Director Appointments – It is Who You Know

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Abstract

Using 9,801 director appointments during 2003-2014, we document the dramatic impact of connections - 69% of new directors have professional ties to incumbent boards, a group representing 13% of all potential candidates. Consistent with facilitating coordination and reducing search costs, connections help boards bring in new skills and diversity. More complex firms and firms in more competitive environments tend to appoint connected directors, experience better market reactions and higher shareholder votes. Connections to incumbent CEOs, however, result in lower announcement returns and shareholder votes. Educational or social ties have little effect. We use death (merger)-induced network loss (gain) as instruments.

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'The best way to get on a board, is to know someone on a board.'

(Old adage)

1. Introduction

Boards are the foundation of a firm's governance structure. Shareholders, however, typically do not nominate the directors who represent them. Instead, the incumbent board nominates new directors, who are almost always subsequently elected. In contrast to other markets where supply and demand meet in open exchanges, the director labor market typically operates in opacity. Companies never advertise vacancies and candidates do not submit their applications. Instead, anecdotal evidence suggests that boards often recruit new members through personal connections, a controversial practice.[1] In this study, we aim to provide comprehensive evidence on this key aspect of director selection, the role of board networks in director appointments.

Using a sample of 9,801 director appointments during 2003-2014, we first document striking evidence on the prevalence of director selection from the professional network of the incumbent directors. Unconditionally, a typical board has a direct (first-degree) connection to just over 0.4% of all the directors listed in BoardEx, but 29% of all new director appointees have such a connection to the incumbent board.[2] Unconditionally, an average board has a direct or indirect (second-degree) connection to about 13% of all directors tracked by BoardEx. In contrast, we find that nearly 69% of new director appointments are selected from the incumbent boards' first- or second-degree network. For S&P 500 firms, 90.3% of the director nominees are selected from the pool of individuals with first- or second-degree connections to the

[1] Many boards, particularly those of larger firms, use search firms to help recruit new directors, yet even here the use of personal connections seems prevalent. Our conversations with a senior executive at a prominent board search firm confirm that board networks and search firms complement each other. According to this executive, boards often use their network to validate or gain trust of the candidates that search firms propose. At the same time, search firms are also mindful of the board network when proposing candidates.

[2] A board has a direct (first-degree) connection to an outside individual if at least one member of the board has worked with this individual at the same firm (with both individuals in director or executive capacity). A board has an indirect (second-degree) connection with an individual if that person has a direct connection with one of the board's direct contacts. For example, if at least one director from firm A also sits on the board of firm B, then firm A is directly connected to all the directors on firm B. A second-degree connection exists between firm A and all the other direct connections of firm B. Note that the existing connections remain even after a director retires or leaves a company, but are eliminated if that director dies. If a first-degree contact dies, the associated second-degree connections are also eliminated.

incumbent board, yet these directors represent only 21% of all directors tracked by BoardEx.[3] Interestingly, the professional network appears to play a dominant role in the recruitment of new directors, in comparison to education or social networks. While nearly 69% of the 9,801 appointees have employment or board based ties with the incumbent directors, only 7% (2%) have educational (social) ties.[4] Further, most of the educational and social ties overlap with professional ties; under 2% of the appointees have only educational or social ties, but not professional ties, to the incumbent board. We, therefore, focus on professional ties for the rest of the paper.

The appointment of directors already connected to the board has potential benefits and risks. On one hand, selecting directors through board networks can be beneficial. First, frequent interaction improves coordination (e.g., McAllister, 1995), which is particularly important because boards tend to act as a whole and seek consensus (Bainbridge, 2002). It is well known in the psychology literature that group cohesion is positively related to group performance. Having existing connections with some of the incumbent directors facilitates the new director adapting to the group dynamics and the corporate culture of the appointing board. Coordination costs arise when new and incumbent directors struggle to work with each other and make efficient decisions. The *coordination hypothesis* argues that appointing a connected director facilitates board coordination and increases firm value.[5] We further argue that coordination is particularly important when a board has to deal with complex and fast-changing situations in a competitive environment

[3] The director experience data in BoardEx are self-reported and may be subject to selection bias, i.e. directors only report the more reputable experiences. If this is the case, the connection variables may be associated with director quality, which may influence announcement returns and shareholder votes. For example, elite networks such as those of the S&P 500 firms may be associated with certain qualities or brand recognition. In a robustness test, we exclude director appointments to S&P 500 firms and find similar results. To further address this issue, we control for the total number of connections of the appointed director in our regression analyses. In addition, our instrumental variable approach also addresses this potential bias. Further, if some connections are not captured by BoardEx, the role of the board network in director appointments may be even greater than documented in this paper. Finally, to make sure our results are not driven by the backfilled experiences after director appointments, we conduct a robustness test for a subsample using only the non-backfilled experiences. Specifically, we repeat the analysis in Tables 4 and 5 using director candidate experiences reported by BoardEx as of January 31, 2009 (earliest vintage we have) for a sub-sample of appointments announced after January 31, 2009. Because these director experiences are reported before their appointments, such experiences cannot be backfilled after the appointments. The results related to director experience are similar to those in the full sample, suggesting that our findings are not driven by backfilled experience data.

[4] BoardEx may have less complete coverage of social ties than of professional and educational ties because executives and directors are more likely to disclose their education and employment history than their membership at social clubs.

[5] Specific predictions of each hypothesis are discussed in Section 2.2 and tabulated in Table 1.

where agile decision making is crucial.

Second, the director labor market often relies on personal references to identify and signal the quality of a potential candidate. Connections, therefore, reduce information asymmetry and lower search costs for connected candidates. A hiring board weighs the cost of a broad search to acquire information about unconnected candidates against the expected additional value such a search may add beyond that of the best available connected candidate.[6] Search cost is likely to be higher when a board seeks candidates from different background or with different experiences from the incumbents or when more detailed information about a candidate is required. The expected additional value of a broad search decreases when the best available connected candidate is of high quality. When the cost of a broad search exceeds the expected additional value of such a search, the hiring board will appoint the most valuable connected candidate without conducting the costly search. The *search cost hypothesis* predicts a greater probability of appointing a connected candidate when the search cost is higher or when a higher-quality connected candidate is available.

On the other hand, adding a connected director to the incumbent board can reinforce homogeneity of the board. Sociologists coined the term 'homophily' to describe the tendency for people to associate and form networks with others similar to themselves. A downside of this tendency is that we associate with people who confirm, rather than challenge, our core beliefs. "Homophily limits people's social worlds in a way that has powerful implications for the information they receive, the attitudes they form, and the interactions they experience." (McPherson, Smith-Lovin, and Cook, 2001). By definition, new directors selected from the board's existing network, in particular those with first-degree ties, share at least some elements of their background with the incumbent directors. To the extent that shared background leads to a similar view of many issues, these boards can become blindsided to certain risks or opportunities.[7] The

[6] The cost can be monetary and/or in management time. For example, the appointing board may need to hire a search firm to conduct a broad search among unconnected candidates. Further, the board may need to interview multiple references to learn about the quality and work style of an unconnected candidate.

[7] It is an empirical question whether connected candidates are more similar to the incumbent board. We study this issue in Section 4.2. Further, it is possible that connections may bring people of different background together, which we find some empirical evidence in Section 4.2.

homophily hypothesis, therefore, argues that connected candidates are more similar to the incumbent board and the appointment of such a director, in particular to an already homogeneous board or to a complex firm (or a firm in competitive environment), reduces firm value. We note, however that while boards certainly need fresh ideas and diverse opinions, the perspectives and opinions do not necessarily have to come from directors. Boards can learn from experts outside of the decision-making body.[8]

Finally, the incumbent board often selects a new director with the possibility (and in some cases the likelihood) of influence by the CEO, the very person the board is supposed to monitor. Exacerbating the situation is the fact that individuals nominated to the board are almost always elected and thereafter are quite difficult to be involuntarily removed. A worst-case scenario is illustrated by the *agency hypothesis:* board appointment of connected directors, in particular those connected to the CEO, represents cronyism, perpetuating existing power in the boardroom at the expense of shareholders and reducing firm value.

Our research question involves understanding more about the choice of appointments of connected or unconnected directors and the resulting market reaction, and the situations where this choice is desirable and undesirable. In testing our hypotheses, we seek to answer the following questions: First, what roles do connections play in director appointments and consequently board composition? Second, what types of firms are more likely to appoint connected directors? Third and fourth, what are the price and vote reaction to the appointment of connected directors and how does it vary with firm characteristics?[9] In addition, how do director departures affect a firm's choice of a replacement director and the market reaction at the new director appointment? Finally, how does the reputation of the intermediate recommender in a second-degree connection affect the appointment of a connected director and what is the price implication?

[8] Both the negative and positive views of appointing connected directors are illustrated by a comment to one of the authors from a well-seasoned board member: "Board appointees can be dangerous. The board can always hire a consultant for the expertise it needs – and fire that expertise if it does not work out. I don't have that flexibility in appointing board members." On the positive side, that quote speaks to the coordination issue. On the negative side, it implies that appointing known candidates may exacerbate agency and homophily problems.

[9] It is possible that director appointments are announced in a proxy statement, which contains a host of other information. However, only about 7% of the appointments in our sample are announced between 60 and 40 days before shareholder meetings, when proxy statements are required to be filed by the SEC. In a robustness test, we exclude these cases. Our results are similar.

We document a dramatic role for board networks in director appointments. First, connected candidates are significantly more likely to be appointed. Using directors who are appointed to peer firm boards in the same MSA around the time of the sample appointments as the potential counterfactual candidates, we are able to control for any unobserved quality associated with a successful director candidate as well as a candidate's willingness to serve. With this empirical setup, we show that connection to the incumbent board increases a candidate's odds of being appointed by 103% (compared to those without connection). Further, connections facilitate appointments that enhance board diversity. A prior work relationship between a candidate and the incumbent board increases the odds of appointing a female director to an all-male board by 33% and increases the odds of appointing a director with a skill that the incumbent board lacks (or with a different industry background) by 19% (34%).

We find support for the agency, coordination, and search cost hypotheses, and limited evidence for the homophily hypothesis. Boards needing greater coordination and when facing higher costs of acquiring information about director candidates, (e.g., complex firms and those in more competitive environments), are more likely to appoint connected directors. The price reaction to connected appointees and votes for connected directors in subsequent board elections are also significantly higher in these situations. In addition, firms with weak internal controls are more likely to appoint directors connected to the incumbent CEOs. The price reaction for such appointments and shareholder votes for these directors are significantly lower. Further, we find that firms are less likely to appoint a director connected or similar to a departing director if the departing director leaves on bad terms, and the market and shareholders react negatively to such appointments. Finally, a candidate with a second-degree connection is more likely to be appointed if her recommender is more reputable, and complex firms benefit from such appointments.

To address the potential omitted variable problem that connected appointments are correlated with unobserved firm or director characteristics that can also affect shareholder reaction, we use 2SLS in our announcement return and shareholder voting regressions with two instrumental variables that capture exogenous shocks to the availability of connected director candidates. As described in the section 3, the two exogenous shocks are recent deaths of a board's contacts (contraction) and recent mergers completed

by connected firms (expansion). First, the network loss due to recent deaths of executives or directors in a firm's network (excluding the deaths of the firm's own directors) represents exogenous shocks to the availability of connected candidates, reducing the probability of appointing a connected director. Second, the expansion of the appointing firm's board network as a result of recent mergers and acquisitions completed by their connected firms (but not involving the appointing firm) increases the probability of appointing connected directors.[10] In both cases, however, there is no obvious reason why the exogenous shocks should affect the market reaction and shareholder voting of subsequent director appointments.

Our research contributes to the literature in several ways. First, we provide comprehensive evidence of the importance of social connections in director appointments in a large sample study. We are unaware of prior research documenting similar statistics.[11] This evidence sheds new light on how boards select director nominees and establishes a benchmark against which the importance of other factors influencing director selection can be compared. Second, a number of recent papers have examined board diversity and its impact on firm policies and performance.[12] Our work adds to this literature by documenting how network connections facilitate boards appointing female directors, as well as directors with different skills and industry backgrounds. Finally, we illustrate the benefits and costs of appointing a connected director. These results contribute to the broad literature of social networks and corporate governance, as well as the ongoing debate of shareholder access to director nomination.

[10] The relevance condition of the two instruments is verified in the first stage of 2SLS, with an F-stat of 24.3 (p-value < 0.0001) in the abnormal return regression (Table 7, Model 1). With two instruments, we are able to perform the overidentification test and fail to reject the exclusion condition.

[11] Cashman, Gillan, and Whitby (2013) find that more connected individuals are more likely to obtain board appointments. Their focus, however, is an individual's overall connections rather than specific connections to the incumbent board. Fahlenbrach, Kim, and Low (2018) find that directors belonging to more connected boards are more likely to gain outside board seats. In contrast, our focus is whether an appointed director is connected to the incumbent board rather than her overall connectedness. We control for the overall connections of director appointees and of the incumbent boards in appropriate regressions.

[12] See, for example, Adams and Ferreira (2009), Adams, Akyol, and Verwijmeren (2018), Adams and Kirchmaier (2016), Agarwal, Qian, Reeb, and Sing (2016), Matsa and Miller (2011), Ahern and Dittmar (2012), Anderson, Reeb, Upadhyay, and Zhao (2011), Baranchuk and Dybvig (2009), Bernile, Bhagwat, and Yonker (2018), Eckbo, Nygaard, and Thorburn (2019), Gul et al (2011), Huang and Kisgen (2013), Kim and Starks (2016), among others.

2. Literature and hypotheses

2.1 Literature[13]

Directors are the primary link between shareholders and the companies they own, yet shareholders typically find it difficult to appoint directors or remove those who are underperforming without costly proxy contests.[14] Nominations are controlled by the nominating committee with the possible (if not likely) influence of the CEO.[15] Indeed, a substantial finance literature, beginning with the seminal work of Hermalin and Weisbach (1998), focuses on CEO involvement in the director nomination process and the consequent agency implications.[16]

An individual director, like the board itself, represents a portfolio of skills and attributes. The literature linking director appointments to their performance and skills goes back at least as far as Fama and Jensen (1983) who argue for ex post settling up. That is, the director labor market rewards good director performance with additional board seats, which finds empirical support as far back as Agrawal and Walkling (1994). Recent studies show that directors subject to proxy contests (Fos and Tsoutsoura, 2014) and distracted directors (Masulis and Zhang, 2019) are likely to lose board seats. Further, labor market pressure appears to influence director behavior (Fos, Li, and Tsoutsoura, 2017).

Companies may seek a particular expertise to fulfill firm needs when appointing a new director. Becher, Walkling and Wilson (2019) find that the selection of directors for the post-merger board of an acquiring firm is consistent with firm need and the desire to upgrade the board, although agency motives are also evident. Güner, Malmendier, and Tate (2008) find that after the appointment of banker directors,

[13] The literature related to the selection, attributes and impacts of directors is growing and vast. In the paragraphs below, we can only illustrate a fraction of this literature related to our hypotheses.

[14] A large literature examines the determinants and the consequences of proxy contests. See Fos (2017) and Brav, Jiang, Li, and Pinnington (2018) for a literature review. In successful contests, the dissident gains board seats by either winning an election or settling with management. We exclude such board appointments in our sample because of their very different nature from the appointments by incumbent boards.

[15] Evidence on allowing shareholder access to the ballot for director nomination is mixed. On one hand, Cohn, Gillan and Hartzell (2016) document increased valuation around events related to the SEC proxy access rule in 2010 for firms where shareholder control is likely to increase. On the other hand, Akyol, Lim, and Verwijmeren (2012) find no evidence that empowering shareholders with proxy access creates value. More recently, Bhandari, Iliev, and Kalodimos (2020) show that firms most likely to benefit from proxy access are not the firms that adopt it.

[16] See, for example, Shivdasani and Yermack (1999), Cai, Garner, and Walkling (2009), Coles, Daniel, and Naveen (2014), Fracassi and Tate (2012), Nguyen (2012), and Levit and Malenko (2016).

firms increase debt financing, although not necessarily to the benefit of shareholders. Also, Harford and Schonlau (2013) document a significantly higher number of subsequent board seats for CEOs and directors who are involved in large acquisitions, regardless of whether such acquisitions create or destroy value.

A growing literature examines the diversity of board composition and its impact on firm policies and performance. A few recent examples include Adams and Ragunathan (2017), Faccio et al (2016), Bernile, Bhagwat, and Yonker (2018), Giannetti and Wang (2019), and Eckbo et al (2019). Two recent studies examine the potential channels of female director appointments, such as STEM and finance education (Adams and Kirchmaier, 2016) and golfing (Agarwal et al, 2016). Our study contributes to this literature by identifying the role that board networks play in recruiting women directors as well as directors who have different industry backgrounds and skills.

