

# The Market for CEOs

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## Abstract

We study the market for CEOs of large publicly-traded US firms, analyze new CEOs' prior connections to the firm, and explore how hiring choices are determined. Our results show that firms hire from a surprisingly small pool of candidates. More than 80% of new CEOs are insiders, i.e., 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. Firms raid CEOs of other firms in only 3% of cases, implying a lack of talent reallocation across firms. Pay differences appear too small to explain these hiring choices. The evidence is inconsistent with standard frictionless assignment models and suggests that firm-specific human capital and personal connections determine CEO hiring.

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

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CEOs appear to have first-order effects on firms, which makes an efficient CEO labor market important. Several influential studies argue that the market for CEOs is well described by perfectly competitive and frictionless assignment models (Tervio 2008; Gabaix and Landier 2008; Edmans, Gabaix, and Landier 2009). Assuming complementarity between transferrable CEO ability and increasing firm sizes, their models can explain the sharp rise in CEO pay since the 1970s. Other influential studies argue that firms' managerial skill requirements have shifted from firm-specific to general skills (Murphy and Zabojnik 2004, 2007; Frydman 2019). Combined with evidence that CEO skills have become more transferrable, this offers another explanation for rising pay (Custodio, Ferreira, and Matos 2013).

This paper documents actual CEO hiring practices 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 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 the range of their 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. 72% 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 observed trend to more outside hiring appears to have ended.<sup>1</sup>

We next show that most of the 19.6% outsiders have prior connections to the hiring firm's board. Fifty-four percent have worked with at least one of the hiring firm's directors, compared to only 3% for 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 CEOs are chosen for their general managerial skills and move freely across firms. Instead, it suggests that the CEO labor market is neither frictionless nor perfectly competitive.

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<sup>1</sup> An increase in external CEO hiring since the 1970s has been documented by Huson, Parrino, and Starks (2001), Murphy and Zabojnik (2004, 2007), Frydman (2019), and Graham, Kim, and Kim (2019).

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 market 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 the optimal match.

Consistent with prior studies, firms with low stock returns and low sales growth are more likely to hire outsiders, but even for them insiders remain the most frequent choice.<sup>2</sup> For example, firms with bottom quintile 1-year industry-adjusted stock returns choose outsiders with 29% probability, compared to 13% for firm with returns in the top quintile. Finally, former executives and current or former board members are most often chosen by firms with low stock returns, low operating performance, and low sales growth. Hence, many badly performing 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 indeed more expensive than internal promotions. This is consistent with outsiders having more transferrable human capital, receiving a premium for accepting the risk of a bad match, or being compensated for frictions in changing jobs and locations. However, the pay differences are small compared to the scale of S&P 500 firms: in the first full year of employment, outsiders receive on average \$1.5 million more than internal promotions, and the differences between raided CEOs, raided other executives, and unattached managers are even smaller. If, as the prior literature suggests, differences in CEO types have large effects on firm value, these pay

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<sup>2</sup> 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).

differences appear too small to explain the dominance of internal promotions or the reluctance to raid other firms' CEOs.<sup>3</sup>

The patterns we document have implications for 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 the firm's 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 all firms choose from a unified talent pool (Tervio 2008; Gabaix and Landier 2008). Instead, the effective candidate pool differs across firms and, for each individual firm, is much smaller than the overall market.<sup>4</sup>

Another surprising finding is the rarity of CEO raids. As CEO ability is gradually revealed over time (Pan, Wang, and Weisbach 2015; Hermalin and Weisbach 2017), 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 reallocations rarely happen reduces CEOs' career opportunities and challenges our understanding of the CEO labor market.

Many of this paper's results can be explained by a model with firm-specific human capital or asymmetric learning about CEO ability. With firm-specific human capital, an executive has valuable firm-specific skills or knowledge that do not transfer to another company (Becker 1962). With asymmetric learning, an executive's employer learns (and knows) more about the executive's 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 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,

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

<sup>4</sup> 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.

raiding executives who already run large operations can cause large losses of firm-specific human capital or severe adverse selection problems.

Asymmetric learning (but not firm-specific human capital) can also explain why, conditional on hiring an outsider, firms hire their directors' professional acquaintances. Having worked together can provide inside knowledge of an executive's ability, thus reducing adverse selection. Alternatively, the executive might have learned about the directors, making the executive more willing to join their firm.

Besides firm-specific human capital and asymmetric learning, the prior literature suggests a number of reasons 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 these mechanisms in the next section.

Our results also affect our understanding of CEO compensation. In a simple assignment model, the level of pay must meet both the CEO's and the firm's outside options and any surplus (or quasi-rent) created by the match is split according to the parties' relative bargaining strength.<sup>5</sup> If the managerial labor market is perfectly competitive, the quasi-rents are 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 higher pay. In reality, especially large firms promote internally, which indicates that the value of greater general skills, even for the largest firms, is dwarfed by the value of insiders' firm-specific human capital.

This observation suggests that the rapid rise in CEO pay since the 1970s might be due to growing quasi-rents from firm-specific skills or asymmetric information, or due to CEOs capturing

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<sup>5</sup> See, for example, Tinbergen (1956), Sattinger (1975, 1979), and Rosen (1981, 1982).

a growing share of these rents. Both firm-specific and general skills are likely to be complementary to firm scale. In fact, given the complexity of large firms, the value of firm-specific knowledge (such as understanding a firm's decision making processes) might increase faster with firm size than the value of general skills.

Our results complement several literatures. We show that the trend to more external CEO hires since the 1970s, documented by Huson, Parrino, and Starks (2001), Murphy and Zbojnik (2007), Frydman (2019), and Graham, Kim, and Kim (2019), has stabilized.<sup>6</sup> 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 1992 to 2013 (with no trend over this period), of whom 8.4% are former executives or board members.

Few papers have examined the mobility of CEOs across firms. In a study of announcement returns, Hayes and Schaefer (1999) show that firms whose executives (and especially CEOs) are raided suffer large value losses. 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 (2019), CEO moves to new firms increase over time but remain rare: during 1950-85, 1.7% of departing CEOs become CEO of another public firm within two years, which rises to 4.0% by 2002-11. Taking the perspective of the hiring firm, we show that 3.2% of CEO hires from 1993-2012 are raids of CEOs.<sup>7</sup>

Finally, our results speak to the literature on CEO career concerns. Fama (1980) and Holmstrom (1999) show that, if executives' performance affects their outside opportunities, a well-functioning market for managers improves incentives and alleviates agency problems. This has spurred a sizeable literature on the effects of top executives' career concerns (Holmstrom and Ricart i Costa 1986; Gibbons and Murphy 1992; Fee and Hadlock 2003, 2004; Giannetti 2011; Colak and Korkeamäki 2017; Coles, Li, and Wang 2018; Graham, Kim, and Kim 2019).

