Board Connections and CEO Successions

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Abstract

This paper studies the effects of board connections on CEO succession and firm outcomes. Connections between the hiring board and CEO candidates positively predict the replacement of incumbent CEOs, especially when pre-succession performance is poor. In addition, board connections with newly hired CEOs improve post-succession operating performance. These effects are more pronounced when firms' information demand is high and when firms have less agency concerns. Consistent with the view that connections increase boards' tolerance for failure, firms with stronger CEO-board connections experience increases in innovation intensity and quality. Overall, board connections shape CEO selection and improve firms' long-term efficiency.

JEL Classification: G30, G32, G34, J01, J41, J50, J60, D80

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1. Introduction

Managerial succession is a major corporate decision that can significantly contribute to subsequent firm outcomes (Bonnier and Bruner, 1989; Denis and Denis, 1995; Hotchkiss, 1995; Huson, Malatesta, and Parrino, 2004). "Hiring the right manager" requires the board to correctly identify and evaluate internal and external candidates based on the complementarities between CEO skills and firm attributes in various dimensions (Pan, 2017). In perfectly competitive and frictionless assignment models analyzed by Gabaix and Landier (2008) and Tervio (2008), CEO skills are fully observed and matched with the firm's specific requirements to maximize output. However, CEO-firm matching is subject to some frictions in the managerial labor market, such as information asymmetry (Stigler, 1962), search costs (Pissarides, 2011), and employment protection legislation (Kini, Williams, and Yin, 2021). A survey of human resource executives by the Corporate Leadership Council (CLC), a human-resources-focused research organization, found that only 20% of respondents were satisfied with their top-management successions.[2] Charan (2005) attributes these inadequacies in the CEO succession process to misjudgments about the firm's business needs and improper candidate identification. Without sufficient information and correct incentive alignments, it is hard for the board to identify all suitable CEO candidates and provide them with well-defined firm-specific skill requirements.[3]

Boards of directors play essential roles in CEO succession, which is a laborious and non-routine task based on the firm's time-varying demands for managerial skill sets and evolving strategic outlook (Gerstein, and Keisman, 1983; Donatiello, Larcker, and Tayan, 2018). Fama and Jensen (1983) state that the board has the right to hire, fire, and set the compensation of top-level managers. Many papers study the role of the board in CEO turnover (e.g., Weisbach, 1988; Huson, Parrino, and Starks, 2001) and compensation (e.g., Hallock, 1997; Bebchuk and Fried, 2003; Chhaochharia and Grinstein, 2009). Borokhovich and Parrino (1996) focus on directors' incentives in outside successions and find that outside directors increase the frequency of external CEO successions. Nevertheless, whether and how directors incorporate their information and incentives in CEO recruitment remains understudied.

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[2] Succession planning can help the firm facilitate CEO transition, but firms tend to shift away from the original succession plan by hiring from outside when firm performance is poor (Larcker, Miles, and Tayan 2014; Cvijanovic, Gantchev, and Li 2022).

[3] Firms may hire top executive search firms. These recruiting firms normally access potential CEOs using their own resources, but some candidates are originally named by the hiring board. The key function of those head-hunting firms is to shorten the candidate list for their client firms, but the final decision of selecting the CEO is made by the client firm (Khurana, 2000).

This paper examines the effects of personal connections between CEO candidates and board members on CEO succession decisions and firm outcomes. There are two non-mutually exclusive channels – information and agency – through which board connections can affect firms' succession decisions. First, the information provided by board connections can facilitate the CEO succession process. In the labor economics literature, social networks have been widely viewed as an important mechanism to reduce information friction in job matches (Montgomery 1991). When evaluating new CEO candidates, some information can be gathered from publicly observable characteristics.[4] However, board connections allow the directors and CEO candidates to glean more hard-to-observe information about the potential match, thus improving both parties' information accessibility.[5] Liu (2014) shows that CEOs' connectedness expands their outside options. In the two-sided matching (Roth and Sotomayor, 1990) process, pre-existing connections between prospective CEO candidates and board members can save the time and effort of collecting information through other costly channels. Board connections can, therefore, help firms enlarge their potential CEO candidates pool and relax restrictions for replacing incumbent CEOs with new ones.

Thus, under the information channel, I hypothesize that board connections with potential CEO candidates can increase CEO succession incidence. Specifically, connections with CEO candidates increase the likelihood of replacing existing CEOs with new ones, especially when their performance is poor. Well-connected CEO candidates should also have a larger probability of being hired as new CEOs.[6] Pre-existing connections between board members and newly hired CEOs can also affect CEO tenures. Zhang (2008) argues that a board with information friction may make poor CEO selection decisions and quickly dismiss newly hired CEOs after the succession. With pre-existing connections, the board has better information about the quality and fit of new CEOs and, thus, the dismissal of these CEOs will be less likely. Additionally, new CEOs' connections with the hiring board equip managers with better knowledge of how to lead the firm

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[4] This includes employment history (Schoar, 2007), age (Li et al., 2017), education (Joos et al., 2003), experience (Cai et al., 2015), geography (Yonker, 2017), mobility (Ryan and Wang, 2012), award-winning experience (Malmendier and Tate, 2009), and innovation activities (Islam and Zein, 2020).

[5] Existing studies have provided evidence that specific unobserved characteristics of CEOs such as style (Bertrand and Schoar, 2003), overconfidence (Malmendier and Tate, 2005) and personality (Kaplan et al., 2012) can affect corporate practices.

[6] Board connections can also affect firms' decisions to hire externally. Firms tend to hire external CEO candidates under certain circumstances, such as poor performance (Boeker and Goodstein, 1993; Parrino, 1997). Board connections with external (internal) candidates provide firms with more options outside (within) the firm. Therefore, board connections increase firms' likelihood of replacing their incumbent CEOs with external (internal) candidates when the past performance is poor (good).

and secure their jobs. Thus, I predict that CEOs with strong pre-existing connections with hiring directors have longer tenures.

Second, the agency problem is another channel through which connections between the hiring board and CEO candidates may affect CEO succession decisions. The board of directors can monitor and discipline CEOs for poor performance through CEO turnover decisions (Adams and Ferreira, 2007). Directors (especially compensation committee members) can also influence CEOs through compensation decisions. At the same time, CEOs are also involved in director appointments and compensation decisions (Coles, Daniel, and Naveen, 2014). Hence, CEO candidates (directors) may prefer to join (hire) a "friendly" firm (CEO) because personal relationships between CEOs and directors provide a channel through which both parties can exploit private benefits for each other (Hwang and Kim, 2009). For instance, well-connected CEO candidates may receive higher compensation and a higher tolerance for failure after being hired as CEOs. Thus, under the agency channel, connections to the hiring board increase CEO candidates' probability of being hired.[7] For similar reasons, CEO with stronger connections may experience longer tenure due to agency problems. Directors connected with the incumbent CEO have less incentives to discipline her. Therefore, I further predict that CEO-board connections increase CEO tenure. As is readily seen, the information and agency channels have the same predictions for key CEO succession decisions. As I will elaborate later, these channels have opposite predictions for post-succession firm outcomes.

To test the effects of board connections on the likelihood of CEO succession, I study both firms' probability of CEO replacement and candidates' probability of being hired in all turnover and succession events from 2000 to 2020. I identify potential external CEO candidates from all available directors from the BoardEx dataset who work for non-hiring firms with similar size (+/-20%) and are located nearby (60 miles) the focal firm.[8] To identify firms' internal CEO candidates, I follow Naveen (2006) and construct a pool of potential internal successors, including non-CEO presidents or COOs in relay successions and non-CEO senior executives (i.e., VP, senior VP, and executive VP) in horse race successions. Next, I use the BoardEx individual network dataset to

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[7] This argument should hold for both internal and external CEO candidates. Although internal CEO candidates already have firm-specific knowledge during their employment, strong connections with other board members from the search committee also give them comparative advantages in the tournament.

[8] Yonker (2017) shows that CEO labor market is geographically segmented. The empirical results are robust to alternative restrictions on distance.

construct board connections (i.e., commonalities in employment, education, social clubs, and government organizations) with potential CEO candidates each year. Using a sample of firm-year panel data, I find significant positive effects of board connections with all CEO candidates (both internal and external) on the likelihood of incumbent CEO turnover.[9] I then use candidate-firm-year level data to test the effects of each CEO candidate's connections with the hiring board on her probability of being hired. I find that connections with board members from the hiring firm significantly increase a CEO candidate's succession probability. Since external and internal candidates are not comparable, I further check board connection effects among the subsamples of external and internal candidates separately. The results show that both external and internal candidates' succession probabilities increase with their previous connections to board members.[10]

This analysis presents two potential endogeneity concerns. First, talented CEO candidates may have good connections with many boards of directors, but a candidate's quality can directly contribute to their probability of being hired as well as the firm's post-succession performance. In this case, a positive correlation between board connections and succession probability is driven by unobserved qualities in the candidate. Another concern is that firm-level unobserved demand for managers may be correlated with board connections, which would mean that hired CEOs tend to have more connections by default. To draw causal inferences from the findings, I use two methods to tackle these endogeneity concerns. First, to control for unobserved individual characteristics, I re-examine the effects of board connections on succession probability with individual fixed effects. I find the results consistently significant, suggesting that the positive relation between board connections and CEO succession is not driven by unobserved heterogeneity at the candidate level. Second, I construct an instrumental variable to proxy for connections between a hiring firm's board and CEO candidates. The instrumental variable is the CEO candidate-board connections in non-hiring firms with similar size (20%) located within 60 miles of the focal firm. Board connections in these non-hiring firms should be similar to those of the hiring firm but are unlikely to affect hiring firms' CEO succession outcomes. The results estimated from two-stage-least-squares (2SLS)

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[9] The estimates of connection effects on CEO turnover probability in survival analysis from cox proportional hazard model (untabulated) are consistent with the results from OLS regression.

[10] Pre-existing connections between the incumbent CEO and hiring board members can also affect CEO succession decisions. Consistent with the agency hypothesis, I find that existing CEOs' connections with the focal board have negative effects on their probability of being replaced. Results are robust when board connections with CEO candidates and with incumbent CEOs are both included in the regression.

regression consistently suggest that board connections have a causal effect on CEO succession incidence.[11]

I then investigate the conditional effects of board connections on CEO succession incidence under prior firm performance. There is a consensus that CEO replacements are negatively correlated with firm performance (Warner and Watts, 1988; Weisbach, 1988; Fee and Hadlock, 2003; Jenter and Kanaan, 2015). In line with these studies, I find a consistent negative relation between firm performance and CEO succession likelihood. More importantly, the results show that board connections with candidate CEOs enhance this negative relation. The literature also finds that underperforming firms tend to appoint external successors. I test the board connection effects on this relation and find that board connections with potential CEO candidates increase the likelihood of outside succession when firms' past performance is poor and increase the likelihood of internal promotion when the past performance is good. Overall, the evidence suggests that board connections improve boards' visibility of prospective candidates, thereby increasing the sensitivity of CEO turnover to past firm performance.