We discuss both costs and benefits from the appointment of connected directors. With regard to the costs, appointing connected directors can potentially increase homophily in the boardroom. As one example, Coles, Daniel, and Naveen (2015) argue that greater overlap and interaction among individuals lead to greater groupthink, defined as a desire for consensus and agreement that can potentially override critical thinking and judgment. In contrast, boards with diverse backgrounds are documented to have greater CEO turnover (Ferris, Jayaraman, and Zhang, 2016 and Giannetti, Liao, and Yu, 2015) and take less risk (Bernil, Bhagwat, and Yonker, 2018). In addition, a growing literature also documents that social ties between outside directors and the CEO can compromise the monitoring function of boards.[17]

However, it is well documented in the sociology and psychology literature that group cohesion improves performance.[18] Thus, commonalities among directors and managers can facilitate effective decision making and improve firm value (e.g., Kang, Kim, and Lu, 2018; Adams, Akyol, and Verwijmeren, 2018). Further, boards friendly to the CEO tend to have greater advising ability (Adams and Ferreira, 2007; Schmidt, 2015).

[17] A few recent examples include Fracassi and Tate (2012), Lee, Lee, and Nagarajan (2014), Nguyen (2012), (Hwang and Kim (2009, 2012), Chidambaran, Kedia, and Prabhala (2012) and Khanna, Kim, and Lu (2015), Ishii and Xuan (2014), and Souther (2018).
[18] See Beal, et al. (2003) for a meta-analysis and literature review.

Finally, the overall connectedness (network centrality) of management or boards has been shown to be associated with firm performance and shareholder value (Larcker, So, and Wang, 2013; Fogel, Ma, and Morck, 2015), CEO compensation (Engelberg, Gao, and Parsons, 2013), CEO turnover (Coles, Wang, and Zhu, 2015), monitoring efficacy (Intintoli, Kahle and Zhao, 2018), value-destroying mergers (El-Khatib, Fogel, and Jandik, 2015), innovation (Faleye, Kovacs, and Venkateswaran, 2014), informed trading (Akbas, Meschke, and Wintoki, 2016), and investment performance (Rossi, et. al., 2018).

2.2 Hypothesis development

The connection between the incumbent board and a potential director candidate can affect the appointment decision and its implication for shareholder wealth in several ways. First, past interactions at workplace can improve coordination. From the incumbent directors' point of view, appointing colleagues they know reduces risk and lowers coordination costs. From the candidate's point of view, she also wants to join a board that she feels comfortable with and trusts. Direct prior interaction between the incumbent directors and the candidate allows for knowledge of each other's work style and group dynamics. Appointing unknown directors, in contrast, requires a steeper learning curve as the new and the incumbent directors adapt to working with each other.

Further, cooperation and coordination are essential to a well-functioning board because boards tend to act as a whole and seek consensus (Bainbridge, 2002). Coordination is particularly important when a board has to deal with fast-changing situations where agile decision making is crucial. Donaldson, Malenko, and Piacentino (2019) argue that boards with more diverse opinions are more likely to result in a deadlock, which in turn is more costly for firms that need agile decisions. The *coordination hypothesis* has the following predictions.

H1a: Boards are more likely to appoint a candidate with direct and strong connections to the incumbent directors, especially in complex, fast-changing situations where agile decision making can be crucial.

H1b: Firms appointing a connected director will experience higher announcement returns and receive higher shareholder votes, particularly when the coordination need is greater.

Second, the appointing board often relies on personal contacts to identify and certify otherwise unknown candidates. In this way, first-degree connections can reduce the search costs for second-degree contacts. Without an appropriate first- or second-degree contact, the appointing board has to incur significant search costs to become informed about an unconnected candidate.

To highlight the distinction from the coordination hypothesis, we model the search cost hypothesis as follows (detailed in Internet Appendix (hereafter I.A.) 4). The hiring board compares the cost of acquiring information about unconnected (unknown) candidates to the expected value such candidates add above that of the best connected (known) candidate. If the search cost is greater than its expected additional value, the board appoints the most valuable of the connected candidates without investigating the unknown candidates. Otherwise, the hiring board incurs costs to learn the details about the unconnected (unknown) candidates. Once the hiring board has adequate information about the connected and unconnected candidates, it appoints the best candidate, regardless of connection.[19]

Thus, the search cost hypothesis predicts a higher probability of appointing a connected candidate if the search cost outweighs the expected incremental value of the best unconnected (unknown) candidate. Search costs are likely higher when a board needs to recruit a candidate from other industries or with expertise unknown to the incumbent board or when the hiring board requires a high level of detail about a candidate's fit with the company, e.g., for complex firms or firms in a more competitive environment. The expected incremental value of the unconnected candidates decreases as quality of the connected candidate increases, e.g., when the connected candidates have CEO or S&P 500 experiences.

A key difference between the coordination and search costs hypotheses is that the former views connected candidates as inherently more valuable, all else equal, while the latter views connections mainly as information channels. Therefore, under the coordination hypothesis, all else equal, the market reaction to the announcement of a connected appointment is always more positive than that of an unconnected one,

[19] We note the possibility that the hiring board may still appoint a connection once it incurs the information acquisition costs and finds out that the unconnected candidates are no better than those already known.

because the pre-announcement expected probability of connected appointment is always less than one. Under the search cost hypothesis, once the hiring board acquires adequate information about the unconnected candidates, the connected candidates are not inherently more valuable than the unconnected ones, all else equal. The stock market reaction to the appointment of an unconnected director, therefore, could be positive or negative depending on the level of actual search costs relative to those expected.[20] Consequently, while the coordination hypothesis predicts a positive response to the appointment of a connected candidate, the search cost hypothesis is agnostic.

For candidates with second-degree connections to the incumbent board, the reputation and the experience of the intermediate recommender, i.e. the first-degree contact through whom a second-degree person is connected, is important and helps to reduce the information asymmetry of these candidates. A more reputable recommender reduces the hiring board's search cost for the second-degree contacts, relative to the unconnected candidates. The recommender may also provide the potential candidate non-public information on the opportunities and challenges this board seat presents. An intermediate contact with greater experience and reputation should be able to make a better match between an appointing firm and candidates.

Similarly, if the departing director has a good relationship with the appointing firm, she may be able to recommend her replacement. In this case, candidates from the departing director's network may also have a greater chance of being appointed. The *search cost hypothesis* has the following predictions:

H2a: The probability of appointing a connected candidate increases with candidate quality (e.g., CEO or S&P 500 board experience) and external search cost, which is higher for candidates with a background or experience different from the incumbent board. It is also higher for complex firms and firms in a more competitive environment.

H2b: Among potential candidates with second-degree connections, those connected to the incumbent board through a more reputable direct contact are more likely to be appointed.

[20] For example, the cost to hire a search firm may reduce reported earnings and the time cost to the CEO and the incumbent board may adversely affect investment and financial decisions, both of which are likely priced in.

H2c: Relative to unconnected candidates, potential candidates connected to the departing director are more likely to be appointed. This likelihood diminishes if the departing director leaves on bad terms.

As shown in Table 1, we note substantial overlap between the predictions of the coordination hypothesis and the search cost hypothesis. For example, both hypotheses predict a higher probability of board appointments of connected candidates. In addition, under both hypotheses, more complex firms and firms in more competitive environments are more likely to appoint connected directors.

However, we also note several distinctions between the two hypotheses. First, as discussed above, the coordination hypothesis predicts a higher probability of appointing a connected candidate, all else equal. In contrast, the search cost hypothesis predicts a higher probability of appointing a connected candidate only if the search cost outweighs the expected incremental value of the best unconnected (unknown) candidate over the best connected (known) candidate. Second, while the coordination hypothesis predicts a more positive market reaction and higher shareholder votes for connected appointees, the search cost hypothesis has no clear predictions for connected appointees in these two tests. Next, the coordination hypothesis has a stronger prediction for the first-degree connections because of the additional confidence gained by direct interaction. In contrast, the search cost hypothesis has a separate prediction regarding the reputation of the recommender in a second-degree connection. Finally, a candidate's connection to the departing director has little implication under the coordination hypothesis because the two will have little or no overlap at the appointing board and the familiarity between them adds little to future board coordination. In contrast, under the search cost hypothesis, the departing director can provide useful information about a candidate from her network.

A third hypothesis argues that adding a connected director to the incumbent board reinforces the homogeneity of the board. Candidates from the board's existing network, in particular those with first-degree ties, share at least some elements of their background with the incumbent directors. The sociology literature argues that people tend to associate with others who are similar to themselves. For example, clients are more likely to follow financial advice if their backgrounds are more similar to those of their advisors (Stolper and Walter, 2019). If such tendency affects board appointments, the connected appointees

may also be similar to the incumbent board along other dimensions. To the extent that a shared background leads to a similar view of many issues, homogenous boards can become blindsided to certain risks or opportunities. By appointing a connected director, the firm can miss an opportunity to bring in fresh perspectives and new skills that the incumbent board lacks or might not even know they are missing. The *homophily hypothesis* has the following predictions:

H3a: Relative to unconnected candidates, the pool of connected candidates is on average more similar to the incumbent board along other dimensions, e.g., in their experiences and industry backgrounds.

H3b: Boards are more likely to appoint connected directors with similar experience and industry backgrounds to themselves.

H3c: The appointment of a connected director reduces firm value and receives lower shareholder votes. The impact is greater for an already homogeneous board and for complex firms and those in a more competitive environment.

Finally, a CEO may be able to influence director nomination and have her friends appointed to the board. Such director appointments exacerbate CEO power and reduce firms' value. The *Agency hypothesis* has the following predictions:

H4a: Boards, in particular those serving under an entrenched CEO, are more likely to appoint candidates connected to the incumbent CEO.

H4b: The appointments of directors connected to incumbent CEOs reduce firm value and receive lower shareholder votes.

3. Data

3.1 Summary statistics

To test our hypotheses, we construct a sample of 9,801 uncontested appointments of outside directors from the BoardEx database during the time period of 2003-2014.[21] BoardEx obtains

[21] We start the sample in 2003 due to availability of announcement dates for director appointments from BoardEx. We examine potential contaminating events around the announcements of the appointments. In 13% of the cases, multiple

announcement dates from company press releases, news articles, and SEC filings (e.g., 8-K and proxy filings). In over 93% of the cases, the director appointments are announced before they first appear in the proxy statements.[22] We require the appointing firms to have available data from Compustat and the Center for Research in Security Prices (CRSP). A subset of our sample firms (6,559 appointments) also has information about shareholder votes on director elections from the RiskMetrics database. I.A. 1 describes our data selection in detail.

We also match a subset of the appointment sample to associated director departures in our analyses. Specifically, we identify the departing director who was replaced by a new director in our appointment sample as the one with the closest departing announcement date from the announcement date of the appointment, within the window of [-12,+12] months around the appointment announcement. This procedure yields 7,604 matched departures for 5,932 director appointments (detailed in I.A. 1)

Table 2 reports firm and director characteristics. Panel A provides statistics of the types of connections (professional, educational and social) between appointed directors and the incumbent board. We are aware of the issue that professional connections may be more tenuous between individuals at middle- or low-level positions. We remove the non-board and non-executive positions where the role description appears less important (as detailed in I.A. 1). Nearly 69% of the 9,801 appointees have professional ties with the incumbent directors. Only 7% (2%) of the appointees, however, have educational (social) ties with the board. In addition, education and social ties only marginally increase the number of connected appointments – from 69% to 70.6%. Therefore, we focus on professional connections in our subsequent analyses.

director appointments are announced within one day before and after; in 16% of the cases, the departure of incumbent directors are also announced during the same window. About 3.8% of director appointments in our sample are announced in the same 3-day window as the announcement dates of CEO turnover, M&A events, or earnings releases. In addition, about 1.5% of appointments are added within three months of a completion of an acquisition in the acquiring firm. In a robustness test (reported in I.A. 1), we remove all of these cases and our results of announcement returns are similar.

[22] We manually verify the BoardEx announcement dates with news search for a random sample of 500 director appointments to S&P 500 firms. In 498 out of the 500 cases, the earliest announcement date we find from news articles is the same as the BoardEx announcement date.

Panel B reveals that the typical appointee is a male, non-CEO, 56 years old, and holding 1.8 other board seats. The average abnormal return around the announcement of an outside director appointment is 0.24% which is statistically significant at the 1% level. Similar to Cai, Garner, and Walkling (2009), the average shareholder votes in director elections and ISS recommendation are both around 96% for new appointees. These appointees, on average, receive 4.65% higher votes than the other directors up for election at the same shareholder meeting.

Panel C reports the average (median) size of the firms in our sample is $12 billion ($1.1 billion) with a book to market ratio of 0.60 (0.48). The typical board has ten members. Seventy-four percent of incumbent directors are independent but about sixty percent are co-opted. The incumbent board on average has 805 first-degree contacts and 25,233 second-degree contacts. The incumbent directors are unlikely to know most of their second-degree contacts well, if they know them at all. Instead, we expect them to rely on their first-degree contacts for recommendations about the second-degree ones.

3.2 Instrumental Variables

To control for endogeneity issues associated with both the market reaction and shareholder votes for connected director appointments, we construct two instrumental variables. Both are exogenous shocks that decrease or increase the board's network. The first exogenous shock to the board's network is the fraction of the board's network reduced by deaths of individuals who had first- or second-degree connections to the incumbent board. The director deaths and dates are also provided by BoardEx. Specifically, for each director appointment, we look back three years for deaths of individuals in the appointing firm board's *external* network. We then use the proportion of the board's unreplaced network loss due to such deaths as an instrument for the firm's subsequent appointment of a connected director. These deaths remove not only the deceased individuals from a firm's network, but also those second-degree connections through the deceased. We are mindful that in some cases, a deceased director or executive might be replaced by someone who the appointing firm is still connected to, offsetting some of the loss to the appointing firm's network. Therefore, we use only the deaths of retired individuals and those of directors

or executives whose current employers are no longer connected to the appointing firm in constructing the instrument (See Figure 1 for an illustration of the different scenarios). Panel B of Table 2 reports an average of 284 deaths of individuals connected to our sample firms during the last three years before each new director appointment, reducing the board network size by an average of 830, or about 1.6% of the network.

Second, we use mergers and acquisitions completed by firms directly connected to an appointing firm as a positive shock to the appointing firms' network. A merger expands the network of an acquiring firm because it obtains the connections of newly added target directors and executives. Any firms connected to the acquiring firm also acquire a second-degree connection to the networks of the retained target directors and executives. We focus on the mergers that are completed by firms directly connected, but not involving an appointing firm, during the three-year period prior to the appointments. To address concerns about the exclusion condition, we further exclude any target or acquirer directors and executives from the network expansion because they are more likely to gain future board appointments (Harford and Schonlau, 2013) and their merger experience may affect the merger decisions and performance of their future employer (Field and Mkrtchyan, 2017).[23] An example is illustrated in Figure 2. Panel B of Table 2 reports an average increase of networks due to recent M&As by firms connected to the appointing firm accounts for about 1.4% of the appointing firm's network.

These shocks to the boards' network, while small in magnitude, are significantly related to the appointments of connected directors and lead to meaningful predictions. We find that the extent of network damage due to deaths is associated with a lower probability of a firm appointing a connected director, while the network gain due to mergers by connected firms is associated with a higher probability. The first-stage F-statistic of our instrumental variables is 24.3 (p-value < 0.0001) in the announcement return regression (Model (1) in Table 7), suggesting that the instruments satisfy the relevance condition. For an appointing firm, the deaths of directors or officers in its network (or the expansion of its network through M&As at other firms) should have no effect on market reaction to or shareholder vote for a director appointment to

[23] In our sample, the appointing firm and the merging firm share the same industry 6%, 15%, and 20% of the time when using 4 digit SICs, 3 digit SICs, and Fama-French 48-industry classifications, respectively.

its board except through the channel of connected appointees. These instruments, therefore, are consistent with the exclusion condition. Having two instruments further allows us to test the over-identification restriction, which provides a check on whether the exclusion condition is violated. The Sargan Chi-square statistic of 1.35 (p-value = 0.2488) for the over-identification test (as reported in Table 7) cannot reject the null hypothesis that the exclusion condition is satisfied.

4. Empirical Analyses

4.1 Prevalence of director appointments from board networks

We begin by documenting the prevalence of director appointments from board networks. Table 3, Panel A, shows that 29% of the director appointees have at least one first-degree connection to the appointing firm's board and an additional 40% have one or more second-degree ties. Thus, nearly 69% of director appointees have at least one first- or second-degree board connection with the appointing firm. This percentage is even higher for firms in the S&P 1500 index (78%) and S&P 500 index (90%). For a simple comparison, we examine the unconditional percentage of connections between a sample firm and all individuals who are ever listed as a director on BoardEx. Panel B shows that the average appointing firm is connected to under 13% of all BoardEx directors (26,038 out of 206,414 individuals). This figure is 15% and 21% for S&P 1500 and S&P 500 firms. Thus, while a typical board is connected with 13% of the director pool,[24] the person appointed to the board is connected 69% of the time. Another way we can interpret these figures is the fact that only 10% of the directors appointed to S&P 500 firms (100% - 90% = 10%) are selected from the pool of 79% non-connected potential candidates (100% - 21% = 79%).