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<sup>6</sup> Other studies that report the percentage of external CEO hires for specific time periods and subsets of 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%), and Cremers and Grinstein (2014, 30%).

<sup>7</sup> While not their focus, 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), Jochem, Ladika, and Sautner (2018), and Cziraki and Groen-Xu (2019).

Our evidence suggests that the external labor market opportunities of top executives, and especially of CEOs, are limited. Most CEO positions are filled by insiders, and even well-performing CEOs are rarely poached by other firms. This is not to say that CEO career opportunities are absent – 5.6% of new CEOs in our sample are former CEOs of other firms, in addition to the 3.2% raided CEOs.

The next section briefly reviews recent developments in 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 costs 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 employees to jobs and equilibrium pay (Tinbergen 1956, Sattinger 1975, 1979; Rosen 1981, 1982).<sup>8</sup> More recently, Gabaix and Landier (2008) and Tervio (2008) have applied perfectly competitive and frictionless assignment models to CEOs.<sup>9</sup> In their models, CEO skills are perfectly observable and portable across firms. Without 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.<sup>10</sup>

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<sup>8</sup> This section borrows heavily from the survey by Edmans, Gabaix, and Jenter (2017).

<sup>9</sup> Edmans, Gabaix, and Landier (2009), Baranchuk, MacDonald, and Yang (2011), Edmans and Gabaix (2011), Eisfeldt and Kuhnen (2013), Jung and Subramanian (2017), and Pan (2017) provide extensions to unobserved effort choice, endogenous firm size distributions, managerial risk aversion, multi-dimensional CEO skills, and imperfectly competitive product markets.

<sup>10</sup> A third possibility is that CEOs' utility from the equilibrium contracts might have decreased, perhaps because risk and effort levels have increased.

Gabaix and Landier (2008) and Tervio (2008) use the first channel to explain 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, receive disproportionately higher pay. If firms become larger, CEO talent becomes more valuable and CEO pay rises. Based on a calibration of their model, Gabaix and Landier (2008) argue that the growth in the value of the median S&P 500 firm can explain the rise of CEO pay from 1980 to 2003.

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 hire insiders or candidates they are familiar with.<sup>11</sup> Moreover, while both models are static, their assumptions suggest 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.

A second explanation for the rise in CEO pay is an increase in CEOs' bargaining power resulting from a shift in firms' demand from firm-specific to general, and therefore portable, managerial skills (Murphy and Zabojnik 2004, 2004; Frydman 2019). Such a shift should intensify the competition for talent and raise the market 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 empirical 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).

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<sup>11</sup> 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)).

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 information, play the decisive role in matching firms and CEOs. Hiring externally would allow firms to access a much larger pool of candidates 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).<sup>12</sup>

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 hire the most able CEOs. Using the surplus created by their optimal match, they should be able to attract almost any executive, including successful CEOs of smaller firms. Yet, the largest firms are most likely to promote internally and rarely raid smaller firms' CEOs. One explanation is that the value of firm-specific skills also scales with firm size. In fact, given the complexity of large firms, the need for firm-specific skills might rise faster with firm size than the need for general skills.

Besides firm-specific human capital and asymmetric learning, the prior literature suggests a variety of reasons why firms might prefer internal promotions to hiring externally. Firstly, a bias towards choosing insiders can motivate lower-ranked managers to compete for the CEO position (Lazear and Rosen 1981; Rosen 1986; Chan 1996).<sup>13</sup> Secondly, contractual frictions might make external hires expensive. Non-compete agreements create barriers against executives moving to other firms (Marx, Strumsky, and Fleming 2009; Garmaise 2011; Kini, Williams, and Yin 2019). Unvested options, restricted stock, and other long-term compensation increase the cost of raiding executives. There is, however, no evidence that restricted compensation 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).

Thirdly, uncertainty about match quality, combined with executives' risk aversion, increases the cost of hiring outsiders. This is likely to especially hamper CEO raids – successful

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<sup>12</sup> There is a large theoretical and empirical literature on asymmetric learning by employers about their own employees. See, for example, Ricart i Costa (1988), Gibbons and Katz (1991), Bernhardt and Scoones (1993), Bernhardt (1995), and Pinkston (2009).

<sup>13</sup> 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).

CEOs are unlikely to move, and expose themselves to the risk of a bad match, unless the new firm is considerably larger, more reputable, or pays considerably more. Such supply-side constraints can explain our observation that firms raid CEOs of much smaller firms, but below-CEO executives of much larger ones.

Finally, firms' preference for insiders might be the result of agency problems or behavioral biases. Incumbent CEOs might advocate for a successor from current management, out of loyalty or to protect their own legacy. Boards can expect more blame for hiring a bad CEO than credit for hiring a great one, which makes less risky inside promotions attractive. Political and stakeholder constraints might prevent firms from paying enough to raid other firms' CEOs, even if doing so would increase value. Directors might also make systematic mistakes, with status-quo bias, familiarity bias, and ambiguity aversion likely to create a preference for insiders, even if outsiders are the value-maximizing choice (Fox and Tversky 1995; Zajac and Westphal 1996).

## **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. 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.<sup>14</sup> We collect information on the date of the appointment, the name of the old and the new CEO, and whether the new CEO was an employee of 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 employed by the firm as an executive or as an independent director. We also search LexisNexis and Factiva for press releases and media coverage of CEO transitions.

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 situations in which an executive joins a firm as part of a succession process and is promoted to CEO soon thereafter, we require that internal promotions must have been with the firm for at least 12 months.<sup>15</sup> Former employees and current or former board members are labeled as "external insiders." All other new CEOs are classified as "outsiders."

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<sup>14</sup> This definition of interim CEOs follows Cremers and Grinstein (2014).

<sup>15</sup> The definition of insiders follows Parrino (1997).

We further sort outsider hires into three groups based on their employment status at the time of the appointment: raided CEOs, raided other executives, and unattached managers. Unattached managers are not employed in an executive position at the time of their appointment. They might be unemployed, retired, working for a non-profit or the government, or running their own (usually consulting) business.