I further test whether well-connected CEOs can better secure their positions. CEOs who are strongly connected to the board of directors have a deeper understanding of the required managerial skill sets and strategic goals of firms. From the agency perspective, personal relationships may make directors less likely to dismiss the CEO. Hence, well-connected CEOs should have longer tenures. Empirically, the regression results from the event-based sample show that CEOs who have more pre-existing connections with the board tend to have longer tenures than their less-connected peers in CEO succession events. The results are consistent with both the agency view and the informational role of connections in CEOs' assessment of job requirements and firm-specific demand.[12]

To distinguish between the two channels, I examine the effect of board connections on post-succession outcomes. Under the information channel, board connections with successors can reduce information asymmetry and improve mutual understanding between newly hired CEOs and boards. Board connections with CEOs help them identify a CEO's unobserved qualities, which may benefit firms in the post-succession period. According to Adams and Ferreira (2007), the

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[11] The results are qualitatively similar with different criteria (e.g., 100/200 miles and +/-20% firm size) in selecting local firms.

[12] It is possible that personal relationships with board of directors help CEOs exploit private benefits, such as longer tenures. If so, one should not expect any increase in CEO-firm matching quality and post-succession firm performance. Hence, the results here are unlikely to be purely driven by agency problems raised by CEO-board connections.

quality of board advice increases as more information is shared between CEOs and directors. Board connections with newly hired CEOs may encourage communication, thus improving firm efficiency through informed board advising. Hence, I expect that board connections increase post-succession firm performance through the information channel. Under the agency channel, board connections should impair firm efficiency due to two reasons. First, board members may replace incumbent CEOs with connected candidates who can bring more benefits to the connected director. The connected CEO candidates may not be as skilled as the incumbent CEO or other candidates without connections. Second, existing studies have shown that CEO-board connections impair monitoring efficiency and destroy firm value (Hwang and Kim, 2009; Fracassi and Tate, 2012; Coles, Daniel, and Naveen, 2014). Hence, post-succession firm performance can be negatively affected by board connections due to agency concerns.

To test the effects of board connections on post-succession performance, I construct a stacked-panel sample consisting of firm-year observations that are five years before and after each succession event. The empirical results indicate that firms with boards that have stronger connections with potential CEO candidates (both internal and external) tend to have better operating performance in the post-succession period. The results support the view that board connections facilitate information transmission between the CEO and the board in the post-succession period, thereby leading to better performance.

Viewed together, the baseline results on key succession decisions and post-succession performance in the paper support the information channel. However, the information and agency channels are not mutually exclusive. Thus, to gain deeper insights into the competing effects of board connections on CEO succession efficiency, I examine the connection effects on firm performance with different exposures to information frictions and agency concerns. On the one hand, firms can benefit more from board connections if the information demand for CEO candidates is higher. Using CEO age and past employment experiences in hiring industries as alternative proxies for boards' difficulties in evaluating CEO quality, I find that board connections have a stronger positive effect on firm performance in the subsample of younger new CEOs and the subsample of new CEOs who have less work experiences in the hiring industry. On the other hand, the information benefits can be undermined by agency costs when firms have weak governance. I then separately use the industry concentration ratio and corporate governance index

as proxies for external and internal governance, respectively.[13] I find that board connections have a stronger positive effect on firm performance in the subsamples of firms with stronger external and internal governance. Overall, the evidence indicates that firms benefit more from board connections when information demand for successor quality evaluation is higher and when corporate governance is strong.

Lastly, this paper explores the effects of board connections on firm innovation. CEO-board connections can result in greater sharing of private information that can help the board understand and tolerate CEOs' short-term failures boards, thereby allowing these CEOs to focus more on firms' long-term growth. Since job security and tolerance for early failures spur innovation (Manso, 2011; Ederer and Manso, 2013; Kini, Shen, Shenoy, Subramaniam, 2022), one can expect that CEO-board connections promote firm innovation activities. Innovation outcomes are unpredictable and hard to contract ex-ante (Aghion and Tirole, 1994). Therefore, well-connected CEOs should have more incentives to invest in long-term but valuable projects when they have private information about future investment opportunities. In addition, the CEO will receive better advice if she reveals more information to the board (Adams and Ferreira 2007). By the same token, one should expect more value creation in innovation activities when CEO-board connections improve the board advising function. Thus, if connections reduce the tolerance for failure and facilitate CEO-board communication on good investment opportunities, the probability of risky and valuable innovation projects will be higher.

I test the effects of connections on post-succession innovation intensity and quality. I first find that firms with a well-connected board have greater R&D expenditures in the following three years after CEO succession. In addition, the number of patents granted to firms with stronger board connections is significantly larger in the post-succession period. To investigate the value-creation of firms' patenting activities, I further test the connection effects on yearly average and total stock returns (following Kogan, Papanikolaou, Seru, and Stoffman, 2007) around patent grants in three years after CEO succession. Both average stock return and total stock returns of all patents granted are significantly higher for firms with stronger board connections. Overall, the results are

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[13] Bebchuk, Cohen, and Ferrell (2009) introduce the measure of entrenchment index as a proxy for firms' internal governance based on six provisions: staggered boards, limits to shareholder bylaw amendments, poison pills, golden parachutes, and supermajority requirements for mergers and charter amendments. Following Giroud and Mueller (2010) who find that industry competition mitigates agency problems, I use industry concentration ratio as a measure of industry competition to proxy for firms' exposure to external governance.

consistent with the view that connections increase the tolerance for early failures and improve the ability of the board to advise managers, thus increasing firms' innovation efficiency.

This paper is related to the large body of literature exploring the functions of corporate boards. Prior studies demonstrate that boards of directors play a pivotal role in both monitoring and advising managers (Hermalin and Weisbach, 1998; Adams and Ferreira, 2007; Chen, Chen, and Kang, 2020). Researchers theoretically argue that efficient contracts designed by the board can alleviate agency problems by aligning the managers' interests with those of shareholders (Jensen and Meckling, 1976; Grossman and Hart, 1986). Among all the essential fiduciary responsibilities of the board, its role in the CEO selection process and the mechanisms through which the board affects the CEO selection process have received less attention. This paper fills that void by examining the informational role of the board in CEO succession decisions.

This paper also contributes to the literature on directors' private learning in managerial labor markets. Some papers study the effects of individual connectedness on top-tier managers' career outcomes, including employment opportunities (Hshieh, Patel, and Li, 2018; Hacamo and Kleiner, 2019), turnover (Liu, 2014; Coles, Wang, and Zhu, 2015), and compensation (Engelberg, Gao, and Parsons, 2013). In a contemporaneous paper, Cziraki and Jenter (2023) examine CEO hiring activities in S&P 500 firms and find that a large group of new CEOs had professional connections with the hiring board.[14] Different from their paper, I provide empirical evidence of the incremental effects of pre-existing board connections on firms' hiring and firing decisions, post-succession firm performances, and post-succession innovation activities. Overall, this paper focuses on the ties between board members and CEO candidates that capture the information exchange between the two parties.

This paper additionally contributes to the burgeoning literature on the role of connections in corporate practices. Several recent studies provide evidence of the informational role of social networks on corporate policies (Shue, 2013; Fracassi, 2017), mergers and acquisitions (Cai and Sevilir, 2012; El-Khatib, Fogel, and Jandik, 2015; Ishii and Xuan, 2014; Schmidt, 2015), and investment decisions (Cohen, Frazzini, and Malloy, 2008; Duchin and Sosyura, 2013). Other studies (Hwang and Kim, 2009; Fracassi and Tate, 2012; Coles, Daniel, and Naveen, 2014) show that on-going board connections with existing CEOs exacerbate agency problems and weaken

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[14] While their paper focuses on S&P 500 firms, my paper includes all US public firms with information available in BoardEx and Compustat database from 2000 to 2020. In my sample, 12% of firms are from the S&P 500 index.

board monitoring and, therefore, harm shareholder value. This paper shows that pre-existing board connections with the incumbent CEO (CEO candidates) provide valuable information about the managerial labor market and improve firm succession efficiencies.

Lastly, prior studies of CEO succession find that past performance and board composition play important roles in CEO turnover and succession decisions (Borokhovich, Parrino, and Trapani, 1996; Parrino, 1997; Huson, Parrino, and Starks, 2001; Weisbach, 1988; Naveen, 2006; Anderson, Bustamante, Guibaud, and Zervos, 2018). Other characteristics also contribute to CEO successions, such as the CEO's age (Li, Low, and Makhija, 2017) and industry background (Parrino, 1997; Crossland, Zyung, Hiller, and Hambrick, 2014), as well as unobserved individual fixed effects (Bertrand and Schoar, 2003). This paper sheds some light on these issues by documenting that the CEO candidate-board connection is an additional determinant of CEO appointments and post-succession performance.

The rest of the paper proceeds as follows. Section 2 reports the data and variable constructions. Section 3 reports the empirical tests of the main hypotheses and establishes causality. Section 4 concludes the paper.

2. Data

2.1 CEO succession events and CEO candidates

The BoardEx datasets provide records of employment reports, role names, job descriptions, functional experiences, board positions, compensation, indicators of independence (NED), and corresponding role starting and ending dates. I identify both internal and external CEO succession events from the BoardEx employment files. Internal and external succession events are defined as CEO replacements wherein the new CEO is hired from inside or outside the firm, respectively. The CEO succession date is indicated by the role start state of each position titled "CEO" or "Chief Executive Officer." Each year, the firm's external CEO candidates are described as directors in the BoardEx database who transit positions and work for firms located within 60 miles of the focal firm. The past employer of external candidates is also required to be similar in size (+/-20%) to the focal firm. To identify firms' internal CEO candidates, I follow Naveen (2006) and construct a pool of potential internal successors, including non-CEO presidents or COOs in relay successions and non-CEO senior executives (i.e., VP, senior VP, and executive VP) in horse race successions. Lastly, I require that the CEOs' pre-succession employment information is trackable. Other CEO

candidate characteristics such as age, MBA degree, and gender are directly obtained from the BoardEx database.

2.2 Board and CEO connections

The BoardEx individual network dataset contains detailed information on each connected pair, including the corresponding overlapping years and overlapping organizations, as well as the individuals' roles in those overlapping organizations. Connections between each CEO candidate and one of the hiring firm's directors in year *t* are identified if the year *t* falls in the range between the first and last overlapping years. These connections include various types of shared activities: university attendance, employment experiences in both public and private firms, and other shared experiences in the armed forces, charities, clubs, medical fields, and sporting and government organizations. To measure the overall board connectedness with all potential CEO candidates, I construct *Connections_Board* as the natural logarithm of the total number of ties between all CEO candidates and all board members. *Connections_Board (External)* is the natural logarithm of the total number of connections between all external CEO candidates and all board members. *Connections_Board (Internal)* is defined analogously. To test the individual candidate's succession probability, I construct *Connections_Candidate* as the natural logarithm of the total number of connections between each CEO candidate and all board members from the hiring firm. To test the effects of CEO-board connections on post-succession outcomes, I construct *Connections_CEO* as the natural logarithm of the total number of connections between the hired CEO and all board members from the hiring firm. Other board characteristics such as board size and board independence are also calculated based on firms' historic employment records reported in the BoardEx database.