As another benchmark, Panel B also looks at a few other characteristics we might associate with director appointments. For the full sample, 12% of directors are appointed from the same BoardEx business sector,[25] 25% are appointed from the same state, and about 23% are appointed from similar sized firms.

[24] The fraction increases to 15% if the director pool does not include individuals who have never been a director before the sample appointment, and is 17% and 16% if we further exclude individuals who are not current directors and directors older than 67 years old, respectively.

[25] We use BoardEx (40) sectors rather than SIC codes because some directors' primary employers are private firms and no SIC codes are available.

These numbers are quite small compared to the 69% of connected directors. Even if we sum the total of all three categories (and eliminate double counting) we only have 43%.[26] For the S&P 500 firms, we find that 51% of all the directors appointed are from either the same sector, state, or similar size segment; this figure is remarkably smaller than the 90% of appointed directors who have connections to the incumbent board.

Panel C reveals that the majority (55%) of appointees have multiple links with the appointing firm. About 33% of all new director nominees are connected to the incumbent CEO, while 36% are connected to one of the other (typically nine) directors but not to the CEO. About 31% of appointees have links with both the CEO and other directors on the board.

4.2 How do connections affect director appointments?

In Table 3, we examine the overall effect of connection to the incumbent board in director appointments using the full sample of BoardEx directors. Many directors, however, may appear to be unlikely candidates for a particular firm, e.g., those from firms of very different size or located far away. Further, there may be other unobserved characteristics associated with being a successful director candidate, including one's willingness to serve.

4.2.1 Board connection and director appointments

In Table 4, we examine the role of connections using a pool of more likely potential counterfactual candidates. Specifically, for each of the 9,801 appointments in our sample, we identify other directors appointed within one year (i.e., [-1,+1]) to firms of similar size (i.e., those with total assets value between 50% and 150% of the sample firms) in the same MSA.[27] These directors are arguably potential candidates for the sample firm but were not appointed.[28] Using these criteria, we are able to identify one or more other candidates for 7,266 out of the 9,801 appointments. This process results in a set of 101,498 candidates

[26] Even if we look at the number of directors appointed from larger firms (defined as those with total assets worth at least 20% more), we find only 44% of all directors come from any firms larger than the appointing firm. This number is still substantially lower than the 69% of directors appointed from board's network.
[27] In a sensitivity test (reported in I.A. 2), we further limit the candidate pool to those who are appointed to other firms in the same Fama-French 12 industry classification. We find similar results.
[28] Erel, Stern, Tan, and Weisbach (2018) use a similar approach to construct a candidate pool for training machine learning algorithms.

(including the appointed ones) for 7,266 appointments.[29] Because the potential candidates are themselves appointed to the board of a similar-sized firm in the same areas around the same time, this helps control for unobserved qualities and a demonstrated willingness to be a board member.

Panel A reports the proportion of appointed directors by whether she is connected to the incumbent board. Among the connected candidates, about 8.2% are appointed, while only 4.9% of unconnected candidates are appointed; the differences between the two proportions are statistically significant at the 1% level. The results are consistent with those in Table 3: connected directors are significantly more likely to be appointed to the board.

To establish whether connections represent a plausible proxy for homophily, we test whether the connected candidates are more similar to the incumbent board than the unconnected candidates along three dimensions: gender, skills, and industry. Panel A of Table 4 shows that while connected candidates are less likely to be a female candidate for an all-male board, they are more likely to have the skills the incumbent board members lack and to come from a different industry. This evidence provides little support to the homophily hypothesis.

Panel B reports logistic regressions where the dependent variable equals one if a director is appointed and zero if she is not. The key variables of interest are various measures of a candidate's connection to the incumbent board. Year and industry fixed effects are included in all specifications, with industries being defined using the Fama and French (1997) 48-industry classification. Standard errors are clustered at the appointment level in all specifications to account for within-appointment correlations of residuals. We also control for the number of potential candidates for each particular appointment (candidate pool size) since this number mechanically affects the chance of a candidate being selected. Ideally, we would like to include director fixed effects to control for director-specific characteristics. The non-linear nature of the logistic regressions, however, leads to the well-known incidental parameter problem when a large number of fixed effects are included (See Fernandez-Val and Weidner (2018) for a review.) Our

[29] By construction, a director candidate can appear twice or more in the sample, as the appointee of a firm and as a potential candidate of a similar-sized firm in the same MSA.

empirical design of using directors appointed to peer firms in the same area around the same time as counterfactual candidates should also reduce the need for director fixed effects. We, nevertheless, control for candidate quality with a number of characteristics that may be valued in the labor market, including indicators for Ivy League graduate, MBA degree, CEO, CFO, COO, IT, and M&A experiences, and each candidate's network size. In addition, we are mindful that director departure is one of the most frequent triggers for new director appointments. The various circumstances surrounding a director departure may have a significant impact on which candidate is appointed. For example, if a director leaves a board on good terms after a long tenure, she may be able to recommend her replacement, or the firm may benefit from a new director similar to her. On the other hand, if a director leaves the firm after a scandal or receiving low shareholder votes, the board may be less likely to seek her recommendation or to look for a replacement similar to her. We therefore control for whether a director appointment is around a director departure, and various reasons for departure, as well as interactions between each reason and the similarity between a candidate and a departing director.[30] The specific reasons for departures are detailed in I.A. 1.

To examine the role of diversity consideration in director appointment, we include an indicator variable that equals one if the candidate is female while all incumbent directors are male. In addition, we further define the "number of new experiences" variable as the sum of 24 indicator variables that each equals one if the candidate has certain experience that the incumbent board lacks.[31] This variable captures the level of new experience that a candidate may add to the board and how much the candidate's background is different from that of the incumbents.

Model (1) reports a positive and statistically significant coefficient for the connection indicator, which equals one if a candidate has a professional connection to the incumbent board. The coefficient of model (1) suggests that on average, a connected director has twice ($e^{0.712} = 2.04$) the odds of being appointed

[30] The coefficients of these variables are not tabulated to conserve space (but available upon request). Overall, the coefficients suggest that boards are more (less) likely to appoint someone similar to the departing director if the departing one leaves on good (bad) terms.

[31] Specifically, the 24 experiences include MBA degree, Ivy League education, government, military, foreign, CEO, CFO, COO, general manager, regulator, finance, human resources, marketing, operating, accounting, law, academic, IT, R&D, strategy, logistics, manufacturing, public relations, and M&A experience.

than an unconnected director. In model (2), we separately measure a candidate's connection to the CEO and her connection to the non-CEO directors. While the coefficients of both variables are positive and statistically significant, the coefficient of the CEO connection indicator suggests an odds ratio of 3.0 ($e^{1.107}$), compared to the odds ratio of 1.6 ($e^{0.491}$) associated with the non-CEO director connection. In addition, the two coefficients are statistically different from each other at the 1% level. This finding suggests that while the nomination committee is required to be composed entirely of independent directors, CEOs still have great influence on how directors are selected. This evidence is consistent with the agency hypothesis.

In the next four specifications, we define four sets of connection variables based on ex ante strength of the tie. If new directors are indeed recruited through board networks, those with stronger ties to the board should have a higher probability of being appointed. Model (3) reports that a first-degree connection increases the odds of being appointed by over 7.7 times (odds ratio $e^{2.04} = 7.7$), while a second-degree connection has a significantly smaller effect (odds ratio of 1.5). Model (4) reveals that having multiple connections with the incumbent board doubles a candidate's odds (odds ratio of 2.3) of being appointed, while having a single connection improves the candidate's odds to a lesser extent (odds ratio of 1.3). Next, Model (5) reports a significantly higher coefficient for those candidates with longer relationship (over ten years) with the incumbent board than those with shorter ones. Finally, model (6) reports a greater coefficient for the candidate with a more recent relationship (within the last ten years) with the board than those whose relationship has ended over ten years ago. In all four regressions, the coefficient difference is significant at the 1% level. These results further corroborate with the critical role board network plays in director appointments.

Panel B of Table 4 reports a positive and statistically significant coefficient for the gender diversity variable in all six specifications. For example, the coefficient in model (1) suggests that an all-male incumbent board is 22% (odds ratio of $e^{0.201} = 1.22$) more likely to add a female director. This evidence suggests that during our sample period boards on average seek gender diversity. This table, however, also reports a negative and statistically significant coefficient in all regressions for the measure of the new experience that a director candidate has but the incumbent board lacks. According to model (1), a director

with a new experience has 13% lower odds of being recruited than a director who has similar experiences as the incumbent directors. This result implies that boards on average appoint directors whose background is similar to their own, consistent with the homophily hypothesis. This evidence is in line with the finding in Adams et al (2018) that firm performance is better when director skill sets exhibit more commonality.

4.2.2 How does board connection affect board diversity and expertise?

Next, in Table 5, we examine whether and how connections between candidates and the incumbent board affect board diversity. The homophily hypothesis asserts that recruiting candidates connected to an incumbent director may exacerbate homogeneity of the board. In contrast, the search cost hypothesis argues that firms are more likely to appoint a connected candidate when the information acquisition cost is higher, such as when the hiring board needs a candidate from other industries or with different expertise. We measure the potential diversity impact of a candidate with three variables: an indicator variable that equals one if the candidate comes from a different industry than the appointing firm,[32] as well as the gender diversity variable and the new experience variable as described in Table 4.[33] Our main variables of interest are the interaction terms between the three diversity variables and the indicator of connection between a candidate and the incumbent board. As in Panel B of Table 4, the dependent variable equals one if a candidate is appointed and zero otherwise.

Table 5 reveals a positive and statistically significant coefficient for the interaction term between the connection indicator and the gender diversity variable in all regressions. According to model (1), the odds of a female being appointed to an all-male board are 33% higher for a connected candidate than an unconnected one. In contrast, the gender diversity variable itself is statistically insignificant. This result suggests that an all-male board tends to appoint a female candidate only when the candidate had previously

[32] We do not include the variable of different industry background as an independent variable in the regressions in Panel B of Table 4 because this variable is correlated with the new experience variable. In an untabulated robustness test, we find a negative and significant coefficient when we replace the new experience variable with the different industry variable in Table 4, Panel B.

[33] In a robustness analysis (reported in Panel E of I.A. 2), we use several alternative measures for diversity. For example, we use an indicator for a female candidate appointed to a board with less than 10% female (the mean and median level in our sample), and various indicator variables for different industry backgrounds between a candidate and incumbent board members. Our results are robust to these alternate specifications.

worked with at least one of the incumbent directors. From the female candidate's point of view, she may feel more comfortable joining an all-male board if she has a trusted colleague on board. This evidence suggests that connections facilitate board efforts to improve gender diversity.

Model (1) of Table 5 also reports a positive coefficient for the interaction term between the connection indicator and the new experience variable but a negative coefficient for the new experience variable itself. Both coefficients are statistically significant at the 1% level, suggesting that boards on average are more likely to appoint a director with similar experience to their own but connections help to alleviate this tendency. Model (1) suggests that conditional on a candidate having a new experience, the odds of being appointed are 19% higher for a connected candidate than an unconnected one.[34]

Model (2) reports a positive coefficient for the interaction term between the connection indicator and the different industry variable but a negative coefficient for the different industry variable itself. Again, both coefficients are significant at the 1% level. The implication is that boards on average are unlikely to recruit a director from outside of the appointing firm's broadly defined industry. It could be that the expertise of these directors is not needed in the firm. However, connections between incumbent directors and potential candidates, help boards to recruit directors from different industry backgrounds. According to the odds ratios in model (2), for candidates coming from a different industry, a connected candidate has 34% higher odds of being appointed than an unconnected candidate. This result highlights the importance of network connections in recruiting directors who can bring in new knowledge and expertise.

The evidence in Models (1) and (2) of Table 5 suggests that networks alleviate boards' tendency to appoint directors similar to themselves and facilitate recruiting directors who add gender diversity, new skills and experience. These results support the search cost hypothesis but not the homophily hypothesis.

[34] In a robustness test (reported in Panel F of I.A. 2), we classify the 24 experiences into three categories: education, executive, and functional experiences to examine the effects of different types of experiences. The odd ratios from these regressions show that while each new experience in education (functional expertise) decreases a chance of getting appointed by 12% (18%), each new executive experience increase that chance by 10%. Further, conditional on a candidate having a new executive experience, the odds of being appointed are 40% higher for a connected candidate than an unconnected one. The equivalent magnitude is 29% for functional experiences, and the effect is not significant for education experiences.

The search cost hypothesis further predicts a higher probability of appointing a connected candidate if the candidate's suitability and quality is high. We proxy candidate quality with two indicator variables for candidates with S&P 500 or CEO experience, respectively. Both are known to signal director prestige (Masulis and Mobbs, 2014; Fich, 2005; Fahlenbrach et al., 2010). Models (3) and (4) of Table 5 report positive coefficients for the interaction terms between the connection indicator and the indicators for CEO experience and S&P 500 experience, respectively, and both coefficients are significant at the 1% level. This result indicates that boards are more likely to appoint a connected candidate if the candidate is of high value to the firm. The odds of appointing a connected candidate are 28% (59%) higher if she has experience in a S&P 500 firm (as a CEO). The negative coefficients of the dummy variables for S&P 500 or CEO experience itself suggest that a candidate with such arguably prestigious experience may have more alternative opportunities. It could also indicate she is less likely to join a board she is not connected to, again highlighting the importance of connections in recruiting directors.

We note that in both Tables 4 and 5, the network size of a candidate, arguably another measure of director quality, is negatively related to the probability of the candidate being appointed to the board, possibly because highly connected candidates, having more alternative opportunities, are less likely to seek more directorships. To understand the relation between overall candidate network and connection to the incumbent board, we include an interaction term between the candidate's network size and her connection to the incumbent board in Model (5). The coefficients of the interaction term and the dummy for connection to the incumbent board are both positive and significant while the candidate network size coefficient remains negative and significant. This evidence suggests that a candidate's connection to the incumbent board is not a proxy for her overall connectedness and quality. Further, a connection between a well-connected candidate and the incumbent board appears to facilitate coordination and to reduce search cost, resulting in greater chance of an appointment. Overall, the results in Table 5 support the search cost hypothesis.

4.3 Which firms appoint a connected director?

We next examine which firms are more likely to appoint a connected director. The coordination hypothesis posits that appointing a new director who has worked with some of the incumbent directors helps to reduce coordination costs amongst board members. We argue that larger boards and more complex firms are likely to need a greater degree of board coordination. Further, the importance of board coordination (and the cost of its absence) is likely to be greater in situations where boards need to make decisions quickly, e.g., firms in a fast-growing industry or facing fierce market competition. Similarly, the search cost hypothesis predicts that boards of complex firms or firms in a more competitive environment often require a high level of details about a candidate's fit and expertise, suggesting higher search cost for an unconnected candidate, which leads to higher probability of appointing a connected one. Consequently, we test whether more complex firms and firms facing more fluid markets are more or less likely to appoint a connected director.

Table 6 reports logistic regressions where the dependent variable takes the value of one if the newly appointed director has a first or second degree connection with at least one of the incumbent directors. Independent variables include board size, complexity factor (Coles, Daniel, and Naveen, 2008)[35], industry sales growth, product market fluidity (Hoberg, Phillips, and Prabhala, 2014), and other firm, board, and CEO characteristics potentially related to the appointment of connected directors. For example, we control for the fraction of directors from local firms (Knyazeva, Knyazeva, and Masulis, 2013), total network size of incumbent directors, and whether the firm has had acquisition activities or CEO turnover in the last year.

As predicted by both the coordination and search cost hypotheses, model (1) of Table 6 shows a positive and significant coefficient for board size.[36] The coefficient indicates 15% greater odds of hiring a connected director than hiring an unconnected director for each additional member of an incumbent board.

[35] In a robustness test, we use the Herfindahl index of a firm's industry segment assets in place of the complexity score and find similar results.

[36] A bigger board also tends to have a larger director network, which can lead to higher probability of finding a suitable candidate within the network. We, therefore, separately control for the size of the incumbent director's network in the regressions in Table 6.