Executive raids are defined as the hiring of an incumbent executive (CEO or other) from another firm into the CEO position of the hiring firm. We require the move to be immediate or with almost no delay, and we ensure, based on the 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 at the old firm. For a raid to be classified as a CEO raid, we require the executive to have been the top executive at the old firm and for the old firm to not be a subsidiary.<sup>16</sup>

We collect additional information on the employment history of all external hires. We record the most recent employer, the start and end of the employment, and the most recent title. We assess whether the previous employer was a private or foreign firm, and whether the executive left as the result of an acquisition. We also identify the highest position held in the executive's career. We rank CEO positions above other executive positions, and permanent positions above interim ones. In cases where titles are the same, we rank positions in larger and in public firms more highly. We exclude firms founded by the executive as most such firms are small, but we make an exception if the executive remained at the firm until it became public. We also record whether the new CEO ever worked as an executive in the same (2, 3, or 4-digit SIC) industry as the hiring firm, in an industry with a supply-chain relation, or held an independent directorship at a firm in the same SIC 2-digit industry. Finally, for unattached managers, we calculate their employment gap, i.e., 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 we are able to identify by publicly traded US firms. By searching press releases and news articles on Factiva and LexisNexis, we find another

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<sup>16</sup> We exclude CEO positions at firms founded by the executive unless the firm has already been taken public. This is to excluded 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.

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 hiring 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 (CRSP). We leave out financial firms (SIC codes 6000-6999) when calculating descriptive statistics of accounting variables. Firms appointing new CEOs are larger than the average S&P 500 firm (shown in the second-to-last column) and have worse performance in terms of industry-adjusted stock returns, ROA, sales growth, and the market-to-book ratio. This is consistent with increased CEO turnover after bad firm performance.<sup>17</sup>

Departing CEOs, shown in Panel B, are older and have longer tenures than the CEO of the average S&P 500 firm. The average (median) departing CEO has an equity stake of 1.4% (0.5%) in the firm. Departing CEOs have average (median) vested options worth \$17.7m (\$2.9m), and a further \$4.8m (\$0.4m) in unvested options and \$3.9m (\$0) in unvested stock. Newly hired CEOs, shown in Panel C, are younger and more likely to be female than in the average S&P 500 firm.

### **3. Insiders vs. outsiders**

This section analyzes all new CEO hires by S&P 500 firms from 1993 to 2012, documents their prior connections to the hiring firm, their previous jobs, and examines 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, and outsiders**

We first document how close new CEOs are to the hiring firm before their appointment. Table 2 classifies all new CEOs as either internal promotions or external hires, defined as anyone who has not been with the firm for at least one year before becoming CEO.<sup>18</sup> 72% of the 1,256 new CEO appointments from 1993 to 2012 are internal promotions, while only 28% are external hires. This shows that, even in recent years, firms' own executives dominate CEO successions.

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<sup>17</sup> 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 (2020).

<sup>18</sup> This definition follows Parrino (1997) and accounts for staged successions in which an external successor is brought into the firm a few months before being promoted.

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 of the hiring firm, while 14% are former executives. There is considerable overlap, as most of the former executives are also board members. Taking this overlap into account, 30% of the external CEO hires are “external insiders”, defined as former executives or current or former board members of the hiring firms.<sup>19</sup> Thus, genuine outsiders make up only 19.6% of the CEO appointments in our sample.

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 managerial skills and to attract outstanding external talent. To further examine the effect of firm size, Panels B and C rank the sample firms each year by book assets and repeat the analysis for firms above and below the median. Unexpectedly, the percentages of new CEOs who are current employees or any insider are higher for larger (76% / 83%) than for smaller firms (68% / 77%).

If firm size and general managerial ability were complementary and 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 the external market for highly-skilled CEOs. Alternatively, the value of firm-specific skills might also increase with firm size, and larger firms are likely to have a deeper pool of insiders to choose from. Our results suggest that the latter effects dominate and thus, reject the hypothesis that all firms choose their CEOs from the same talent pool.<sup>20</sup>

### *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 2019), which others have attributed to an increase in firms’ demand for general managerial skills (Murphy and Zbojnik 2004, 2007; Frydman 2019). To

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<sup>19</sup> This group includes comeback CEOs (Fahlenbrach, Minton, and Pan 2008) as well as non-executive directors who have never been an employee of the firm (Hoitash and Mkrtchyan 2018).

<sup>20</sup> The reallocation of managerial talent across firms does not occur a few years before the CEO appointment. Cremers and Grinstein (2014) show that more than 90% of inside promotions have been with the firm for at least 5 years, and Murphy and Zbojnik (2007) find an average pre-promotion tenure of insiders of almost 20 years. The corresponding numbers in our sample are 84% and 17 years, respectively.

assess whether this increase in external hiring is visible in our sample, Table 3 reports CEO hiring patterns for 1993-1999, 2000-2006, and 2007-2012.

There is no evidence of a decline in insiders' dominance during our sample period. The percentage of internal promotions dips from 74% in 1993-99 to 70% in 2000-06, but recovers again to 74% in 2007-12. The percentage of genuine outsiders, i.e., appointees who are neither former nor current executives nor board members, rises from 18.7% in 1993-99 to 20.9% in 2000-06, but then falls back to 18.6% in 2007-12. As a result, the percentage of new CEOs who are insiders is slightly higher towards the end of our sample period than at its start, suggesting that the previously observed trend to more outside hiring has ended.

### *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, that 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 managerial 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 network connections between new CEOs and the hiring firm's board.

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 network connection as having contemporaneously worked at the same firm, or as having contemporaneously served on the same board, at any time before the CEO appointment. To assess whether there are unusually many network 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  $\pm 2$  years of the focal CEO's hiring. The matching algorithm is described in Appendix A. Due to the only partial overlap

between BoardEx's and our sample period, we are able to match 123 of the 246 outside hires in our sample with data on network connections.

Table 4 shows a striking difference in board connections between actually hired CEOs and alternative candidates. Fifty-four percent of newly hired outsiders have previously worked with at least one director of the hiring firm. The corresponding number for new CEOs hired by similar firms in the same period is only 3%. Hence, personal connections between directors and CEO candidates appear to play an important role in hiring decisions. In fact, our analysis likely understates the importance of such links as we have focused on professional connections and ignored social and educational ones.

Hiring directors' personal acquaintances 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, thus reducing adverse selection. Alternatively, having worked together might give a candidate useful information about a firm's directors, which might make the candidate more willing to join. It is also possible that directors are biased, with familiarity bias and ambiguity aversion creating a preference for hiring acquaintances. In all these cases, the familiarity between directors and candidates increases the perceived or actual value of the match.