2.3 Succession outcomes

This paper examines the effects of board connections on succession outcomes at both the individual and firm levels. To test the connection effects on CEO's ability to secure the job, I construct a measure of CEO tenure as the number of years spans from the succession to the turnover. The firm-level analyses include the effects of board connections on post-succession firm performance and innovation efficiency. I use the information from Compustat annual fundamental dataset to construct post-succession performance and firms' R&D variables. The post-succession

operating performance (ROA_{t+1}) is measured as net income in year t + 1 divided by total assets in year t. I further construct several measures of innovation efficiency. $R\&D_{t+3}$ is the natural logarithm of total R&D expenditures from year t+1 to t+3 for CEO succession events in year t. Other firm-level characteristics and control variables are also obtained from Compustat. The information about post-succession patenting activities is obtained from United States Patent and Trademark Office (USPTO) database. I construct three variables, including total patents grants, average value across all patents granted, and the total value of patens to capture the quantity and quality of firms' innovation outcomes. The *Number_patents* is the natural log of the number of patents granted for the firm from year t+1 to t+3. The *Avg_value (Total_value)* is the natural logarithm of the average (total) patent value (following Kogan et al., 2017) from year t+1 to t+3 for CEO succession events in year t.

2.4 Summary statistics

Table 1 summarizes the statistics of hiring firms and board connections. The sample consists of firm-year observations from 2000 to 2020. The average firm size, measured as the natural logarithm of total assets, is 6.57. The average ROA is 0.034. The average leverage ratio is 0.219. The average log transformation of R&D expenditures is 0.05. The average board size is 9.65, and the average board independence is 73.8%. Board connections with internal/external CEO and CEO candidates are reported in Table 1. The total number of connections between board members from hiring firms and all CEO candidates ranges from 0 to 75, with a mean of 12.144 and a median of 0. Among all candidates, board members have a maximum of 4 ties with external CEO candidates and a maximum of 72 ties with internal CEO candidates. Since the internal CEO candidates have pre-existing relationships with the boards of the hiring firms, they demonstrate stronger connections than external candidates.

Table 2 summarizes the statistics of CEO (candidates) and succession outcomes. The observable qualities of CEO candidates are similar to eventually hired CEOs. On average, 27% of CEOs have an MBA degree. Similarly, 28.4% of CEO candidates have an MBA degree. The average age of CEOs is 54, the same as CEO candidates. Among all CEOs, 4.2% are female. The proportion of females among CEO candidates is 3.7%. The natural log of connections between boards and hired CEOs is 1.569, which is higher than that of CEO candidates (0.46). The average post-succession performance (ROA_{t+1}) is 0.065. The natural log of the CEO tenure is 1.51. The

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total R&D expenditure around CEO succession events is 1.74 million dollars. The average value of patents issued around CEO succession is 2.773, and the total value is 6.054.

3. Empirical Tests

3.1 Board Connections and CEO Succession Incidence

My empirical analyses start with the relation between board connections and CEO succession incidence, including both firms' probability of replacing incumbent CEOs and candidates' probability of being hired as new CEOs. I expect that board connections with potential CEO candidate can increase CEO succession likelihood due to both information benefits and agency problems. On one hand, board connections enrich the pool of qualified CEOs and reduce the information asymmetry in the managerial labor market. On the other hand, board connections provide incentives for directors (candidates) to hire (join) a friendly CEO (board) to exploit their private benefits in the post-succession period. The first main question of interest is whether board connections with potential internal and external CEO candidates will increase the likelihood of incumbent CEO replacements. To address this question, I use firm-year level data to estimate panel regressions in the following specification:

$$Succession_{it} = \alpha + \beta_1 Board\ Connections_{it} + \gamma_1 Z_{it} + \eta_i + \xi_t + \mu_j + \epsilon_{it} \qquad (1)$$

where the main explanatory variable, $Board\ Connections_{it}$, is the natural log of the total number of connections between board members and all potential CEO candidates. The dependent variable, $Succession_{it}$, is an indicator variable equal to one if a firm i replaces its CEO with a new candidate in year t and zero otherwise. I further control for several firm (and CEO) characteristics Z_{it} and include firm fixed effects, η_i, industry fixed effects, μ_j, and year fixed effects, ξ_t, in the regressions.

[Insert Table 3 Here]

Table 3 reports regression results regarding the impact of board connections with potential CEO candidates on the likelihood of succession events. The sample consists of firm-year observations from 2000 to 2020. Columns (1) to (3) are regressions with various fixed effects. As reported in Column (3) with firm, industry, and year fixed effects, a one-standard-deviation increase in board connections is associated with a 0.63% greater probability of CEO succession.

The coefficients on board connections reported in other columns are consistently and significantly positive. Since the incumbent CEOs might also have pre-existing connections with board members when they were hired, the effects of board connections with CEO candidates on CEO replacement decision should be weakened. Thus, I further control for the board connections with the incumbent CEO and find that the results are largely unaffected. Consistent with the agency argument, I find a significant and negative relation between board connections with incumbent CEOs on succession (replacement) likelihood, suggesting that incumbent CEOs with stronger pre-existing connections are less likely to be dismissed by their "friends". Overall, the results suggest the view that board connections reduce managerial labor market frictions and shape the CEO succession process. It also implies that pre-existing connections may raise agency concerns where incumbent CEOs are replaced with friendly CEOs.

To further confirm the role of connections in the CEO succession process, I test the effects of CEO candidates' connections with hiring directors on the probability of being hired as CEOs. From the CEO candidates' perspective, those connected with the hiring board have more visible qualities than less-connected ones. On the other hand, CEOs have more incentives to work with people who are previously connected. For both reasons, well-connected CEO candidates should have a higher likelihood of being hired. To examine the connection effects on CEO candidates' probability of being hired, I use candidate-firm-year level data to estimate cross-sectional regressions in the following specification:

$$Succeed_{ikt} = \alpha + \beta_1 CEO(candidate) - Board\ Connections_{ikt} + \gamma_1 Z1_{it} + \gamma_2 Z2_{kt} + \eta_i + \xi_t + \epsilon_{ikt}\ (2)$$

where $Succeed_{ikt}$ is an indicator variable equals to one if a candidate k is hired by firm i as CEO in year t. The main variable of interest, $CEO\ (candidate) - Board\ Connections_{ikt}$, is the natural log of the total number of connections between each CEO candidate k and all board of directors from the hiring firm. I further control for several firm (CEO candidate) characteristics $Z1_{it}$ ($Z2_{kt}$) and include firm fixed effects, η_i and year fixed effects, ξ_t, in the regressions.

[Insert Table 4 Here]

Table 4 presents results regarding the impact of board connections on CEO candidates' succession probability. The sample consists of candidate level observations in all succession events. Columns (1) to (3) report the effects of board connections with any, external, and internal CEO

candidates, respectively. On average, a one-standard-deviation increase in CEO (candidate)-board connections is correlated with a 2.42% greater probability of that candidate being hired as CEO. The results suggest that a CEO candidate's connections with the hiring board improve their labor market outcomes. The overall evidence is consistent with both the information view that board connections reduce information frictions in managerial labor market and the agency view that private relationships provide incentives for directors (candidates) to hire (join) their friends.

One possibility is that CEO candidates with good traits may have well and rich connections, and candidates' quality can directly contribute to their probability of being hired. To alleviate the concern that CEO candidates' qualities may be endogenously correlated with their connections and their probability of being hired, I exploit two ways to establish casual effects of board connections. For the individual level test, I add candidate fixed effects in the regression analysis and find similar results reported in Table A2. The results in the regression with candidate fixed effects are consistent with the previous test and confirm that the positive effects of CEO candidates' connections with the hiring board on their succession probabilities are less unlikely due to individual-level unobservd heterogeneity.

To further establish and casual link and address endogeneity concerns, I construct instrumental variables as a proxy for board connections in the focal firm following equation (3).

$$Board\ Connections_{it} = \alpha + \beta_1 Peer\ Board\ Connections_{it} + \gamma_1 Z_{it} + \eta_i + \xi_t + \mu_j + \epsilon_{it}$$
(3)

$$Succession_{it} = \alpha + \beta_1 Board\ \widehat{Connections}_{it} + \gamma_1 Z_{it} + \eta_i + \xi_t + \mu_j + \epsilon_{it} \quad (4)$$

where $Peer\ Board\ Connections_{it}$ is the natural log of total number of connections between directors from peer firms and their potential CEO candidates. Specifically, for each hiring firm, I choose a group of peer firms with similar size (+/- 20%) located within 60 miles of the focal firm. Then, I identify hypothetical CEO candidates for all non-hiring peer firms. Next, I calculate the average number of board connections with these hypothetical CEO candidates in local firms as the instrument to proxy for true board connections in the focal firm. The geographically proximate firms may share similar board connections. However, it is unlikely that board connections of firms in the same geographic areas may affect the succession outcomes of other firms. In the second stage of the 2SLS regression, I re-examine the board connection effects on firms' succession

likelihood following equation (4). The main variable of interest, $\widehat{Board\ Connections}_{it}$ is predicted from the first stage regression following equation (3).

[Insert Table 5 Here]

Table 5 reports the two-stage-least-squares (2SLS) regression results regarding the impact of board connections with potential internal and external candidates on firms' succession events. Column (1) reports the results of the first stage, and Columns (2) through (4) report the second stage. Column (1) shows that board connections to hypothetical candidates in geographically proximate firms are positively correlated with each other, suggesting that the instrumental variable satisfies the relevant condition. The positive coefficients in Columns (2) through (4) show that instrumented board connections increase the probability of CEO succession, which is consistent with the previous analyses. These findings provide causal inferences that board connections increase the incidence of CEO succession.

To better understand the informational role of board connections, I further examine board connection effects on existing CEOs' turnover to performance sensitivity. According to the literature (Parrino, 1997), firms tend to replace CEOs with outsiders when firm performance is poor. If board connections reduce managerial labor-market frictions and provide valuable information or incentives for hring directors to hire a well-known friend, the board connections should have stronger effects for external (internal) succession events when pre-succession performance is poor (good).