Model (2) shows that firms with a greater complexity score are also more likely to appoint a director from the board's network. Note that in model (2), we do not include firm size and leverage since these two variables are components of the complexity factor. For a one standard deviation increase in the complexity factor, the odds of appointing a connected director are 9.4% higher than that of appointing an unconnected one. Models (3) and (4) report a positive coefficient on industry sales growth and product market fluidity. Odds ratios of coefficients in models (3) and (4) show that a one standard deviation increase in industry sales growth or in market fluidity is associated with 21.1% or 8.4% higher odds of appointing a connected director, respectively. Further, firms with lower B/M ratio and lower ROA, characteristics of faster growth, are more likely to appoint a connected director. These results are consistent with the argument that firms with greater coordination need or higher search costs are more likely to appoint directors connected to the incumbent board.

The agency hypothesis suggests that directors from the incumbent CEO's network may be appointed to benefit management rather than the shareholders. Model (5) of Table 6 presents logistic regressions where the dependent variable equals one if a firm appoints a director connected with the CEO, and zero otherwise. Our main independent variables of interest are measures for board monitoring and CEO entrenchment, such as the fractions of independent, coopted directors, institutional holdings, and the indicator for a busy board.

Model (5) shows a positive and significant correlation between the proportion of co-opted directors and the probability of hiring an individual from the incumbent CEO's network. One standard deviation in the fraction of coopted directors is associated with 8.6% higher odds of a firm appointing a director linked to the CEO. This result contrasts with the negative coefficient of fraction of coopted directors in models (1) to (4) where the dependent variable equals one for appointing a director connected to any member of the incumbent board. That is, a more coopted board is more likely to appoint a new director connected to the CEO but not connected to other board members. Firms with more independent directors are not more likely to appoint a new director connected to the CEO as in model (5), but are more likely to appoint a director connected to other members of the board, suggested by the positive and significant coefficients in models

(1) to (4). In addition, model (5) shows that firms with more institutional holdings are less likely to appoint a director connected the CEO. Overall, the evidence in model (5) supports the agency hypothesis.

4.4 Market reaction to director appointments

We next examine the stock market reaction to the appointment of a director from the board's network. If a connected director benefits more complex firms and firms in competitive industries with better coordinated boards, these types of firms should experience a more positive market reaction at the announcement of a connected appointment. In contrast, if the appointment of a connected director limits the board's exposure to different opinions and opportunities, such an appointment should be viewed negatively by the stock market. The agency hypothesis also predicts a more negative market reaction if a connected director exacerbates managerial entrenchment.

It is conceivable that director appointments from a board's network could be driven by omitted variables. For example, connected directors could have more experience and better skills/reputation. Alternatively, firms with certain governance characteristics may tend to appoint a connected director. As a result, when firms appoint a connected director, the stock market reaction may be driven by these omitted firm or director characteristics. To address this potential problem of endogeneity, we employ the standard 2SLS estimation procedure with our two instrumental variables: network loss due to deaths of connected directors and network gain due to M&A activities by connected firms (detailed in section 3.2).[37]

Table 7 reports the results of the 2SLS regressions where the dependent variable is the appointing firm's market adjusted stock returns in the three-day window centered on the announcement date of an outside director appointment.[38, 39] The independent variables of interest include the instrumented probability

[37] Because the main variable of interest is an indicator variable, the conditional expectation function (CEF) associated with the first stage regression may be nonlinear, which is not consistent with the standard 2SLS method. To address the potential problems due to an incorrectly specified nonlinear first stage, in a robustness analysis (reported in Panel C, I.A. 2), we follow Angrist and Pischke (2008) and use a three-step estimation approach discussed in detail in I.A. 3. Our results are robust.

[38] Our results are robust to the use of market-model CAR. We use market adjusted returns instead of CARs in our analyses since we control for the previous year's stock return, which is mechanically correlated with CARs.

[39] It is possible that the appointment of a connected director by certain firms is anticipated by the market. In an unreported robustness test, we use the residuals from regressions in Table 6 as estimates of the surprise element and use these residuals as the main independent variables in the return regressions. Our results are similar.

of appointing a connected director and several instrumented interaction terms between connection and the firm's coordination needs. Other control variables include firm characteristics in the logistic regressions in Table 6 and characteristics of the new director nominee, such as her age, gender, network size, number of board seats, and whether she is a CEO of another public firm. Finally, we also control for whether the appointment is around the time of a director departure, the reasons for such departure, and the interactions between each departure reason and an indicator variable for similarity between the departing director and the appointed director.[40]

Model (1) of Table 7 reports the first stage regression, and models (2) to (7) report the second stage regressions.[41] In Model (1), the coefficient of the death-induced network loss instrument is negative and the coefficient of the merger-induced network gain instrument is positive, both statistically significant at the 1% level. The first-stage F-statistic of our instruments is 24.3 (p-value < 0.0001), suggesting that the instruments satisfy the relevance condition. The Sargan Chi-square statistic is 1.35 (p-value = 0.2448) for the over-identification test, which cannot reject the null hypothesis that the exclusion condition is satisfied. The coefficients of appointing firm characteristics have similar directions as in Table 6. Some characteristics of the appointee appear to be positively correlated with her connection to the appointing board, such as being a CEO, and having a high number of board seats or a large network.

Model (2) of Table 7 shows an insignificant coefficient for the instrumented connected appointee variable, suggesting that the market on average does not view these appointments negatively. More interestingly, the instrumented interaction term between the indicator for connected appointees and proxies for coordination need are all significantly positive in models (3) to (6). According to model (3), a one standard deviation increase in the instrumented interaction terms between (log) board size and the

[40] These variables are not tabulated to save space (but are available upon request). Coefficients are largely expected. For example, the interaction between the similarity indicator (between the appointee and the departing director) and an indicator for poor performance in the departing director's main job is negative, suggesting that the market reacts negatively to the replacement similar to a director departing on bad terms.

[41] To conserve space, in Tables 7 and 8, we report only the first stage regression corresponding to the second stage in model (2) (the baseline regression). First stage regressions for the interaction terms between connection and coordination needs variables, as well as those for CEO and non-CEO connections, are available upon request.

connected director variable is associated with 4.3% higher abnormal return.[42] This effect is quite meaningful, given the standard deviation of 4.9% for the abnormal announcement return in our sample. Model (4) shows that a one standard deviation increase in the instrumented interaction between a firm's complexity factor score and the connected director variable is associated with an increase of abnormal announcement return by 1.5%. These findings are consistent with the market recognizing the benefits from the appointment of connected directors in more complex firms.

In models (5) and (6), we study the market reaction to the appointment of a connected director for firms in a more competitive business environment. The main independent variables are the instrumented interaction terms between our connected appointee variable and each of the two competitiveness measures - industry sales growth (model (5)) and product market fluidity (model (6)). As predicted by the coordination hypothesis, both interaction terms are positive and significant, indicating a favorable market reaction to the appointment of a connected director to firms in high sales growth industries and in more fluid markets. Models (5) and (6) indicate a 0.91% (0.97%) greater abnormal announcement return for one standard deviation increase in the instrumented interaction term between the connected appointee variable and industry sales growth (market fluidity). These results in models (2) to (6) of Table 7 suggest that connected directors add value to shareholders of complex firms and firms in competitive industries, lending support to the coordination hypothesis. These findings are also in line with the results in Table 6 suggesting these types of firms are more likely to appoint a director from their board's network.

The agency hypothesis conjectures that a CEO will seek to entrench herself by recruiting individuals from her personal network to the board. A negative market reaction to such an appointment is consistent with this hypothesis. Model (7) of Table 7 shows a negative and significant coefficient on the instrumented probability of appointing a director connected with the CEO, suggesting a market reaction of

[42] We note that the coefficients of the instrumented variables should be interpreted as a local treatment effect. For example, the coefficient of the instrumented connection indicator in the market reaction regression measures the change in market reaction if the recent network gain (loss) due to mergers by connected firms (deaths of connected directors) changes the probability of appointing a connected director from 0 to 1.

-3.3% to such appointment. This evidence is consistent with the agency hypothesis.

The homophily hypothesis predicts a negative market reaction to an appointment of a connected director to an already homogeneous board. We, therefore, develop three measures for board homogeneity: i) fraction of male directors on the board; ii) industry overlap among board members, measured as the average number of the shared industries across each pair of board members (out of the 40 BoardEx industry sectors); and iii) similarity in experiences among board members, measured as the average number of the same experiences across each pair of board members (out of 24 experiences). We then regress the abnormal announcement return on the interaction between each of these board homogeneity measures and the connection variable, along with other control variables. The (untabulated) coefficients of the three interactions are negative but are only marginally significant (at the 5% level in one case and 10% in the other two cases), suggesting weak evidence of negative market reaction to an appointment of a connected director to a homogenous board. This evidence lends some limited support to the homophily hypothesis.

4.5 Shareholder votes for director appointments

In addition to trading in the stock market, shareholders also evaluate corporate directors by voting in director elections. In Table 8, we examine shareholder votes at the first director election on or after the date of director appointments using 2SLS regressions.[43] To abstract away from firm/year-level performance and governance, the dependent variable is the excess votes a newly appointed director receives over the average votes of all other directors up for election at the same shareholder meeting. The main independent variables of interest include the instrumented connection variable as well as the instrumented interactions between the connection variable and several complexity and competition variables, as well as the instrumented CEO connection. Other control variables are those used in Table 7 and the variables shown in prior studies to affect shareholder votes, which include the ISS recommendation and indicator variables

[43] For directors appointed at a shareholder meeting, the first election is on the same day as the director appointment. Many directors, however, are appointed between shareholder meetings. In these cases, we use the first director election after appointments.

for whether the newly appointed director serves on the audit, nomination, and compensation committees.[44]

Model (1) of Table 8 reports the first stage regression, and models (2) to (7) report the second stage regressions. Similar to Table 7, the fraction of death- (merger-) induced network loss instrument is negatively (positively) correlated with the likelihood of appointing a connected director. The relevance condition of the instruments is also satisfied, with the first-stage F-statistic of 14.9 (p-value < 0.0001). Further, the over identification test fails to reject the exclusion condition, with the Sargan Chi-square statistic of 0.06 (p-value = 0.8071).

Model (2) reports the baseline regression without any interaction terms, while in models (3) to (6), we interact the director connection variable with each complexity variable (board size and the complexity factor) and competitiveness measure (industry sales growth and market fluidity). Similar to the result in the announcement return regressions, Model (2) reports an insignificant coefficient on the instrumented connected director variable.

In models (3) and (4), both the direction and statistical significance of the interaction terms between the connected director variable and the complexity variables are consistent with the results from announcement return regressions. That is, shareholders of the more complex firms (with a larger board or a greater complexity factor) are more likely to give significantly higher votes for the appointment of connected directors. The economic magnitude is also meaningful. For example, estimates from models (3) and (4) reveal that a one standard deviation increase in the instrumented interaction between the connected director variable and the log of board size (the complexity factor) is associated with 10.0% (7.1%) higher excess shareholder votes for the director appointee, respectively. These effects are non-trivial, compared to the unconditional average excess shareholder votes of 4.6% for the 6,559 newly appointed directors in our sample.

[44] ISS recommendation may also be viewed as an outcome variable. In a robustness test, we use ISS recommendation as the dependent variable and document higher probability of ISS support for connected directors if the appointing firm has a larger board or is more complex. We find similar results when we use voting decisions by large independent institutions as the dependent variable. These results support the coordination hypothesis. In another robustness test, we exclude ISS recommendation as a control variable from the vote tests and find similar results.

To test whether shareholders of firms in more competitive environment favor a director from the board's social network, we include instrumented interaction terms between the director connection variable and industry sales growth and product market fluidity, respectively, in regressions (5) and (6). Both instrumented interactions terms show positive coefficients that are statistically significant at the 5% level. This result indicates higher shareholder votes for directors connected to the incumbent board if the firm is in a high growth industry or in a highly fluid market, supporting the coordination hypothesis.

We next test the agency hypothesis in the context of shareholder votes for a director connected to the CEO. Model (7) reports a coefficient of -3.8% for the instrumented connection to the CEO and an insignificant coefficient of -2.9% for the instrumented connection to non-CEO directors.

4.6 Director departures around director appointments

4.6.1 How do director departures affect director appointments?

We first ask the question of how director departures affect a firm's decision to appoint replacement directors. For the 5,932 appointments with matched departures, we identify a pool of 60,187 candidates using the approach described in Table 4. Panel A of Table 9 reports logistic regressions where the dependent variable equals one if a candidate is appointed and zero if she is not. Our independent variables of interest include two indicator variables for whether a candidate is connected to or similar to the matched departing director, and the interaction terms between each of these two indicators and a variable that indicates "bad terms" departures. The "bad terms" variable is a dummy variable that is equal to one if the departing director leaves the firm due to one of the following reasons: poor firm performance or firm scandals in the firm she leaves or at her primary employer, and her short tenure with the board.[45]

[45] In the test of shareholder votes in models (3)-(4) of Panel B, Table 9, we further include three additional departure reasons in constructing the "bad terms" variable: low shareholder vote or negative ISS recommendation in the departing director's recent election, and her absence from board meetings. These regressions are estimated using a sub-sample of firms with available shareholder voting data and board attendance data from RiskMetrics. We do not include these three reasons in the tests in Panel A and models (1)-(2) of Panel B of Table 9 because about one third of the sample firms do not have voting or attendance data. In a robustness test, the results remain similar when we include these three reasons in the "bad terms" variable and limit the sample to firms with available voting and board attendance data.

Model (1) in Panel A of Table 9 reports positive and significant coefficients for indicators of a candidate's connection to the continuing incumbent board and to the departing director. The coefficient of the connection to the continuing board suggests an odds ratio of 1.8 ($e^{0.597}$), compared to the odds ratio of 1.4 ($e^{0.331}$) associated with a connection to the departing director. A Wald test confirms that the two coefficients are statistically different from each other at the 1% level. Further, in all four specifications, a candidate's connection to the incumbent board remains statistically significant at the 1% level, with coefficient similar to those reported in Tables 4 and 5. This evidence suggests that the connection to the incumbent board remains an important factor in director appointments after controlling for the circumstances surrounding the associated director departures.

In model (2), we find a negative and statistically significant coefficient for the interaction terms between a candidate's connection to the departing director and the dummy variable for bad term departures. This evidence suggests that a director departing a firm on bad terms is less likely to recommend a colleague to the firm or to recommend the firm to a colleague. Models (3) to (4) examine whether candidates with similar experiences as departing directors are more or less likely to be appointed. While the positive and significant coefficient of "similar to departing director" in models (3) to (4) suggests that boards on average tend to find a similar replacement, model (4) shows that the tendency is lowered if the director leaves the firm on bad terms. In these circumstances, the firm may need a new director with different skills or background to help change the status quo of the board. Overall, the results in Panel A of Table 9 support the search cost hypothesis.

4.6.2 How do director departures affect announcement returns and shareholder votes of replacement director appointments?

We next study how the circumstances surrounding director departures affect the stock market reaction to and shareholder votes for the replacement director appointments. Models (1)-(2) and (3)-(4) of Panel B report OLS regressions of the abnormal announcement returns and the excess shareholder votes for these replacement directors, respectively. We focus on the interaction term between the indicator

variable for an appointee connected (or similar) to the departing director and the dummy variable that tracks "bad terms" departures.

Model (1) of Panel B reports a negative and statistically significant coefficient of the interaction between an appointee's connection to the departing director and the dummy variable for negative reasons of departures. This result is consistent with the stock market's disappointment at the firm's inability to make meaningful changes when needed. Model (2) reports a positive coefficient when the replacement director is similar to the departing director, which suggests that the stock market values continuity of board composition in routine succession. The interaction term between the similarity variable and the bad-term departure variable is, however, negative and statistically significant at the 5% level. These findings again suggest that market participants react negatively when a firm does not make necessary changes.

Models (3)-(4) of Panel B use shareholders' votes for director appointments as the dependent variable. The negative and significant interaction term in Model (3) suggests that shareholders do not favor the appointment of an individual connected to a departing director who leaves the firm on bad terms.

4.7 Recommenders' reputation in appointments of 2nd degree connections

The search cost hypothesis predicts that the reputation and experience of the (presumed) recommender, i.e. the first-degree contact through whom a second-degree contact is connected to the incumbent board, helps to reduce the hiring board's search cost for the second-degree contact relative to an unconnected (unknown) candidate. Further, a well-experienced recommender may also make better matches from the firms' candidates, benefiting the appointing firms. We test these predictions in a sub-sample of director appointments where the appointee has a secondary degree connection with the appointing board and compare these appointees with other potential candidates who also have secondary connections to the board. We measure reputation by: i) whether the recommender has CEO experience; ii) whether the recommender has experience in a large (S&P 500) firm; iii) the recommender's number of experiences (out of the 24 experiences); iv) the recommender's number of current board seats; and v) the score from a factor analysis where the components are the above four variables.

Panel A of Table 10 reports logistic regressions where the dependent variable equals one if a candidate is appointed and zero if she is not. We identify a candidate pool using the approach described in Table 4. The coefficients of the reputation variables in all models of Panel A, Table 10 are positive and statistically significant at the 1% level, suggesting that for a candidate with second-degree connections of the appointing firm, the chance of her being appointed increases with the reputation of her recommender.