The importance of professional networks in CEO hiring is underexplored. There is strong evidence that networks facilitate job searches of rank-and-file employees.<sup>21</sup> There is also evidence that networks play a role in the selection of new directors (Adams and Ferreira 2009; Agarwal, Qian, Reeb, and Sing 2016; Cai, Nguyen, Walkling 2019), as well as evidence that connections between directors and CEOs are correlated with higher CEO pay (Hwang and Kim 2009; 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 suggests that connections to directors increase executives' chances of being hired as CEO.

Alternatively, it is also possible that prior connections between directors and new CEOs are indicative of an unobserved CEO characteristic relevant to hiring decisions, such as knowledge of a specific technology or type of firm. If this were the case, the evidence in this section would

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<sup>21</sup> See, for example, Rees (1966), Corcoran, Datcher, and Duncan (1980), Granovetter (1995), Kasinitz and Rosenberg (1996), Bayer, Ross, and Topa, (2008), Kramarz and Nordström Skans (2014), and the review by Ioannides and Datcher Loury (2004).

reinforce the conclusion that specific, rather than general, knowledge is of first-order importance in selecting CEOs. In either case, the evidence is hard to reconcile with models in which CEOs are chosen for their general managerial skills and move freely across firms.

### 3.2 Where do firms find external CEO hires?

To better understand the challenges and opportunities firms face when hiring externally, we next examine the backgrounds of the 352 external CEO hires. The results are in Table 5. 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 unattached managers who are not currently in an executive position.<sup>22</sup>

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: 2.8% outsiders (Panel A) and 0.4% former executives or board members (Panel B). Hence, when choosing a new CEO, firms tend to ignore the most obvious source of established CEO talent.

In a frictionless managerial labor market, with firms competing for general managerial skills, we would expect frequent reallocations of CEOs across firms. If more able CEOs match with larger firms (as in Gabaix and Landier 2008), any change in firms’ size ranking should cause CEOs to switch firms. On-the-job learning about CEO ability (as in Hermalin and Weisbach 1998) should move more successful CEOs to larger firms and less successful CEOs to smaller ones. CEO departures should lead to cascades of CEO moves, as each affected firm raids the CEO of the next smaller firm. In reality, few CEO reallocations happen.<sup>23</sup>

There are several potential explanations for this lack of CEO mobility. Uncertainty about match quality might cause (especially well-matched) CEOs to be reluctant to switch firms. Incumbent CEOs might endanger their current jobs by interviewing with other firms. Moving costs might be high for CEOs with working spouses or school-age children. Whatever the explanation, their lack of mobility limits CEOs’ outside options and career concerns.

If outsider hires are not CEOs of other firms, who are they? Most are below-CEO executives at other firms: 55% of outsider hires and 11% of all hires. This suggests that firm-

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<sup>22</sup> Unattached managers include the currently unemployed, retired executives, and a small number who are working for the government or non-profit organizations.

<sup>23</sup> Among outsider hires, 70% of raided CEOs have previously worked with at least one of the hiring firm’s directors. As a result, only 1% of new hires are raided CEOs of other firms who are unconnected to the hiring firm’s board.

specific human capital alone cannot explain the lack of CEO raids: raids of below-CEO executives are more than three times as frequent as CEO raids. Instead, other frictions, or an unwillingness of incumbent CEOs to switch firms, must be hampering CEO raids.

Finally, unattached managers, i.e., outsiders not currently in an executive position, make up 31% of outsider hires (and 6% of all CEO hires). Hiring unattached managers should be relatively easy, as they give up neither firm-specific human capital nor an unusually good match and do not worry about upsetting their employer by interviewing. 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.

To better understand what human capital firms acquire by hiring outsiders, Table 6 tabulates the professional backgrounds of the 169 raided executives and 77 unattached managers. Besides 35 CEO raids, most raids of outsiders 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.<sup>24</sup>

The backgrounds of the unattached hires show a similar preference for operational leadership experience. However, unattached managers are significantly more senior: 60% have already been a CEO, while only 21% of raids target CEOs. Hence, there appears to be substantial demand for CEO experience among hiring firms, yet it is mostly filled by hiring unemployed former CEOs, instead of by poaching current ones.<sup>25</sup>

Returning to Table 5, Panel B tabulates the sources of the 106 “external insiders”, i.e., former employees and 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 dominance of unattached managers indicates that their human capital is not in high demand by other firms, which suggests that most “external insiders” are hired because of their close connection to the firm. Their lack of labor market appeal is also evident in the average (median) length of time since their last executive

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<sup>24</sup> The idea that operational rather than staff (e.g., finance, human resources) roles prepare executives for the CEO position is consistent with prior evidence in Helfat, Harris, and Wolfson (2006).

<sup>25</sup> Acquisitions are an important source of unemployed ex-CEOs. In untabulated results, we find that 19% of unattached hires (31% of unattached outsider hires) and 53% of raided other executives with CEO experience lost their CEO position because their firm was acquired.

position (Panel C): 28 (23) months for unattached managers who are “external insiders”, compared to only 14 (9) months for unattached managers who are outsiders to the hiring firm.<sup>26</sup>

Another interesting observation is that 62% of the “external insiders” have prior CEO experience (untabulated): 25% are comeback CEOs, i.e., former CEOs of the hiring firm, 32% have previously been the CEO of another firm, and 5% are raided from current CEO jobs. Hence, firms’ demand for CEO experience is also evident when recruiting among former employees and board members.

To summarize, the analysis in this sections shows that CEO raids are rare: only 3.2% of new CEOs are poached from the CEO position at another firm. Most outsider hires are instead below-CEO executives at other firms or unattached, many of whom 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 future research. It is especially surprising given our focus on S&P 500 firms, which should be able to hire successful CEOs from many smaller firms.

### **3.4 The prior firms of raided executives**

The prior section has shown that only 15% of new hires are raids of other firms’ executives – 3.2% CEO raids and 12.2% below-CEO raids. Given the importance of talent reallocation in many theories of the executive labor market and for CEOs’ career concerns, an important question is why executive raids are not more frequent. As a first step, this section examines what types of firms new CEO hires are raided from.

The top panel of Table 7 shows that almost 80% of executive raids by S&P 500 firms target publicly traded US firms. 15-20% of raided hires are from private US firms, and less than 5% are from foreign firms. This suggests another set of restrictions on the effective CEO candidate pool: most candidates are already executives at public US firms, with few private-firm executives and almost no foreigners included. Whether this is because boards are unfamiliar with private-firm and foreign executives, or because these executives lack (or have been unable to demonstrate) skills required to run an S&P 500 firm is an open question.