[Insert Table 6 Here]

Table 6 presents the effects of board connections with internal and external candidates on firms' succession events. The dependent variable, *(External/Internal) Succession*, equals one if the firm replaces the incumbent CEO with a new (external/internal) CEO and zero otherwise. The negative coefficient in Column (1) indicates that, on average, board connections with potential CEO candidates are more substantial when pre-succession performance is poor. The interaction between connections and pre-succession ROA is significantly negative in Column (2) but significantly positive in Column (3). The results show that board connections are more important when the firm's performance is bad (good) prior to an external (internal) succession. Overall, the evidence suggests that board connections reduce firms' tolerance for incumbent CEOs' underperformance and shape firms' decision to hire externally.

3.2 Board Connections and CEO Tenure

I then investigate whether and how pre-existing CEO-board connections affect CEOs' career outcomes. Since CEOs who have more connections with hiring board members have better knowledge about firm-specific requirements for the CEO position, the successor CEO is more likely to satisfy the board and, in so doing, secure her job position. In addition, well-connected CEOs may receive less challenges from the friendly board, thus have longer tenures.

[Insert Table 7 Here]

Table 7 reports the results of regressions regarding CEO-board connections on CEOs' ability to secure their jobs. The event-based sample consists of all successions from 2000 to 2020. The main variable of interest is pre-existing CEO-board connections. On average, a one-standard-deviation increase in CEO-board connections is associated with a 4.21% increase in CEO tenure.[15] The positive correlation between Connections and CEO Tenure implies that CEO-board connections provide both information and incentives in the matching process, thus helping CEOs better secure their positions.

Previous results have shown that board connections with candidates affect the manager-firm matching process. The results are consistent with both information and agency arguments. The next part of this paper aims to differentiate the information hypothesis from the agency hypothesis by empirically investigating how board connections affect CEO succession outcomes. I first test board connection effects on post-succession performance and they explore firm innovation outcomes as a sources of information benefits. To explore the board connection effects on outcomes of firms who experienced CEO succession events, I use stacked firm-year panel data around all successions to estimate regressions in the following specification:

$$Y_{it} = \alpha + \beta_1 Post_{it} * CEO\_Board\ Connections_{it} + \beta_2 Post_{it} + \beta_3 CEO\_Board\ Connections_{it} + \gamma_1 Z_{it} + \eta_i + \xi_t + \mu_j + \epsilon_{it} \quad (5)$$

The sample consists of firm-year observations in [-5, +5] year window around all CEO succession events. The main variable of interest is the interaction term of $Post_{it} * CEO\_Board\ Connections_{it}$, where $Post_{it}$ indicates whether the firm hired a new CEO in the

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[15] The results are consistent with the results of examining board connections with incumbent CEOs and the turnover probability test discussed in section 3.1.

past five years. $CEO\_Board\ Connections_{it}$ measures the pre-existing board connections with truly hired CEO in the year before succession. Y_{it} corresponds to a set of measures of CEO succession outcomes, including operating performance, R&D expenditures, and patenting activities. I further control for several firm (and CEO) characteristics Z_{it} and include firm fixed effects, η_i, industry fixed effects, μ_j, and year fixed effects, ξ_t, in the regressions.

3.3 Board Connections and Post Succession Performance

To investigate whether board connections provide valuable information or raise agency concerns in the CEO succession process, I analyze the relation between CEO-board connections and post-succession performance. If board connections with the CEO help the board better identify unobserved CEO qualities which then allow them to collaborate more effectively, post-succession performance should be better among firms that hire CEOs with more board connections.

[Insert Table 8 Here]

Table 8 reports on the effects of board connections with new CEOs on firms' post-succession performance. The sample consists of all succession event firms within the prior and following five years around the succession year. The model specification is the same as equation (6). The regressions in Columns (1) through (4) include various fixed effects. The positive significant coefficients on the interaction term consistently show that firms with stronger CEO-board connections experience better post-succession performance, suggesting that well-connected CEOs provide beneficial information and create value for the firm.

Next, this paper explores the heterogeneity of board connection effects on post-succession performance. Intuitively, evaluations of younger CEO candidates or candidates with less work experiences in the hiring industry rely more on other information sources, such as connections with hiring firms. In this case, firms may reap more benefits from hiring younger or less trackable CEOs with more connections. Furthermore, connections can better help the board to ascertain and evaluate CEO quality when the market is more competitive. On the other hand, existing studies (Hwang and Kim, 2009; Fracassi and Tate, 2012; Coles, Daniel, and Naveen, 2014) suggest that CEO-board connections could negatively impact firm value because they make agency problems more likely to arise. Therefore, I expect that the better performance experienced by firms with stronger board connections only exists when internal and external governance is strong.

[Insert Table 9 Here]

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Regression results are reported in Table 9. The sample consists of all succession event firms within the prior and following five years around the succession year. *Post* is an indicator equal to one if the firm-year is after the succession year *t*, and zero otherwise. *CEO Age* is the natural logarithm of a CEO's age in year *t*. *Experience* is the number of years for past employment history in the focal industry. *HHI* index is the four-digit SIC industry sales concentration ratio. *E-index* is the entrenchment index from Bebchuk, Cohen, and Ferrell (2009). The positive and significant coefficient in Column (2) and (4) shows that CEO-board connections create more post-succession value for firms when the CEO is younger or lack of industry experience. This evidence implies that board connections provide more marginal benefits when there is less trackable information about CEOs. Similarly, the positive and significant coefficient in Column (5) suggests that CEO-board connections create more value for the firm after succession events when the market competition (*HHI*) is higher (lower), confirming that connections are more likely to improve succession performance when the market is more competitive. Lastly, the positive and significant coefficient in Column (7) shows that CEO-board connections improve post-succession firm performance when *E-index* is low. The results suggest that only firms with good governance benefit from CEO-board connections in CEO succession events. Overall, in this subsection, I find that CEO-board connections improve post-succession firm performance. The positive effects of CEO-board connections are stronger when CEO candidates have less trackable information and when firms' external competition and internal governance is stronger.

3.4 Board Connections and Post-succession Innovation

Previous results have shown that CEO-board connections make firms better-off in the post-succession period. This section aims to explore potential explanations of the performance gained by firms with stronger board connections. I specifically focus on firm innovation activities. Ederer and Manso (2013) show that the threat of termination discourages innovation. Well-connected CEOs, who are more likely to have the trust of the board, have more incentive to take on risky but valuable projects when they have private information about future investment opportunities. A well-connected board will also have a higher tolerance for risky long-term projects because they are more informed about the CEO's actions. Since R&D expenditures and patenting activities generate uncertain cash flows and are thus considered risky investments, I expect well-connected CEOs to spend more on long-term quality investments. In this subsection, I use R&D expenditures,

patenting intensity, and patent value to measure firms' tolerance for failures and how much valuable innovation well-connected CEOs are willing to invest in.

[Insert Table 10 Here]

Table 10 reports regression results regarding the impact of board connections with new CEOs on firms' innovation activities. The model specification is the same as equation (5). The sample consists of all succession event firms within the prior and following five years around the succession year. $R\&D_{t+3}$ is the natural logarithm of total R&D expenditures from year $t+1$ to $t+3$, where year t is the succession year. *Num_patents* is the natural log of the number of patents granted for the firm from year $t+1$ to $t+3$. The positive and significant results in Column (1) show that well-connected CEOs are more likely to increase R&D investment in the post-succession period compared to less-connected ones. The positive and significant results in Columns (2) through (4) suggest that well-connected CEOs are more likely to increase patent filings. In addition, the quality of patenting activities also increases in the post-succession period. The overall evidence in this subsection supports the view that CEO-board connections improve CEO and board functions, thus increasing firms' post-succession innovation quantity and quality.

4. Conclusions

This paper studies the effects of connections (i.e., employment, education, and social ties) between CEO candidates and board members on CEO succession. Boards that have stronger connections with potential CEO candidates are more likely to replace their incumbent CEOs with external candidates, especially when their pre-succession performance is poor. From the individual perspective, CEO candidates' connections to the hiring board increase their probability of being hired. More importantly, well-connected CEOs have more information that allows them to better secure their positions and enjoy longer tenure. Since information facilitates board advising and informed management, CEO-board connections improve post-succession operating performance. The information benefits are larger when firms' information demand for accessing candidates' quality is higher. Also, the information benefits are undermined when firms' governance is weak. CEO-board connections give CEOs higher tolerance for early failures, increasing both the quality and quantity of firms' innovation. Overall, board connections provide valuable information during and after CEO succession events, improve firm performance, and increase firm investment efficiency.

This paper also suggests potential avenues for further exploration. First, the positive relation between candidate-board connections and high succession probability may be explained by several other reasons. Searching cost is an essential consideration in any manager-firm match. For external succession, firms might rely more on the third-party to facilitate recruitment. This paper does not include any empirical analysis of firms' choices in engaging recruiting firms. Future research can explore the incremental benefits or costs of hiring third-party in CEO succession. In addition, unobserved management style and upcoming changes in corporate culture can remain hidden when new CEOs are hired. CEO-board connections might reflect some culture-based relationships which affect CEO succession outcomes. Lastly, the information context carried by the connections is not observable. Many existing studies focus on the effects of individual network centrality (e.g., degree, closeness, betweenness, and eigenvalues) on managerial job market outcomes and corporate decision-making. The information content related to the employer-employee match is challenging to capture by any conventional measures. Future research on social networks could focus more on qualitative analyses, which would enable researchers to better measure and examine the context of the connections.

References

Adams, R. B., and Ferreira, D., 2007. A theory of friendly boards. The Journal of Finance 62 (1), 217-250.

Aghion, P., and Tirole, J., 1994. The management of innovation. The Quarterly Journal of Economics, 109(4), 1185-1209.

Anderson, R. W., Bustamante, M. C., Guibaud, S., and Zervos, M., 2018. Agency, firm growth, and managerial turnover. The Journal of Finance 73 (1), 419-464.

Bebchuk, L., and Fried, J. M., 2003. Executive compensation as an agency problem, Journal of Economic Perspectives 17, 71–92.

Bebchuk, L., Cohen, A., and Ferrell, A., 2009. What matters in corporate governance? The Review of Financial Studies 22 (2), 783-827.

Bertrand, M., and Schoar, A., 2003. Managing with style: The effect of managers on firm policies. The Quarterly Journal of Economics 118 (4), 1169-1208.

Boeker, W., and Goodstein, J., 1993. Performance and successor choice: The moderating effects of governance and ownership. Academy of Management Journal, 36(1), 172-186.

Bonnier, K. A., and Bruner, R. F., 1989. An analysis of stock price reaction to management change in distressed firms. Journal of Accounting and Economics, 11(1), 95-106.

Borokhovich, K. A., Parrino, R., and Trapani, T., 1996. Outside directors and CEO selection. Journal of Financial and Quantitative Analysis 31 (3), 337-355.

Cai, Y., and Sevilir, M., 2012. Board connections and M&A transactions. Journal of Financial Economics 103 (2), 327-349.

Cai, Y., Sevilir, M., and Yang, J., 2015. Are they different? CEOs made in CEO factories. Working paper, Santa Clara University.