Panel B reports OLS regression of the abnormal announcement returns (models (1)-(5)) and the excess shareholder votes (models (6)-(10)) for these appointments. We focus on the reputation factor variable and its interaction with board size, complexity factor, industry sales growth, and product market fluidity, respectively. The coefficient of the reputation factor itself is positive in models (1) and (6), but only statistically significant in model (6), suggesting greater shareholder voting support for the appointment of a second-degree connection of the board recommended by a more reputable or experienced first-degree contact. Models (2), (3), (7), and (8) show that for complex firms (measured by with large board and high complexity factor), market participants and shareholders value the appointment of a second-degree connected director when her recommender has better reputation. Taken together, the evidence in Table 10 supports the search cost hypothesis and illustrates how a second-degree connection may facilitate the appointment of a director.

4.8 Additional Analyses

4.8.1 Number and length of director connections

In Tables 5,7 and 8, we measure a newly appointed director's connection with the incumbent board with an indicator variable. Table 4 shows that the strength of the ties also matters. First, connections with an increased number of incumbents facilitates the assimilation of the newcomer but could also exacerbate homophily. Second, the length of such shared experience can help in gathering nuanced details about a candidate and iron out frictions arising from different personalities, work styles, and approaches to problems. In this section, we use these two alternate measures of the ties (number and length of connections) as the main variables of interest and test the robustness of our findings. These two measures are shown in

Panels A1 and A2 of I.A. 2 where we repeat the analysis in Table 5. Next, we use these two alternate measures in our instrumental variable approach. Results are shown in Panels A3 and A4 of I.A. 2 where we repeat the analyses of abnormal returns and shareholder votes (Tables 7 and 8). Our main findings are robust to these alternate measures.

4.8.2 Longevity of appointment

The longevity of a director appointment is an indicator of how well the new director matches the appointing firm. We therefore examine the tenure of the appointed directors in our sample. The sample for this test includes 6,494 director appointments that have subsequently terminated before the director turns 70 years old. Panel B of I.A. 2 summarizes the results of the second stage of 2SLS where the dependent variable is the natural logarithm of tenure (in number of years) of the 6,494 appointments, using the fraction of network loss due to deaths of connected directors and fraction of network gain due to M&As by connected firms as instrumental variables. The positive and significant coefficients of the interaction terms between connection and coordination need variables in models (2), (3), and (4) suggest that connected directors are more likely to stay longer in more complex firms, firms with larger boards, or operating in industries with high sales growth. This evidence is consistent with the coordination hypothesis.

4.8.3 Education and social activity connections

In additional analyses, we include shared education experience and social activities to define the connection between appointees and incumbent boards. Untabulated tests show that the education and/or social activity connection variables do not produce significant results when they are included side-by-side with professional links. Moreover, additional education and/or social activity ties do not appear to strengthen or weaken the effects of professional ties. This evidence suggests that professional connections are the main channel through which boards recruit new directors.

4.8.4 Time to fill director vacancy

Finally, we study how long a director vacancy remains open, since the time to find a replacement may depend on the reasons for the departure. For example, if a director leaves a firm on bad terms, the firm

may need a very different replacement while the potential candidates may be reluctant to join the board, both of which could result in a longer vacancy. In addition, if a departure is sudden, the firm is likely to have less time to plan for succession. In contrast, if the departures are planned, it should take less time to find a replacement. In Panel G of I.A. 2, we run a Tobit regression of the natural logarithm of the vacancy period in the sample of 5,932 appointments matched with director departures. A Tobit regression is used since the dependent variable, vacancy period, is zero for any appointments that happen before departures. [46] Panel G of I.A. 2 shows positive and statistically significant coefficients for the dummy variables that classify departures due to either poor firm performance or a negative ISS recommendation in recent director election, suggesting that it takes longer to fill the vacancy in these adverse circumstances. In contrast, the regression reports negative and significant coefficients if the departing director retires due to age, or leaves after a merger, possibly due to the planned nature of such departures. These results are consistent with our predictions.

5. Summary and Conclusions

Shareholder representation by the board of directors is at the center of corporate governance in U.S. public firms. Director appointments are critical to effective board oversight and advising. Shareholders typically have little say in which directors are nominated, yet these same directors are almost always elected and are subsequently difficult to remove. While anecdotes suggest the importance of social networks in director appointments, surprisingly little empirical research is available on this subject. In this paper, we examine the prevalence of director appointments from the network of incumbent boards and test hypotheses related to these appointments. Using 9,801 director appointments during the period of 2003-2014, we document that nearly 69% of director nominees are selected from the board's networks, which on average comprise only 13% of the potential talent pool. This phenomenon is even more striking for the largest firms. More importantly, in the absence of a connection, incumbent directors tend to recruit candidates with characteristics similar to their own, limiting the diversity and skill set of the board. Connections, however,

[46] We note that the vacancy period is a noisy proxy for the time to find a replacement director because a board may start the search before the departure announcement.

appear to play a critical role in recruiting candidates who have different gender, skills, and industry background from the incumbent board.

Whether appointments of connected directors are beneficial to shareholders is an empirical question. The coordination hypothesis asserts the benefits from connected directors whose prior work relationship with the incumbent directors fosters trust and facilitates better board coordination. The search cost hypothesis suggests lower information acquisition cost for connected candidates, which is particularly important when a higher level of details about the candidate is required. In contrast, the homophily hypothesis views such appointments as perpetuating homogeneous opinions and lack of creativity. In addition, the agency hypothesis views the director appointees connected to the CEO as perpetuating managerial cronyism.

We find evidence for the coordination, search cost, and agency hypotheses and little support for the homophily hypothesis. First, complex firms and firms operating in a more competitive environment, i.e. firms in greater need of board coordination or facing higher search cost, tend to appoint directors connected to the incumbent board. Such appointments also receive a more positive market reaction and higher shareholder votes. Further, firms are more likely to appoint a connected candidate if the candidate clears a certain threshold for suitability or ability. Our results also reveal how reputational effects impact the importance of connections. Finally, we find that boards controlled by the CEO are more likely to appoint a director who has personal connection to the CEO. In addition, the market and shareholders react negatively to the appointments of these directors. Results are robust to numerous sensitivity analyses.

This paper provides the first comprehensive evidence on the prevalent role of a board's network in recruiting new directors, as well as how such practice affects board composition and diversity. The evidence provided in the paper adds to the corporate governance literature by shedding new light on the director nomination process, a key component of shareholder representation by board of directors. These results also provide a benchmark for future research that examines the director selection process. Finally, our findings provide new information to the ongoing debate of proxy access and the strengths and weaknesses of corporate governance in America.

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Table 1: Hypotheses and predictions

This table lists the predictions of the four hypotheses in our main tests.

Independent variables	Coordination	Search cost	Homophily	Agency
Panel A: Dep var = Probability of board appointments (Tables 4, 5, 9, and 10)				
Connections	(+)	(+)		
1st degree	(+)	(+)		
2nd degree		(+)		
Connections to CEO				(+)
Stronger connections (Longer, multiple, and more recent)	(+)	(+)		
Diversity variables (Gender, experience, industry background)			(-)	
Connection * Expertise (CEO or S&P 500 Experience)		(+)		
Connection * Diversity		(+)	(-)	
Connection to departing director		(+)		
Connection to departing director * Departing on bad terms		(-)		
Reputation of intermediate recommender in 2nd degree ties		(+)		
Panel B: Dep Var = Firm appoints a connected director (Table 6)				
Firm Complexity	(+)	(+)		
Competitive environment	(+)	(+)		
Managerial entrenchment (Dep Var = Firm appoints director connected to the CEO)				(+)
Panel C: Dep var = Market Reaction, Shareholder votes (Table 7, 8, and 10)				
Connections	(+)		(-)	
Connection * Firm Complexity	(+)		(-)	
Connection * Competitive environment	(+)		(-)	
Connections to CEO				(-)
Reputation of intermediate recommender in 2nd degree ties * Firm complexity		(+)		
Connection * Board homogeneity			(-)	
Panel D: Dep Var = Longevity of appointment (Internet Appendix 2)				
Connection * Coordination need	(+)			

Table 2: Sample description

The sample consists of 9,801 new uncontested outside director appointments announced during 2003-2014 from the BoardEx database. We require that firms in our sample have available data from Compustat and the Center for Research in Security Prices (CRSP). Shareholder vote data are from the ISS (Riskmetrics) database. Except where stated, this table reports characteristics of appointing firms and appointed directors from the year before the director appointment. All variables are defined in Appendix 1.

	N	Mean	Median	Standard Deviation
Panel A: Director Connections				
% of appointments where the incumbent board has at least one connection with appointed directors				
Connected professionally (1)	9,801	68.87%		
Connected through education (2)	9,801	7.48%		
Connected through social activities (3)	9,801	1.92%		
Either (1), (2), or (3)	9,801	70.64%		
Panel B: Director Appointments				
Appointee is a CEO (1/0)	9,801	0.113	0	0.317
Appointee's number of board seats	9,801	1.819	1	1.902
Appointee's age	9,801	56.156	57	7.801
Appointee is female (1/0)	9,801	0.163	0	0.369
Appointee's total networks	9,801	10,432	7,633	10,182
1st degree networks	9,801	153	90	180
2nd degree networks	9,801	10,278	7,542	10,012
Abnormal returns (-1,+1) at director appointment announcement (%)	9,801	0.243	0.006	4.898
M&A last 12 months (1/0)	9,801	0.094	0	0.292
CEO turnover last 12 months (1/0)	9,801	0.193	0	0.395
Number of connected directors' deaths last 3 years	9,801	283.605	250	226.805
Fraction of network loss due to director death	9,801	0.016	0.013	0.010
Fraction of network increase due to M&As	9,801	0.014	0.005	0.020
Shareholder vote for director appointment (%)	6,559	96.430	98.361	5.704
Excess shareholder vote for director appointment	6,559	4.646	3.282	8.728
ISS recommendation (1/0)	6,559	0.957	1	0.202
Appointed director will serve in audit committee (1/0)	6,559	0.379	0	0.485
Appointed director will serve in nomination committee (1/0)	6,559	0.227	0	0.419
Appointed director will serve in compensation committee (1/0)	6,559	0.292	0	0.455

Panel C: Firm and Governance Characteristics				
Assets ($ million)	9,801	12,579	1,116	47,633
Market cap ($ million)	9,801	6,468	862	19,371
Sales ($ million)	9,801	4,990	666	13,956
Leverage	9,801	0.209	0.163	0.206
Number of business segments	9,801	2.167	1	1.847
B/M	9,801	0.601	0.479	0.572
Product market fluidity	9,801	7.888	6.927	4.375
Sales growth (%)	9,801	9.503	7.287	27.699
Complexity factor	9,801	0.039	-0.051	0.987
Total incumbent directors' networks	9,801	26,038	24,502	15,568
1st degree networks	9,801	805	599	719
2nd degree networks	9,801	25,233	23,896	14,890
Local labor market	9,801	0.035	0.027	0.033
Board size	9,801	10.084	9	3.360
Expanding board (1/0)	9,801	0.323	0	0.468
Busy board (1/0)	9,801	0.141	0	0.348
Fraction of independent directors	9,801	0.737	0.750	0.128
Fraction of coopted directors	9,801	0.592	0.625	0.308
Institutional holdings	9,801	0.611	0.677	0.294
CEO tenure	9,801	8.762	8.581	5.063
CEO chairman (1/0)	9,801	0.422	0	0.494

Table 3: Directors appointed from social networks

This table reports the connections that a newly appointed director has with incumbent directors at the appointing firm. Panel A reports connections that appointed directors have with appointing firms in our sample. For comparison, Panel B reports several benchmarks: the fraction of all BoardEx directors who have at least one first- or second-degree connection with the appointing firm and the fraction of appointed directors that are from the same sector as the appointing firm, from the same state as the appointing firm's headquarter, and/or from firms of similar size to that of the appointing firm. To determine the percentage of all directors that the firm has connections with, we examine all available BoardEx directors at the time of each new director appointment. We then report the average proportion of directors that have at least one first- or second-degree connection with incumbent directors. "Same sector" is defined based on the business sectors in the BoardEx database. Firms of "similar size" are those with total assets within 50% of each other. Panel C reports different types of connections.

Panel A: Summary statistics

	All firms (N = 9,801)			**S&P 1500 (N = 5,763)**			**S&P 500 (N = 2,544)**		
	1st degree	2nd degree	Total	1st degree	2nd degree	Total	1st degree	2nd degree	Total
Number of appointments where the firm has at least one connection with appointed directors	2,851	3,899	6,750	1,772	2,693	4,465	949	1,320	2,269
% of appointments where the firm has at least one connection with appointed directors	29.09%	39.78%	68.87%	31.10%	47.27%	78.37%	37.76%	52.53%	90.29%

Panel B: Benchmarks

% of ALL BoardEx directors that the firm has at least one 1st or 2nd degree connection with	0.39%	12.22%	12.61%	0.52%	15.19%	15.71%	0.79%	20.10%	20.88%
% of appointed directors from same sector as appointing firm (1)			12.20%			12.02%			11.34%
% of appointed directors from same state as appointing firm (2)			24.51%			25.98%			25.91%
% of appointed directors from firms of similar size to appointing firm (3)			22.53%			27.12%			30.88%
% of appointed directors from either (1), (2), or (3)			42.98%			47.74%			50.90%

Panel C: Connection types

	N of appointments	% of total appointments (N = 9,801)
Appointing firm has one connection with appointed director	1,398	14.26%
Appointing firm has multiple connections with appointed director	5,352	54.61%
Appointed director is connected with the CEO	3,270	33.36%
Appointed director is connected with only non-CEO directors	3,480	35.51%
Appointed director is connected with both CEO and non-CEO directors	3,083	31.46%

Table 4: Board connection and director appointments

For each of the 9,801 appointments in our sample, we identify other directors appointed within 12 months to firms of similar size in the same Metropolitan Statistical Area. We view these directors as potential, but unselected candidates for the sample firm. Firms of "similar size" are those with total assets value between 50% and 150% of the sample firms. Of the 9,801 appointments, we are able to identify at least one other candidate in 7,266 cases (with 101,498 candidates in total including the selected candidates). Panel A reports the proportion of appointed directors and some differences in several characteristics between connected and unconnected directors in the candidate pool. Panel B reports logistic regressions where the dependent variable equals one if a candidate is appointed and zero if she is not. Panel B also controls for (untabulated for brevity) the reasons for the closest director departure(s) within 12 months of the sample director appointment's announcement date and the interactions between each reason and a dummy variable that equals one if the candidate has more common experiences (out of the 24 experience measures) with the departing director than the sample median, and zero otherwise. The departure reasons include: retirement due to old age, departing director gains a new non-CEO position in a different firm, departing director gains a new CEO position in a different firm, departed with CEO, M&A before departure, departing director is CEO of another firm with M&As, firm scandal, poor firm performance, poor firm performance of primary employer, firm scandal in primary employer, departing director has low vote in recent director election, departing director has negative ISS recommendation, departing director absent from over a quarter of board meetings, and departing director has short tenure. If an appointment is associated with more than one departure, we measure these variables for each candidate-departure pair and then aggregate the value for each candidate. Year and industry fixed effects are included in all specifications, with industries being defined using the Fama and French (1997) 48-industry classification. All variables are defined in Appendix 1. Standard errors are clustered at the appointment level. The t values are reported in parentheses. In each of Models (2) to (6), we include two connection variables measuring the differential strength of the ties and report the Wald test p-value of the difference in coefficients. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Panel A: Summary statistics

	N	% Appointed	Female candidate for an all-male board (1/0)	Number of new experiences	Different industry from firm (1/0)
Connected	68,916	8.24%	4.90%	0.60	71.51%
Unconnected	32,582	4.87%	6.41%	0.53	63.85%
T-stat of difference		$(21.23)^{***}$	$(-9.47)^{***}$	$(9.57)^{***}$	$(13.03)^{***}$

Panel B: Which directors are appointed?

	Dependent variable = Appointed (1/0)					
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-0.680	-0.618	-0.720	-0.653	-0.713	-0.664
	(-13.57)***	(-11.57)***	(-11.62)***	(-12.93)***	(-13.50)***	(-13.10)***
Connected (1/0)	0.712					
	(22.88)***					
Connected to CEO (1/0)		1.107				
		(31.27)***				
Connected to non-CEO (1/0)		0.491				
		(14.61)***				
1st degree connection (1/0)			2.039			
			(47.86)***			
2nd degree connection (1/0)			0.421			
			(12.98)***			
Multiple connection (1/0)				0.851		
				(26.33)***		
Single connection (1/0)				0.238		
				(5.00)***		
Long connection (1/0)					1.802	
					(32.42)***	
Short connection (1/0)					0.660	
					(20.87)***	
Recent connection (1/0)						0.930
						(28.18)***
Past connection (1/0)						0.261
						(6.32)***
Female candidate for an all-male board (1/0)	0.201	0.226	0.257	0.214	0.233	0.213
	(3.92)***	(4.39)***	(4.94)***	(4.18)***	(4.53)***	(4.16)***
Number of new experiences	-0.140	-0.126	-0.100	-0.130	-0.115	-0.120
	(-8.55)***	(-7.69)***	(-5.99)***	(-7.91)***	(-6.95)***	(-7.34)***
Candidate pool size	-0.077	-0.076	-0.073	-0.077	-0.075	-0.076
	(-99.74)***	(-95.35)***	(-89.54)***	(-97.83)***	(-95.41)***	(-97.45)***
Ivy graduate (1/0)	0.037	0.030	0.053	0.027	0.042	0.031
	(1.24)	(1.01)	(1.75)*	(0.90)	(1.41)	(1.03)
MBA degree (1/0)	0.013	0.009	0.017	0.012	0.007	0.017
	(0.50)	(0.33)	(0.61)	(0.44)	(0.26)	(0.64)
CEO experience (1/0)	0.024	0.021	0.004	0.024	0.006	0.013
	(0.72)	(0.63)	(0.12)	(0.70)	(0.17)	(0.38)
CFO experience (1/0)	0.000	-0.005	-0.060	-0.011	-0.024	-0.008
	(0.00)	(-0.12)	(-1.35)	(-0.26)	(-0.56)	(-0.19)
COO experience (1/0)	0.063	0.048	0.057	0.056	0.050	0.046
	(1.54)	(1.17)	(1.37)	(1.37)	(1.21)	(1.13)
IT experience (1/0)	0.033	-0.017	-0.068	-0.001	-0.019	-0.004
	(0.52)	(-0.26)	(-1.03)	(-0.01)	(-0.30)	(-0.06)
M&A experience (1/0)	0.063	0.065	0.042	0.048	0.047	0.067
	(0.53)	(0.54)	(0.34)	(0.40)	(0.39)	(0.56)
S&P 500 experience (1/0)	0.073	0.012	-0.025	0.020	-0.006	-0.002
	(2.70)***	(0.42)	(-0.85)	(0.74)	(-0.23)	(-0.08)
Candidate's network (log)	-0.116	-0.122	-0.126	-0.122	-0.121	-0.123
	(-23.80)***	(-24.89)***	(-24.97)***	(-24.89)***	(-24.60)***	(-24.95)***
Appointment without director departure (1/0)	-0.021	-0.036	-0.036	-0.024	-0.021	-0.014
	(-0.68)	(-1.15)	(-1.11)	(-0.75)	(-0.67)	(-0.44)
N	101,498	101,498	101,498	101,498	101,498	101,498
Pseudo R-sq.	0.1441	0.154	0.1952	0.1492	0.1569	0.1524
p-value of Wald test		< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001

Table 5: How does board connection affect board diversity and expertise?

This table reports logistic regressions where the dependent variable equals one if a candidate is appointed and zero if she is not. The sample includes 101,498 candidates described in Table 4. Other control variables are similar to the variables used in Table 4, Panel B, model (1). All variables are defined in Appendix 1. Year and industry fixed effects are included in all specifications, with industries being defined using the Fama and French (1997) 48-industry classification. Standard errors are clustered at the appointment level. The t values are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

	Dependent variable = Appointed (1/0)				
	(1)	(2)	(3)	(4)	(5)
Intercept	-0.631	-0.219	-0.601	-0.633	-0.447
	(-12.34)***	(-4.04)***	(-11.79)***	(-12.49)***	(-7.75)***
Connected (1/0)	0.635	0.626	0.616	0.665	0.348
	(18.24)***	(10.30)***	(17.49)***	(19.11)***	(5.81)***
Connected (1/0) * Female candidate for an all-male board (1/0)	0.285	0.278	0.322	0.285	0.304
	(2.26)**	(2.21)**	(2.56)**	(2.27)**	(2.41)**
Female candidate for an all-male board (1/0)	-0.007	-0.023	-0.060	-0.033	-0.050
	(-0.07)	(-0.21)	(-0.55)	(-0.31)	(-0.45)
Connected (1/0) * Number of new experiences	0.172				
	(3.96)***				
Number of new experiences	-0.283				
	(-6.88)***				
Connected (1/0) * Different industry from firm (1/0)		0.291			
		(4.00)***			
Different industry from firm (1/0)		-1.220			
		(-20.54)***			
Connected (1/0) * CEO experience (1/0)			0.462		
			(5.59)***		
CEO experience (1/0)	0.027	0.041	-0.403	-0.013	-0.014
	(0.79)	(1.21)	(-5.16)***	(-0.38)	(-0.41)
Connected (1/0) * S&P 500 experience (1/0)				0.248	
				(2.81)***	
S&P 500 experience (1/0)	0.074	0.173	0.065	-0.153	0.063
	(2.73)***	(6.05)***	(2.38)**	(-1.83)*	(2.33)**
Connected (1/0) * Candidate's network (log)					0.069
					(6.94)***
Candidate's network (log)	-0.115	-0.066	-0.119	-0.120	-0.169
	(-23.43)***	(-12.60)***	(-24.27)***	(-24.48)***	(-19.42)***
N	101,498	101,498	101,498	101,498	101,498
Controls	Yes	Yes	Yes	Yes	Yes
Pseudo R-sq.	0.1447	0.1573	0.1433	0.1427	0.1437

Table 6: Which firms appoint a connected director?

Models (1) to (4) report logistic regressions where the dependent variable equals one if an appointed director in our sample has at least one connection with a board member of the appointing firm. Model (5) reports logistic regressions where the dependent variable equals one if an appointed director is connected with the incumbent CEO. Year and industry fixed effects are included, with industries being defined using Fama and French (1997) classification. All variables are defined in Appendix 1. The t values are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

	Connected (1/0)				Connected to CEO (1/0)
	(1)	(2)	(3)	(4)	(5)
Intercept	-8.814	-12.817	-9.028	-8.894	-6.524
	(-23.04)***	(-22.75)***	(-24.61)***	(-22.90)***	(-16.61)***
Board size (log)	0.381		0.312	0.370	-0.059
	(3.07)***		(2.64)***	(2.94)***	(-0.51)
Complexity Factor		0.091			
		(2.00)**			
Industry sales growth			0.007		
			(2.01)**		
Product market fluidity				0.019	
				(2.37)**	
Assets (log)	0.206		0.119	0.196	0.166
	(8.96)***		(6.17)***	(8.35)***	(8.41)***
Leverage	-0.395		-0.430	-0.373	-0.011
	(-2.89)***		(-3.47)***	(-2.69)***	(-0.09)
B/M	-0.190	-0.209	-0.243	-0.185	-0.104
	(-3.88)***	(-3.21)***	(-5.12)***	(-3.75)***	(-2.14)**
ROA	-0.481	-0.259	-0.669	-0.460	-0.619
	(-3.18)***	(-1.57)	(-4.77)***	(-2.98)***	(-4.27)***
Stock return	0.034	0.055	0.035	0.039	0.064
	(0.68)	(0.93)	(0.71)	(0.77)	(1.34)
Expanding board (1/0)	0.307	0.341	0.314	0.314	0.231
	(5.55)***	(5.13)***	(5.76)***	(5.60)***	(4.81)***
Fraction of independent directors	0.844	0.609	0.794	0.819	0.182
	(3.94)***	(2.35)**	(3.80)***	(3.75)***	(0.87)
Busy board (1/0)	0.674	0.650	0.789	0.701	0.498
	(6.00)***	(5.06)***	(7.16)***	(6.11)***	(7.21)***
Fraction of coopted directors	-0.175	-0.275	-0.200	-0.200	0.268
	(-1.59)	(-2.05)**	(-1.86)*	(-1.79)*	(2.60)***
Institutional holdings	0.117	0.424	0.237	0.156	-0.253
	(1.09)	(3.47)***	(2.36)**	(1.43)	(-2.58)***
CEO tenure (log)	-0.024	0.042	0.014	-0.013	-0.062
	(-0.44)	(0.64)	(0.26)	(-0.24)	(-1.16)
CEO chairman (1/0)	-0.033	0.038	-0.058	-0.017	0.017
	(-0.64)	(0.59)	(-1.13)	(-0.31)	(0.35)
Total incumbent directors' network (log)	0.681	1.287	0.774	0.689	
	(16.29)***	(22.19)***	(21.04)***	(16.09)***	
Total CEO network (log)					0.419
					(9.48)***
Local labor market	2.082	2.489	2.818	2.015	1.950
	(2.60)***	(2.49)**	(3.65)***	(2.46)**	(2.75)***
M&A last 12 months (1/0)	0.165	0.276	0.179	0.181	0.043
	(1.80)*	(2.34)**	(1.98)**	(1.92)*	(0.56)
CEO turnover last 12 months (1/0)	0.059	0.066	0.055	0.077	0.096
	(0.89)	(0.84)	(0.85)	(1.14)	(1.65)
N	9,801	9,801	9,801	9,801	9,801
Pseudo R-sq	0.2943	0.3115	0.2762	0.2925	0.2447

Table 7: Abnormal returns at director appointment announcements

This table reports the results from the 2SLS regressions of the abnormal returns in the three-day window centered on a director appointment announcement date, using the fraction of network loss due to deaths of connected directors and fraction of network gain due to M&As by connected firms as instrumental variables. Model (1) reports the first stage corresponding to the second stage in model (2). First stage regressions for the interaction terms between connection variable and each of the coordination need variables, as well as those of the connections to the CEO and non-CEO, respectively, are included in the estimation but not tabulated to conserve space. We also control for (but untabulated for brevity) the reasons of the closest director departure(s) within 12 months of the announcement date of a sample director appointment and the interactions between each reason and a dummy variable for the similarity between the departing director and appointee. Year and industry fixed effects are included, with industries being defined using Fama and French (1997) classification. All variables are defined in Appendix 1. The t values are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

	Abnormal returns (-1,+1) at director appointment announcement						
	1st stage	2nd stage					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	-1.208	-3.457	-7.665	-3.622	8.511	-2.497	-9.708
	(-8.74)***	(-0.47)	(-0.74)	(-0.38)	(1.47)	(-0.47)	(-1.81)*
Fraction of network loss due to director death	-0.849						
	(-2.07)**						
Fraction of network gain due to M&As	0.445						
	(2.02)**						
Connected		-2.821	-8.987	-2.004	-6.679	-2.128	
		(-1.63)	(-1.52)	(-0.38)	(-1.45)	(-0.55)	
Connected to CEO							-3.293
							(-1.88)*
Connected to non-CEO incumbent directors							-1.756
							(-0.98)
Coordination need variable			*Board size (log)*	*Complexity factor*	*Ind. Sales growth*	*Product market fluidity*	
Connected * Coordination need			6.834	2.083	0.153	0.322	
			(2.06)**	(2.16)**	(2.00)**	(2.17)**	
Coordination need			0.337	-1.018	-0.014	0.005	
			(0.12)	(-1.35)	(-0.28)	(0.05)	
Board size (log)	0.114	0.374			-0.736	0.205	11.598
	(5.73)***	(0.52)			(-1.26)	(0.39)	(0.18)
Assets (log)	0.008	-0.013	0.014		-0.098	-0.017	-0.224
	(2.34)**	(-0.19)	(0.15)		(-1.51)	(-0.29)	(-0.17)
Leverage	-0.069	0.325	0.012		0.997	0.316	-6.653
	(-3.13)***	(0.64)	(0.03)		(2.22)**	(0.81)	(-0.17)
B/M	-0.018	0.301	0.217	0.135	0.473	0.315	-1.150
	(-2.17)**	(1.91)*	(1.36)	(0.73)	(3.16)***	(2.32)**	(-0.14)
ROA	-0.062	0.047	-0.208	0.333	0.670	-0.066	-0.989
	(-2.42)**	(0.10)	(-0.40)	(0.78)	(1.43)	(-0.15)	(-0.14)
Stock return	0.011	-0.046	0.000	-0.102	-0.148	-0.022	0.215
	(1.25)	(-0.36)	(0.00)	(-0.73)	(-1.11)	(-0.18)	(0.12)

Expanding board (1/0)	0.028	-0.131	-0.007	-0.123	-0.401	-0.154	0.863
	(3.28)***	(-0.65)	(-0.03)	(-0.62)	(-2.24)**	(-0.96)	(0.15)
Fraction of independent directors	0.108	0.715	1.175	0.508	-0.307	0.553	10.768
	(3.03)***	(0.91)	(1.46)	(0.79)	(-0.43)	(0.88)	(0.19)
Busy board (1/0)	0.030	0.377	0.502	0.184	0.057	0.354	-2.112
	(2.39)**	(1.48)	(1.68)*	(0.66)	(0.24)	(1.61)	(-0.15)
Fraction of coopted directors	-0.035	-0.050	-0.211	-0.176	0.287	-0.110	-6.422
	(-1.98)**	(-0.16)	(-0.70)	(-0.49)	(0.95)	(-0.40)	(-0.18)
Institutional holdings	0.031	-0.084	0.084	-0.024	-0.360	-0.042	7.032
	(1.82)*	(-0.29)	(0.29)	(-0.07)	(-1.27)	(-0.16)	(0.17)
CEO tenure (log)	0.007	-0.117	-0.085	-0.050	-0.185	-0.048	1.050
	(0.79)	(-0.92)	(-0.62)	(-0.31)	(-1.35)	(-0.39)	(0.16)
CEO chairman (1/0)	-0.010	0.094	0.042	0.022	0.197	0.110	-1.221
	(-1.24)	(0.73)	(0.32)	(0.16)	(1.50)	(0.93)	(-0.16)
Incumbent directors' total networks (log)	0.065	0.195	0.504	0.366	-0.438	0.160	6.284
	(9.32)***	(0.50)	(1.59)	(0.48)	(-1.40)	(0.58)	(0.18)
Local labor market	-0.067	0.997	0.649	1.385	1.511	1.319	-20.216
	(-0.53)	(0.58)	(0.34)	(0.63)	(0.81)	(0.76)	(-0.17)
M&A last 12 months (1/0)	0.018	-0.190	-0.106	0.064	-0.350	-0.245	1.639
	(1.17)	(-0.82)	(-0.44)	(0.24)	(-1.45)	(-1.09)	(0.15)
CEO turnover last 12 months (1/0)	0.010	-0.018	0.018	0.197	-0.109	0.004	0.384
	(0.83)	(-0.11)	(0.10)	(1.00)	(-0.62)	(0.03)	(0.14)
Appointee is a CEO (1/0)	0.028	-0.153	-0.040	-0.127	-0.420	-0.116	2.060
	(2.20)**	(-0.66)	(-0.16)	(-0.47)	(-1.88)*	(-0.55)	(0.16)
Appointee has M&A experience (1/0)	0.019	-0.106	-0.016	-0.071	-0.306	0.059	5.428
	(0.54)	(-0.21)	(-0.03)	(-0.11)	(-0.57)	(0.12)	(0.17)
Appointee's number of board seats	0.019	0.060	0.143	0.048	-0.118	0.031	0.936
	(8.22)***	(0.54)	(1.47)	(0.50)	(-1.33)	(0.40)	(0.18)
Appointee's age (log)	0.053	0.248	0.460	0.187	-0.249	0.202	1.978
	(1.88)*	(0.51)	(0.89)	(0.34)	(-0.52)	(0.46)	(0.19)
Appointee is female (1/0)	-0.011	-0.010	-0.059	0.143	0.101	-0.013	-0.480
	(-1.05)	(-0.06)	(-0.33)	(0.80)	(0.60)	(-0.08)	(-0.16)
Appointee's total networks (log)	0.076	0.179	0.507	0.105	-0.544	0.107	6.696
	(40.17)***	(0.41)	(1.27)	(0.25)	(-1.62)	(0.35)	(0.18)
Appointment without director departure (1/0)	-0.001	0.105	0.096	0.032	0.108	0.137	-1.376
	(-0.08)	(0.51)	(0.42)	(0.13)	(0.48)	(0.67)	(-0.16)
N	9,801	9,801	9,801	9,801	9,801	9,801	9,801
Adj R-sq	0.3681	0.0203	0.0206	0.0258	0.0207	0.0208	0.0203

Relevance condition:
F-stats = 24.33 (p-value < .0001)
Overidentifying restrictions:
Sargan χ^2 = 1.35 (p-value = .2448)
Basmann χ^2 = 1.33 (p-value = .2472)

