.0	33.0	76
... for external insiders	29.0	25.5	23.3	2.0	58.0	82

Table 6: Outsider hires' prior roles and industry experience

This table tabulates the prior titles, roles, and industry experience of the 246 outsiders hired as CEOs. Panel A shows the most recent job title for the 169 raided hires and the highest prior job title for the 77 unattached hires. When an executive had more than one title (e.g., President & COO), the more senior one is tabulated. Segment Heads include heads of segments, divisions, and subsidiaries. Panel B provides examples of specific roles associated with the titles. Panel C shows whether CEO hires have previously worked in the hiring firm's 2-digit SIC industry as an executive or as a non-executive director.

Panel A: Most recent (highest prior) title of raided (unattached) hires				
Title	Raided hires		Unattached hires	
	Number	Percent	Number	Percent
Segment Head	55	32.5	7	9.1
CEO	35	20.7	46	59.7
Vice President / EVP / SVP	28	16.6	6	7.8
President	18	10.7	11	14.3
COO	8	4.7	2	2.6
Partner / Principal	7	4.1	2	2.6
Executive Vice Chair	7	4.1	2	2.6
CFO	5	3.0	1	1.3
Executive Chair	3	1.8	0	0.0
CTO	2	1.2	0	0.0
Other Segment-level Executive	1	0.5	0	0.0
Total	169	100	77	100

Panel B: Examples of roles

Segment Head: CEO Brewing Unit, CEO of Asia/Pacific Business, CEO and EVP of Healthcare, Chairman & CEO Global Consumer, Chairman of Consumer and Personal Care Group, President and CEO Wireless Services, President of Consumer and Small Business Banking, President of Global Snacks Division, President of the Online Services Business, President of North American Operations, President and Chief Operating Officer of North America, President & COO of Space and Strategic Missiles Sector, Head of Global Strategic Marketing and Business Development, Head of the Financial Services Practice

Vice President / EVP / SVP: Executive Vice President of Global Downstream, Executive Vice President Sales and Marketing, Senior Vice President Diagnostic Operations, Senior Vice President and Group Executive Personal Systems Group, Group Vice President

Partner / Principal: Global Managing Partner, Managing Partner, General Partner, Venture Partner, Partner, Principal

Other Segment-level Executive: COO Insurance Solutions

Panel C: Industry experience

	Raided hires		Unattached hires	
	Number	Percent	Number	Percent
As executive	72	42.6	41	53.2
As non-executive director (NED)	46	27.2	33	43.4
As executive or NED	87	51.5	45	58.4
Total	169	100	77	100

Table 7: The prior firms of raided executives

This table analyzes the target firms of executive raids, i.e., the firms from which raided executives were recruited. *Firm value* is book assets minus book value of equity plus market value of equity, where book value of equity is shareholders' equity plus deferred taxes plus balance sheet tax credits minus book value of preferred stock. *Firm value* and *book assets* are in millions of 2012 dollars. *Industry-adjusted returns* are averages of monthly returns, in percent, net of the value-weighted 3-digit SIC industry return, and measured ending the month preceding the CEO hiring. *Return on assets (ROA)* is operating cash flow divided by book assets. *Sales growth* is the year-on-year growth rate of sales. *M/B* (market-to-book) is firm value divided by book assets. All balance sheet items are measured at the end of the fiscal year preceding the CEO hiring, are winsorized at the 1% level, and exclude financial firms (SIC codes 6000-6999). Definitions of types of executive raids are in Table 5.

	Raided other executives		Raided CEOs		Raided CEOs (extended sample)	
	N	%	N	%	N	%
Type of origin firm						
US public	119	77.8%	32	80.0%	98	83.1%
US private	28	18.3%	6	15.0%	17	14.4%
Foreign public	6	3.9%	1	2.5%	1	0.8%
Foreign private	0	0.0%	1	2.5%	1	0.8%
Observations	153		40		118	
	Mean	Median	Mean	Median	Mean	Median
Firm value	115,033	60,521	10,396	5,240	4,894	2,254
Book assets	73,607	30,720	7,752	4,718	3,671	2,304
12m ind.-adj. return	0.55	-0.01	-0.40	0.13	-0.01	0.00
36m ind.-adj. return	0.36	0.09	-0.13	0.10	-0.13	-0.04
ROA	0.06	0.05	0.01	0.04	-0.02	0.03
Sales growth	0.05	0.02	0.06	0.04	0.09	0.06
M/B	1.95	1.72	1.68	1.48	1.84	1.62
Ratio (origin/destination) firm:						
Firm value	11.54	4.34	0.38	0.28	0.99	0.39
Book assets	12.90	4.23	0.31	0.24	0.85	0.29
Difference (origin-destination) firm:						
12m ind.-adj. return	1.68	0.82	0.78	0.60	1.11	1.11
36m ind.-adj. return	0.79	0.52	0.01	-0.14	-0.05	-0.23
ROA	0.03	0.01	-0.01	0.01	-0.01	0.00
Sales growth	0.03	0.00	0.06	0.06	0.04	0.03
M/B	0.11	0.05	0.28	0.13	0.22	0.03

Table 8: Firm characteristics and hiring choices – insiders vs. outsiders

This table shows descriptive statistics for S&P 500 firms hiring 1,256 CEOs from 1993-2012. Panel A sorts firms by type of CEO hired. Panel B shows the percentages of each hiring type for the top and bottom quintiles of firm characteristics. Definitions of hiring types are in Table 5. *Firm value* is book assets minus book value of equity plus market value of equity, where book value of equity is shareholders' equity plus deferred taxes plus balance sheet tax credits minus book value of preferred stock. All are in millions of 2012 dollars. *Number of segments* is the number of operating segments. *Industry-adjusted returns* are averages of monthly returns, in percent, net of the firm's value-weighted 3-digit SIC industry return, measured ending the month preceding the CEO hiring. *Industry returns* are monthly value-weighted average returns of all firms in the firm's 3-digit industry. *Return on assets (ROA)* is operating cash flow divided by book assets. *Sales growth* is the year-on-year growth rate of sales. *M/B* (market-to-book) is firm value divided by book assets. All balance sheet items are measured at the end of the fiscal year before the CEO hiring, are winsorized at the 1% level, and exclude financial firms (SIC codes 6000-6999).

Panel A: Characteristics of hiring firms (by type of hire)						
	Internal promotion		External insider		Outsider	
	Mean	Median	Mean	Median	Mean	Median
Firm value	26,856	11,510	21,090	9,335	15,608	9,408
Book assets	18,383	8,470	16,034	6,744	12,993	6,928
Number of segments	4.08	4.00	4.19	4.00	3.55	3.00
12m ind.-adj. return	0.09	0.00	-1.66	-1.20	-1.09	-0.37
12m industry return	0.57	0.77	0.32	0.64	0.53	0.71
ROA	0.05	0.05	0.01	0.04	0.03	0.04
Sales growth	0.08	0.06	0.04	0.02	0.03	0.02
M/B	1.89	1.53	1.63	1.41	1.85	1.52
R&D/assets	0.02	0.00	0.03	0.02	0.03	0.01
CAPX/assets	0.06	0.05	0.05	0.03	0.05	0.04
Leverage	0.24	0.24	0.26	0.24	0.26	0.25
Old CEO age	61	61	56	56	58	58
Old CEO tenure	8.8	7.0	5.7	3.5	7.0	5.0

Panel B: Frequencies of hiring types (by firm characteristics)						
	Top Quintile			Bottom Quintile		
	Internal promotion	External insider	Outsider	Internal promotion	External insider	Outsider
Firm value	83%	8%	9%	65%	10%	25%
Book assets	80%	8%	13%	66%	8%	25%
Number of segments	71%	10%	19%	66%	9%	25%
12m ind.-adj. return	82%	5%	13%	55%	16%	29%
12m industry return	74%	7%	19%	70%	10%	19%
ROA	76%	5%	19%	60%	14%	26%
Sales growth	78%	7%	15%	66%	13%	21%
M/B	76%	6%	18%	71%	9%	20%
R&D/assets	65%	10%	25%	76%	7%	17%
CapEx/assets	78%	7%	15%	73%	9%	18%
Leverage	69%	11%	21%	70%	5%	24%
Old CEO age	84%	6%	11%	53%	17%	29%
Old CEO tenure	80%	6%	14%	60%	17%	23%

Table 9: Regression analysis of CEO hiring choices: insiders vs. outsiders

This table shows estimates of models of CEO hiring choice. Column 1 shows coefficients from a linear probability model with internal promotion as the dependent variable. Columns 2-4 show marginal effects from a multinomial logit model where the three choices are internal promotion, external insider, and outsider. The marginal effects are evaluated at the means of the independent variables, which are described in Table 8. All independent variables are rescaled to have a standard deviation of one. Firm characteristics are measured at the end of the fiscal year before the CEO hiring. Standard errors are clustered by 3-digit SIC industry. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

	OLS		Multinomial Logit	
	Internal promotion	Internal promotion	External insider	Outsider
	(1)	(2)	(3)	(4)
Log firm value	0.0487*** (3.636)	0.0511*** (3.610)	-0.0086 (-1.097)	-0.0425*** (-3.419)
12m ind.-adj. return	0.0939*** (7.081)	0.0940*** (6.312)	-0.0343*** (-4.846)	-0.0597*** (-4.798)
12m industry return	0.0377*** (2.757)	0.0330** (2.305)	-0.0123* (-1.708)	-0.0208* (-1.680)
ROA	0.0154 (1.504)	0.0013 (0.082)	-0.0094* (-1.749)	0.0081 (0.542)
Sales growth	0.0117 (0.755)	0.0121 (0.845)	-0.0059 (-0.715)	-0.0063 (-0.505)
M/B	-0.0054 (-0.314)	0.0025 (0.145)	-0.0066 (-0.581)	0.0042 (0.292)
R&D/assets	-0.0407** (-2.351)	-0.0380*** (-2.738)	0.0136* (1.929)	0.0244** (2.053)
CapEx/assets	0.0251* (1.941)	0.0294** (1.969)	-0.0095 (-1.113)	-0.0199 (-1.533)
Leverage	-0.0233 (-1.570)	-0.0224 (-1.591)	0.0144** (1.968)	0.0080 (0.642)
Constant	0.7330*** (57.712)			
R ²	0.074			
Observations	1,136	1,136	1,136	1,136

Table 10: Firm characteristics and hiring choices – raided executives vs. unattached hires

This table shows descriptive statistics for S&P 500 firms hiring outsider CEOs from 1993-2012. Panel A sorts hiring firms by source of outsider CEO. Panel B shows percentages of outsider CEOs hired from different sources for the top and bottom terciles of firm characteristics. Definitions of sources of CEO hires are in Table 5. Definitions of firm characteristics are in Table 8.

Panel A: Characteristics of firms hiring outsiders (by source of hire)						
	Raided CEO		Raided other executive		Unattached manager	
	Mean	Median	Mean	Median	Mean	Median
Firm value	26,289	17,042	17,638	9,361	11,422	7,499
Book assets	24,340	15,895	11,741	6,342	8,610	5,514
Number of segments	4.03	3.00	3.42	3.00	3.56	3.00
12m ind.-adj. return	-0.53	0.03	-1.14	-0.14	-1.26	-1.32
12m industry return	0.08	0.37	0.95	0.85	-0.06	0.64
ROA	0.02	0.03	0.04	0.04	0.02	0.02
Sales growth	0.03	0.03	0.03	0.03	0.05	0.02
M/B	1.56	1.29	1.86	1.55	2.05	1.52
R&D/assets	0.02	0.00	0.04	0.01	0.03	0.00
CAPX/assets	0.06	0.05	0.05	0.05	0.05	0.04
Leverage	0.27	0.26	0.24	0.24	0.27	0.25
Old CEO age	57	55	58	58	58	58
Old CEO tenure	7.4	4.5	7.0	6.0	6.8	5.0

Panel B: Frequencies of outsider sources (by firm characteristics)						
	Top Tercile			Bottom Tercile		
	Raided CEO	Raided other executive	Unattached manager	Raided CEO	Raided other executive	Unattached manager
Firm value	23%	48%	29%	4%	64%	32%
Book assets	25%	48%	27%	5%	62%	33%
Number of segments	20%	49%	31%	14%	53%	33%
12m ind.-adj. return	15%	59%	26%	8%	54%	38%
12m industry return	8%	65%	27%	16%	53%	31%
ROA	11%	60%	29%	17%	45%	38%
Sales growth	17%	56%	27%	12%	48%	40%
M/B	13%	55%	32%	18%	46%	36%
R&D/assets	15%	63%	23%	16%	51%	33%
CapEx/assets	16%	60%	23%	9%	58%	32%
Leverage	16%	51%	33%	16%	63%	21%
Old CEO age	14%	56%	31%	20%	53%	27%
Old CEO tenure	13%	56%	31%	16%	54%	30%

Table 11: Regression analysis of CEO hiring choices: raided executives vs. unattached hires

This table shows marginal effects from a multinomial logit model of CEO hiring choice for firms hiring outsiders. The three choices are raided CEO, raided other executive, and unattached manager, which are defined in Table 5. The marginal effects are evaluated at the means of the independent variables, which are described in Table 8. All independent variables are rescaled to have a standard deviation of one. Firm characteristics are measured at the end of the fiscal year before the CEO hiring. Standard errors are clustered by 3-digit SIC industry. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

	Multinomial Logit		
	Raided CEO (1)	Raided other executive (2)	Unattached manager (3)
Log firm value	0.0815*** (3.504)	-0.0312 (-0.781)	-0.0503 (-1.355)
12m ind.-adj. return	0.0233 (1.116)	-0.0014 (-0.043)	-0.0218 (-0.700)
12m industry return	-0.0057 (-0.268)	0.0758** (1.994)	-0.0701** (-2.113)
ROA	-0.0240 (-0.563)	0.0891 (1.539)	-0.0651 (-1.343)
Sales growth	0.0304* (1.678)	0.0230 (0.589)	-0.0533 (-1.325)
M/B	-0.0681* (-1.951)	-0.0440 (-0.920)	0.1120*** (2.644)
R&D/assets	-0.0141 (-0.596)	0.0497 (1.466)	-0.0355 (-1.107)
CapEx/assets	0.0517** (2.253)	0.0108 (0.244)	-0.0625 (-1.438)
Leverage	-0.0201 (-0.905)	-0.0399 (-1.120)	0.0600* (1.870)
Observations	212	212	212

Table 12: New CEO pay

This table reports descriptive statistics for new CEO compensation by CEO type (Panel A) and by source of outsider hire (Panel B). Total pay is TDC1 from ExecuComp and includes salary, bonus, the value of option and stock grants, payouts from long-term incentive plans, and all other pay. All compensation numbers are in thousands of 2012 dollars and winsorized at the 5th and the 95th percentile. *Abnormal pay* is the residual from a regression of total CEO pay on the value of the firm (book assets minus book value of equity plus market value of equity), year fixed effects, 3-digit SIC industry fixed effects, and interactions of firm values with industry fixed effects. *Total pay as a % of firm value* is total pay divided by the value of the firm. *Partial year* is the fiscal year in which the new CEO starts. *First full year* is the subsequent fiscal year.

Panel A: Insiders vs. outsiders						
	Internal promotion		External insider		Outsider	
	Mean	Median	Mean	Median	Mean	Median
Total pay (partial year)	8,695	6,189	11,554	8,417	13,969	11,110
... as a % of firm value	0.073%	0.040%	0.137%	0.099%	0.197%	0.110%
Abnormal pay (partial year)	476	-371	3,419	1,650	5,269	4,560
Total pay (first full year)	8,273	6,385	8,817	7,110	8,723	6,684
... as a % of firm value	0.069%	0.041%	0.104%	0.059%	0.123%	0.073%
Abnormal pay (first full year)	162	-362	1,385	1,209	1,683	735

Panel B: By source of outsider hire						
	Raided CEO		Raided other executive		Unattached manager	
	Mean	Median	Mean	Median	Mean	Median
Total pay (partial year)	12,658	9,382	15,144	12,555	12,589	9,314
... as a % of firm value	0.091%	0.050%	0.216%	0.147%	0.227%	0.090%
Abnormal pay (partial year)	4,189	3,263	6,208	6,044	3,948	3,113
Total pay (first full year)	10,139	8,578	8,587	6,357	8,311	6,568
... as a % of firm value	0.100%	0.042%	0.130%	0.074%	0.120%	0.079%
Abnormal pay (first full year)	1,508	873	1,673	532	1,796	674

Table 13: New CEO pay – regression analysis

This table reports regressions of CEO compensation on indicator variables for new CEO types and control variables. The omitted category are internal promotions. The dependent variable is the natural logarithm of CEO pay in the first full year the new CEO leads the firm, in thousands of 2012 dollars, and winsorized at the 5th and the 95th percentile. CEO pay is TDC1 from ExecuComp and includes salary, bonus, the value of option and stock grants, payouts from long-term incentive plans, and all other pay. Descriptions of the independent variables are in Table 8. Firm characteristics are measured at the end of the fiscal year before the CEO hiring. All independent variables other than the CEO-type indicators are rescaled to have a standard deviation of one. Standard errors are clustered by 3-digit SIC industry. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Dependent variable: Ln(New CEO pay, first full year)				
	(1)	(2)	(3)	(4)
Outsider - raided CEO	0.30*** (3.114)	0.26** (2.447)	0.33*** (2.990)	0.29** (2.442)
Outsider - raided other executive	0.20*** (2.637)	0.23*** (2.656)	0.22*** (2.773)	0.27*** (2.991)
Outsider - unattached manager	0.24*** (2.988)	0.20* (1.973)	0.28*** (3.171)	0.24** (2.120)
External insider	0.00 (0.021)	-0.03 (-0.359)	0.03 (0.336)	-0.00 (-0.026)
Log firm value	0.45*** (14.239)		0.44*** (12.282)	
12m ind.-adj. return			0.06*** (2.907)	0.06** (1.983)
12m industry return			0.03 (0.956)	0.04 (1.049)
ROA			-0.01 (-0.588)	-0.03 (-1.182)
Sales growth			0.06*** (2.989)	0.08*** (2.757)
M/B			0.04** (2.041)	0.05*** (2.794)
R&D/assets			0.08** (2.460)	0.08** (2.168)
CapEx/assets			0.04 (1.459)	0.06* (1.698)
Leverage			0.05* (1.882)	0.05 (1.459)
Industry (SIC3) F.E.	Yes	Yes	Yes	Yes
Year F.E.	Yes	Yes	Yes	Yes
Industry (SIC3) F.E. × Log firm value	No	Yes	No	Yes
R ²	0.501	0.564	0.521	0.593
Observations	1,053	1,053	1,003	1,003

Online Appendix: Other determinants of CEO hiring choices

Table A1: The effects of non-compete enforceability and blockholders on hiring choices

This table shows estimates of models of CEO hiring choice similar to those in Table 9 in the paper. Panel A adds the enforceability of non-compete agreements at the state level from Garmaise (2011). The enforceability index can take values from 0 to 12, with higher numbers corresponding to better enforcement. Panel B adds blockholder ownership, defined as the percentage of equity held by shareholders with stakes of at least five percent. Column 1 of each panel shows coefficient estimates from a linear probability model with internal promotion as the dependent variable. Columns 2-4 show marginal effects from a multinomial logit model where the three choices are internal promotion, external insider, and outsider. Descriptions of the independent variables are in Table 8. All independent variables are rescaled to have a standard deviation of one. Firm characteristics are measured at the end of the fiscal year before the CEO hiring. Standard errors are clustered by 3-digit SIC industry. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Panel A: Non-compete enforceability				
	OLS	Multinomial Logit		
	Internal promotion	Internal promotion	External insider	Outsider
	(1)	(2)	(3)	(4)
Garmaise index	-0.0064 (-0.507)	-0.0087 (-0.692)	0.0117 (1.460)	-0.0030 (-0.251)
Log firm value	0.0468*** (3.394)	0.0489*** (3.216)	-0.0063 (-0.906)	-0.0426*** (-3.109)
12m ind.-adj. return	0.0950*** (7.383)	0.0944*** (6.573)	-0.0359*** (-3.975)	-0.0584*** (-5.010)
12m industry return	0.0393*** (2.894)	0.0340** (2.398)	-0.0128 (-1.623)	-0.0211* (-1.720)
ROA	0.0157 (1.552)	0.0025 (0.178)	-0.0094*** (-2.807)	0.0070 (0.471)
Sales growth	0.0104 (0.679)	0.0103 (0.586)	-0.0041 (-0.635)	-0.0061 (-0.343)
M/B	-0.0064 (-0.368)	0.0007 (0.035)	-0.0061 (-0.763)	0.0054 (0.318)
R&D/assets	-0.0451** (-2.423)	-0.0424** (-2.335)	0.0162** (2.008)	0.0262 (1.534)
CapEx/assets	0.0242* (1.856)	0.0281* (1.736)	-0.0115 (-1.083)	-0.0166 (-1.265)
Leverage	-0.0235 (-1.528)	-0.0221 (-1.426)	0.0121* (1.879)	0.0100 (0.730)
Constant	0.7354*** (56.851)			
R ²	0.076			
Observations	1,107	1,107	1,107	1,107

Table A1 – continued

Panel B: Blockholder ownership (1996-2012)				
	OLS	Multinomial Logit		
	Internal promotion	Internal promotion	External insider	Outsider
	(1)	(2)	(3)	(4)
Block ownership (%)	-0.0060 (-0.364)	-0.0005 (-0.028)	-0.0178* (-1.868)	0.0183 (1.296)
Log firm value	0.0564*** (3.241)	0.0612*** (3.330)	-0.0163* (-1.722)	-0.0449*** (-2.771)
12m ind.-adj. return	0.0945*** (6.367)	0.0935*** (5.084)	-0.0375*** (-4.084)	-0.0559*** (-3.530)
12m industry return	0.0592*** (3.939)	0.0571*** (3.138)	-0.0169* (-1.931)	-0.0402** (-2.517)
ROA	0.0058 (0.526)	-0.0073 (-0.387)	-0.0010 (-0.161)	0.0083 (0.517)
Sales growth	0.0245 (1.039)	0.0408* (1.794)	-0.0151 (-1.382)	-0.0257 (-1.290)
M/B	-0.0227 (-1.125)	-0.0174 (-0.856)	-0.0047 (-0.353)	0.0222 (1.328)
R&D/assets	-0.0500*** (-2.886)	-0.0454*** (-2.747)	0.0204*** (2.619)	0.0249* (1.755)
CapEx/assets	0.0286** (2.121)	0.0358* (1.910)	-0.0154 (-1.413)	-0.0204 (-1.249)
Leverage	-0.0287* (-1.783)	-0.0267 (-1.560)	0.0198** (2.381)	0.0068 (0.449)
Constant	0.7374*** (50.046)			
R ²	0.096			
Observations	770	770	770	770