Charan, R., 2005. Ending the CEO succession crisis. Harvard Business Review 83 (2), 72-81.

Chen, S. S., Chen, Y. S., Kang, J. K., and Peng, S. C., 2020. Board structure, director expertise, and advisory role of outside directors. Journal of Financial Economics 138 (2), 483-503.

Chhaochharia, V., and Grinstein, Y., 2009. CEO compensation and board structure. The Journal of Finance 64 (1), 231-261.

Chidambaran, N. K., Kedia, S., and Prabhala, N., 2011. CEO director connections and corporate fraud. Fordham University Schools of Business Research Paper, 1787500.

Cohen, L., Frazzini, A., and Malloy, C., 2008. The small world of investing: Board connections and mutual fund returns. Journal of Political Economy 116 (5), 951-979.

Coles, J. L., Daniel, N. D., and Naveen, L., 2014. Co-opted boards. The Review of Financial Studies 27 (6), 1751-1796.

Coles, J. L., Wang, A. Y., and Zhu, C., 2015. Director network and CEO turnover. Working paper, University of Utah.

Crossland, C., Zyung, J., Hiller, N. J., and Hambrick, D. C., 2014. CEO career variety: Effects on firm-level strategic and social novelty. Academy of Management Journal 57 (3), 652-674.

Cvijanovic, D., Gantchev, N., and Li, R., 2022. CEO succession roulette. Available at SSRN 2862653.

Cziraki, P., and Jenter, D., 2023. The market for CEOs. European Corporate Governance Institute–Finance Working Paper, (831).

Denis, D. J., and Denis, D. K., 1995. Performance changes following top management dismissals. The Journal of Finance, 50(4), 1029-1057.

Donatiello, N. E., Larcker, D. F., and Tayan, B., 2018. CEO talent: A dime a dozen, or worth its weight in gold? European Financial Management, 24(3), 301-308.

Duchin, R., and Sosyura, D., 2013. Divisional managers and internal capital markets. The Journal of Finance 68 (2), 387-429.

Ederer, F., and Manso, G., 2013. Is pay for performance detrimental to innovation? Management Science, 59(7), 1496-1513.

El-Khatib, R., Fogel, K., and Jandik, T., 2015. CEO network centrality and merger performance. Journal of Financial Economics 116 (2), 349-382.

Engelberg, J., Gao, P., and Parsons, C. A., 2013. The price of a CEO's rolodex. The Review of Financial Studies 26 (1), 79-114.

Fama, E. F., and Jensen, M. C., 1983. Separation of ownership and control. The Journal of Law and Economics 26 (2), 301-325.

Fee, C. E., and Hadlock, C. J., 2003. Raids, rewards, and reputations in the market for managerial talent. The Review of Financial Studies, 16(4), 1315-1357.

Fracassi, C., 2017. Corporate finance policies and social networks. Management Science 63(8), 2420-2438.

Fracassi, C., and Tate, G., 2012. External networking and internal firm governance. The Journal of Finance 67 (1), 153-194.

Gabaix, X., and Landier, A., 2008. Why has CEO pay increased so much? The Quarterly Journal of Economics, 123(1), 49-100.

Gerstein, M., and Keisman, H., 1983. Strategic selection: Matching executives to business conditions. Sloan Management Review (pre-1986), 24(2), 33.

Giroud, X., and Mueller, H. M., 2010. Does corporate governance matter in competitive industries? Journal of Financial Economics, 95(3), 312-331.

Grossman, S. J., and Hart, O. D., 1986. The costs and benefits of ownership: A theory of vertical and lateral integration. Journal of Political Economy 94(4), 691-719.

Hacamo, I., and Kleiner, K., 2019. Competing for talent: Firms, managers, and social networks. Working paper, Indiana University.

Hallock, Kevin F., 1997, Reciprocally interlocking boards of directors and executive compensation, Journal of Financial and Quantitative Analysis 32, 331–344.

Hermalin, B. E., and M. S. Weisbach., 1998. Endogenously chosen boards of directors and their monitoring of the CEO, American Economic Review 88, 96–118

Hotchkiss, E. S., 1995. Post-bankruptcy performance and management turnover. The Journal of Finance, 50(1), 3-21.

Hshieh, S. and Patel, N. and Li, J, 2018. Director networks, mobility, and governance: Evidence from corporate bankruptcies. SSRN. http://dx.doi.org/10.2139/ssrn.3019113

Huson, M. R., Malatesta, P. H., and Parrino, R., 2004. Managerial succession and firm performance. Journal of Financial Economics, 74(2), 237-275.

Huson, M. R., Parrino, R., and Starks, L. T., 2001. Internal monitoring mechanisms and CEO turnover: A long-term perspective. The Journal of Finance 56 (6), 2265-2297.

Hwang, B. H., and Kim, S., 2009. It pays to have friends. Journal of Financial Economics 93 (1), 138-158.

Ishii, J., and Xuan, Y., 2014. Acquirer-target social ties and merger outcomes. Journal of Financial Economics 112 (3), 344-363.

Islam, E., and Zein, J., 2020. Inventor CEOs. Journal of Financial Economics 135 (2), 505-527.

Jensen, M. C., and Meckling, W. H., 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. Journal of Financial Economics 3 (4), 305-360.

Jenter, D., and Kanaan, F., 2015. CEO turnover and relative performance evaluation. The Journal of Finance, 70(5), 2155-2184.

Joos, P., Leone, A., and Zimmerman, J., 2003. Selecting CEOs: Matching the person to the job. Working paper, University of Rochester.

Kaplan, S. N., Klebanov, M. M., and Sorensen, M., 2012. Which CEO characteristics and abilities matter? The Journal of Finance 67(3), 973-1007.

Khurana, R., 2000. Three-party exchanges: The case of executive search firms and CEO search.

Kini, O., Shen, M., Shenoy, J., and Subramaniam, V., 2022. Labor unions and product quality failures. Management Science, 68(7), 5403-5440.

Kini, O., Williams, R., and Yin, S., 2021. CEO noncompete agreements, job risk, and compensation. The Review of Financial Studies, 34(10), 4701-4744.

Kogan, L., Papanikolaou, D., Seru, A., and Stoffman, N., 2017. Technological innovation, resource allocation, and growth. The Quarterly Journal of Economics 132 (2), 665-712.

Larcker, D. F., Miles, S., and Tayan, B., 2014. Seven myths of CEO succession. Rock Center for Corporate Governance at Stanford University Closer Look Series: Topics, Issues and Controversies in Corporate Governance and Leadership No. CGRP-39.

Li, X., Low, A., and Makhija, A. K., 2017. Career concerns and the busy life of the young CEO. Journal of Corporate Finance 47, 88-109.

Liu, Y., 2014. Outside options and CEO turnover: The network effect. Journal of Corporate Finance 28, 201-217.

Malmendier, U., and Tate, G, 2009. Superstar CEOs. The Quarterly Journal of Economics 124 (4), 1593-1638.

Malmendier, U., and Tate, G., 2005. CEO overconfidence and corporate investment. The Journal of Finance, 60(6), 2661-2700.

Manso, G., 2011. Motivating innovation. The Journal of Finance, 66(5), 1823-1860.

Montgomery, J. D., 1991. Social networks and labor-market outcomes: Toward an economic analysis. The American Economic Review, 81(5), 1408-1418.

Naveen, L., 2006. Organizational complexity and succession planning. Journal of Financial and Quantitative Analysis 41 (3), 661-683.

Pan, Y., 2017. The determinants and impact of executive-firm matches. Management Science, 63(1), 185-200.

Parrino, R., 1997. CEO turnover and outside succession a cross-sectional analysis. Journal of Financial Economics 46 (2), 165-197.

Pissarides, C. A., 2011. Equilibrium in the labor market with search frictions. American Economic Review, 101(4), 1092-1105.

Roth, A. E., and Sotomayor, M., 1992. Two-sided matching. Handbook of game theory with economic applications, 1, 485-541.

Ryan, H. E., and Wang, L., 2012. CEO mobility and the CEO-firm match: Evidence from CEO employment history. SSRN. http://dx.doi.org/10.2139/ssrn.1772873

Schmidt, B., 2015. Costs and benefits of friendly boards during mergers and acquisitions. Journal of Financial Economics 117 (2), 424-447.

Schoar, A., 2007. CEO careers and style. Working Paper, NBER.

Shue, K., 2013. Executive networks and firm policies: Evidence from the random assignment of MBA peers. The Review of Financial Studies 26 (6), 1401-1442.

Stigler, G. J., 1962. Information in the labor market. Journal of Political Economy, 70(5, Part 2), 94-105.

Terviö, M., 2008. The difference that CEOs make: An assignment model approach. American Economic Review, 98(3), 642-668.

Warner, J. B., Watts, R. L., and Wruck, K. H., 1988. Stock prices and top management changes. Journal of Financial Economics, 20, 461-492.

Weisbach, M. S., 1988. Outside directors and CEO turnover. Journal of Financial Economics 20, 431-460.

Yonker, S. E., 2017. Geography and the market for CEOs. Management Science 63 (3), 609-630.

Zhang, Y., 2008. Information asymmetry and the dismissal of newly appointed CEOs: An empirical investigation. Strategic Management Journal, 29(8), 859-872.

Table 1. Summary Statistics of Firm Characteristics and Board Connections

This table reports the summary statistics of hiring firms and their board connections. The sample is the firm-year panel data. *Size* is the natural log of total assets. *ROA* is the net income scaled by total assets. *Leverage* is the book value of debt. *R&D* is the R&D expenses scaled by total assets. *Board Size* is the total number of board members from the BoardEx database. *Board Ind* is the board independence from the BoardEx database. *Connections Board_raw* is the number of total connections (i.e., employment, education, and social ties) between board members of the firm and potential internal and (or) external CEO candidates in each year. *Connections Board_raw (External)* is the number of total connections (i.e., employment, education, and social ties) between board members of the firm and potential external CEO candidates in each year. *Connections_Board_raw (Internal)* is the number of total connections (i.e., employment, education, and social ties) between board members of the firm and potential internal CEO candidates in each year. *Connections Board* is the natural log of total connections (i.e., employment, education, and social ties) between board members of the firm and potential internal and (or) external CEO candidates in each year. *Connections Board (External)* is the natural log of total connections (i.e., employment, education, and social ties) between board members of the firm and potential external CEO candidates in each year. *Connections_Board (Internal)* is the natural log of total connections (i.e., employment, education, and social ties) between board members of the firm and potential internal CEO candidates in each year. Detailed variable definitions are reported in Table A1.