Table 8: Shareholder votes after director appointments

This table reports the results from the 2SLS regressions of the excess shareholder votes for the appointed directors in our sample, using the fraction of network loss due to deaths of connected directors and fraction of network gain due to M&As by connected firms as instrumental variables. Model (1) reports the first stage corresponding to the second stage in model (2). First stage regressions for the interaction terms between connection variable and each of the coordination need variables, as well as those of the connections to the CEO and non-CEO, respectively, are included in the estimation but not tabulated to conserve space. In results untabulated for brevity, we also control for other control variables as in Table 7 and ISS recommendation and three indicators variables for membership at audit, compensation, and nomination committees. Year and industry fixed effects are included, with industries being defined using Fama and French (1997) classification. All variables are defined in Appendix 1. The t values are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

	Excess shareholder vote						
	1st stage	2nd stage					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	-1.361	21.429	60.974	81.675	-9.350	-1.021	10.932
	(-7.84)***	(0.57)	(1.90)*	(1.25)	(-1.02)	(-0.05)	(0.19)
Fraction of network loss due to director death	-1.141						
	(-2.03)**						
Fraction of network gain due to M&As	0.573						
	(2.27)**						
Connected		-3.404	-14.959	18.617	-10.043	-16.184	
		(-1.26)	(-0.80)	(0.63)	(-1.59)	(-1.01)	
Connected to CEO							-3.799
							(-1.71)*
Connected to non-CEO							-2.892
							(-1.09)
Coordination need variable			*Board size (log)*	*Complexity factor*	*Ind. Sales growth*	*Product market fluidity*	
Connected * Coordination need			15.767	9.980	0.306	1.065	
			(2.23)**	(2.18)**	(2.01)**	(2.51)**	
Coordination need			-17.922	-5.449	-0.100	-0.050	
			(-1.94)*	(-1.25)	(-0.88)	(-0.15)	
ISS recommendation (1/0)	0.034	16.388	16.933	15.784	17.193	16.820	16.449
	(1.58)	(13.03)***	(23.07)***	(9.52)***	(31.41)***	(21.36)***	(15.16)***
N	6,559	6,559	6,559	6,559	6,559	6,559	6,559
Adj R-sq	0.3797	0.3596	0.3619	0.3093	0.3604	0.3601	0.3596
Relevance condition:							
F-stats = 14.89 (p-value < .0001)							
Overidentifying restrictions:							
Sargan χ^2 = .06 (p-value = .8071)							
Basmann χ^2 = .06 (p-value = .8086)							

Table 9: Director departures around director appointments

We identify the departing director who was replaced by the new director in our appointment sample as the one with the closest departing date from the appointment date, within the window of [-12,+12] months around the appointment. This procedure yields 7,604 matched departures for 5,932 director appointments. If an appointment is matched with multiple departures (because the departures are on the same day), we aggregate the reasons of the departures for the appointment in our test. Panel A reports logistic regressions where the dependent variable equals one if a candidate is appointed and zero if she is not. (We identify a candidate pool using the approach described in Table 4.) Other control variables in Panel A are similar to the variables used in Table 4, Panel B, model (1). Standard errors are clustered at the appointment level. Panel B reports OLS regressions of the director appointment abnormal announcement returns (models (1)-(2)) and the excess shareholder votes for the appointed directors (models (3)-(4)). Other control variables in models (1)-(2) and (3)-(4) of Panel B are similar to those used in Table 7, model (2) and Table 8, model (2), respectively. All variables are defined in Appendix 1. The t values are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Panel A: How do director departures affect director appointments?

	Dependent variable = Appointed (1/0)			
	(1)	(2)	(3)	(4)
Connected to incumbent board (1/0)	0.597	0.596	0.713	0.713
	(14.09)***	(14.03)***	(17.78)***	(17.79)***
Connected to departing director (1/0)	0.331	0.386		
	(10.05)***	(8.36)***		
Connected to departing director (1/0) * Depart in bad terms (1/0)		-0.121		
		(-2.14)**		
Similar to departing director (1/0)			0.203	0.360
			(3.50)***	(4.21)***
Similar to departing director (1/0) * Depart in bad terms (1/0)				-0.216
				(-2.03)**
Depart in bad terms (1/0)		-0.033		-0.022
		(-1.33)		(-1.37)
N	60,187	60,187	60,187	60,187
Controls	Yes	Yes	Yes	Yes
Adj R-sq	0.1455	0.1456	0.1427	0.1428

Panel B: How do director departures affect returns at director appointments?

	Abnormal returns (-1,+1) at director appointment announcement		Excess shareholder vote	
	(1)	(2)	(3)	(4)
Connected to incumbent board (1/0)	-0.229	-0.251	-0.737	-0.726
	(-1.29)	(-1.47)	(-2.04)**	(-2.04)**
Connected to departing director (1/0)	0.194		0.771	
	(0.92)		(1.76)*	
Connected to departing director (1/0) *	-0.495		-1.029	
Depart in bad terms (1/0)	(-1.88)*		(-2.06)**	
Similar to departing director (1/0)		1.120		0.662
		(3.21)***		(0.96)
Similar to departing director (1/0) * Depart		-1.020		-0.831
in bad terms (1/0)		(-2.29)**		(-1.04)
Depart in bad terms (1/0)	0.316	0.250	-0.140	-0.447
	(1.89)*	(1.79)*	(-0.43)	(-1.62)
N	5,932	5,932	4,093	4,093
Controls	Yes	Yes	Yes	Yes
Adj R-sq	0.0308	0.0323	0.3552	0.3546

Table 10: Recommenders' reputation in appointments of second-degree connections

This table uses a sample of director appointments where the appointee has a second-degree connection with the appointing firm. A presumed recommender is the first-degree contact through whom the incumbent board is connected to the second-degree contact (hereafter 'recommender'). Panel A reports logistic regressions where the dependent variable equals one if a candidate is appointed and zero if she is not. (We identify a candidate pool of second-degree contacts using the approach described in Table 4.) Other control variables in Panel A are similar to the variables used in Table 4, Panel B, model (1). Standard errors are clustered at the appointment level. Panel B reports OLS regression of the director appointment abnormal announcement returns (models (1)-(5)), and the excess shareholder votes for the appointments (models (6)-(10)). Other control variables in Panel B for models (1)-(5) and (6)-(10) are similar to the variables used in Table 7, model (2) and Table 8, model (2), respectively. Year and industry fixed effects are included in all Panels, with industries being defined using the Fama and French (1997) 48 industries. All variables are defined in Appendix 1. The t values are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

Panel A: How does recommenders' reputation affect director appointments?

	Dependent variable = Appointed (1/0)				
	(1)	(2)	(3)	(4)	(5)
Recommender's CEO experience	0.012				
	(10.26)***				
Recommender's S&P 500 experience		0.022			
		(6.23)***			
Recommender's number of experiences			0.002		
			(9.21)***		
Recommender's number of board seats				0.002	
				(10.05)***	
Recommender's reputation factor					0.035
					(5.73)***
N	71,015	71,015	71,015	71,015	71,015
Controls	Yes	Yes	Yes	Yes	Yes
Adj R-sq	0.1287	0.127	0.1281	0.1286	0.1263

Panel B: How does recommenders' reputation affect returns at director appointments?

	Abnormal returns (-1,+1) at director appointment announcement					Excess shareholder vote				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Coordination need variable		*Board size (log)*	*Complex-ity factor*	*Ind. Sales growth*	*Product market fluidity*		*Board size (log)*	*Complex-ity factor*	*Ind. Sales growth*	*Product market fluidity*
Reputation factor	0.297	-1.285	0.170	0.221	0.313	0.558	-7.515	0.608	0.607	0.339
	(1.51)	(-1.64)	(1.27)	(1.67)*	(1.79)*	(2.84)***	(-5.06)***	(2.09)**	(2.44)**	(1.02)
Reputation * Coordination		0.675	0.183	0.223	0.014		3.041	0.517	0.004	0.028
		(2.29)**	(1.92)*	(0.25)	(0.71)		(5.48)***	(2.88)***	(0.27)	(0.77)
Coordination		0.589	-0.043	0.698	0.005		0.635	1.999	-0.042	-0.093
		(1.48)	(-0.32)	(0.56)	(0.21)		(0.81)	(7.98)***	(-1.90)*	(-1.93)*
N	3,899	3,899	3,899	3,899	3,899	3,092	3,092	3,092	3,092	3,092
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj R-sq	0.0320	0.0324	0.0403	0.0321	0.0321	0.3780	0.3841	0.3378	0.3789	0.3823

Figure 1: Deaths of connected directors and network loss - Example

To construct the instrument for director death-induced network loss, we identify three scenarios:

1. The deceased director (D) does not hold any executive or director position at the time of death. In this case, there is no natural replacement director for her. Director D had a past connection with the appointing firm's director X and with potential candidate Z, among others. If the deceased director is the appointing firm's first-degree connection (Figure 1A), her death leads to the loss of appointing firm's (second-degree) connection to potential candidates through her, as well as the (first-degree) connection to her. If the deceased director is the appointing firm's second-degree connection (Figure 1B), her death leads to the loss of only that one connection.

Figure 1A:

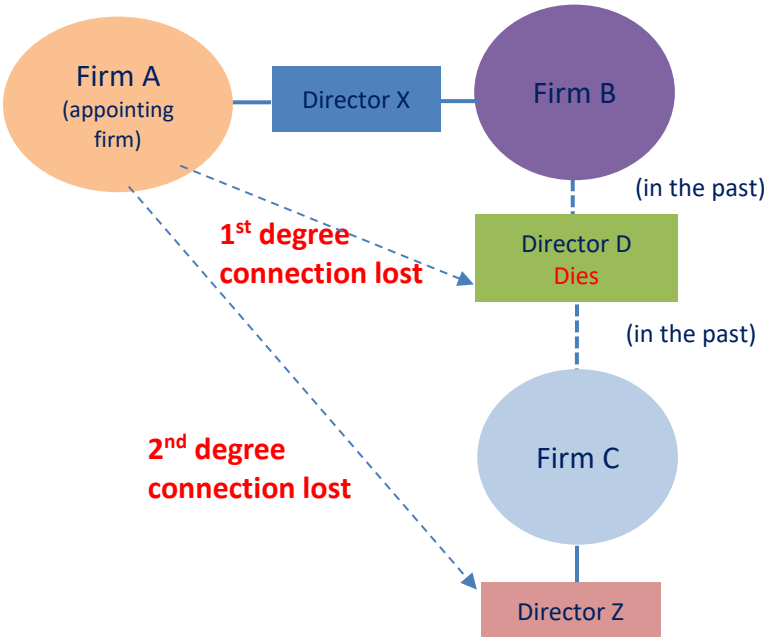
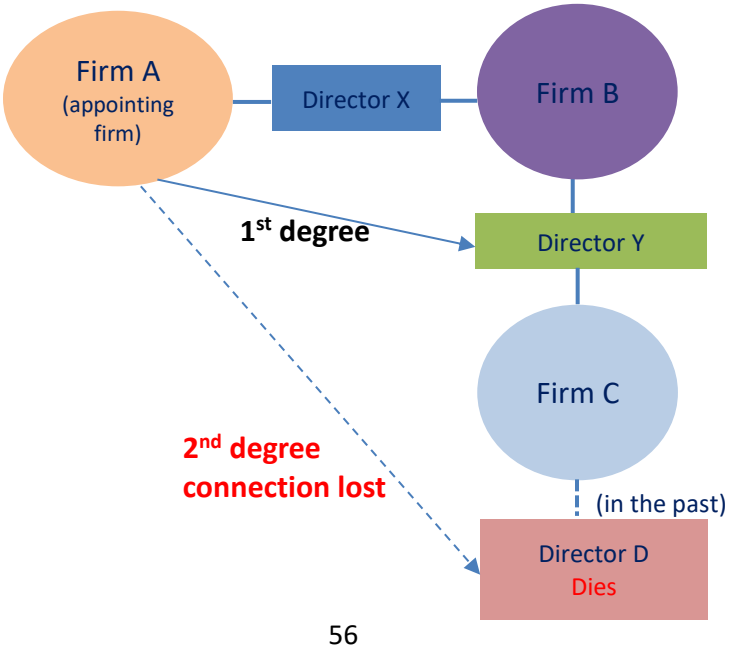


Figure 1B:



2. The deceased director (director D) is an executive or director of a firm (B) which is still connected to the appointing firm (A) through other individuals. Firm B will find a replacement for her and, by definition, the replacement (director Z) would be connected to firm A. As illustrated in Figures 1C and 1D, while firm A loses the connection to the deceased director D and her other connections outside of firm B, it also gains the connection to the replacement director Z and her other connections. In this case, the death on average should have little effect, except the deceased director might have a greater or lesser network than the replacement director. These cases are excluded from the construction of the instrument.

Figure 1C:

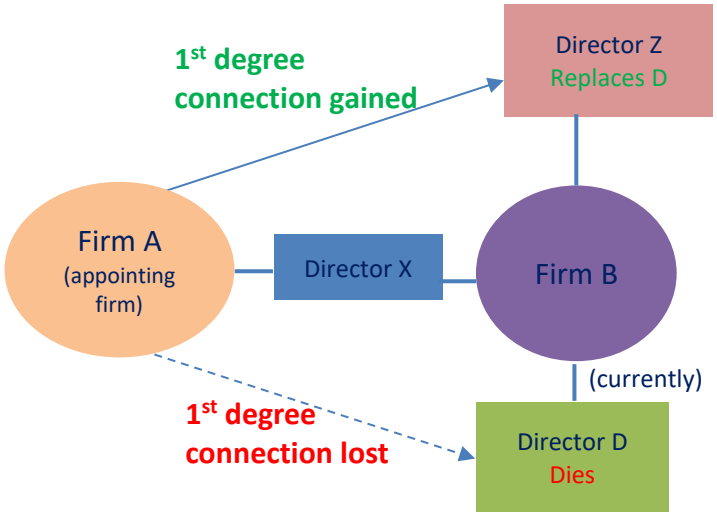
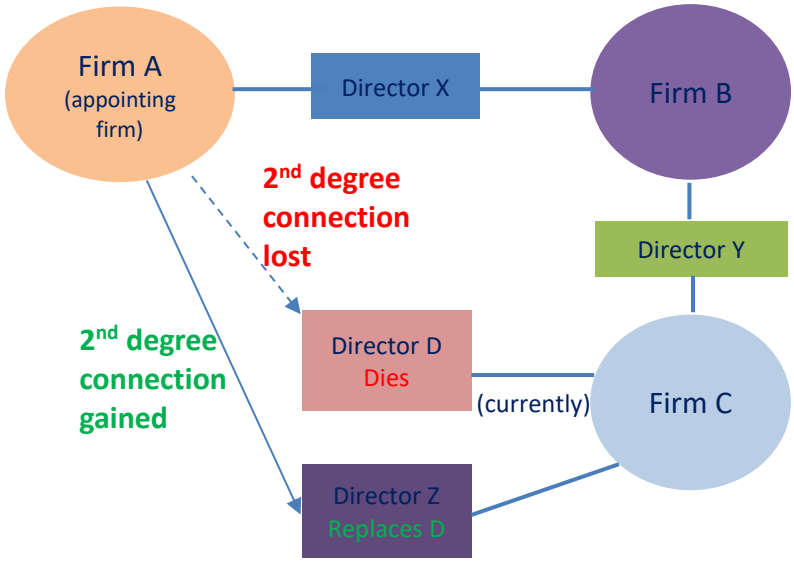


Figure 1D:



3. The deceased director D is an executive or director of a firm (B) that is the only connection to the appointing firm (A) via a past connection to director X. After the death of director D, firm A is no longer connected to firm B. As illustrated in Figures 1E and 1F, while Firm B will find a replacement for the deceased director D, the replacement

director Z is unlikely to come from firm A or firm A's network and, therefore, has little impact on firm A's network. Thus, the associated first- and second-degree connections are lost.

Figure 1E:

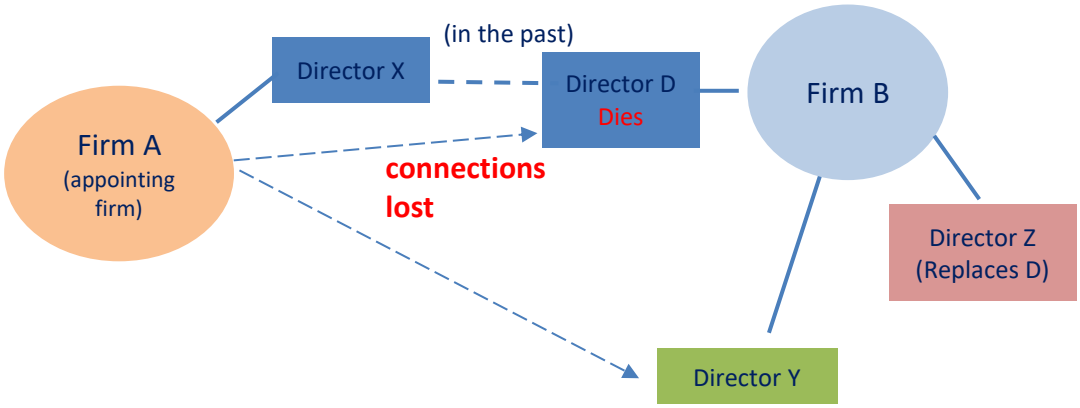
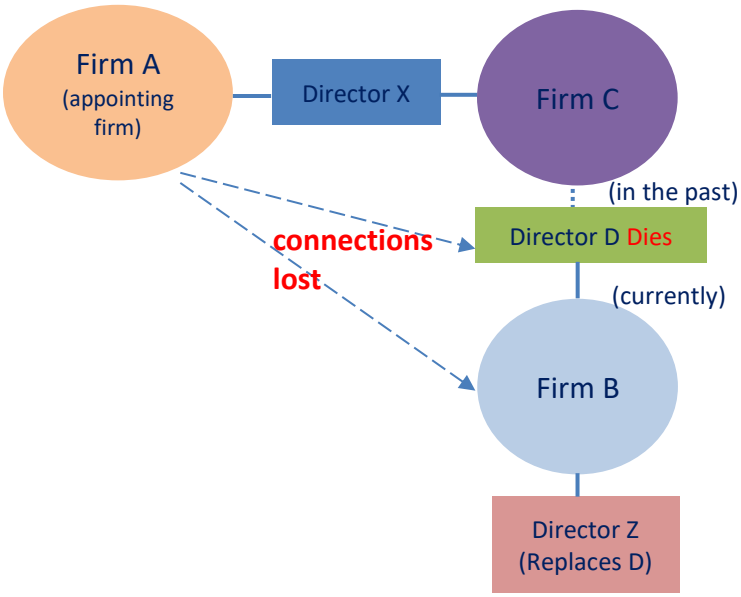


Figure 1F:



We consider only scenarios 1 and 3 in the construction of our instrument and exclude the death cases in scenario 2.

Figure 2: Acquisitions of connected firms and network gain - Example

Appointing firm A is connected to firm B through director X, who sits on both A and B's board. When firm B acquires C, director Y from C joins B and becomes a 1st degree connection with director X. We do not count director Y when calculating the increase in firm A's network for our instrument, since Y is directly involved in the M&A as a director of the target firm C. Instead, if director Y shares a board with a director Z through a firm different than the target firm C, we count director Z as a gain in firm A's network, since director Z becomes a 2nd degree connection of firm A's director X as a result of the merger.

Figure 2A: Before acquisition

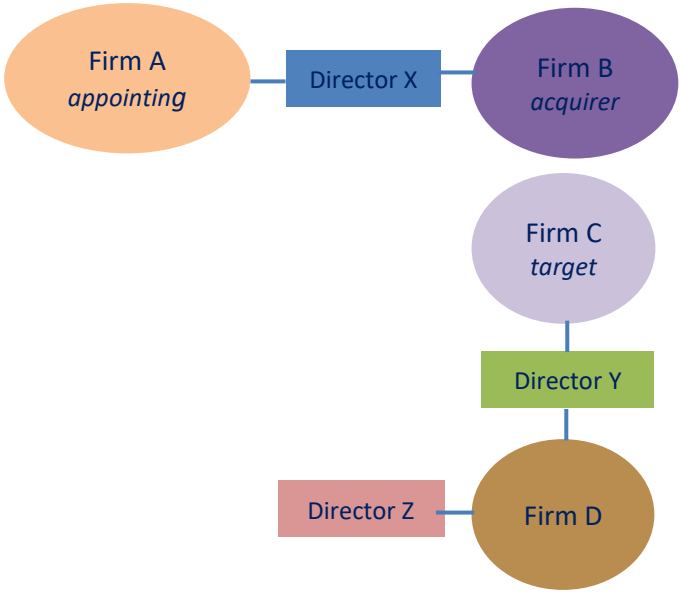
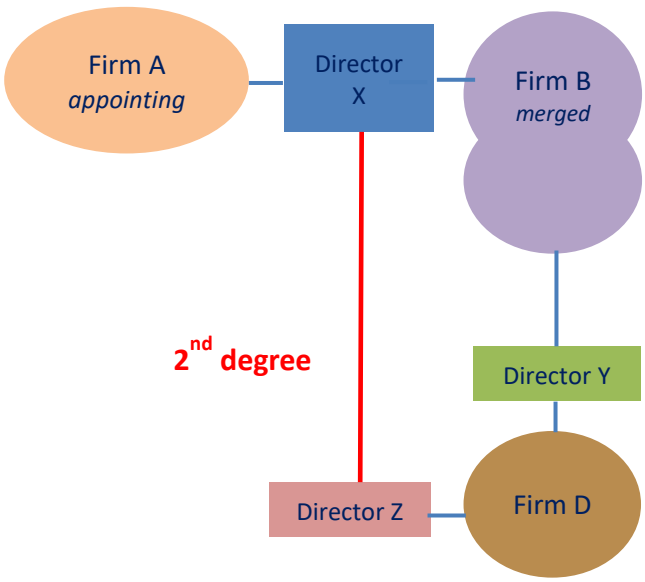


Figure 2B: After firm B acquires firm C



Appendix 1: Variable definitions

Abnormal return (-1,+1) around an outside director appointment announcement is calculated as the stock return of an appointing firm over the three trading days centered on a director appointment announcement date, minus the CRSP value-weighted market return over the same period.

Appointed (1/0) equals one if a candidate is appointed to a sample firm, and zero otherwise.

Appointed director (candidate) is a CEO (1/0) equals one if the appointee (candidate) is a CEO of a public firm.

Appointed director's (candidate's) number of board seats is the number of directorships in public firms that the appointee (candidate) holds at the time of the sample appointment.

Appointee's (candidate's) total networks are the total number of 1st and 2nd degree connections of an appointed director (candidate) at the time of the sample appointment.

Appointment without director departure (1/0) equals one if there is no director departure within 12 months of an appointment of a new director.

Board size is the total number of directors in the board.

Book-to-market (BM) equals the book value of common equity divided by the market value of common equity.

Candidate pool size is the number of potential director candidates for a particular appointment in our sample; an individual is classified as a candidate if she was appointed to a firm in the same Metropolitan Statistical Area (MSA) as and with total assets value between 50% and 150% of the sample appointing firm, within 12 months of the announcement date of the sample director's appointment.

CEO chairman (1/0) equals one if a CEO is also the chairman of the board and zero otherwise.

CEO connection (1/0) takes value of one if an appointee (candidate) is connected to the incumbent CEO and zero otherwise.

CEO tenure equals the number of years the incumbent CEO has been in her position.

CEO turnover last 12 months (1/0) equals one if there is a CEO turnover event during the past 12 months of a sample director appointment.

Complexity factor is the score from a factor analysis where the components are number of business segments, natural logarithm of sales, and leverage.

Connected (1/0) equals one if the appointing firm has at least one incumbent director who has a first- degree or second-degree connection with the appointee (candidate).

Connected to CEO (1/0) equals one if the CEO of the appointing firm has a first-degree or second-degree connection with the appointee/candidate.

Connected to non-CEO (1/0) equals one if the appointee/candidate is connected to only non-CEO directors of the appointing firm.

Connection through education (1/0) equals one if the appointee/candidate and at least one of the incumbent directors have obtained the same major and/or degree from the same college within 12 months of each other.

Connection through social activities (1/0) equals one if the appointee/candidate and at least one of the incumbent directors are both officers of the same social or professional organization during the same time period.

Coordination need variables include board size, complexity factor, mean industry sales growth with industries being defined using Fama and French (1997) classification, and product market fluidity.

Depart in bad terms (1/0) equals one if the departing director leaves the firm due to one of the following reasons: poor firm performance or firm scandals in the firm she leaves or in her primary employer, or short tenure with the board.

Depart with CEO (1/0) equals one if the CEO of the firm also departs within 12 months before a director departure, and zero otherwise.

Departing director absent from board meetings (1/0) equals one if a departing director attends less than 75% of board meetings in the year leading to the departure, and zero otherwise.

Departing director has short tenure (1/0) equals one if the departing director's tenure is shorter than the median tenure of the board.

Departing director has negative ISS recommendation (1/0) equals one if the departing director receives a negative ISS recommendation in the most recent director election, while at least one other director at the same firm receives a positive ISS recommendation for elections at the same shareholder meeting, and zero otherwise.

Departing director has low vote (1/0) equals one if the shareholder vote for the departing director in the most recent election is below the median shareholder vote for all director elections at the same shareholder meeting.

Departing director gains a new CEO (non-CEO) position in a different firm equals one if a departing director is appointed to a CEO (non-CEO) position in a different firm during the 12-month period centered on the date of her departure, and zero otherwise.

Departing director is CEO of another firm with M&As (1/0) equals one if a departing director is also the CEO of a firm that experienced M&As within 12 months before the departure announcement date, and zero otherwise.

Different industry from firm (1/0) equals one if the industry portfolio of a candidate includes an industry (BoardEx sector) that is outside the industry of the appointing firm. Here, industry portfolio is defined as the collection of industries of the firms where an individual serves as a director or executive.

Different industry alternative_1 (1/0) equals one if the industry of the candidate's primary employer is outside of that of the appointing firm, and zero otherwise.

Different industry alternative_2 (1/0) equals one if the industry portfolio of a candidate includes an industry that is not covered by the industry portfolio of the incumbent directors, where industry portfolio is defined as the collection of industries of the firms where an individual serves as a director or executive.

Different industry alternative_3 (1/0) equals one if the industry of the candidate's primary employer is outside of those of the incumbent directors, and zero otherwise.

Excess shareholder votes for director appointment are the percentage votes for the newly appointed director minus the company average votes for all other directors up for election at the same shareholder meeting.

Female candidate for a low % female board is equal to one if a candidate is female while less than 10% of incumbent directors are female (the mean and median level in our sample), and zero otherwise.

Female candidate for an all-male board (1/0) equals one if a candidate is female while all incumbent directors are male, and zero otherwise.

Firm scandal (1/0) equals one if a firm faced a class action shareholder lawsuit or had to file financial restatements within 12 months before the director departure announcement date, and zero otherwise. Class action shareholder lawsuit and financial restatements data are obtained from Stanford Law School Securities Class Action Clearinghouse and Audit Analytics, respectively.

Firm scandal in primary employer (1/0) equals one if the firm that employs the departing director as an executive experienced a scandal in the year before the departure, and zero otherwise.

First-degree connection exists between two individuals when both have worked (in either director or executive capacity) at the same company during an overlapped period of time.

Fraction of coopted directors equals the number of outside directors who join the firm after the current CEO, divided by the number of outside directors.

Fraction of independent directors equals the number of outside directors divided by board size.

Fraction of male directors is the number of male directors, divided by board size.

Fraction of network loss due to director death equals the number of first- and second-degree connections lost in the appointing firm's director network due to deaths of (unreplaced) connected directors in the last three years, divided by the size of its director network at the time of a new director appointment.

Fraction of network gain due to M&As equals the second-degree connections gained in the appointing firm's director network due to M&As of connected firms in the last three years, divided by the size of its director network at the time of a new director appointment.

Incumbent directors' networks are the total number of 1st and 2nd degree connections of the incumbent directors at appointing firms.

Institutional holdings equal the fraction of the total shares outstanding held by institutions.

Institutional vote is the average voting support for a sample director by large, independent institutions. For each institution, we average the fund voting records for each director election in our sample. Large institutions are defined as those that vote in at least 3,300 director elections (the median in our sample) during our sample period. Independent institutions are those that vote with management or with ISS in under 95% of the director elections (the median in our sample).

ISS recommendation (1/0) equals one if the ISS recommend "For" for the election of a newly appointed outside director and zero otherwise.

Length of connections equals the natural logarithm of one plus the total length (in years) of all connections between incumbent directors and the candidate/appointee.

Length of connections with CEO is set to the natural logarithm of one plus the length (in years) of connection between the incumbent CEO and the candidate/appointee.

Leverage equals total debt divided by total assets.

Local labor market equals the number of directors working in firms within 60 miles of appointing firms scaled by the total number of BoardEx directors at the time of a new director appointment.

Long connection (1/0) equals one if a candidate/appointee's connection to the incumbent board is at least ten years long, and zero otherwise.

M&A before departure (1/0) equals one if there is any M&A activity involving a firm as either a target firm or acquiring firm within 12 months before the announcement of a director departure from the firm, and zero otherwise.

M&A last 12 months (1/0) equals one if there is any M&A activity involving the appointing firm within the past 12 months of the announcement date of a sample director's appointment and zero otherwise.

Multiple connection (1/0) equals one if the candidate/appointee is connected to more than one incumbent board member and zero otherwise.

Normal retirement (1/0) equals one if a departing director's age was over 70 at the time of her departure.

Number of connections equals to the natural logarithm of one plus the number of incumbent directors who are connected with the candidate/appointee.

Number of connected directors' deaths in last three years equals the number of deaths in the appointing firms' director network in the last three years before a new director appointment.

Number of experiences is the sum of 24 dummy variables that each equals one if the candidate (or board of incumbent directors) has such experience, including MBA degree, Ivy League graduate, government, military, foreign, CEO, CFO, COO, general manager, regulation, finance, human resources, marketing, operating, accounting, law, academic, IT, R&D, strategy, logistics, manufacturing, public relations, and M&A experience.

Number of new experiences is the sum of 24 dummy variables each equal to one if the candidate has such experience that none of the incumbent directors have; the experiences include MBA degree, Ivy League graduate, government, military, foreign, CEO, CFO, COO, general manager, regulation, finance, human resources, marketing, operating, accounting, law, academic, IT, R&D, strategy, logistics, manufacturing, public relations, and M&A experience.

Number of new education experiences is the sum of two dummy variables, each of which equals to one if the candidate has an experience that none of the incumbent directors have; the two experiences include holding an MBA degree and being an Ivy League graduate.

Number of new executive experiences is the sum of three dummy variables, each of which equals to one if the candidate has an experience that none of the incumbent directors have; the experiences include those as a CEO, a CFO, or a COO.

Number of new functional experiences is the sum of 20 dummy variables, each of which equals one if the candidate has an experience that none of the incumbent directors have; the experiences include those in government, military, foreign, general manager, regulation, finance, human resources, marketing, operating, accounting, law, academic, IT, R&D, strategy, logistics, manufacturing, public relations, or M&As.

Past connection (1/0) equals one if a candidate/appointee is connected to the incumbent board and the connection ended more than ten years before the sample director appointment, and zero otherwise.

Poor firm performance (1/0) equals one if the firm that a director leaves experiences ROA, ROE, and stock returns one standard deviation below the respective industry medians of Compustat firms in the year leading to the departure, and zero otherwise.

Poor firm performance in primary employer (1/0) equals one if the firm that employs the departing director as an executive experienced ROA, ROE, and stock returns one standard deviation below the respective industry medians of Compustat firms in the year leading to the departure, and zero otherwise.

Product market fluidity is obtained from the Hoberg-Phillips' data library.

Recent connection (1/0) equals one if is a candidate/appointee is connected to the incumbent board and the connection has not ended or ended within ten years before the sample director appointment, and zero otherwise.

Recommender is the first-degree contact through whom an appointing board is connected to a second-degree appointee/candidate.

Recommender's CEO experience (1/0) equals one if the recommender has any CEO experience, and zero otherwise.

Recommender's number of experiences measures the recommender's number of experiences (out of the 24 experiences).

Recommender's number of board seats measures the recommender's number of current board seats.

Recommender's reputation factor is the score from a factor analysis where the components include four variables: recommender's CEO experience, S&P 500 experience, number of experiences, and number of board seats.

Recommender's S&P 500 experience (1/0) equals one if the recommender has experience (as directors or executives) in a S&P 500 index firm, and zero otherwise.

Second-degree connection exists between two individuals when both have first-degree connection to a third person.

Shareholder votes for director appointment is the percentage of shareholders who vote "for" an appointment of an outside director.

Short connection (1/0) equals one if a candidate/appointee's connection to the incumbent board is shorter than ten years, and zero otherwise.

Similar to departing director (1/0) equals one if a candidate or appointee has more common experiences with the departing director than the sample median, with experiences measured using the 24 experiences, and zero otherwise.

Single connection equals one if the candidate/appointee is connected to only one incumbent board member and zero otherwise.

Stock return is the compounded daily stock return during the fiscal year ending before a director appointment.

Unconnected director (1/0) equals one if the appointing firm does not have any incumbent director who has a first-degree or second-degree connection with the appointee or candidate.

Vacancy period is the number of days from the day a director leaves her directorship to the day the vacated board seat is filled. This variable equals zero if a departure occurs after an appointment.