Because there are only 40 raids of current CEOs in our sample, we also report results from an extended sample where the hiring firms are not restricted to the S&P500 but include all public

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<sup>26</sup> These employment gaps for unattached hires are consistent with the evidence in Ertimur, Rawson, Rogers, and Zechman (2018).

US firms from 1992-2012.<sup>27</sup> This increases the number of CEO raids to 118. Results from this extended sample, reported in the two right-most columns, are similar to those from the S&P500 sample.

The next interesting result in Table 7 is that CEOs are poached from very different firms than below-CEO executives, especially in terms of firm size. Raids of current CEOs target smaller firms, both in absolute and relative terms: the median prior firm of raided CEOs has a market capitalization (book assets) of only 34% (24%) of that of the hiring firm. Raids of below-CEO executives, on the other hand, target larger firms: the median prior firm of raided below-CEO executives has a market capitalization (book assets) of 387% (423%) of that of the hiring firm.

These size differences are an indicator of the costs firms face when raiding executives. If raiding CEOs were costless, we would expect frequent moves of CEOs between fairly similar firms. Instead, CEO moves across firms 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. These costs or frictions might be incurred directly by the CEO (e.g., giving up a good match at the old firm) or by the firm (e.g., the inability to properly vet incumbent CEOs).

Firms raiding below-CEO executives from much larger companies suggests that such raids are easier. Many of the raided executives are heads of segments or divisions (see Section 3.3) and move to a smaller firm for their first CEO job. Executives benefit by obtaining a CEO position, and hiring firms benefit by bringing in expertise from larger firms that often have better processes, structures, or technologies.<sup>28</sup>

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 below-CEO raids outperform on all these metrics. Below-CEO executives being poached from well-performing firms has previously been observed by Fee and Hadlock (2003). The observation that CEOs are raided from worse performers is new and interesting.

One explanation for this pattern is that even S&P 500 firms find it costly to lure away other firms' CEOs. If match quality is highly uncertain, successful CEOs might be reluctant to give up

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<sup>27</sup> See Section 2 for more information about the data collection for this extended sample of CEO raids.

<sup>28</sup> Bloom and Van Reenen (2007) and Bloom, Brynjolfsson, Foster, Jarmin, Patnaik, Saporta-Eksten, and Van Reenen (2019) show a positive correlation between firm size and the sophistication of management practices.

a good match and risk failure in another firm. This might explain why CEO moves are rare, are to much larger (and therefore much more attractive) firms, and are by CEOs with relatively mediocre recent performance (who might be less enamored by their current match).

#### **4. What determines firms' hiring choices?**

We next examine what firm characteristics determine 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 hiring choices are affected by both firm size and firm performance. Panel A reports firm characteristics by type of hire, while Panel B sorts firms into quintiles based on their characteristics and reports hiring frequencies for the top and bottom quintile.

The probability of an internal promotion increases with firm size. The average market value of firms promoting internally is 27bn, compared to 22bn for firms hiring external insiders and 16bn for firms hiring true outsiders (Panel A). Firms with market value in the top quintile promote internally 83% of the time, while firms in the bottom quintile do so only 65% of the time. The difference is made up by outsider hires, who are 25% in the smallest quintile but only 9% in the largest one (Panel B).

The small number of outsider hires among the largest firms is a challenge for our understanding of CEO compensation. CEO pay has risen by far the most for the largest firms, which Tervio (2008) and Gabaix and Landier (2008) explain with rising firm sizes and larger firms benefiting more from general managerial skills. However, this should also make larger firms more eager to search externally for highly-skilled CEOs. In reality, larger firms are more likely to promote internally, suggesting that for them general skills are less important than firm-specific ones. This raises the possibility that the rise in CEO pay since the 1970s might be due to growing quasi-rents from firm-specific (rather than general) human capital, whose value likely also increases with firm size.

Consistent with the prior literature, Table 8 also shows that better performing firms are more likely to promote internally.<sup>29</sup> Internal promotions are associated with higher industry-adjusted stock returns, market-to-book ratios, ROA, and sales growth than the hiring of external insiders or outsiders (Panel A). Firms with industry-adjusted stock returns (ROA) in the top quintile promote internally 82% (76%) of the time, while firms in the bottom quintile do so only 55% (60%) of the time. However, even among firms with bottom quintile performance, the majority of CEO hires are internal promotions, and outsider hires are always below 30%. There is also suggestive evidence that high capital expenditures are associated with more internal promotions, while high R&D intensity is associated with fewer.

An interesting observation is that hiring external insiders – i.e., former employees or current or former board members – is associated with even lower stock returns, ROA, and market-to-book ratios than the hiring of outsiders. External insider hires are also associated with the prior CEO leaving at an unusually low age and short tenure, suggesting performance-induced turnovers. Hence, when bad performance causes firms to not promote internally, they frequently turn to former executives or to directors rather than outsiders for help.

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

The coefficient estimates show that internal promotions are significantly positively related to firm size and industry-adjusted stock returns, and insignificantly positively to ROA, sales growth, and market-to-book. Internal promotions are also positively related to industry stock returns and capital expenditures, and negatively to R&D intensity. The quantitatively 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 4.7 percentage point increase).<sup>30</sup> The  $R^2$  of the regressions is, however, small and much of firms' choices between insiders and outsiders remains unexplained.

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<sup>29</sup> See, for example, Datta and Guthrie (1994) and Parrino (1997).

<sup>30</sup> In untabulated regressions, we have also controlled for the state-level enforceability of non-compete agreements coded by Garmaise (2009). Contrary to expectations, the enforceability index is negatively correlated with internal promotions, but the effect is small and statistically insignificant.

#### 4.1 Raided hires vs. unattached managers

Conditional on hiring an outsider, firms have a choice between raiding another firm's CEO, raiding a below-CEO executive, or hiring an unattached manager. Table 10 examines the firm characteristics associated with these choices. Panel A reports 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.<sup>31</sup>

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 hire an unattached manager. The average market value of firms raiding CEOs is 27bn, compared to 17bn for firms raiding below-CEO executives and 11bn for firms hiring unattached executives (Panel A). Firms with market value in the top tercile raid CEOs for 23% of their outsider hires, while firms in the bottom tercile do so only 4% of the time. Small firms instead raid more below-CEO executives and hire more unattached managers (Panel B).

Table 10 also shows that, conditional on hiring an outsider, hiring an unattached manager is more popular for firms with low stock returns, low industry returns, low ROA, low sales growth, and high leverage. For example, firms with industry-adjusted stock returns in the bottom tercile hire unattached managers for 38% of their outsider hires, while firms in the top tercile do so only 26% of the time. This is consistent with badly-performing firms struggling to attract executives from other firms and therefore hiring unemployed executives. Well-performing firms are able to raid other firms' executives, with larger firms raiding both CEOs and below-CEO executives and smaller firms targeting 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 expenditure, and insignificantly positively to industry-adjusted stock returns. Below-CEO raids are significantly positively correlated with ROA and industry returns, and insignificantly positively with 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, ROA, sales growth, industry-adjusted stock

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<sup>31</sup> We sort firms into terciles rather than quintiles (used in Table 8) because of the small number of outsider hires.

returns, and investment into R&D and physical capital. Hence, with the exception of the market-to-book ratio, unattached hires are associated with signals of bad firm performance.

The evidence in Tables 10 and 11 suggests that the attractiveness of the hiring firm is an important factor in the CEO labor market. The few CEO raids in the data 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 3.4). Better firm and industry performance is associated with more CEO and below-CEO raids, while worse performance predicts unattached hires. Hence, the firms most likely to hire outsiders, and presumably most in need of executive talent, appear least able to attract executives from other firms.

## **5. CEO pay**

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

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

During the hiring year, outsiders are paid substantially more than external insiders and internal promotions. Average pay for outsiders is 15.1 million, compared to 11.7 million for external insiders and 8.4 million for internal promotions. These numbers are, however, somewhat 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, industry fixed effects, and the interaction of the two, estimated using all CEOs in ExecuComp. This reduces the differences, with mean abnormal pay of 5.3 million for outsiders, 3.5 million for external insiders, and 0.0 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 in the subsequent fiscal year. In the first full year of employment, mean abnormal pay falls to 1.5 million for both outsiders and external insiders and remains 0.0 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, 0.11% for external insiders, and 0.07% for internal promotions. If, as the prior literature suggests, differences in CEO types and skills 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.<sup>32</sup>

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 well-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 employment year, average abnormal pay is 1.3 million for raided CEOs, 1.5 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 new CEO pay in the first full year of employment on indicators for the different categories of CEO

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<sup>32</sup> See, for example, Bertrand and Schoar (2003), Chang, Dasgupta, and Hilary (2010), Donatiello, Larcker, and Tayan (2018), Bennedsen, Pérez-González, and Wolfenzon (2020), and Jenter, Matveyev, and Roth (2020).

hires and controls for firm size, firm performance, industry fixed effects, interactions between firm size and industry fixed effects, and other firm characteristics, all 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 small.<sup>33</sup> The estimated pay premium for outsiders is larger when firm performance and characteristics are included, which suggests that outsiders are hired into situations in which internal promotions are paid relatively little. Interestingly, there is no evidence that badly performing firms have to pay a premium to attract CEOs, as new CEO pay is positively correlated with pre-hiring stock returns, industry returns, sales growth, and market-to-book.

## **6. Conclusion**

The evidence in this paper shows that firms hire CEOs from a surprisingly small pool of candidates. Among CEO hires by S&P 500 firms from 1993 to 2012, more than 80% of new CEOs are insiders, i.e., 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 CEOs are chosen for their general managerial skills and move freely across firms.

Our results suggest that the market for CEOs is not well described by frictionless and perfectly competitive assignment models in which all firms choose from a unified talent pool. Instead, CEO hiring appears determined by firm-specific human capital and personal connections. As a result, the effective candidate pool differs across firms and, for each individual firm, is much smaller than the overall market. While these models are a useful benchmark, they need to be substantially enriched before they describe the actual CEO labor market.

Our results affect our understanding of CEO compensation. The outside options of both firms and CEOs appear to be limited, as firms' effective candidate pool is small and as incumbent CEOs rarely move to other firms. This suggests an imperfectly competitive market and the existence of match surpluses. Hence, the rapid rise in CEO pay since the 1970s might be due to

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<sup>33</sup> Ertimur, Rawson, Rogers, and Zechman (2018) find that externally hired CEOs with an employment gaps – i.e., unattached hires – receive lower pay than other external hires. Our results suggests that this is because they combine outsiders (who receive a premium) and external insiders (who do not).

growing quasi-rents from firm-specific skills or asymmetric information, or due to CEOs capturing a growing share of these rents.

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## **Appendix A: 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 size of the focal firm (where size is defined as equity market capitalization plus total liabilities) (iii) in the same SIC 4-digit 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 SIC 3-digit, 2-digit, and 1-digit 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 15 cases there are no alternative candidates that satisfy (i) and (ii), and we drop these 15 CEO hires from the analysis. There are eight alternative candidates that are matched to two CEO hires. The matching procedure yields 123 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 new and old CEOs, respectively. All dollar values are in millions and 2012 dollars. *Market value* is book assets less the book value of equity plus market value of equity, where the book value of equity is shareholders' equity plus deferred taxes plus balance sheet tax credits minus the book value of preferred stock. *Market to book (M/B)* is the market value of the firm divided by book assets. *ROA* is operating cash flow divided by book assets. *Sales growth* is the year-on-year percentage change in sales. *Leverage* is the ratio of total debt to book assets. All variables using 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). *12m avg. industry-adjusted returns* are average monthly stock returns net of the value-weighted 3-digit SIC industry. Returns of hiring firms are measured up to the month preceding the CEO hiring, and returns of all S&P 500 firms are measured up to the last month of their fiscal year. *Ownership stake* is the CEO's percentage equity ownership stake including vested options.

<b>Panel A: Firm characteristics</b>								
	Mean	Median	Std.	Min.	Max.	Obs.	S&P Mean	Diff. T-stat.
Market 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***
12m ind.-adj. return	-0.27	-0.12	2.99	-19.94	24.52	1,189	0.48	-8.31***
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***
CapEx/Assets	0.06	0.05	0.04	0.00	0.20	1,057	0.05	7.68***
R&D/Assets	0.03	0.00	0.04	0.00	0.21	1,065	0.02	2.76***
Leverage	0.25	0.25	0.15	0.00	0.68	1,060	0.19	11.43***
<b>Panel B: Old CEO</b>								
Age	60	61	7	35	83	1,170	56.06	17.75***
Female	0.009	0.000	0.096	0.000	1.000	1,188	0.011	-0.68
Tenure	8.2	6.0	7.0	0.0	47.0	1,155	6.5	7.62***
Ownership stake (%)	1.42	0.49	2.94	0.01	18	1,098	1.941	-4.32***
Value of vested options	17,224	2,891	38,763	0.00	258,289	1,187	16,621	0.49
Value of unvested options	4,723	341	12,822	0.00	96,443	1,187	7,360	-1.78*
Value of unvested shares	3,890	0	9,884	0.00	71,278	1,187	5,533	-2.39**
<b>Panel C: New CEO</b>								
Age	53	54	6	35	74	1,140	56.06	-14.00***
Female	0.027	0.000	0.163	0.000	1.000	1,141	0.011	3.24***

**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 worked at the hiring firm but do not at the time of the appointment. *Board members* are current or former directors of the firm. *True 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 use only firms of above- or below-median size, respectively. Size is measured using book assets and firms are ranked each year.

<b>Panel A: All firms (1,256 CEO hires)</b>				
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%

  

<b>Panel B: Above median size (623 CEO hires)</b>				
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%

  

<b>Panel C: Below median size (633 CEO hires)</b>				
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 hires 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 worked at the hiring firm but do not at the time of the appointment. *Board members* are current or former directors of the firm. *True outsiders* are neither former nor current executives or board members of the hiring firm.

<b>Panel A: 1993-1999 (418 CEO hires)</b>				
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%

  

<b>Panel B: 2000-2006 (515 CEO hires)</b>				
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%

  

<b>Panel C: 2007-2012 (323 CEO hires)</b>				
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 network connections between directors and new CEOs. Only true outsiders, i.e., new hires who are neither current nor former insiders, are included in the analysis. A network connection between a director and a new CEO is defined as having contemporaneously worked as executives or board members at the same firm 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 Appendix A.

	CEO hires		Alternative candidates	
	Number	%	Number	%
Board connection	66	53.7	4	3.3
No board connection	57	46.3	119	96.7
Total	123		123	

**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, based on written sources, 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 a named 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*, who are 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. Panel C reports summary statistics on the time since the last executive position of unattached hires.

<b>Panel A: Outsiders (246 hires)</b>						
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%			

  

<b>Panel B: External insiders (106 hires)</b>						
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%			

  

<b>Panel C: Time since last executive position for unattached hires</b>						
	Mean	Median	SD	P10	P90	Number
Time since last position (months)						
... for outsiders	13.6	8.5	13.4	2.0	33.0	76
... for "external insiders"	27.8	23.0	23.8	0.0	58.0	82

**Table 6: Outsider hires' prior titles and roles**

This table tabulates the prior titles and roles 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.

<b>Panel A: Most recent (highest prior) title of raided (unattached) hires</b>				
<b>Title</b>	<b>Raided hires</b>		<b>Unattached hires</b>	
	<b>Number</b>	<b>Percent</b>	<b>Number</b>	<b>Percent</b>
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
<b>Total</b>	<b>169</b>	<b>100</b>	<b>77</b>	<b>100</b>

<b>Panel B: Examples of roles</b>	
<b>Title</b>	<b>Examples</b>
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

**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 hired. *Market value* is book assets less the book value of equity plus market value of equity, where the book value of equity is shareholders' equity plus deferred taxes plus balance sheet tax credits minus the book value of preferred stock. *Market to book (M/B)* is the market value of the firm divided by book assets. *ROA* is operating cash flow divided by book assets. *Market value* and *book assets* are in 2012 \$ millions. *ROA* is operating cash flow divided by book assets. *Sales growth* is the year-on-year percentage change in sales. 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). *Industry returns* are monthly value-weighted average returns of all firms in the firm's 3-digit industry in percent. *Industry-adjusted returns* are averages of monthly returns, in percent, net of the value-weighted 3-digit SIC industry, and measured ending the month preceding the CEO hiring. Definitions of CEO types 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
Market 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:						
Market 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 1,260 CEOs from 1993-2012. Panel A sorts hiring firms by type of CEO hired. Panel B shows the percentage of hire types by quintile of firm characteristics. *Market value* and *book assets* are in 2012 \$ millions. *Market value* is book assets less the book value of equity plus market value of equity, where the book value of equity is shareholders' equity plus deferred taxes plus balance sheet tax credits minus the book value of preferred stock. *Market to book (M/B)* is the market value of the firm divided by book assets. *Return on assets (ROA)* is operating cash flow divided by book assets. *Sales growth* is the year-on-year percentage change in sales. 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). *Industry returns* are monthly value-weighted average returns of all firms in the firm's 3-digit industry, expressed in percentage points. *Industry-adjusted returns* are monthly, in percentage points, net of the firm's value-weighted 3-digit SIC industry, and measured ending the month preceding the CEO hiring. Definitions of CEO types and origins are in Table 5.

<b>Panel A: Characteristics of hiring firms (by type of hire)</b>						
	Internal promotion		External insider		Outsider	
	Mean	Median	Mean	Median	Mean	Median
Market value	27,112	11,528	21,745	9,678	15,532	9,397
Book assets	18,557	8,511	17,323	6,619	12,449	6,771
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	0.03	0.04	0.04
Sales growth	0.08	0.06	0.04	0.02	0.04	0.03
M/B	1.89	1.53	1.66	1.43	1.86	1.52
R&D/assets	0.02	0.00	0.03	0.02	0.03	0.01
CapEx/assets	0.06	0.05	0.05	0.04	0.05	0.04
Leverage	0.24	0.24	0.26	0.24	0.24	0.25
Departing CEO age	61	61	56	56	58	58
Departing CEO tenure	8.8	7.0	5.7	3.5	7.0	5.0

  

<b>Panel B: Frequencies of hiring types (by firm characteristics)</b>						
	Top Quintile			Bottom Quintile		
	Internal promotion	External insider	Outsider	Internal promotion	External insider	Outsider
Market value	83%	8%	9%	65%	10%	25%
Book assets	80%	8%	13%	66%	8%	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%
Departing CEO age	84%	6%	11%	53%	17%	29%
Departing CEO tenure	80%	6%	14%	60%	17%	23%

**Table 9: Regressions of new CEO hiring choices: insiders vs. outsiders**

The table shows models of CEO hiring choice. Column 1 contains a linear probability model with internal promotion as the dependent variable. Columns 2-4 contain a multinomial logit model where the three choices are internal promotion, external insider, and outsider. Definitions of the independent variables are in Table 8. All independent variables are rescaled to have a standard deviation of 1. Standard errors are clustered by (SIC 3-digit) industry. The symbols \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% level, respectively.