	N	Mean	Median	Std. Dev.	Min	Max
Firm Characteristics						
Size	68,030	6.570	6.605	2.216	1.295	11.999
ROA	68,030	0.034	0.083	0.247	-1.358	0.410
Leverage	68,030	0.219	0.164	0.225	0.000	1.088
R&D	68,030	0.050	0.000	0.117	0.000	0.710
Board Size	68,030	9.645	9.000	3.545	4.000	19.000
Board Ind	68,030	0.738	0.750	0.138	0.375	1.000
Board Connectedness	N	Mean	Median	Std. Dev.	Min	Max
Connections_Board _raw	68,030	12.144	0.000	18.415	0.000	75.000
Connections_Board_raw (External)	68,030	0.069	0.000	0.478	0.000	4.000
Connections_Board_raw (Internal)	68,030	11.910	0.000	18.083	0.000	72.000
Connections_Board	68,030	1.367	0.000	1.615	0.000	4.331
Connections_Board (External)	68,030	0.031	0.000	0.205	0.000	1.609
Connections_Board (Internal)	68,030	1.348	0.000	1.612	0.000	4.290

Table 2. Summary Statistics of CEO (Candidates) and Succession Outcomes

This table reports the statistics of CEOs, CEO candidates, and succession outcomes for each hiring firm. The sample is at the firm-CEO (candidate)-year level. The internal candidates of the firm are identified following Naveen (2006). The external candidates of the firm each year are directors from the BoardEx database who transit positions and worked for the firm located within 60 miles of the focal firm. The past employer of external candidates is also required to have a similar size (+/-20%) to the focal firm. *MBA* equals one if the CEO (candidate) of the focal firm has an MBA degree. *Female* equals one if the CEO (candidate) of the focal firm is a female. *Age* is the difference between year t and the CEO (candidate)'s birth year. *Connections_CEO* is the natural log of total connections (i.e., employment, education, and social ties) between board members of the firm and the CEO in year t. *Connections_candidate* is the natural log of total connections (i.e., employment, education, and social ties) between board members of the firm and the CEO candidates in year t. *ROA_{t-1}* is the net income scaled by total assets in year t-1. *CEO tenure* is the natural log of CEO tenures. *R&D t+3* is the natural log of total R&D expenditures from year t+1 to t+3. *Num_patents* is the natural log of number of patents granted for the firm from year $t+1$ to $t+3$. *Avg_value* is the natural log of the average patent value from Kogan et al. (2017) from year t+1 to t+3. *Total_value* is the natural log of the total value of patents granted from year $t+1$ to $t+3$. Detailed variable definitions are reported in Table A1.

CEO Characteristics	N	Mean	Median	Std. Dev.	Min	Max
MBA	5,143	0.270	0.000	0.444	0.000	1.000
Female	5,143	0.042	0.000	0.201	0.000	1.000
Age	5,143	54.046	54.000	7.546	37.000	76.000
Connections_CEO	5,143	1.569	2.079	1.137	0.000	2.996

Candidates Characteristics	N	Mean	Median	Std. Dev.	Min	Max
MBA	421,203	0.284	0.000	0.451	0.000	1.000
Female	421,203	0.037	0.000	0.190	0.000	1.000
Age	421,203	53.980	54.000	7.770	37.000	76.000
Connections_Candidate	421,203	0.460	0.000	0.943	0.000	2.996

Succession Outcomes	N	Mean	Median	Std. Dev.	Min	Max
ROA_{t+1}	5,938	0.065	0.092	0.178	-0.833	0.366
CEO tenure	5,177	1.512	1.610	0.785	0.000	2.944
R&D_{t+3}	6,239	1.740	0.000	2.577	0.000	1.000
Num_patents	6,239	1.081	0.000	1.913	0.000	76.000
Total_value	2,120	6.054	5.944	3.153	-0.646	11.747
Avg_value	2,120	2.773	2.664	2.009	-1.908	6.662

Table 3. Board Connections and CEO Succession Likelihood

This table reports regression results regarding the impact of board connections with potential internal and external candidates on firms' succession likelihood. The dependent variable, *Succession*, equals one if the firm replaces the old CEO with a new CEO. *Connections_Board* is the natural log of total connections (i.e., employment, education, and social ties) between board members of the firm and potential internal and (or) external CEO candidates in each year. The internal candidates of the firm are identified following Naveen (2006). The external candidates of the firm each year are directors from the BoardEx database who transit positions and worked for the firm located within 60 miles of the focal firm. The past employer of external candidates is also required to have a similar size (+/-20%) to the focal firm. *Size* is the natural log of total assets. *ROA* is the net income scaled by total assets. *Leverage* is the book value of debt. *R&D* is the R&D expenses scaled by total assets. *Board Size* is the total number of board members from the BoardEx database. *Board Ind* is the board independence from the BoardEx database. *CEO MBA* equals one if the existing CEO of the focal firm has an MBA degree. *CEO Female* equals one if the existing CEO of the focal firm is a female. *CEO Age* is the natural log of the difference between year t and the existing CEO's year of birth. Continuous variables are winsorized at the 1% and 99% levels. Detailed variable definitions are reported in Table A1. All regressions include firm, industry (2-digit SIC), and year fixed effects. Robust standard errors, clustered at the year level, are reported in parentheses below coefficient estimates. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

VARIABLES	(1)	(2)	(3)
	Succession		
Connections_Board	0.0038**	0.0034**	0.0101***
	(0.002)	(0.002)	(0.002)
Size	0.0010	0.0035***	0.0224***
	(0.001)	(0.001)	(0.003)
ROA	-0.0662***	-0.0906***	-0.0745***
	(0.008)	(0.009)	(0.014)
Leverage	0.0195***	0.0153**	0.0307**
	(0.006)	(0.007)	(0.012)
R&D	-0.0343*	-0.0670***	0.0186
	(0.018)	(0.020)	(0.036)
Board Size	0.0023***	0.0022***	-0.0025**
	(0.001)	(0.001)	(0.001)
Board Ind	0.0857***	0.1119***	0.1524***
	(0.015)	(0.016)	(0.025)
CEO MBA	0.0006	0.0001	-0.0030
	(0.003)	(0.003)	(0.006)
CEO Female	0.0416***	0.0385***	0.0460***
	(0.008)	(0.008)	(0.014)
CEO Age	-0.3297***	-0.3270***	-0.7328***
	(0.010)	(0.010)	(0.019)
Observations	64,191	64,190	63,622
R-squared	0.026	0.031	0.166
Firm FE	No	No	Yes
Industry FE	No	Yes	Yes
Year FE	Yes	Yes	Yes

Table 4. Board Connections and CEO Candidates Succession Probability

This table reports regression results regarding the impact of board connections on CEO candidates' succession probability. The sample consists of all succession event firms with potential (internal/external) CEO candidates for each year. The dependent variable, *Succeed,* equals one if the candidate is hired as CEO in year *t*. *Connections_Candidate* is the natural log of total connections (i.e., employment, education, and social ties) between board members of the firm and the CEO candidates in year *t*. *Size* is the natural log of total assets. *ROA* is the net income scaled by total assets. *Leverage* is the book value of debt. *R&D* is the R&D expenditures scaled by total assets. *Board Size* is the total number of board members from the BoardEx database. *Board Ind* is the board independence from the BoardEx database. *Candidate MBA* equals one if the candidate of the focal firm has an MBA degree. *Candidate Female* equals one if the candidate of the focal firm is a female. *Candidate Age* is the natural log of the difference between year *t* and the candidate's birth year. Continuous variables are winsorized at the 1% and 99% levels. Detailed variable definitions are reported in Table A1. Regressions include firm, industry (2-digit SIC), and year fixed effects. Robust standard errors, clustered at the year level, are reported in parentheses below coefficient estimates. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

	(1)	(2)	(3)
VARIABLES		*Succeed*	
Candidates	All	External	Internal
Connections_Candidate	0.0228***	0.0065***	0.0086***
	(0.001)	(0.002)	(0.001)
Size	0.0049***	0.0010	0.0052**
	(0.001)	(0.001)	(0.002)
ROA	-0.0066	0.0061	-0.0035
	(0.005)	(0.005)	(0.010)
Leverage	0.0007	0.0006	-0.0068
	(0.004)	(0.003)	(0.007)
R&D	0.0239**	0.0192	0.0344
	(0.011)	(0.012)	(0.028)
Board Size	-0.0026***	-0.0002	-0.0088***
	(0.000)	(0.000)	(0.001)
Board Ind	0.0401***	-0.0024	0.2674***
	(0.005)	(0.005)	(0.018)
Candidate MBA	0.0006	0.0004	0.0032
	(0.001)	(0.001)	(0.003)
Candidate Female	0.0010	-0.0003	0.0041
	(0.002)	(0.003)	(0.007)
Candidate Age	-0.0395***	0.0049*	-0.2060***
	(0.004)	(0.003)	(0.012)
Observations	411,113	326,473	84,124
R-squared	0.064	0.107	0.156
Firm FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

Table 5. Board Connections and CEO Succession Probability – 2SLS Analysis

This table reports two-stage-least-squares (2SLS) regression results regarding the impact of board connections with potential internal and external candidates on firms' succession events. The *Peer Board Connections (IV)* is the average board connections among all geographically proximate non-hiring firms for the focal firm. *Connections_ board* is the natural log of total connections (i.e., employment, education, and social ties) between board members of the firm and potential internal and (or) external CEO candidates in each year. The internal candidates of the firm are identified following Naveen (2006). The external candidates of the firm each year are directors from the BoardEx database who transit positions and worked for the firm located within 60 miles of the focal firm. The past employer of external candidates is also required to have a similar size (+/-20%) to the focal firm. *Succession* equals one if the firm replaces the old CEO with a new CEO. *Size* is the natural log of total assets. *ROA* is the net income scaled by total assets. *Leverage* is the book value of debt. *R&D* is the R&D expenses scaled by total assets. *Board Size* is the total number of board members from the BoardEx database. *Board Ind* is the board independence from the BoardEx database. *CEO MBA* equals one if the existing CEO of the focal firm has an MBA degree. *CEO Female* equals one if the existing CEO of the focal firm is a female. *CEO Age* is the natural log of the difference between year t and the existing CEO's year of birth. Continuous variables are winsorized at the 1% and 99% levels. Detailed variable definitions are reported in Table A1. Robust standard errors, clustered at the year level, are reported in parentheses below coefficient estimates. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

VARIABLES	(1)	(2)	(3)	(4)
	1st Stage		2nd Stage	
	Connections_Board		Succession	
Peer Board Connections (IV)	0.1248***			
	(0.006)			
Connections_Board		0.0741***	0.0946***	0.0948***
		(0.012)	(0.014)	(0.014)
Size	0.0339***	0.0001	0.0188***	0.0188***
	(0.012)	(0.002)	(0.003)	(0.003)
ROA	0.0546*	-0.0952***	-0.0792***	-0.0776***
	(0.032)	(0.008)	(0.014)	(0.014)
Leverage	0.0472	0.0124	0.0272**	0.0282**
	(0.038)	(0.008)	(0.012)	(0.012)
R&D	0.1214	-0.0778***	0.0041	0.0052
	(0.074)	(0.019)	(0.036)	(0.036)
Board Size	0.1724***	-0.0112***	-0.0173***	-0.0176***
	(0.004)	(0.002)	(0.003)	(0.003)
Board Ind	-4.3225***	0.4472***	0.5208***	0.5221***
	(0.078)	(0.066)	(0.067)	(0.067)
CEO MBA	-0.0337*	0.0020	-0.0007	-0.0007
	(0.020)	(0.003)	(0.006)	(0.006)
CEO Female	-0.0473	0.0419***	0.0503***	0.0507***
	(0.046)	(0.008)	(0.014)	(0.014)
CEO Age	0.5229***	-0.3662***	-0.7748***	-0.7773***
	(0.056)	(0.014)	(0.020)	(0.020)
Observations	63,624	64,190	63,624	63,622
R-squared	0.820	0.032	0.165	0.167
Industry FE	Yes	Yes	No	Yes
Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	No	Yes	Yes

Table 6. Board Connections and CEO Succession – Firm Performance Before Successions

This table reports regression results regarding the impact of board connections with potential internal and external candidates on firms' succession events. The dependent variable, *(External/Internal) Succession*, equals one if the firm replaces the old CEO with a new (outside/internal) CEO. *Connections_Board* is the natural log of total connections (i.e., employment, education, and social ties) between board members of the firm and potential internal and (or) external CEO candidates each year. *Size* is the natural log of total assets. *ROA_{t-1}* is the net income scaled by total assets in year *t-1*. *Leverage* is the book value of debt. *R&D* is the natural log of R&D expenditures. *Board Size* is the total number of board members from the BoardEx database. *Board Ind* is the board independence from the BoardEx database. *CEO MBA* equals one if the existing CEO of the focal firm has an MBA degree. *CEO Female* equals one if the existing CEO of the focal firm is a female. *CEO Age* is the natural log of the difference between year *t* and the existing CEO's birth year. Continuous variables are winsorized at the 1% and 99% levels. Detailed variable definitions are reported in Table A1. All regressions include firm, industry (2-digit SIC), and year fixed effects. Robust standard errors, clustered at the year level, are reported in parentheses below coefficient estimates. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

	(1)	(2)	(3)
VARIABLES		*Succession*	
Candidates	All	External	Internal
*ROA_{t-1}*Connections_Board*	-0.1305***	-0.3272***	0.0271***
	(0.040)	(0.091)	(0.008)
Connections_Board	0.1744***	0.3973***	-0.0120***
	(0.006)	(0.015)	(0.002)
ROA_{t-1}	-0.0744***	-0.0735***	-0.0980***
	(0.017)	(0.018)	(0.019)
Size	0.0220***	0.0244***	0.0276***
	(0.005)	(0.005)	(0.004)
Leverage	0.0350**	0.0294*	0.0364***
	(0.015)	(0.016)	(0.014)
R&D	-0.0144	-0.0045	0.0010
	(0.039)	(0.038)	(0.040)
Board Size	-0.0016	-0.0005	0.0013
	(0.001)	(0.001)	(0.001)
Board Ind	0.1562***	0.1025***	0.0606**
	(0.022)	(0.022)	(0.025)
CEO MBA	-0.0072	-0.0088	-0.0042
	(0.007)	(0.007)	(0.007)
CEO Female	0.0418***	0.0451***	0.0454***
	(0.015)	(0.015)	(0.015)
CEO Age	-0.6880***	-0.6978***	-0.7345***
	(0.020)	(0.020)	(0.020)
Observations	68,582	68,582	68,582
R-squared	0.235	0.217	0.165
Firm FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

Table 7. CEO-Board Connections and CEO Tenure

This table reports regression results regarding the impact of CEO-board connections on CEO tenures. The sample consists of all succession event firms within five years around the succession year. The dependent variable, *CEO tenure* is the natural log of CEO tenures. *Connections_CEO* is the natural log of total connections (i.e., employment, education, and social ties) between board members of the firm and the CEO in year *t*. *Post* is an indicator that equals one if the year is after the succession year. *Size* is the natural log of total assets. *ROA* is the net income scaled by total assets. *Leverage* is the book value of debt. *R&D* is the R&D expenditures scaled by total assets. *Board Size* is the total number of board members from the BoardEx database. *Board Ind* is the board independence from the BoardEx database. *CEO MBA* equals one if the existing CEO of the focal firm has an MBA degree. *CEO Female* equals one if the existing CEO of the focal firm is a female. *CEO Age* is the natural log of the difference between year *t* and the existing CEO's year of birth. Continuous variables are winsorized at the 1% and 99% levels. Detailed variable definitions are reported in Table A1. Regressions include firm, industry (2-digit SIC), and year fixed effects. Robust standard errors, clustered at the year level, are reported in parentheses below coefficient estimates. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

	(1)	(2)	(3)
VARIABLES		*CEO tenure*	
Connections_CEO	0.0479***	0.0356***	0.0266***
	(0.014)	(0.008)	(0.008)
Size	0.0412***	0.0468***	0.0449***
	(0.012)	(0.010)	(0.011)
ROA	-0.2034***	-0.2105**	-0.3085***
	(0.061)	(0.086)	(0.109)
Leverage	-0.2509	-0.0123	0.1496
	(0.184)	(0.250)	(0.187)
R&D	0.0152**	0.0139**	0.0150***
	(0.006)	(0.006)	(0.006)
Board Size	0.3507***	0.3449***	0.4878***
	(0.098)	(0.105)	(0.140)
Board Ind	0.0100	0.0155	-0.0170
	(0.022)	(0.021)	(0.029)
CEO MBA	-0.1125**	-0.1353*	-0.1659*
	(0.052)	(0.070)	(0.099)
CEO Female	-0.1761	-0.2355**	-0.3948***
	(0.124)	(0.116)	(0.141)
CEO Age	0.2325**	0.3099***	0.3355***
	(0.089)	(0.113)	(0.112)
Observations	4,815	4,745	3,845
R-squared	0.183	0.250	0.452
Industry FE	No	Yes	Yes
Year FE	Yes	Yes	Yes

Table 8. CEO-Board Connections and Post Succession Performance

This table reports regression results regarding the impact of board connections with new CEOs on firms' succession performance. The sample consists of all succession event firms within five years around the succession year. The dependent variable, *ROA $_{t+1}$* is the return on assets in the year *t+1*. *Connections_CEO* is the natural log of total connections (i.e., employment, education, and social ties) between board members of the firm and the CEO in year t. *Post* is an indicator that equals one if the year is after the succession year. *Size* is the natural log of total assets. *ROA* is the net income scaled by total assets. *Leverage* is the book value of debt. *R&D* is the R&D expenditures scaled by total assets. *Board Size* is the total number of board members from the BoardEx database. *Board Ind* is the board independence from the BoardEx database. *CEO MBA* equals one if the existing CEO of the focal firm has an MBA degree. *CEO Female* equals one if the existing CEO of the focal firm is female. *CEO Age* is the natural log of the difference between year *t* and the existing CEO's year of birth. Continuous variables are winsorized at the 1% and 99% levels. Detailed variable definitions are reported in Table A1. Regressions include firm, industry (2-digit SIC), and year fixed effects. Robust standard errors, clustered at the year level, are reported in parentheses below coefficient estimates. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

	(1)	(2)	(3)	(4)
VARIABLES		*ROA $_{t+1}$*		
Post Connections_CEO*	0.0015*	0.0020**	0.0017**	0.0024***
	(0.001)	(0.001)	(0.001)	(0.001)
Post	-0.0029	-0.0044**	-0.0032	-0.0052***
	(0.002)	(0.002)	(0.002)	(0.002)
Connections_CEO	0.0008	-0.0007	0.0016***	-0.0007
	(0.000)	(0.000)	(0.001)	(0.000)
Size	0.0030***	-0.0039***	0.0059***	-0.0042***
	(0.001)	(0.001)	(0.001)	(0.001)
ROA	0.7031***	0.1579***	0.6550***	0.1565***
	(0.009)	(0.022)	(0.010)	(0.022)
Leverage	0.0323***	0.0189**	0.0307***	0.0175**
	(0.005)	(0.007)	(0.006)	(0.007)
R&D	-0.1442***	0.0371	-0.1617***	0.0326
	(0.026)	(0.030)	(0.032)	(0.029)
Board Size	0.0001	-0.0015***	-0.0003	-0.0015***
	(0.000)	(0.000)	(0.000)	(0.000)
Board Ind	-0.0386***	0.0007	-0.0184	-0.0001
	(0.012)	(0.008)	(0.012)	(0.008)
CEO MBA	-0.0013	-0.0027***	-0.0007	-0.0025***
	(0.001)	(0.001)	(0.001)	(0.001)
CEO Female	0.0076***	0.0001	0.0041*	-0.0001
	(0.003)	(0.002)	(0.002)	(0.002)
CEO Age	0.0136**	-0.0114***	0.0125**	-0.0122***
	(0.005)	(0.003)	(0.006)	(0.003)
Observations	43,787	43,747	43,504	43,470
R-squared	0.623	0.801	0.612	0.790
Firm FE	No	No	Yes	Yes
Industry FE	No	Yes	No	Yes
Year FE	Yes	Yes	Yes	Yes

Table 9. CEO-Board Connections and Post Succession Performance – Subsample Analysis

This table reports subsample analyses regarding the impact of board connections with new CEOs on firms' succession performance. The sample consists of all succession event firms within five years around the succession year. The dependent variable, *ROA $_{t+1}$* is the return on assets in the year *t+1*. *Connections_CEO* is the natural log of total connections (i.e., employment, education, and social ties) between board members of the firm and the CEO in year t. *Post* is an indicator that equals one if the year is after the succession year. *CEO Age* is the natural log of the difference between year t and the existing CEO's year of birth. *Experience* is the number of years for the past employment history in the focal industry. HHI is the 4-digit SIC industry concentration index. *E-index* is the entrenchment index following Bebchuk, Cohen, and Ferrell (2009). *Size* is the natural log of total assets. *ROA* is the net income scaled by total assets. *Leverage* is the book value of debt. *R&D* is the R&D expenditures scaled by total assets. *Board Size* is the total number of board members from the BoardEx database. *Board Ind* is the board independence from the BoardEx database. *CEO MBA* equals one if the existing CEO of the focal firm has an MBA degree. *CEO Female* equals one if the existing CEO of the focal firm is a female. *CEO Age* is the natural log of the difference between year *t* and the existing CEO's year of birth. Continuous variables are winsorized at the 1% and 99% levels. Detailed variable definitions are reported in Table A1. Regressions include firm, industry (2-digit SIC), and year fixed effects. Robust standard errors, clustered at the year level, are reported in parentheses below coefficient estimates. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