<b>Estimation method:</b>	<b>OLS</b>		<b>Multinomial Logit</b>	
<b>Dependent variable:</b>	<b>Internal promotion</b>	<b>Internal promotion</b>	<b>External insider</b>	<b>Outsider</b>
	(1)	(2)	(3)	(4)
Log market 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 <sup>2</sup>	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 hired. Panel B shows percentages of outsider CEOs hired from different sources for the top and bottom terciles of firm and CEO characteristics. Definitions of CEO types and origins are in Table 5. Definitions of firm characteristics are in Table 8.

<b>Panel A: Characteristics of firms hiring outsiders (by source of hire)</b>						
	Raided CEO		Raided other executive		Unattached manager	
	Mean	Median	Mean	Median	Mean	Median
Market value	27,189	17,289	17,478	9,219	10,799	7,304
Book assets	25,974	16,005	10,891	6,153	7,680	5,077
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	0.03	0.03	0.05	0.05	0.04	0.03
Sales growth	0.04	0.04	0.04	0.03	0.06	0.02
M/B	1.57	1.29	1.84	1.55	2.14	1.55
R&D/assets	0.02	0.00	0.04	0.01	0.03	0.00
CapEx/assets	0.06	0.05	0.05	0.05	0.05	0.04
Leverage	0.25	0.26	0.24	0.23	0.26	0.25
Departing CEO age	57	55	58	58	58	58
Departing CEO tenure	7.4	4.5	7.0	6.0	6.8	5.0

<b>Panel B: Frequencies of outsider sources (by firm characteristics)</b>						
	Top Tercile			Bottom Tercile		
	Raided CEO	Raided other executive	Unattached manager	Raided CEO	Raided other executive	Unattached manager
Market value	23%	48%	29%	4%	64%	32%
Book assets	25%	48%	27%	5%	62%	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%
Departing CEO age	14%	56%	31%	20%	53%	27%
Departing CEO tenure	13%	56%	31%	16%	54%	30%

**Table 11: Regressions of new CEO hiring choices: raided executives vs. unattached hires**

The table reports a multinomial logit model of CEO hiring choice for firms hiring outsiders. The three choices are raided CEO, raided other executive, and unattached manager. Definitions of CEO types and origins are in Table 5. Definitions of the independent variables are in Table 8. All independent variables are rescaled to have a standard deviation of 1. Standard errors are clustered by (SIC 3-digit) industry. The symbols \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% level, respectively.

	Multinomial Logit		
	Raided CEO	Raided other executive	Unattached manager
	(1)	(2)	(3)
Log market 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 of new CEO compensation by CEO type (Panel A) and the method of CEO appointment for outsider CEOs (Panel B). *Partial year* refers to the fiscal year in which the CEO starts their appointment. *First complete year* is the first complete fiscal year the CEO spends in office. *Abnormal total compensation* is the residual from a regression of total CEO pay on industry (SIC 3-digit) fixed effects, firm size (book value of total liabilities plus equity market capitalization), and the interaction of the two. *Total pay as a % of firm value* is calculated by dividing total pay by the market value of the firm.

<b>Panel A: Insiders vs. outsiders</b>						
	Internal promotion		External insider		Outsider	
	Mean	Median	Mean	Median	Mean	Median
Total pay - partial year	8,396	6,193	11,716	8,524	15,067	11,110
... as a % of firm value	0.073%	0.040%	0.140%	0.099%	0.203%	0.120%
Abnormal pay - partial year	49	-560	3,496	931	5,258	4,279
Total pay - first full year	8,271	6,399	8,786	7,279	8,740	6,684
... as a % of firm value	0.069%	0.040%	0.105%	0.059%	0.122%	0.072%
Abnormal pay - first full year	12	-402	1,462	1,475	1,544	541

  

<b>Panel B: By source of outsider hire</b>						
	Raided CEO		Raided other executive		Unattached manager	
	Mean	Median	Mean	Median	Mean	Median
Total pay - partial year	13,350	9,382	16,238	12,555	13,856	9,314
... as a % of firm value	0.101%	0.055%	0.220%	0.153%	0.238%	0.106%
Abnormal pay - partial year	4,258	2,969	6,071	5,342	4,395	3,649
Total pay - first full year	10,117	8,578	8,604	6,357	8,092	6,568
... as a % of firm value	0.089%	0.042%	0.131%	0.074%	0.118%	0.077%
Abnormal pay - first full year	1,321	795	1,475	507	1,764	512

**Table 13: New CEO pay – regression analysis**

This table reports regressions of new CEO compensation on indicator variables for 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, expressed in millions of 2012 \$ and winsorized at the 5<sup>th</sup> and the 95<sup>th</sup> percentile. All firm characteristics are measured at the end of the fiscal year before the CEO hiring. \*, \*\*, and \*\*\* denote significance at the 10%, 5%, and 1% level, respectively.

<b>Dependent variable: Ln(New CEO pay, first full year)</b>				
	(1)	(2)	(3)	(4)
Outsider - raided CEO	0.24** (2.575)	0.25** (2.302)	0.33*** (3.066)	0.33*** (2.622)
Outsider - raided other executive	0.14** (2.001)	0.17** (2.119)	0.20** (2.595)	0.24*** (2.624)
Outsider – unattached manager	0.20** (2.330)	0.20* (1.876)	0.26*** (2.676)	0.27** (2.302)
External insider	-0.07 (-0.771)	-0.10 (-0.943)	0.02 (0.161)	-0.02 (-0.158)
Ln(book assets)	0.42*** (11.738)		0.46*** (12.302)	
12m ind.-adj. return			0.09*** (3.752)	0.08*** (2.647)
12m industry return			0.06** (2.142)	0.06** (2.294)
ROA			-0.01 (-0.452)	-0.03 (-0.964)
Sales growth			0.06*** (2.857)	0.09*** (2.968)
M/B			0.14*** (5.158)	0.12*** (3.502)
R&D/Assets			0.09*** (2.798)	0.08** (2.566)
CapEx/Assets			0.04 (1.493)	0.07** (2.070)
Leverage			0.03 (1.233)	0.03 (0.740)
Industry (SIC3) F.E.	Yes	Yes	Yes	Yes
Industry (SIC3) F.E. × Ln(book assets)	No	Yes	No	Yes
Observations	1,051	1,051	1,001	1,001
R-squared	0.40	0.47	0.46	0.53