VARIABLES	(1) Age > Median	(2) Age < Median	Experience>= year	Experience < 1 year	(3) Low HHI	(4) High HHI	(5) Low E-index	(6) High E-index
Post*Connections	0.0011	0.0036***	-0.0014	0.0033***	0.0032***	0.0017	0.0010*	-0.0005
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Post	-0.0014	-0.0083***	0.0022	-0.0057**	-0.0074***	-0.0040	-0.0031*	-0.0002
	(0.002)	(0.003)	(0.005)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)
Connections	-0.0003	-0.0015*	0.0039*	-0.0017**	-0.0018**	-0.0004	-0.0002	0.0013**
	(0.000)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)
Size	-0.0012	-0.0043	-0.0044	-0.0007	-0.0059***	-0.0066***	-0.0059**	-0.0068**
	(0.001)	(0.003)	(0.003)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
ROA	0.2365***	0.1208***	0.1105***	0.2653***	0.1081***	0.1888***	0.1488***	0.0903***
	(0.029)	(0.026)	(0.025)	(0.034)	(0.025)	(0.026)	(0.018)	(0.029)
Leverage	0.0262**	0.0275**	-0.0002	0.0170	0.0123	0.0145	0.0044	-0.0330***
	(0.009)	(0.013)	(0.012)	(0.013)	(0.008)	(0.011)	(0.005)	(0.008)
R&D	0.1165**	-0.0105	-0.0625	-0.0222	-0.0578	0.0156	0.1723***	-0.1640*
	(0.053)	(0.052)	(0.046)	(0.053)	(0.038)	(0.062)	(0.028)	(0.083)
Board Size	-0.0015***	-0.0014***	-0.0013**	-0.0017***	-0.0011**	-0.0018***	-0.0019*	0.0000
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)
Board Ind	-0.0091	0.0177	0.0001	-0.0037	0.0042	-0.0054	0.0029	0.0003
	(0.009)	(0.012)	(0.011)	(0.008)	(0.015)	(0.007)	(0.007)	(0.016)
CEO MBA	0.0010	-0.0041***	-0.0077***	0.0008	-0.0021	0.0005	-0.0002	0.0013
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
CEO Female	0.0029	-0.0028	-0.0147***	0.0031	0.0008	-0.0037	0.0012	0.0023
	(0.004)	(0.002)	(0.003)	(0.003)	(0.002)	(0.003)	(0.001)	(0.003)
CEO Age	-0.0182**	-0.0322***	-0.0217***	-0.0067**	-0.0142***	-0.0053	-0.0036	0.0079
	(0.008)	(0.010)	(0.007)	(0.003)	(0.004)	(0.004)	(0.003)	(0.005)

Observations	22,420	21,048	17,253	28,115	21,197	22,273	15,657	10,007
R-squared	0.795	0.793	0.827	0.827	0.786	0.794	0.843	0.793
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 10. Board Connections and Post-Succession Innovation Activities

This table reports regression results regarding the impact of board connections with new CEOs on firms' patenting activities. The sample consists of all succession event firms within five years around the succession year. *R&D* $_{t+3}$ is the natural log of total R&D expenditures from year t+1 to t+3. *Num_patents* is the natural log of the number of patents granted for the firm from year *t+1* to *t+3*. *Avg_value* is the natural log of the average patent value from Kogan et al. (2017) from year t+1 to t+3. *Total_value* is the natural log of the total value of patents granted from year *t+1* to *t+3*. *Connections_CEO* is the natural log of total connections (i.e., employment, education, and social ties) between board members of the firm and the CEO in year t. *Post* is an indicator that equals one if the year is after the succession year. *Size* is the natural log of total assets. *ROA* is the net income scaled by total assets. *Leverage* is the book value of debt. *R&D* is the R&D expenditures scaled by total assets. *Board Size* is the total number of board members from the BoardEx database. *Board Ind* is the board independence from the BoardEx database. *CEO MBA* equals one if the existing CEO of the focal firm has an MBA degree. *CEO Female* equals one if the existing CEO of the focal firm is a female. *CEO Age* is the natural log of the difference between year *t* and the existing CEO's year of birth. Continuous variables are winsorized at the 1% and 99% levels. Detailed variable definitions are reported in Table A1. Regressions include firm and year fixed effects. Robust standard errors, clustered at the year level, are reported in parentheses below coefficient estimates. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

VARIABLES	(1) $R\&D_{t+3}$	(2) Num_patents	(3) Avg_value	(4) Total_value
Post*Connections_CEO	0.0624***	0.0312***	0.0332***	0.0568***
	(0.008)	(0.007)	(0.009)	(0.015)
Post	-0.1120***	-0.0650***	-0.0503***	-0.1073***
	(0.022)	(0.017)	(0.017)	(0.031)
Connections_CEO	-0.0289***	-0.0233***	-0.0189***	-0.0426***
	(0.006)	(0.006)	(0.006)	(0.011)
Size	0.3813***	0.1294***	0.1546***	0.3491***
	(0.008)	(0.018)	(0.017)	(0.037)
ROA	-0.5496***	0.2084***	0.2860**	0.7379***
	(0.068)	(0.049)	(0.112)	(0.132)
Leverage	10.7744***	-0.1135**	-0.1240**	-0.2302**
	(0.237)	(0.048)	(0.055)	(0.108)
R&D	0.0241***	0.7342***	0.7786***	2.0286***
	(0.006)	(0.134)	(0.177)	(0.320)
Board Size	0.3431***	0.0066*	0.0000	0.0048
	(0.113)	(0.004)	(0.005)	(0.008)
Board Ind	0.1492***	0.0124	-0.0423	-0.1882
	(0.020)	(0.136)	(0.132)	(0.241)
CEO MBA	-0.0912**	0.0714***	-0.0577**	0.0192
	(0.040)	(0.017)	(0.020)	(0.027)
CEO Female	-0.2601***	-0.0129	0.0601**	0.0406
	(0.052)	(0.015)	(0.023)	(0.037)
CEO Age	2.4374***	-0.1054*	0.1217***	-0.2849***
	(0.060)	(0.052)	(0.034)	(0.096)
Observations	45,937	46,216	16,949	16,949
R-squared	0.675	0.922	0.956	0.948
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Appendix A.

Table A1. Variable Index

Variables	Definition
Age	the natural log of the difference between year *t* and the candidate's birth year
Avg_value	the natural log of the average value patent from Kogan et al. (2017) from year *t+1* to *t+3*
Board Independence	the level of board independence according to the BoardEx database
Board Size	the total number of board members from the BoardEx database
CEO tenure	the natural log of CEO tenures
Connections Board_raw	the number of total connections (i.e., employment, education, and social ties) between board members of the firm and potential internal and (or) external CEO candidates in each year
Connections Board_raw (External)	the number of total connections (i.e., employment, education, and social ties) between board members of the firm and potential external CEO candidates in each year
Connections_Board	the natural log of total connections (i.e., employment, education, and social ties) between board members of the firm and potential internal and (or) external CEO candidates in each year
Connections_Board (External)	the natural log of total connections (i.e., employment, education, and social ties) between board members of the firm and potential external CEO candidates in each year
Connections_Board (Internal)	the natural log of total connections (i.e., employment, education, and social ties) between board members of the firm and potential internal CEO candidates in each year
Connections_Board_raw (Internal)	the number of total connections (i.e., employment, education, and social ties) between board members of the firm and potential internal CEO candidates in each year
Connections_candidate	the natural log of total connections (i.e., employment, education, and social ties) between board members of the firm and the CEO candidate in year *t*
Connections_CEO	the natural log of total connections (i.e., employment, education, and social ties) between board members of the firm and the CEO in year *t*
E-index	the entrenchment index following Bebchuk, Cohen, and Ferrell (2009)
Female	equals one if the candidate of the focal firm is female, and zero otherwise
HHI	the 4-digit SIC industry concentration index
Leverage	the book value of debt
MBA	equals one if the candidate of the focal firm has an MBA degree, and zero otherwise
Num_patents	the natural log of the number of patents granted for the firm from year *t+1* to *t+3*
R&D	the R&D expenditures scaled by total assets
R&D t+3	the natural log of total R&D expenditures from year *t+1* to *t+3*
ROA	the net income scaled by total assets
ROA t+1	the net income scaled by total assets in year *t+1*
Size	the natural log of total assets
Succeed	equals one if the candidate is hired as CEO in year *t*, and zero otherwise
Succession	equals one if the firm replaces the old CEO with a new CEO, and zero otherwise
Total_value	the natural log of the total value of patents granted from year *t+1* to *t+3*

Table A2. Board Connections and CEO Succession Probability with Candidate Fixed Effects

This table reports regression results regarding the impact of board connections on CEO candidates' succession probability. The sample consists of all succession event firms with potential (internal/external) CEO candidates for each year. The dependent variable, *Succeed,* equals one if the candidate is hired as CEO in year t. *Connections_Candidate* is the natural log of total connections (i.e., employment, education, and social ties) between board members of the firm and the CEO candidate in year *t*. *Size* is the natural log of total assets. *ROA* is the net income scaled by total assets. *Leverage* is the book value of debt. *R&D* is the R&D expenditures scaled by total assets. *Board Size* is the total number of board members from the BoardEx database. *Board Ind* is the board independence from the BoardEx database. *Candidate MBA* equals one if the candidate of the focal firm has an MBA degree. *Candidate Female* equals one if the candidate of the focal firm is female. *Candidate Age* is the natural log of the difference between year *t* and the candidate's birth year. Continuous variables are winsorized at the 1% and 99% levels. Detailed variable definitions are reported in Table A1. Regressions include candidate and year fixed effects. Robust standard errors, clustered at the year level, are reported in parentheses below coefficient estimates. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

	(1)	(2)	(3)
VARIABLES		*Succeed*	
Candidates	All	External	Internal
Connections_Candidate	0.0195***	0.0073***	0.0099***
	(0.001)	(0.002)	(0.001)
Size	-0.0005	0.0001	-0.0034
	(0.000)	(0.000)	(0.006)
ROA	-0.0058***	-0.0052***	-0.0068
	(0.002)	(0.001)	(0.010)
Leverage	-0.0021***	-0.0003	-0.0136**
	(0.001)	(0.001)	(0.007)
R&D	-0.0018	0.0023	-0.0029
	(0.003)	(0.002)	(0.032)
Board Size	-0.0005***	-0.0000	-0.0063***
	(0.000)	(0.000)	(0.001)
Board Ind	0.0138***	0.0038***	0.1630***
	(0.002)	(0.001)	(0.028)
Candidate MBA	-0.0001	0.0003	-0.0025
	(0.000)	(0.000)	(0.005)
Candidate Female	0.0018*	-0.0004	-0.0024
	(0.001)	(0.001)	(0.011)
Candidate Age	-0.0182***	0.0007	-0.3205***
	(0.001)	(0.001)	(0.027)
Observations	411,113	326,473	84,124
R-squared	0.062	0.107	0.156
Candidate FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes