External Networking and Internal Firm Governance

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ABSTRACT

We use panel data on S&P 1500 companies to identify external network connections between directors and CEOs. We find that firms with more powerful CEOs are more likely to appoint directors with ties to the CEO. Using changes in board composition due to director death and retirement for identification, we find that CEO-director ties reduce firm value, particularly in the absence of other governance mechanisms to substitute for board oversight. Moreover, firms with more CEO-director ties engage in more value-destroying acquisitions. Overall, our results suggest that network ties with the CEO weaken the intensity of board monitoring.

* University of Texas at Austin and University of California at Los Angeles. We would like to thank Mark Grinblatt, Yael Hochberg, Albert Sheen, Aris Stouraitis, Avanidhar Subrahmanyam, Alexander Vedrashko, and seminar participants at Claremont McKenna College, Dartmouth College, University of Oregon, Tulane University, UCLA, University of Washington, the 2010 annual meeting of the American Finance Association (Atlanta), the 2010 International Conference on Corporate Finance and Financial Markets (Hong Kong), and the 2010 West Coast and Rocky Mountains Finance Workshop (Simon Fraser University) for helpful comments. We acknowledge financial support from the Fink Center for Finance and Investments (UCLA) and the Price Center for Entrepreneurial Studies (UCLA).

Electronic copy available at: http://ssrn.com/abstract=1213358

Executives and directors of major corporations are linked in many ways. They may serve together on the board of directors of another company or they may have worked together, either as employees or directors, in the past. They may also be connected outside their employment networks. Executives may play golf at the same country clubs, attend Business Roundtable meetings together, or serve as trustees for the same charitable organizations. Or, they may have graduated from the same MBA programs. Such network connections between the management groups of different firms may increase value for shareholders by creating conduits through which valuable information can flow from one firm to another.[1] However, pre-existing network connections between executives and directors within a firm may undermine independent corporate governance, reducing firm value.[2]

We test whether network connections between management and potential directors influence director selection and subsequent firm performance. We find that firms with more powerful chief executive officers (CEOs) are more likely to add new directors with pre-existing network ties to the CEO. Further, firms with more CEO-director connections have significantly lower valuations. Consistent with weaker board monitoring, high connection firms make more frequent acquisitions, but their merger bids destroy $473 million of shareholder value on average, $354 million more than the bids of other firms. The effects are concentrated in firms with weak shareholder rights, suggesting that strong governance along other dimensions can partially substitute for effective monitoring by the board of directors.

Following the wave of corporate scandals in the early 2000s, lawmakers mandated increases in the independence of corporate boards. Major U.S. exchanges now require the majority of directors in listed firms to be independent. In addition, new regulations have heightened independence requirements for key board committees. Yet there is little empirical evidence linking greater board independence to better firm performance. One potential reason for this empirical failure is the endogeneity of board selection. Hermalin and Weisbach (1998) show that poorly performing firms increase board independence in equilibrium, undermining the cross-sectional relation between independence and performance. However, Hermalin and Weisbach (1991) and Bhagat and Black (2000) fail to find evidence that board

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independence improves firm performance, even controlling for this effect.[3] Another possibility is that empirical (and statutory) notions of director independence fail to capture the true ideal modeled in corporate governance theories. Directors who have network connections to the CEO may qualify as independent directors, but not perform the intended role as unbiased monitors.[4]

We use a panel data set of S&P 1500 firms to measure the prevalence and impact of CEO-director ties in large U.S. corporations. We construct several proxies for network connections using detailed biographical information on CEOs and directors. In each year, we identify directors who share a current employment position outside the firm with the CEO (typically external directorships). In addition, we identify directors who are officers or active participants in the same nonprofessional organizations as the CEO (e.g., golf clubs or charities). We also consider directors' histories. We identify directors who shared past memberships in non-professional organizations with the CEO, directors who were employed by the same company as the CEO in the past (excluding the current company), and directors who attended the same educational institutions as the CEO. For our main analysis, we construct an aggregate measure of connectedness that sums the connections of all types between each director and the CEO. However, our results do not depend on this aggregation and, in particular, are robust to focusing individually on connections formed through shared (past) career paths or nonprofessional activities.

We find that the allocation of connected directors across firms is not random. In particular, firms with powerful CEOs – measured using the entrenchment index (Bebchuk, Cohen, and Ferrell (2004)) – are significantly more likely to add new outside directors with pre-existing network ties to the CEO. The result is robust to controlling for director characteristics like age and expertise as well as year and industry fixed effects. We find similar results using other common measures of CEO power, such as consolidation of the titles CEO, chairman of the board, and president (Morck, Shleifer, and Vishny (1989), Adams, Almeida, and Ferreira (2005)), and CEO tenure (Hermalin and Weisbach (1988)).

Firms with powerful CEOs may add more connected directors for reasons that are benign from shareholders' perspective: such firms may exploit the CEO's network in hiring directors to minimize search costs or exploit inside information about director quality. Friendly boards may improve value by

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providing better policy advice if (powerful) CEOs are reluctant to share private information with independent directors (Adams and Ferreira (2007), Schmidt (2009)). However, powerful CEOs may also use their increased bargaining power over the selection process to shift board composition towards their preferences and, in particular, to weaken future board monitoring (Hermalin and Weisbach (1998)). To distinguish these hypotheses, we test directly whether CEO-director connections impact firm value.

First, we consider the implications of CEO-director ties for the relation between independence and firm value. Using a standard pooled OLS regression, we show that there is no statistically significant relation between firm value and independence in our data. However, when we re-classify directors with network ties to the CEO as insiders, the effect of independence strengthens economically and becomes statistically significant. Though suggestive, this evidence is difficult to interpret due to the endogeneity of CEO-director ties. As a next step we use the death or retirement of directors to identify changes in board composition that are not due to conditions inside the firm (and, critically, to recent firm performance). We find a significant increase in value around the death or retirement of a director with network ties to the CEO. The improved performance is significant compared to the change in value around the death or retirement of an unconnected director. Thus, remaining concerns about the exogeneity of director death or retirement must differentially affect connected directors to explain our results. As robustness checks, we include a variety of additional controls. We also propose an alternative identification strategy: to each firm that experienced the death or retirement of a director with ties to the CEO, we compare the change in performance to a matched control firm from the same industry at the time of the shock with similar characteristics and board composition (including the number of CEO-director ties). In all cases, firms with more CEO-director connections underperform.

Our results suggest that weakened monitoring is an important consequence of director network ties to the CEO. Consistent with this mechanism, we find that the impact of directors with CEO ties on firm value is greatest in the absence of strong shareholder rights, measured using the GIM index (Gompers, Ishii, and Metrick (2003)). To provide more direct evidence of differences in monitoring intensity, we measure the impact of CEO-director ties on firms' acquisition decisions. Major acquisitions are often

initiated by the CEO, but require board approval. Moreover, they can have a substantial impact on firm value. Thus, they are a natural context in which to study the impact of management-friendly boards on monitoring. We find that firms with a higher percentage of independent directors with network ties to the CEO acquire at a heightened rate. The result holds when we use firm fixed effects to measure the effect using within-firm changes in network ties and when we use director deaths and retirements to instrument for network ties. We also measure the value consequences of the deals for shareholders. We find that the average cumulative abnormal return for the three-day window surrounding merger announcements is lower for firms with a higher percentage of connected directors and that the average value created by the deals (for acquiring shareholders) is negative. Again, value destruction is concentrated in firms with weak shareholder rights, suggesting that other forms of governance can substitute for board oversight.

Overall, our results suggest that network ties between directors and the CEO undermine the effectiveness of internal governance. A natural question is whether the new regulations concerning board structure implemented following the Sarbanes-Oxley Act (SOX) have impacted the frequency with which such directors are added to corporate boards. Though there have been significant increases in board independence following SOX, even among firms that already complied with its provisions prior to 2002, we find no evidence of a significant change in either the fraction of directors connected with the CEO serving on corporate boards or the propensity of firms to add such directors to their boards. Thus, the reduction of CEO-director ties could be an effective target for future governance reform.

Our analysis builds on a large existing literature in management and finance. Zajac and Westphal (1996) find evidence that firms in which the CEO has more control over the director selection process are more likely to add directors with a history of implementing CEO-friendly policies in other firms. Avery, Chevalier, and Schaefer (1998) find that CEOs who pursue acquisitions are more likely than other CEOs to add outside directorships. Our evidence on director selection refines these results by demonstrating that the identity of the director matters – that is, whether the CEO has a pre-existing relationship with the candidate – and not just the policies that he or she is likely to advocate. Similarly, Westphal and Zajac (1995) develop a measure of demographic similarity between CEOs and directors – based on age,

functional background, educational level similarity, and insider/outsider similarity – and show that greater similarity between the CEO and the board is related to higher CEO compensation. We focus on shared experiences rather than shared backgrounds to isolate the impact of personal relationships on firm value.

Existing evidence on the value implications of network connections is mixed. Network ties appear to enhance value by facilitating information flow in a variety of contexts: venture capital investment (Hochberg, Ljungqvist, and Lu (2007)), mutual fund investment (Cohen, Frazzini, and Malloy (2008)), analyst recommendations (Cohen, Frazzini, and Malloy (2010)), and corporate investment (Fracassi (2008)). However, network ties also appear to weaken corporate governance, leading to distortions in director selection (Kuhnen (2009)), CEO retention decisions (Nguyen-Dang (2008)), and corporate investment (Guner, Malmendier, and Tate (2008)). In addition, several recent papers argue that network connections through cross-directorships lead to higher executive compensation (Larcker et al. (2005), Barnea and Guedj (2007), and Hwang and Kim (2009)).[5] Our analysis builds on the latter set of literature. We use a broader panel data set than most existing studies (2,083 firms; eight years; 20,189 directors). The time-series dimension allows us to address the potential endogeneity of network ties: we measure the value implications of network ties between directors and CEOs in large U.S. firms using within-firm changes and shocks to network ties due to director deaths and retirements. We also consider a comprehensive set of network ties, including not only current professional ties, but also links through past employment, social activities, and education.

The remainder of the paper is organized as follows. In Section I, we describe the data. In Section II, we describe the construction of our network measures and test the impact of CEO-director ties on director selection. In Section III, we measure the impact of connections on firm value and the strength of corporate governance. Section IV concludes.

I. Data

The core of our data set is biographical information on the directors and top five disclosed earners of publicly traded U.S. companies, obtained from the *BoardEx* database of Management Diagnostics Ltd. Our sample contains information on S&P 1500 firms between 2000 and 2007. For each fiscal year during the sample period, we observe demographic information on each of the firms' directors and top earners, including age, gender, and nationality. We also observe detailed information on their professional and leisure activities. We observe their current place of employment and job title and all corporate boards on which they sit, including information on the board committees on which they serve. In addition, we have detailed information on their employment histories, including organizations in which they work, roles, role descriptions, and years of employment. Outside of the professional realm, we observe other organizations to which they belong (like charities and leisure clubs), the roles they perform in those organizations, and the years in which they are members. Finally, we observe their educational histories, including institutions attended, graduation years, and degrees earned. We provide additional details on the data and its construction in the Appendix.

To perform our analysis, we match the biographical data from *BoardEx* with director-, executive-, and firm-level information from several sources. To measure corporate investment choices at the project level, we merge our data with the *SDC Platinum Mergers & Acquisitions Database*. We include disclosed value deals involving U.S. targets. We exclude leveraged buyouts, exchange offers, repurchases, spinoffs, minority stake purchases, recapitalizations, acquisitions of remaining interest, self-tenders, and privatizations. To measure value changes around merger bids, we obtain stock return information from *CRSP*.

We obtain firm-level financial information from *Compustat*. We use the natural logarithm of the ratio of the market value of assets to book value to proxy for Tobin's *Q*. The book value of assets is total assets. The market value of assets is total assets plus the market value of equity minus the book value of

equity. The market value of equity is the stock price at the end of the fiscal year times common shares outstanding. The book value of equity is total stockholders' equity (or, if that is missing, the first available of total common equity plus total preferred stock or total assets minus total liabilities) minus the liquidating value of preferred stock (or, if that is missing, the first available of the redemption value of preferred stock or total preferred stock) plus deferred taxes and investment tax credit (if available). We measure cash flow as income before extraordinary items plus depreciation scaled by the lag of total assets. ROA is income before extraordinary items plus interest expense scaled by the lag of total assets. Market leverage is long-term debt plus debt in current liabilities, divided by the numerator plus the market value of equity.

Finally, we retrieve two firm-level governance measures constructed using data from the RiskMetrics Group: the GIM index, which measures the number of anti-shareholder provisions in the firm's charter or in state laws to which the firm is subject, and the entrenchment index, which refines the GIM measure by considering only a subset of six provisions that are most related to managerial entrenchment.

Table I contains summary statistics of the data. In Panel A, we provide demographic details at the director level. The data contain 108,770 director-year observations on 20,189 distinct directors. The average age in the sample is 59 and the average director tenure is eight years. Roughly 70% of director-years are served by independent directors and 10% by women. On average, directors sit on 1.5 boards. In Panel B, we summarize the firm-level data. Our sample consists of 11,468 observations on 2,083 firms. The average firm is large, with assets of $14 billion. The typical board has roughly nine members, 69% of whom are independent.

Table I here.

II. CEO-Director Network Connections

A. Social Network Index (SNI)

We use our core biographical data from *BoardEx* to construct several binary measures of network connections between outside directors and the CEOs of their firms. We consider connections of four

types: current employment (CE), prior employment (PE), education (Ed), and other activities (OA). Current employment connections are typically external directorships in the same firm. These connections are more general than traditional "interlocking directorship," since the director need not be an executive of an external firm in which he works with the CEO to qualify as connected (directorship is sufficient). Prior employment connections capture overlapping prior employment in any firm excluding the firm for which we are measuring social ties between the CEO and the board. Education connections require that the director and CEO attended the same school and graduated within one year of each other. Other activities connections are shared memberships in clubs, organizations, or charities.[6] In our sample, directors have other activity ties to the CEO via 1,056 distinct organizations. Among organizations that account for at least 10 CEO-director ties in a sample year are Boy Scouts of America, Conference Board Inc., Commercial Club of Chicago, Kennedy Center Corporate Fund, Boys and Girls Clubs of America, the American Petroleum Institute, the Museum of Science and Industry, Northwestern University, and the Chicago Symphony Orchestra.[7] Also included, though typically less common, are professional organizations like the American Heart Association. One concern is the size and anonymity of some of these organizations. To mitigate this concern, we require active participation in the organization in our definition of OA connections. That is, a director and CEO must be officers or directors in the organization and not merely members to count as connected.[8] A second concern is the degree to which membership in organizations like the American Heart Association might capture a specific expertise, rather than a network tie between the director and CEO. We verify the robustness of our results to including direct measures of expertise (e.g., indicator variables for doctors, lawyers, accountants, and financial experts) as controls in our regressions. We also conduct a parallel analysis in which we exclude OA connections altogether. Our main results are unaffected, confirming that close ties matter whether they derive from a history of common employment or from shared social endeavors. In the Internet Appendix[9], we tabulate the results of our key regressions linking network ties to firm value under this alternative approach.

Our main measure of network ties, Social Network Index (*SNI*), aggregates the number of connections of all four types between the outside director and the CEO. In roughly 16% of director-years, the director

shares a connection with the CEO (*SNI*>0). The most common sources of network connections are past employment and other activities and the least common are education and current employment. This pattern is reassuring, since cross-directorships (i.e., current employment connections) are the most challenging to separate from other firm- and industry-level variation. In Panel A of Table I, we provide director-level summary statistics for the subsamples of directors with at least one *SNI* connection to the CEO and unconnected directors. We also provide *p*-values for *t*-tests of the significance of cross-sample differences in means. Because of the large sample sizes, small economic differences are often nevertheless statistically significant. Notably, roughly 69% of connected directors are statutorily independent, compared to 79% of unconnected directors. To separate the impact of independence from network ties, we either control for independence in our analysis or focus only on connections among independent directors. There are also significant differences in the committee assignments of connected and unconnected directors. In particular, connected directors are significantly more likely to serve on the executive committee.[10]

To conduct firm-level analysis, we compute the percentage of directors who have at least one network tie to the CEO.[11] In Panel B of Table I, we report firm-level summary statistics for firms with percentages above and below the sample median. Connected boards tend to be larger, older, and have older CEOs. Perhaps surprisingly, they also have shorter average director tenure. Notably, connected boards also appear to have lower values of common performance measures: *Q*, cash flow, and ROA, though the last difference is insignificant.[12]

In Panel C of Table I, we present the pairwise correlations of the individual components of the *SNI* measure with each other and with aggregate *SNI*, both at the firm and the director level. The majority of pairwise correlations are positive and significant, suggesting, for example, that a director and CEO who serve together on an external corporate board are also more likely to do charitable work or go to the symphony together.

To illustrate the variation in network ties between CEOs and directors, we map the full set of board ties for Citi Corp in the years 2001 and 2002, during the period in which Citi was assembling its "financial

supermarket" (tabulated in the Internet Appendix). Consistent with the patterns in Table I, the bulk of the network ties occur through past employment and other activities. We find that 56% of the directors share a network tie with CEO Sandy Weill in 2001 and 47% in 2002, well above the sample average of 15% and the banking industry average of 14%, illustrating the substantial cross-sectional variation that exists in board composition across firms. There is also substantial variation over time: between 2001 and 2002, three connected directors leave the board and are replaced by only one new director (who is also connected to Weill). More generally, changes in board connections also occur (1) when there is a change in CEO and (2) when a director or CEO gains or loses an external board seat or activity. We focus on time-series (and within-board) variation in network ties wherever possible to identify their impact separately from omitted firm-level differences. However, even this identification strategy may be insufficient. For example, several connections among the Citi directors arise due to past employment in Travelers before its combination with Citi. To address changes in network ties that may be endogenous to firm policy, we also consider director exits due to deaths and retirements.

B. Director Selection

To assess further the properties of the *SNI* measure, we analyze the firm's choice of new directors. We compare the incidence of pre-existing network ties to the CEO among new directors added by firms with more and less powerful CEOs. Because powerful CEOs have more bargaining power over the director selection process, we expect the characteristics of new directors added in such firms to more fully reflect CEO preferences. A relation between CEO power and *SNI* ties would suggest that close ties matter to the CEO. It is then natural to ask whether this preference is in the interest of the firm's claimholders.

We use the entrenchment index to measure CEO power. Notice in Panel B of Table I that the entrenchment index has a significant positive association with CEO-director connections. We identify all outside directors added to the board during our sample period and measure their connectedness to the CEO at the time they join the board using the *SNI* index. We then regress connectedness on the entrenchment index, controlling for director age and independence, firm size, *Q*, and ROA (all measured at the beginning of the fiscal year in which the director appointment occurs). We cluster the standard

errors at the firm level to account for the possibility that director additions within the same firm are not independent.

Table II presents the results. In Column 1, we find that directors added to the board in firms with more powerful CEOs have significantly more existing network ties to the CEO. The effect is also economically significant. A one standard deviation increase in the entrenchment index (1.3) is associated with an 18% increase in the *SNI* index from its mean. In Column 2, we add fixed effects for the Fama-French 49 industry groups and in Column 3 we supplement the industry effects with year fixed effects. The industry effects account for the possibility that certain businesses require a specific expertise in the management team and that individuals with such expertise share connections through various professional organizations. While ideally we would include a firm effect to capture firm-specific differences in the need for such expertise, the entrenchment index contains little meaningful within-firm variation over the seven year sample period. The year effects account for potential differences in the timing of board changes across firms with more or less powerful CEOs. In both cases, we confirm the positive relation between CEO power and pre-existing network ties between new directors and the CEO.

Table II here.

We also perform a number of robustness checks on the evidence. First, we consider alternative measures of CEO power. We re-estimate the regressions in Table II using consolidation of the titles CEO, chairman of the board, and president (*BOSS*) and CEO tenure as power measures. We find qualitatively similar results, though the results using the entrenchment index are strongest statistically. In the Column 1 specification, for example, we estimate a coefficient of 0.018 on the *BOSS* measure (p-value = 0.08) and 0.013 on CEO tenure (p-value = 0.19). We also consider a third alternative: the ratio of CEO total compensation to total compensation of the next highest paid executive in the firm (Hayward and Hambrick (1997), Bebchuk, Cremers, and Peyer (2007)). The drawback of this measure relative to the other three is the endogeneity of compensation; nevertheless, it yields similar results. In the Column 1 specification, we estimate a coefficient of 0.031 (p-value = 0.02) on the natural logarithm of the compensation ratio. We also use principal component analysis on the correlation matrix of the power

measures to separate the common power component from the idiosyncratic noise in the proxies. In the Internet Appendix, we provide additional details on the construction of a power index using this approach and use it to replicate the results from Table II. In our main analysis, we include the entrenchment index, *BOSS*, and CEO tenure. However, the results are stronger if we include the compensation ratio as a fourth input to the index. We also estimate an additional regression specification, controlling for the percentage of directors already serving on the board at the time of the appointment who have *SNI* connections to the CEO and interacting this control with the CEO power index. We find some evidence that more connections between the CEO and existing directors increases the number of ties between the CEO and newly appointed directors, particularly if the CEO is also powerful, though the statistical significance of the results is sensitive to the specification of CEO power. In this case, the CEO not only has power to influence the selection process, but also has a friendly board already in place to approve his choices.

Overall, our evidence supports the hypothesis that CEOs prefer to have their friends on the board. However, the value implications of this board structure for shareholders are unclear. Powerful CEOs may use their networks to minimize search costs in finding capable directors. They may also have private information about the ability of director candidates with whom they share network ties. On the other hand, we find that our result holds even if we measure connections using only other activities in which both the CEO and director participate. In the Column 3 specification, for example, the coefficient on the entrenchment index is 0.012 with a *t*-statistic of 3.93 using other activity connections as the dependent variable. Thus, CEOs would need to be at least as adept at discerning director quality through charitable or social activities as through shared work experience. Another possibility is CEOs prefer to have their friends on the board because they expect weaker monitoring, to the potential detriment of shareholders. To distinguish these possibilities, we provide direct evidence on the link between *SNI*, firm value, and monitoring intensity in the remainder of the paper.

III. Network Ties and Firm Outcomes

Recent governance reforms have mandated increased director independence, presumably to strengthen monitoring. Yet, there is little reliable evidence linking greater independence to higher firm value. We begin by asking whether the failure to account for network ties between CEOs and directors contributes to this empirical failure. We run a pooled OLS regression of Tobin's *Q* on the number of independent directors on the board, controlling for board size, firm size, market leverage, and the GIM measure of corporate governance.[13] We measure all independent variables at the beginning of the fiscal year and adjust standard errors for clustering at the firm level. Column 1 of Table III reports the results.

Table III here.

The variables generally have the anticipated effects on value: higher leverage, larger board size, and weaker shareholder rights are all associated with lower firm valuations. We also find little impact of independence on firm value, consistent with prior research (e.g., Hermalin and Weisbach, 1991). The effect of independence strengthens, but remains (marginally) insignificant when we correct for year fixed effects (Column 2). To assess the role of connections in undermining the link between independence and value, we re-define independence by subtracting the number of directors with at least one *SNI* connection to the CEO. In Columns 3 and 4, we re-estimate the regressions using this alternative definition of independence. Removing directors with *SNI* ties to the CEO from the set of independent directors reveals a significant positive relation between independence and firm value. The economic magnitude of the effect remains relatively modest: in the Column 4 specification, increasing independence by one standard deviation increases Tobin's *Q* by 5.1% from its mean. The results are similar using the percentage of independent directors as the regressor of interest, with or without the board size control.

The results suggest that unconnectedness captures true independence (and incentives to monitor) better than statutory independence. However, these regressions are subject to the same endogeneity concerns that make the original regression of Tobin's *Q* on independence difficult to interpret. In the cross-section, some firms may be better than others and low director independence may be a symptom rather than the

cause. Board composition may also vary with firm strategy (e.g., firms that grow by internal expansion versus firms that grow by acquisition) and those differences in strategy may be responsible for any differences in performance. In the time series, firms may increase board independence (or remove directors with *SNI* ties) precisely when performance is weak. Or, firms may adjust board composition as they adjust their strategies over time. Thus, our next step is to measure the impact of *SNI* connections on firm value using a more careful identification strategy to address the endogeneity of board composition.

A. Firm Value

Our evidence thus far suggests that network ties between directors and CEOs undermine director independence. In this section, we measure the direct impact of network ties on firm value separately from the impact of independence, focusing on within-firm changes in the fraction of independent directors with at least one *SNI* tie to the CEO. To address the endogeneity of (changes in) board composition, we isolate a subset of changes in board connectedness that are plausibly unrelated to firm performance. Specifically, we consider decreases in connectedness due to director deaths and retirements. We define a director departure as a retirement if the director is at or beyond the company's mandatory retirement age.

One immediate issue is whether to include the death or retirement of a CEO, since these events also sever network ties to the company's sitting directors. Because CEOs are responsible for the day-to-day operations of the firm, a CEO death or retirement is likely to affect many performance-relevant decisions inside the firm, regardless of whether it severs ties with the firm's independent directors. Thus, we do not include such shocks among our set of events. The primary role of independent directors, on the other hand, is not to initiate firm policies, but to advise management and to approve CEO proposals. Thus, the death or retirement of an independent director with a network tie to the CEO is not likely to create operational upheavals that will confound our estimates, but instead is likely to generate a shock to the mechanism of interest: the ease with which the CEO can gain approval for proposed projects.

An advantage of our context is that we observe natural sets of "treatment" and "control" events. In our sample, there are 101 deaths of independent directors and 866 retirements. Of the independent directors who die during the sample, 17 had at least one *SNI* tie to the CEO. Of the independent directors who

retire, 134 were connected to the CEO. Thus, overall, the sample contains 151 events in which a director-CEO tie is severed and 816 "control" events in which no director-CEO links are affected. Our main identification strategy is to compute the difference in value changes around the two types of event. The differences-in-differences approach corrects for other (unobserved) factors that might be associated with both the death or retirement of directors and changes in firm value. We also subdivide our sample based on shareholder rights, measured using the GIM index. If different governance mechanisms are substitutes, we expect to see a greater impact of weak board monitoring among firms that also have weak shareholder rights.

In Panel A of Figure 1, we plot Tobin's *Q* for the seven-year window around the death or retirement of an independent director, where year 0 is the end of the fiscal year in which the death or retirement occurs. We plot separate time paths for directors with and without network ties to the CEO to separate the impact of network ties from the general effect of independent director death or retirement. Among connected directors we observe a noticeable improvement in firm value over the event window. The average change in value from year -1 (the last observation of *Q* before the event) to year +2 is 0.093, significant at the 5% level using standard errors adjusted for firm-level clustering.[14]

Figure 1 here.

Notably, there appears to be some improvement in value from -2 to -1. However, our identification of the "event year" (year 0) is clearly an upper bound. Consider, for example, a hypothetical firm with a fiscal year ending in December. If a connected director died in early January of 2003, we would classify fiscal year 2003 as year 0 (so that *Q* in year 0 is the value observed in December of 2003, after the death). If this director had an illness prior to death, it is possible that the connection was effectively severed during 2002. This would not make the event less valid for identification, but the year -1 value of *Q* (observed in December of 2002) would now capture value after the "true" event date. Since stock prices can and should adjust quickly to incorporate new information about future firm value, it would be reasonable to expect some adjustment to the change in board composition in the year of the change. Moreover, it is important to note the flatness in the plot from year -3 to year -2 (and from +2 to +3). This suggests that

the value changes we observe within the -3 to +3 window are associated with the event and are not part of a longer-term continuous time trend. By contrast, firm value appears to be flat around the deaths and retirements of unconnected directors. The average change in value from year -1 to year +2 is a statistically insignificant 0.013. Moreover, the difference in the average value change between connected and unconnected director departures (0.079) is statistically significant at the 10% level (*p*-value = 0.055). Though firm value is lower in firms with connected directors in year -3, it appears to converge to the value among firms with unconnected directors by year +3. In Panels B and C, we split the sample using the value of the GIM index at the time of the death or retirement event. Firms with index values below (above) the sample median have strong (weak) shareholder rights. We find that the improvement in value from removing independent directors with ties to the CEO is concentrated in the set of firms with weak shareholder rights (Panel C). Among these firms, the average change in value from year -1 to year +2 is 0.136, significant at the 1% level. In firms with strong shareholder rights, the effect is an insignificant 0.031 over the same horizon.[15]

Next, we analyze these patterns in a formal differences-in-differences framework. We define an indicator variable *After* that takes the value one for each full fiscal year after the death or retirement of an independent director. We also interact *After* with an indicator for connected deaths or retirements (i.e., cases in which the exiting independent director had at least one *SNI* tie to the CEO). We then regress Tobin's *Q* on *After* and its interaction with the connections indicator for the sample of firms that experience an independent director death or retirement. All regressions contain firm fixed effects and include only firms for which we observe at least one fiscal year before and at least one fiscal year after the event. Thus, the coefficient on *After* captures the average within-firm change in value around events involving unconnected independent directors. The coefficient on the interaction captures the difference in differences, or the impact of *SNI* connections on the value change. Because individual firms can experience multiple events, we include a panel of firm-years for each individual event and adjust for a panel-specific firm effect. Standard errors are clustered at the firm level to correct both for the repetition of firm-years across such events and for within-firm serial correlation of the residuals.

In Column 1 of Table IV, we present a baseline regression without controls for the symmetric window containing the five fiscal years around each event ([-2,2]). We estimate an overall change in value of 0.1036 among firms that lose a connected independent director to death or retirement, an effect that is significant at the 1% level. When unconnected directors exit, we observe a 0.0332 increase in value. The difference in differences is 0.0704, which is statistically significant at the 10% level. In Column 2, we re-introduce standard valuation regression controls from Table III: firm size, market leverage, board size, director independence, and the GIM governance index. The controls appear to explain a portion of the value increase among firms that experience unconnected director exits, but have little impact on our estimate of the difference in differences. Economically, an effect of 0.07 represents a 16% increase in Tobin's *Q* from its mean. De-logging, this effect translates to a 7.2% increase in market value scaled by book assets.

Table IV here.

In Columns 3 and 4, we re-estimate the specification from Column 2 over two alternative event windows: [-1,2] and [-3,3]. The first window "stacks the deck" against finding changes in the connected sample (or a significant difference in differences) by excluding the lower year -2 and -3 values of Tobin's *Q* from the calculation of average pre-event value. We find a significant difference in differences over both windows. Not surprisingly, the shorter [-1,2] window provides the smallest point estimate (0.0639); however, it also gives the most statistically reliable estimate. Overall, there is no evidence that our conclusions are sensitive to the choice of event window.

Our results are consistent with the hypothesis that connected independent directors provide weaker monitoring. Thus, in Column 5 to 7, we investigate whether the effect is mitigated in the presence of strong shareholder rights to substitute for active governance by the board. We split the sample of independent director deaths and retirements based on the value of the GIM index at the beginning of the event year. We classify firms with GIM below the sample median (10) as having strong shareholder rights (Column 4) and firms with GIM at or above the sample median as having weak shareholder rights (Column 5). We find that the increase in value around the departure of connected directors is indeed

concentrated in firms with weak shareholder rights. We find a difference in differences of 0.099, significant at the 5% level, in this subsample. By contrast, there is no significant difference among firms with strong shareholder rights. Finally, in Column 7 we test whether the cross-subsample difference is significant by running a full-sample regression including the triple interaction of *After* with the dummy for connectedness and a dummy for weak shareholder rights. Though similar in magnitude to our baseline differences-in-differences estimates, the triple interaction effect is not statistically significant.

As a robustness check, we also consider the significance of the change in value around the deaths or retirements of connected independent directors relative to an alternative benchmark. Instead of using value changes around the death or retirement of unconnected independent directors as the benchmark, we match each firm that experienced a connected independent director death or retirement to a similar firm (or firms) that did not experience a shock to board composition. This approach is similar to the identification strategy used by Azoulay, Graff Zivin, and Wang (2010) to estimate the impact of "superstar" academics on the productivity of their collaborators. We compare value changes in the treated and control samples to compute the average treatment effect for the treated, using the nearest-neighbor matching technology developed by Abadie and Imbens (2011) and used in recent studies by Colak and Whited (2007) and Malmendier and Tate (2009). We provide additional details and estimates in the Internet Appendix. We find that not only the direction, but also the magnitude of our estimates is nearly identical to the differences-in-differences estimates in Table IV, even though the benchmark samples are completely different. Thus, our result that connections between independent directors and the CEO lead to lower firm value does not appear to be an artifact of choosing any one particular estimation methodology.

Thus far, our results suggest that connections to the CEO among independent directors lower firm value, particularly in the absence of strong substitutes for board monitoring. Next, we re-visit the basic valuation regressions from Table III. In Column 1 of Table V, we re-run the regression, but including the percentage of independent directors with a network tie to the CEO as a separate explanatory variable from director independence. The regression mirrors our findings thus far: the coefficient on the network ties

variable is negative and significant, but, having controlled for this effect, the coefficient on independence is positive and marginally significant.

Table V here.

In the next two columns, we employ our death and retirement variables as instruments to account for the endogeneity of connections in this baseline regression. To adapt our approach to a firm-year panel regression, we define the instruments as follows. First, we count in each firm the number of independent directors with network ties to the CEO who have died during the sample period up to the current fiscal year (*Deceased Director*). Second, we count the retirements of connected directors using the same procedure (*Retired Director*). We use the instruments only in regressions that include firm fixed effects; thus, our estimates use the changes in network ties around death or retirement "events" for identification (i.e., identification comes from differences in average *Q* around increments of the step functions defined by the instruments). Because this specification does not benchmark the effect of connected departures with the effect of unconnected departures, the control variables play a more important role. That is, we cannot rely on differencing to partial out characteristics that are (on average) similar across groups. Thus, in addition to the controls from Column 1, we add direct controls for director and CEO age and tenure to control for the impact of age and experience on the likelihood of death or retirement. Finally, because it has limited within-firm variation over our seven-year sample, we exclude the GIM index from these regressions. As elsewhere, standard errors are clustered at the firm level. The first-stage regression confirms that the death or retirement of a connected independent director leads to a significant decrease in the percent of independent directors with ties to the CEO (Column 2).[16] This result suggests that firms are unable to immediately replace connected independent directors with equally connected new directors. In the second stage, we use only the within-firm decreases in network ties between independent directors and the CEO that are predicted by the death and retirement instruments to identify the effect on firm value. We again find that network ties predict lower firm value. At the mean number of independent directors, removing one connected director would decrease the percentage of independent directors by roughly 0.148 and increase firm value by roughly 0.098, an effect similar in magnitude to the event

studies on the connected sample. In Columns 4 to 7, we split the sample at the median of the GIM index and re-estimate the IV regressions on the two subsamples. We again find that the implied improvement in firm value from removing a connected director is stronger in the subsample of firms with weak shareholder rights. Overall, we confirm the results from the differences-in-differences analysis in the instrumental variables setting and tie our valuation results back to our motivating panel regression of firm value on director independence.

Before turning to our next set of tests, it is important to address the limitations of our identification strategy. We measure the impact of independent director connections on value using only within-firm changes in the degree of connectedness due to independent director deaths or retirements. The identifying assumption is that such departures – unlike typical board exits – are not driven by firm performance itself. Deaths provide a nearly ideal shock for identification in the sense that it is difficult to tell plausible stories for how this assumption would generally fail. Though there may be some anticipation of director death in certain cases, it is important to note that (1) the directors are still on the board in the year of their deaths (suggesting at least some surprise in their passing) and (2) our evidence suggests that deaths nevertheless predict significant variation in independent director connectedness. Director retirements, on the other hand, are easier to anticipate; though, again, our evidence suggests that firms cannot or do not fully mitigate the impact of connected director retirements on overall board connectedness. A larger issue is that some directors remain on the board beyond their scheduled retirement years. In the absence of strict enforcement of firms' mandatory retirement ages, there is the possibility that directors' ultimate retirement dates are determined not just by age and personal considerations, but also by firm performance. We have shown that connected directors retire just prior to performance improvements, but there is no evidence that the retirement times of unconnected independent directors are influenced by performance in any way.[17] The remaining concern, then, is that connected directors do not cause the observed bad performance (e.g., by performing less monitoring), but for some reason are more useful in hard times. The latter story seems less plausible given that there is no evidence that firms choose more connected new directors in times of weak performance (Table II). Adding firm fixed effects to the specifications in Table

II does not reveal a within-firm relation between performance and the connections of newly added directors.

As a final step, we briefly analyze independent director deaths in isolation. In Panel A of Figure 2, we replicate the graph of firm value from Panel A of Figure 1, but using only independent director deaths to define events.

Figure 2 here.

We observe a similar pattern: value is lower among connected firms prior to the event, but converges after the death of the connected independent director. We also replicate the analysis splitting the sample into firms with strong and weak shareholder rights. Again, we find a similar pattern to Figure 1: the improvement in value around connected independent director deaths appears to be concentrated in firms with weak shareholder rights.[18] It is evident from Panel A of Figure 2 that performance is relatively flat over the horizon -3 to -1 around a connected director death and again following the death from (the end of) year 0 to year 3. We compute the difference in differences over our standard -2 to +2 horizon. We find an improvement in value around connected director deaths of 0.077, which is significant at the 5% level using errors clustered at the firm level. Comparing mean performance around the deaths of unconnected directors over the same horizon does not yield any significant change (0.020; *p*-value =0.46). Finally, the difference in differences is 0.057, which is marginally insignificant (*p*-value = 0.125). Because there are only 17 deaths of connected directors, it is not feasible to perform our full multivariate regression analysis using only deaths as events. Though not entirely conclusive, the pattern around director deaths looks quite similar to the pattern around retirement, lending credence to the causal interpretation. In the next section, we strengthen this interpretation by providing direct evidence of weaker monitoring by boards with more connections to the CEO.

B. Monitoring Intensity

One of the ostensible benefits of independent directors is increased monitoring: relative to insiders, independent directors should be more willing to vote against managerial initiatives that are harmful to

shareholders. Conversely, a board in which independent directors are tied to the CEO may produce less diversity of opinion or dissent, ultimately destroying firm value.

In this section, we test whether network ties between independent directors and the CEO affect monitoring intensity, focusing on the firm's acquisition decisions. We focus on acquisitions for several reasons. First, acquisitions are often initiated by the CEO, but require board approval. Second, even a single acquisition can have major value consequences for the acquiring firm's shareholders. Third, acquisitions have observable announcement dates and project characteristics, which allow us to connect decisions to firm value changes in an event study framework. Finally, major investment projects, such as acquisitions, fall within the purview of the executive committee. We observe that directors with external network ties to the CEO are overrepresented on the executive committee (See Table I and the Internet Appendix).[19]

In Panel A of Table VI, we analyze the effect of network ties on merger frequency. We estimate a logit regression in which the binary dependent variable indicates at least one merger bid in excess of $10 million during the fiscal year. We cluster standard errors at the firm level.

Table VI here.

In Column 1, we present the baseline regression including only the percentage of independent directors with network ties to the CEO at the beginning of the fiscal year as an explanatory variable. We find a modest positive effect: the odds of a merger are 1.1 times higher in a company with a one standard deviation higher percentage of connected independent directors. In Column 2, we introduce firm fixed effects in a conditional logit regression. The fixed effects capture time-invariant differences across firms in acquisitiveness, addressing, for example, the concern that there are more network ties between independent directors and the CEO in firms that grow by acquisition versus firms that grow through internal investment. We also add common time-varying determinants of merger decisions as controls: firm cash flow, *Q*, market leverage, and board size and independence, all measured at the beginning of the fiscal year. Finally, we add year fixed effects to capture waves in merger activity. As expected, we find that firm cash flow has a positive effect on merger odds, while the effect of leverage is negative. The

coefficient on network ties is again positive: the odds of a merger are 1.15 times higher when a firm increases its percentage of connected independent directors by one standard deviation. In Column 3, we exploit variation in the influence of connected directors over acquisition decisions. In particular, we test whether the impact of networked directors on merger frequency is highest when networked directors sit on the executive committee. We also add additional controls for the size and independence of the executive committee. One obstacle to this test is that we must restrict our sample to companies that have an identifiable executive committee, lowering the power of our analysis. Nevertheless, we find an economically stronger positive impact of networked directors on merger frequency when those directors sit on the executive committee. The odds of a merger are 1.27 times higher when a firm increases its percentage of connected independent directors on the executive committee by one standard deviation.

In the context of mergers, the impact of network ties between the board and CEO are particularly challenging to interpret due to endogeneity concerns. Firms may have more network ties between directors and the CEO because they have done acquisitions in the past and added directors from the target companies (as in the Citi example in Section II). Or, firms may add directors with lots of network connections (including, potentially, to the CEO) in anticipation of pursuing future acquisitions and using information they can gather through those network conduits. In Columns 4 and 5, we address the endogeneity of independent director network ties to the CEO using the death and retirement instruments we developed in Section III.A. Using a two-stage least squares approach allows us to identify the impact of CEO-director ties on merger frequency using only the subset of within-firm changes in the percentage of independent directors with ties to the CEO that are due to connected director deaths or retirements. It is important to note that the coefficient estimates are not directly comparable to the odds ratios reported in Columns 1 through 3. Column 4 reports the first-stage estimation, regressing the percentage of independent directors with network ties to the CEO on the two instruments, our prior set of control variables, and firm and year fixed effects. As in Section III.A, we control for the annual maximum age and tenure of the board's independent directors and the age and tenure of the CEO, measured at the beginning of the fiscal year.[20] The death and retirement instruments have a strong negative impact on the

percentage of directors tied to the CEO. A Wald test rejects at 1% the hypothesis that the instruments have no effect on the endogenous variable. In Column 5, we report the second-stage estimation, which regresses the binary indicator of merger activity during the fiscal year on the controls and the variation in the percentage of networked directors predicted by the instruments. As in the prior estimations, we find a positive, and marginally significant, effect. We also verify that we cannot reject the overidentifying restrictions of the model (*p*-value = 0.75). Economically, a one standard deviation increase in the percentage of independent directors with network ties to the CEO increases the probability of a merger by roughly 0.16 (from its mean of 0.26).

Heightened acquisition activity on its own need not indicate weaker board monitoring. If firms underinvest on average, then the extra mergers we observe when the board has closer ties to the CEO could increase shareholder value. In this case, less true independence on the board would be optimal, since it removes a roadblock toward implementing value-improving projects. To distinguish this possibility from weaker monitoring (or, a failure of connected independent directors to curtail CEO empire-building tendencies), we analyze the market reaction to merger bids. To ensure that deals are large enough to impact the stock price of firms in our sample of S&P 1500 companies, we require that the value of the transaction be at least 10% of the acquirer's market capitalization at the beginning of the fiscal year in which the deal takes place.[21] We measure daily abnormal returns as the return to the acquirer's stock minus expected returns from a market model with parameters estimated using up to a year of daily stock returns (over a period ending 20 days prior to the announcement) and using the CRSP value-weighted index to measure market returns.[22] We report cumulative abnormal returns (CARs) over the three-day window [-1, +1], where day 0 is the date on which the firm announces the merger bid. We cluster standard errors by event date to control for cross-sectional return correlation.[23] In Panel B of Table VI, we report the market reaction to all merger bids in our sample (Column 1), stock bids (Column 3), and cash bids (Column 4). We also split merger bids based on the acquirer's level of the GIM index. Column 5 reports the CARs to bidders with index levels below the sample median (10) and Column 6 reports CARs for bidders above the median. Our results are consistent with prior findings: the average bid has a

negative, but insignificant impact on the acquirer's stock price. Cash bids have positive and significant CARs, but stock bids have stronger (in magnitude) negative CARs. Bids by companies with weak shareholder rights have negative and insignificant CARs while bids by companies with strong shareholder rights have essentially no impact on acquirer value.

The remaining rows report returns to bidders depending on the connectedness of the acquirer's directors to the company's CEO. We split the sample at the median percentage of independent directors with network ties to the CEO and compute the CAR to merger bids separately in each group. The final row on the table reports the magnitude and statistical significance of the difference between the market's reaction to bids by firms in the two groups. In Column 1, we find that the mean CAR to merger bids among firms with a high degree of connectedness between independent directors and the CEO is negative and significant (81 basis points over three days). Among firms with few or no connections, on the other hand, the mean CAR is positive (15 basis points), though insignificant. The difference between the two groups (1%) is statistically significant at the 10% level. Thus, extra acquisitiveness among firms with less true independence of the directors from the CEO appears to destroy shareholder value. In the Internet Appendix, we verify that this short-term loss is not reversed in the long run.

We also make several additional cross-group comparisons of the short-run market reaction to merger bids. In Column 2, we compare CARs among firms with more and fewer connections between the CEO and executive committee. Mirroring Panel A, the value destruction in firms with many executive committee connections (96 basis points) is larger than the value destruction in firms with many board-level connections, though the difference between connected and unconnected firms is slightly smaller than the board-level difference. We also find little difference in the frequency of stock bids between firms with more and fewer connections between directors and the CEO, and lower CARs among connected firms for both types of deal. Thus, the negative CARs in the full sample are not explained by different financing choices in firms with connected boards. Most interestingly, we find that the market reacts negatively only to the merger bids of firms with more ties between independent directors and the CEO and weak shareholder rights, as measured by the GIM index (Column 6). The effect is large (1.3%) and

statistically significant at the 1% level. When shareholder rights are strong, the mean market reaction to merger bids is small and insignificant in firms with and without director ties to the CEO (Column 5). Likewise, in firms with few connections between directors and the CEO, but weak shareholder rights, there is a positive and insignificant mean market reaction to merger bids. This result suggests that strong shareholder rights can substitute for strong internal governance: only when both types of governance are weak do we see overinvestment to the detriment of the shareholders. Finally, to quantify the value destruction due to merger bids, we multiply the three-day CAR times the pre-bid acquirer market capitalization for each merger bid. On average, merger bids in the high connections subsample destroy $473 million in shareholder value, $354 million more than the average bid in the low connections group.[24]

Overall, our results mirror our findings on firm value, providing evidence of a mechanism through which CEO-director ties lower firm value. To gauge the potential importance of this mechanism, we compare the magnitudes of the value destruction around merger bids to the overall value effect measured in Section III.A. We use the estimates from Column 3 of Table V to compute the economic magnitude of the effect on overall firm value. The median firm in the regression sample has total assets of $2.422B.[25] Since median *Q* is 1.51, this implies assets have a market valuation of $3.653B. Thus, a one standard deviation increase in the percentage of independent directors with ties to the CEO (0.21) results in a $499M decline in firm value. Comparing to our estimates in Table VI, the decline in overall firm value is roughly 1.05 times the mean value destroyed by an acquisition in a firm with abnormally high CEO-director connections ($473M). Thus, the failure by a connected board to reject roughly one additional (bad) CEO-inspired merger could generate a discount in firm value roughly equal to what we measure in the data.

IV. Conclusion and Discussion

A well-functioning board of directors provides both valuable advice to management and a check on its policies. An effective director should not just “rubber stamp” management’s actions, but should take a contrarian opinion when management’s proposals are not in the interest of the firm’s shareholders. Thus,

it is important to identify director characteristics that affect their ability or willingness to bring valuable new information into the firm and to properly perform their monitoring role. Our results suggest that adding directors with external network ties to the CEO may undermine the effectiveness of corporate governance.

We find that firms in which a high percentage of independent directors have external network ties to the CEO make more frequent acquisitions than firms with fewer CEO-director connections. Moreover, these acquisitions destroy shareholder value on average, particularly in firms that also have weak shareholder rights. More generally, we find that firm value – measured by Tobin's Q – improves when independent directors with ties to the CEO leave the board. Consistent with weaker monitoring as the mechanism, firms with more powerful CEOs are more likely to appoint new directors with pre-existing network ties to the CEO. That is, more powerful CEOs exploit their heightened bargaining power over the selection process to shape the board according to their preferences.

Though our results provide clear evidence on the consequences of CEO-director ties for shareholders, they provide less insight into the motivation of connected independent directors. One possibility is that connected directors agree to serve on the board to expedite the CEO's agenda and are complicit in the value-destroying decisions that result. Connected directors may realize that certain policies proposed by the CEO are not in the shareholders' interest, but are reluctant to oppose them for fear of losing valuable external social ties or future career opportunities. Another possibility, however, is that close ties between the CEO and the board and resulting similarities in backgrounds and experiences increase the extent to which the board and management engage in "groupthink" while determining firm policies (Janis (1972)). Directors may be more willing to give the benefit of the doubt to management when they have a closer relationship with (or more trust in) the CEO. An attractive aspect of this story is that it does not require the directors (or CEO) to consciously disregard shareholder interests. Instead, failure to gather sufficient information or to adequately consider all alternatives might result from common cognitive biases.

Regardless of which motives dominate, our results have important implications for the corporate governance debate. We find evidence that external governance mechanisms can substitute for weak

internal governance. The negative reaction to merger bids among firms with many network ties between independent directors and the CEO and the reduction in Tobin's *Q* are strongest in firms with weak shareholder rights. We also ask whether the governance reforms mandated by SOX have had a significant impact on the prevalence of CEO-director ties that fall outside the scope of the formal definition of independence. Romano (2005), for example, argues that reforms mandating increased board independence are window-dressing since firms can circumvent the requirements by hiring directors who satisfy the statutory requirements for independence, but who are nonetheless captured by the CEO. We split our sample into firms that were compliant with the SOX mandate of at least 50% independent directors at the end of the last fiscal year to end prior to passage of the legislation and firms that were not. Confirming the patterns in Duchin, Matsusaka, and Ozbas (2010), we find a sharp increase in board independence beginning in 2002 and continuing through 2005. We also see convergence in the percentage of independent directors among firms that were compliant with SOX prior to its passage and firms that were not. On the other hand, we see no pattern in the percentage of independent directors with network ties to the CEO over time: the frequency of such directors on the board and the rate at which they are added to boards stay roughly constant throughout the sample period (Figure 3). Thus, network ties between independent directors and the CEO remain an important issue for optimal board composition and corporate governance design.

Figure 3 here.

Finally, we ask whether there is any relation between the prevalence of CEO-director network ties and a firm's likelihood of participating in the TARP program during the financial crisis of late 2008. We find higher percentages of connected independent directors among the TARP companies at the end of our sample period (2007). On average, 38.6% of independent directors in TARP-participating banks have network ties to the CEO, compared to an industry average of 13.6% and our overall sample average of 15%. Likewise, 30% of directors in General Motors have such connections, compared to an industry average of 2.28%. Though merely suggestive, this evidence implies that board composition should be a continuing target of regulatory reforms. Moreover, future academic research on the implications of

director independence for corporate policies should consider carefully the deviation between the economic notion of independence and the types of director that fulfill statutory independence requirements.

Appendix

Our analysis uses information from the *BoardEx* database of Management Diagnostics Ltd. *BoardEx* collects information on company executives and directors of U.S. companies from SEC filings (proxy statements, annual reports, and 8-k filings), company press releases, corporate websites, and U.S. stock exchanges (NYSE, Amex, and NASDAQ). It also supplements this information using reliable press sources, such as the *Financial Times* and *Wall Street Journal*. *BoardEx* began collecting information on U.S. companies in 2003, starting with the largest market capitalization firms. For this initial sample, *BoardEx* researched company details (including the identity of all executive and directors) for the three previous years (back to 2000). They then constructed a historical profile of each executive and director. These profiles contain detailed information on the individual's work history, education, nonbusiness-related activities (like charitable work or club memberships), and awards, including positions in companies not themselves covered by the database. In 2005, *BoardEx* dramatically increased its sample of U.S. firms, researching company details back (only) to 2003 for the new firms. Currently, the database covers 7,215 U.S.-based companies.

We restrict our analysis to S&P 1500 firms between the years 2000 and 2007.[26] Given the specifications of the *BoardEx* database, it is not possible to construct exhaustive data on board composition in U.S. firms prior to 2000. While any directors or company executives who serve in any *BoardEx*-covered firm between 2000 and 2007 would be present in the database (with full historical biographical information), any directors or executives who left the company prior to 2000 and did not have later experience in a *BoardEx* firm would not be included, even for companies that are themselves part of the *BoardEx* universe after 2000. Thus, constructing a "panel" data set on board composition prior to 2000 would entail a survivorship bias, requiring either the analysis of incomplete information on sample firms' board composition or a restriction to only firms in which all directors appear in the *BoardEx* director pool after the year 2000. We also verify the completeness of the director identification on our 2000 to 2007 sample period by merging the *BoardEx* sample with directors data from *RiskMetrics*

(IRRC) for firm-years shared by both data sets. Restricting the time period to years after 2000, however, does not address the potential bias introduced by the increase in the *BoardEx* universe in 2005 (described above). Because *BoardEx* used market capitalization to prioritize data collection, the initial 2003 sample covers a large majority of the S&P 1500 firms: at most 23% of such firms were added as part of the 2005 expansion. Thus, our restriction to S&P 1500 firms should mitigate the problem. But, as a result, it is unclear whether the patterns we identify in our analysis will extrapolate to smaller firms.

Finally, because *BoardEx* collects data not only from required corporate disclosures, but also from the press and company websites, it is possible that there are differences in the quality of the biographical data across companies and over time. This issue is most important for the data on education and nonbusiness activities, since the SEC does not require companies to disclose this information on the proxy statement to shareholders. In our analysis, we include firm and year fixed effects to capture these differences. By identifying the impact of board composition using within-firm changes, for example, we can remove the impact of differences across firms in media coverage. More difficult to address, however, are differences in data quality across individuals on the same board. Such differences may be limited in practice, since *BoardEx* follows the same search procedures for each individual and companies appear to enforce a degree of commonality in the reporting of director information on their company websites (e.g., education information is reported either for all directors or for none). We also restrict our sample to companies tracked as part of a prominent index (the S&P 1500), which should maximize the amount and quality of available director information in press and company sources. We also test whether our inclusion of all S&P 1500 firms, and, in particular, firms outside the S&P 500, might introduce biases due to differential coverage of directors in the "most prestigious" firms (or within-firm changes in the quality of coverage as firm prestige increases). We find that our key estimates are virtually unaffected (and typically slightly larger in magnitude) when we restrict our analysis only to sample years in which firms were members of the S&P 500 or to firms that were part of the S&P 500 in 2000, though our tests are (necessarily) less powerful.

Indeed, our sample data appear to be reasonably comprehensive. We observe information on education for approximately 82% of directors. The missing data are not randomly distributed over the sample; notably, we are significantly less likely to observe missing education information in larger firms, but more likely for older directors with longer tenure on the board. This pattern, however, is consistent either with variation in the quality of the primitive data sources or with variation in the presence of directors with no higher education (or a combination of the two). Likewise, we have information covering 88,369 nonbusiness activities among 29,983 directors and disclosed earners in sample firms, for an average of approximately three activities per individual. Roughly one quarter of directors do not have any included nonbusiness activities. In this context, it is even more challenging to separate missing information from a lack of participation in relevant activities. We find, again, that a lack of activities is more common among smaller firms and among longer-tenured directors. However, unlike education data, older directors are significantly less likely to lack nonbusiness activities. The latter finding suggests that lower data quality for activities that occur further in the past may not be a first-order concern. Ultimately, our classification scheme includes directors with missing information in the control sample. Thus, any ties we miss between these directors and the CEO should attenuate the measured differences between the treated and control samples. We also control directly for characteristics like firm size, director age, and director tenure, which may both predict firm outcomes and correlate with data quality.

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[1] For background on the formation of social networks and their role in organizations, see Watts (2003), Kilduff and Tsai (2003), McPherson, Smith-Lovin, and Cook (2001), Laumann (1973), and Marsden (1987).

[2] Subrahmanyam (2008) constructs a model in which firms trade off information flow about managerial ability against lax monitoring in deciding whether to add networked directors to the board.

[3] See Hermalin and Weisbach (2003) for a survey of the extensive empirical literature.

[4] In this sense, our analysis complements Masulis and Mobbs (2009), who try to separate inside directors who improve monitoring from those who are captured by the CEO.

[5] An earlier literature finds little evidence that director interlocks significantly increase CEO pay (Core, Holthausen and Larcker (1999), Hallock (1997)).

[6] We do not impose a restriction on the timing of other activities. Though our information on education, employment, and other activities is comprehensive, we do not always observe the start and end date for each endeavor. This problem is most severe for other activities. We do not observe the start date roughly 53% of the time and the end date 38% of the time and cannot classify a director and CEO as linked if we require overlapping tenures. Including them in the control sample may severely attenuate the measured impact of network connections on decision-making. However, the error in our specification is likely to be small. Most of the other activities – like golf memberships and charitable work – are long-lasting activities, so that two members for whom we do not observe the exact start and end dates are highly likely to have overlapping tenures.

[7] In the Internet Appendix, we list the 50 organizations that generate the most CEO-director ties.

[8] This restriction makes little difference to our results. For some activities, like membership in Augusta National Golf Club, any membership is likely to be an "active" membership (since the purpose of the organization is to engage in social activity). We also estimate a specification in which we relax the requirement of active membership for these types of social clubs, with little impact on the results.

[9] The Internet Appendix is available at http://www.afajof.org/supplements.asp.

[10] In the Internet Appendix, we confirm these patterns using pooled and fixed effects regressions.

[11] Our results are qualitatively unchanged if we instead consider the number of directors with ties to the CEO or the total number of network ties between directors and the CEO (controlling for board size).

[12] In Table I, we report statistics on *Q* measured in levels. However, in all regression analyses that follow, *Q* is included in log form to address the clear skewness in its distribution.

[13] We use Tobin's *Q* to proxy for firm value following, for example, Hermalin and Weisbach (1991), Morck, Shleifer, and Vishny (1988), and Villalonga and Amit (2006). Scaling the market value of assets by book assets removes heteroskedasticity. Moreover, high ratios (partially) capture a stronger market belief in the ability of management to productively deploy assets in the future.

[14] Note that the average change in *Q* does not exactly equal the changes in average *Q* observable in Figure 1 due to a small number of firms with missing values of *Q* at -1 or +2.

[15] In Panel B, we see a difference in the level of *Q* between firms that experience exits of connected and unconnected independent directors. However, it is important to note that these plots are univariate and do not control for factors like board size and the number of independent directors, which predict both value and connections. The key finding in the figure is the lack of any apparent trends in value around either type of event.

[16] A Wald test rejects at the 1% level the hypothesis that the instruments are uncorrelated with the endogenous regressor. We also verify that we cannot reject the overidentifying restrictions of the model (p-value = 0.66).

[17] See also the Internet Appendix for a regression analysis of the general predictors of director retirement. We also exclude early retirements from our analysis for precisely these reasons; in those cases, age or illness are less likely to be the first-order determinant of the retirement choice.

[18] We only graph value changes out to year 2 in the subsamples, since there is only one remaining observation in year 3 among the connected director deaths in the strong shareholder rights subsample.

[19] This result comes from observing a snapshot of board composition. A careful analysis of how committee memberships are allocated across directors is beyond the scope of this paper.

[20] We test the robustness of the results to several specifications of the age and tenure controls. Including mean director age and tenure rather than the maximum, for example, yields stronger results.

[21] Many prior studies instead use a 5% threshold (see, for example, Morck, Shleifer, and Vishny (1990)). Our results are robust to using the lower threshold. However, our results appear to be strongest for the largest deals.

[22] The results are nearly identical using a simple market adjustment in which abnormal returns are the difference between daily stock returns and the same-day *CRSP* value-weighted index return.

[23] Since few events in our sample overlap in time, clustering has little impact on the standard errors. The results are also robust to clustering at the firm level, as elsewhere in the paper.

[24] The value destruction among high connection firms is significant at the 1% level and the difference at the 5% level. Interestingly, the bulk of this difference comes in stock, and not cash, deals. Even though the difference in CARs between high and low connection firms is larger in magnitude for the cash deals, this finding suggests that the larger size of stock deals leads to a greater loss in dollar value.

[25] We make our computations at the median because of the large skewness of the firm size distribution and because we are looking at the effect in levels rather than logs. Thus, we avoid overestimating the magnitude of the effect due to the impact on mean assets of a handful of massive firms (like Citi).

[26] Because Management Diagnostics began their data collection in 2003, firms that were part of the S&P 1500 between 2000 and 2003, but delisted before 2003 are not part of the *BoardEx* universe and cannot be included in our analysis. Our download consists of data from 2000 to 2007 for all S&P 1500 firms as of 2007 plus S&P 1500 firms that delisted between 2003 and 2007. Our key estimations include firm fixed effects in part to correct for any biases related to this sample selection.

Table I
Summary Statistics

Social Network Index (SNI) is the sum of *Current Employment Connection* , *Prior Employment Connection* , *Education Connection* , and *Other Activity Connection* . *Current Employment Connection* indicates that both the director and CEO currently serve externally in at least one common firm. *Prior Employment Connection* indicates that the director and CEO both served in at least one common company in the past, excluding prior roles in the company in question. *Education Connection* indicates that the director and CEO attended the same school at the same time. *Other Activity Connection* indicates that the director and CEO share active membership in at least one nonprofessional organization. *Financial Education* is an indicator equal to one if the director is an MBA, CPA, CFA, or has a degree in economics, management, accounting, or business. *Financial Role* is an indicator for past or current experience as a CFO, Treasurer, Accountant, or Vice President for Finance. *Financial Industry Experience* is an indicator for current or past employment in a financial firm (SIC 6000-6999). *%x* is the percentage of directors on the board with characteristic x. For the connection variables, *%x* excludes the CEO from the numerator. *ROA* is net income plus interest expense divided by the lag of total assets. *Q* is total assets plus market equity minus book equity, divided by total assets. *Cash Flow* is net income plus depreciation, scaled by beginning-of-year total assets. *Market Leverage* is long-term debt plus debt in current liabilities, divided by the numerator plus market equity. *Entrenchment Index* measures antishareholder charter provisions and is defined and constructed by Bebchuk, Cohen, and Ferrell (2004). *Total Compensation Ratio* is the ratio of CEO total compensation to the total compensation of the next highest paid executive in the firm. In Panel A, *Connected (Unconnected) Directors* have values of *SNI* greater than (equal to) zero. In Panel B, *Connected (Unconnected) Boards* have a percentage of directors with at least one *SNI* tie to the CEO greater than (less than or equal to) the sample median. Standard errors used to test differences in means between the connected and unconnected subsamples are adjusted for firm-level clustering.

													p -value
	Obs.	Mean	Median	Std. Dev.	Obs.	Mean	Median	Std. Dev.	Obs.	Mean	Median	Std. Dev.	(C-U)
Panel A. Director-Year Data (20,189 Directors)													
	Full Sample				Connected Directors				Unconnected Directors				
Age	108,665	59.187	60	8.937	15,998	60.326	61	8.810	81,101	59.617	60	8.934	0.000
Female	108,770	0.101	0	0.302	16,001	0.089	0	0.284	81,200	0.116	0	0.320	0.000
Tenure	104,459	8.123	5.8	7.821	15,415	7.642	5.6	7.420	77,922	7.957	5.7	7.696	0.105
Years in Sector	108,661	9.888	6.9	9.649	15,986	9.248	6.3	9.264	81,114	9	6.6	9.277	0.612
Independent	108,770	0.688	1	0.463	16,001	0.688	1	0.463	81,200	0.786	1	0.410	0.000
Number of Board Seats	108,770	1.543	1	0.924	16,001	1.725	1	1.064	81,200	1.533	1	0.917	0.000
Financial Education	108,770	0.433	0	0.496	16,001	0.438	0	0.496	81,200	0.426	0	0.494	0.219
Financial Role (Current or Past)	108,770	0.150	0	0.357	16,001	0.151	0	0.358	81,200	0.149	0	0.356	0.765
Financial Industry Experience	106,113	0.085	0	0.278	15,690	0.116	0	0.320	79,125	0.069	0	0.253	0.000
Audit Committee Member	108,619	0.427	0	0.495	15,973	0.402	0	0.490	81,097	0.492	0	0.500	0.000
Executive Committee Member	59,858	0.422	0	0.494	9,855	0.453	0	0.498	44,329	0.370	0	0.483	0.000
Nominating Committee Member	92,026	0.432	0	0.495	13,580	0.438	0	0.496	68,903	0.480	0	0.500	0.000
Compensation Committee Member	107,845	0.413	0	0.492	15,832	0.412	0	0.492	80,549	0.469	0	0.499	0.000
Social Network Index (SNI)	97,201	0.183	0	0.434									
Current Employment Connection (CE)	97,201	0.013	0	0.112									
Prior Employment Connection (PE)	97,201	0.092	0	0.288									
Education Connection (Ed)	97,201	0.005	0	0.069									
Other Activity Connection (OA)	97,201	0.074	0	0.261									

Table I (cont.)

	Obs.	Mean	Median	Std. Dev.	Obs.	Mean	Median	Std. Dev.	Obs.	Mean	Median	Std. Dev.	*p* -value (C-U)
Panel B. Firm-Year Data (2,083 Firms)													
	Full Sample				Connected Boards				Unconnected Boards				
Assets	11,379	14,490	1,598	73,457	5,472	21,800	2,463	97,672	5,854	7,616	1,060	36,963	0.000
ROA	9,888	0.066	0.072	0.295	4,691	0.061	0.068	0.399	5,153	0.071	0.075	0.146	0.116
Q	11,350	2.010	1.511	1.593	5,459	1.903	1.409	1.610	5,839	2.112	1.607	1.575	0.000
Cash Flow	10,854	0.092	0.093	0.281	5,141	0.083	0.083	0.374	5,661	0.100	0.103	0.155	0.007
Market Leverage	11,310	0.216	0.160	0.210	5,438	0.248	0.195	0.220	5,820	0.188	0.135	0.195	0.000
CEO age	11,520	54.585	55	7.689	5,525	55.158	55	7.580	5,940	54.088	54	7.738	0.000
CEO tenure	11,079	5.092	3.2	5.907	5,311	5.236	3.6	5.850	5,715	4.995	2.9	5.970	0.287
BOSS	11,523	0.301	0	0.459	5,525	0.328	0	0.470	5,943	0.279	0	0.448	0.002
Entrenchment Index	8,190	2.470	3	1.303	4,021	2.545	3	1.302	4,123	2.398	2	1.298	0.011
Total Compensation Ratio	10,086	3.993	1.783	28.674	4,959	4.375	1.804	35.492	5,073	3.649	1.768	20.077	0.215
Board Size	11,468	9.417	9	2.837	5,525	9.842	9	2.972	5,943	9.022	9	2.645	0.000
% Independent	11,468	0.687	0.714	0.175	5,525	0.686	0.714	0.173	5,943	0.687	0.714	0.176	0.822
Mean Board Age	11,468	58.888	59.3	4.393	5,525	59	59.444	4.233	5,943	58.713	59.111	4.531	0.023
Mean Board Tenure	11,030	8.132	7.650	4.112	5,313	7.669	7.233	3.988	5,717	8.562	7.967	4.179	0.000
% SNI	11,468	0.150	0.091	0.203	5,525	0.299	0.25	0.203	5,943	0.010	0	0.029	0.000
% CE	11,468	0.010	0	0.043	5,525	0.020	0	0.059	5,943	0.001	0	0.009	0.000
% PE	11,468	0.078	0	0.146	5,525	0.158	0.118	0.177	5,943	0.003	0	0.016	0.000
% Ed	11,468	0.004	0	0.024	5,525	0.009	0	0.033	5,943	0.000	0	0.006	0.000
% OA	11,468	0.057	0	0.105	5,525	0.112	0.1	0.129	5,943	0.006	0	0.021	0.000

Panel C. Pairwise Correlations (*p* -values in parentheses)

	Director-Level Data						Firm-Level Data				
	SNI	CE	PE	ED	OA		% SNI	% CE	% PE	% Ed	% OA
Social Network Index (SNI)	1					% SNI	1				
Current Employment Connection (CE)	0.3561 (0.00)	1				% CE	0.4053 (0.00)	1			
Prior Employment Connection (PE)	0.7246 (0.00)	0.0946 (0.00)	1			% PE	0.7983 (0.00)	0.1581 (0.00)	1		
Education Connection (Ed)	0.1933 (0.00)	0.0041 (0.20)	0.0221 (0.00)	1		% Ed	0.1564 (0.00)	-0.007 (0.46)	0.0107 (0.25)	1	
Other Activity Connection (OA)	0.657 (0.00)	0.0564 (0.00)	0.053 (0.00)	0.0314 (0.00)	1	% OA	0.6221 (0.00)	0.1574 (0.00)	0.0871 (0.00)	0.0642 (0.00)	1

Table II
CEO Power and Director Selection

The sample is restricted to newly appointed non-executive directors (one observation per new director). The dependent variable is *Social Network Index (SNI)* at the time of appointment, where *SNI* is defined as the sum of *Current Employment Connection*, *Prior Employment Connection*, *Education Connection*, and *Other Activity Connection*. *Current Employment Connection* indicates that both the director and CEO currently serve externally in at least one common firm. *Prior Employment Connection* indicates that the director and CEO both served in at least one common company in the past, excluding prior roles in the company in question. *Education Connection* indicates that the director and CEO attended the same school at the same time. *Other Activity Connection* indicates that the director and CEO share active membership in at least one nonprofessional organization. *Entrenchment Index* measures antishareholder charter provisions and is defined and constructed by Bebchuk, Cohen, and Ferrell (2004). *Age* is the director's age, measured in years. *Independence* is an indicator variable equal to one if the director is independent. *ROA* is net income plus interest expense, scaled by the lag of total assets. *Q* is the natural logarithm of the ratio of the market value of assets to the book value of assets. *Firm Size* is the natural logarithm of total assets. *ROA*, *Q*, and *Firm Size* are measured at the beginning of the fiscal year. Industries are the Fama-French 49 industry groups. All standard errors are clustered at the firm level. All regressions include a constant. * indicates significance at the 10% level; ** significance at 5%; *** significance at 1%.

	OLS (1)	OLS (2)	OLS (3)
Entrenchment Index	0.0155	0.0106	0.0109
	(3.50)***	(2.29)**	(2.35)**
Age	0.0028	0.0026	0.0027
	(3.88)***	(3.54)***	(3.70)***
Independence	0.0239	0.0262	0.0381
	(1.56)	(1.64)	(2.26)**
ROA	-0.0175	-0.0172	-0.0230
	(0.29)	(0.28)	(0.37)
Q	-0.0114	0.0010	-0.0026
	(0.85)	(0.07)	(0.19)
Firm Size	0.0177	0.0122	0.0116
	(5.13)***	(3.30)***	(3.02)***
Industry Fixed Effects	no	yes	yes
Year Fixed Effects	no	no	yes
Observations	4,562	4,516	4,516
Adjusted R^2	0.02	0.04	0.04

Table III
Independent Directors and Firm Value

The dependent variable is *Tobin's Q*, measured as the natural log of the ratio of the market value of assets to the book value of assets. All independent variables are measured at the beginning of the fiscal year. *Firm Size* is the natural log of total assets. *Board Size (Independence)* counts the number of directors (independent directors). *Independence - Connections* counts the number of independent directors minus independent directors with at least one *Social Network Index (SNI)* tie to the CEO. *SNI* is defined as the sum of *Current Employment Connection*, *Prior Employment Connection*, *Education Connection*, and *Other Activity Connection*. *Current Employment Connection* indicates that both the director and CEO currently serve externally in at least one common firm. *Prior Employment Connection* indicates that the director and CEO both served in at least one common company in the past, excluding prior roles in the company in question. *Education Connection* indicates that the director and CEO attended the same school at the same time. *Other Activity Connection* indicates that the director and CEO share active membership in at least one nonprofessional organization. *Market Leverage* is long-term debt plus debt in current liabilities, divided by the numerator plus market equity. *GIM* is the Gompers, Ishii, and Metrick (2003) governance index. All standard errors are clustered at the firm level. All regressions include a constant. * indicates significance at the 10% level; ** significance at 5%; *** significance at 1%.

	OLS	OLS	OLS	OLS
	(1)	(2)	(3)	(4)
Firm Size	0.0057	0.0011	0.0061	0.0029
	(0.78)	(0.15)	(0.85)	(0.42)
Independence	0.0002	0.0075		
	(0.05)	(1.60)		
Independence - Connections			0.006	0.0108
			(1.93)*	(3.04)***
Board Size	-0.0069	-0.0128	-0.0096	-0.0135
	(1.67)*	(2.81)***	(2.56)**	(3.50)***
Market Leverage	-1.3416	-1.329	-1.3397	-1.3274
	(27.91)***	(28.12)***	(27.97)***	(28.28)***
GIM	-0.0062	-0.0063	-0.0066	-0.0063
	(1.94)*	(1.99)**	(2.08)**	(2.02)**
Year Fixed Effects		yes		yes
Observations	7,159	7,159	7,159	7,159
Adjusted R^2	0.37	0.39	0.37	0.39

Table IV
Director Network Ties to the CEO and Market Value: Event Studies

Events are the death or retirement of a connected or unconnected independent director. Firms are included in the regressions only if a director dies or retires during a sample year and only over the event window in the column title. For firms with multiple events, each event is included individually with all firm-years in the event window. Connections to the CEO are measured using the *Social Network Index (SNI)*. *SNI* is defined for independent directors as the sum of *Current Employment Connection*, *Prior Employment Connection*, *Education Connection*, and *Other Activity Connection*. *Current Employment Connection* indicates that both the director and CEO currently serve externally in at least one common firm. *Prior Employment Connection* indicates that the director and CEO both served in at least one common company in the past, excluding prior roles in the company in question. *Education Connection* indicates that the director and CEO attended the same school at the same time. *Other Activity Connection* indicates that the director and CEO share active membership in at least one nonprofessional organization. The dependent variable is *Tobin's Q*, measured as the natural log of the ratio of the market value of assets to the book value of assets. All independent variables are measured at the beginning of the fiscal year. *Board Size (Independence)* counts the number of directors (independent directors). *Firm Size* is the natural log of total assets. *Market Leverage* is long-term debt plus debt in current liabilities, divided by the numerator plus market equity. *GIM* is the Gompers, Ishii, and Metrick (2003) governance index. *After* is a dummy variable equal to one for all full fiscal years after a director death or retirement. All standard errors are clustered at the firm level. All regressions include a constant. * indicates significance at the 10% level; ** significance at 5%; *** significance at 1%.

	[-2, 2]		[-1, 2]	[-3, 3]	[-2, 2]		Full Sample
					GIM < Median	GIM ≥ Median	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
After	0.0332	0.0226	0.0151	0.0345	0.0044	0.0367	-0.0026
	(2.63)***	(1.88)*	(1.00)	(2.82)***	(0.25)	(2.24)**	(0.14)
After * (Connected)	0.0704	0.0726	0.0639	0.0678	0.0387	0.0992	0.0342
	(1.84)*	(1.92)*	(1.98)**	(1.65)*	(1.22)	(2.20)**	(1.12)
After * (GIM ≥ Median)							0.049
							(2.10)**
After * (Con.) * (GIM ≥ Med.)							0.0663
							(1.18)
Board Size		-0.012	-0.0104	-0.0064	-0.0145	-0.0067	-0.0109
		(1.71)*	(1.02)	(1.07)	(2.13)**	(0.65)	(1.71)*
Independence		0.0166	0.0092	0.0157	0.0198	0.0136	0.017
		(3.00)***	(1.19)	(3.08)***	(2.88)***	(1.68)*	(3.14)***
Firm Size		-0.0712	-0.0952	-0.0998	-0.0966	-0.0531	-0.0772
		(1.89)*	(1.49)	(3.13)***	(1.79)*	(1.38)	(2.23)**
Market Leverage		-0.3425	-0.2842	-0.4147	-0.1975	-0.5744	-0.3856
		(4.03)***	(2.22)**	(5.48)***	(1.90)*	(4.96)***	(4.71)***
GIM		-0.0003	-0.0158	0.009			
		(0.03)	(1.31)	(0.77)			
Firm Fixed Effects	yes	yes	yes	yes	yes	yes	yes
Observations	3,711	3,160	2,425	3,863	1,583	1,650	3,233
Adjusted R^2	0.87	0.90	0.91	0.88	0.90	0.88	0.89

Table V
Director Network Ties to the CEO and Market Value: IV Regressions

% Independent SNI is the percentage of independent directors with connections to the CEO. Connections to the CEO are measured using the *Social Network Index (SNI)*. *SNI* is defined for independent directors as the sum of *Current Employment Connection*, *Prior Employment Connection*, *Education Connection*, and *Other Activity Connection*. *Current Employment Connection* indicates that both the director and CEO currently serve externally in at least one common firm. *Prior Employment Connection* indicates that the director and CEO both served in at least one common company in the past, excluding prior roles in the company in question. *Education Connection* indicates that the director and CEO attended the same school at the same time. *Other Activity Connection* indicates that the director and CEO share active membership in at least one nonprofessional organization. The dependent variable in Columns (1), (3), (5), and (7) is *Tobin's Q*, measured as the natural log of the ratio of the market value of assets to the book value of assets. The dependent variable in Columns (2), (4), and (6) is *% Independent SNI*. All independent variables are measured at the beginning of the fiscal year. *Board Size (Independence)* counts the number of directors (independent directors). *Firm Size* is the natural log of total assets. *Market Leverage* is long-term debt plus debt in current liabilities, divided by the numerator plus market equity. *GIM* is the Gompers, Ishii, and Metrick (2003) governance index. *Retired Director* counts the number of independent directors with *SNI* ties to the CEO who have retired during the sample period, up to the current fiscal year. *Deceased Director* counts the number of independent directors with *SNI* ties to the CEO who have died within one year of leaving the board, up to the current fiscal year. All standard errors are clustered at the firm level. All regressions include a constant. * indicates significance at the 10% level; ** significance at 5%; *** significance at 1%.

		IV Regression					
		Full Sample		GIM < Median		GIM ≥ Median	
	OLS	First Stage	Second Stage	First Stage	Second Stage	First Stage	Second Stage
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
% Independent SNI	-0.1069		-0.6593		-0.3587		-0.8099
	(3.14)***		(2.77)***		(1.91)*		(2.30)**
Board Size	-0.0131	0.0029	0.0054	0.0047	0.0006	0.0016	0.0081
	(2.89)***	(1.25)	(1.43)	(1.41)	(0.13)	(0.48)	(1.49)
Independence	0.0084	-0.0055	-0.0031	-0.0057	0.002	-0.0057	-0.006
	(1.78)*	(1.96)*	(0.75)	(1.52)	(0.36)	(1.28)	(1.04)
Firm Size	0.0037	0.0138	-0.173	0.0065	-0.1681	0.0264	-0.1620
	(0.52)	(1.46)	(9.00)***	(0.51)	(7.31)***	(1.74)*	(4.72)***
Market Leverage	-1.3258	0.0069	-0.3107	0.0101	-0.2781	-0.0075	-0.3347
	(28.31)***	(0.27)	(6.06)***	(0.27)	(3.51)***	(0.20)	(5.13)***
GIM	-0.0060						
	(1.90)*						
Maximum Ind. Director Age		0.0000	-0.0012	0.0005	0.0015	-0.0008	-0.0058
		(0.04)	(0.68)	(0.51)	(0.73)	(0.42)	(1.76)*
Maximum Ind. Director Tenure		-0.0015	-0.0013	-0.0028	-0.0009	-0.0005	-0.0016
		(1.57)	(1.03)	(1.70)*	(0.51)	(0.43)	(0.88)
CEO Age		0.0036	0.0029	0.0042	0.0024	0.0029	0.0018
		(3.58)***	(2.21)**	(2.93)***	(1.66)*	(1.90)*	(0.99)
CEO Tenure		0.0016	0.0006	0.0011	0.0006	0.0023	0.0022
		(1.47)	(0.46)	(0.73)	(0.38)	(1.38)	(0.98)
Retired Director		-0.0799		-0.0979		-0.0701	
		(5.57)***		(4.83)***		(3.16)***	
Deceased Director		-0.0928		-0.1098		-0.0988	
		(3.93)***		(5.74)***		(2.85)***	
Year Fixed Effects	yes	yes	yes	yes	yes	yes	yes
Firm Fixed Effects	no	yes	yes	yes	yes	yes	yes
Observations	7,159	6,686	6,686	3,525	3,525	3,064	3,064
Adjusted R^2	0.39						

Table VI
Director Network Ties to the CEO and M&A Decisions

In Panel A, the dependent variable in all columns, but Column (4) is a binary indicator which equals one if the firm did at least one acquisition valued in excess of $10 million during the fiscal year. The dependent variable in Column (4) is *% Independent SNI*. *Social Network Index (SNI)* is defined for independent directors as the sum of *Current Employment Connection*, *Prior Employment Connection*, *Education Connection*, and *Other Activity Connection*. *Current Employment Connection* indicates that both the director and CEO currently serve externally in at least one common firm. *Prior Employment Connection* indicates that the director and CEO both served in at least one common company in the past, excluding prior roles in the company in question. *Education Connection* indicates that the director and CEO attended the same school at the same time. *Other Activity Connection* indicates that the director and CEO share active membership in at least one nonprofessional organization. *% (Exec.Com.) Independent SNI* is the percentage of independent directors (on the executive committee) with *SNI* connections to the CEO. All independent variables are measured at the beginning of the fiscal year. *Board Size (Independence)* counts the number of directors (independent directors). Executive committee size and independence are also in numbers. *Cash Flow* is net income plus interest expense, scaled by the lag of total assets. *Q* is the natural logarithm of the ratio of the market value of assets to the book value of assets. *Market Leverage* is long-term debt plus debt in current liabilities, divided by the numerator plus market equity. *Retired Director* counts the number of independent directors with *SNI* ties to the CEO who have retired during the sample period, up to the current fiscal year. *Deceased Director* counts the number of independent directors with *SNI* ties to the CEO who have died within one year of leaving the board, up to the current fiscal year. Coefficients in Columns (1) to (3) are presented as odds ratios. Standard errors are clustered at the firm level. All regressions include a constant. In Panel B, the sample consists of all merger bids with transaction value at least 10% of the acquirer's beginning-of-fiscal-year market capitalization. The dependent variable is the cumulative abnormal return to the acquirer's stock in the three trading days surrounding the merger bid, with the announcement date as day 0. Cumulative abnormal returns are the sum of abnormal returns, where expected returns are computed from a market model estimated using up to one year of daily stock returns and the *CRSP* value-weighted index as market returns. *Stock Bids* are deals in which any portion was financed using equity. *Cash Bids* are 100% cash and/or debt financed. *GIM* is the Gompers, Ishii, and Metrick (2003) governance index. Standard errors are clustered by event date. Number of observations and robust *t*-statistics in parentheses. * indicates significance at the 10% level; ** significance at 5%; *** significance at 1%.

Panel A. Merger Frequency

				IV-2SLS Regression	
	Logit	Conditional Logit	Conditional Logit	First Stage	Second Stage
	(1)	(2)	(3)	(4)	(5)
% Independent SNI	1.5889	1.9541			0.7912
	(2.67)***	(1.66)*			(1.67)*
% Exec. Com. Ind. SNI			3.1953		
			(2.37)**		
Board Size		0.9989	1.0554	0.004	-0.0031
		(0.03)	(0.87)	(1.66)*	(0.45)
Executive Committee Size			0.8598		
			(1.60)		
Cash Flow		9.7121	10.2351	-0.0065	0.3565
		(3.35)***	(2.13)**	(0.32)	(4.54)***
Q		1.3659	1.2612	0.0037	0.0394
		(1.58)	(0.67)	(0.37)	(1.26)
Market Leverage		0.0912	0.08	0.0172	-0.3543
		(3.71)***	(2.78)***	(0.57)	(3.66)***
Independence		0.9282	0.937	-0.006	-0.0074
		(1.63)	(0.92)	(2.06)**	(0.91)
Exec. Com. Independence			1.1181		
			(1.13)		
Maximum Ind. Director Age				0.0002	-0.0024
				(0.26)	(0.65)
Maximum Ind. Director Tenure				-0.0015	0.0010
				(1.57)	(0.35)
CEO Age				0.0036	-0.0023
				(3.47)***	(0.96)
CEO Tenure				0.0018	-0.0060
				(1.59)	(2.75)***
Retired Director				-0.077	
				(5.03)***	
Deceased Director				-0.1063	
				(5.50)***	
Year Fixed Effects	no	yes	yes	yes	yes
Firm Fixed Effects	no	yes	yes	yes	yes
Observations	7,340	4,219	2,292	6,453	6,453

Table VI (cont.)

Panel B. Announcement Effects						
	All Bids		Stock Bids	Cash Bids	GIM < Median	GIM ≥ Median
	(1)	(2)	(3)	(4)	(5)	(6)
Full Sample	-0.0033	-0.0046	-0.0207	0.0102	-0.0006	-0.0057
	(601; 1.24)	(305; 1.40)	(262; 4.56)***	(339; 3.56)***	(293; 0.17)	(308; 1.59)
% Connected ≥ Median	-0.0081		-0.0241	0.0053	-0.0021	-0.0134
	(299; 2.37)**		(136; 4.23)***	(163; 1.42)	(141; 0.41)	(158; 3.11)***
% Exec. Com. Connected ≥ Median		-0.0096				
		(122; 2.35)**				
% Connected < Median	0.0015		-0.0170	0.0148	0.0008	0.0023
	(302; 0.39)		(126; 2.39)**	(176; 3.41)***	(152; 0.14)	(150; 0.39)
% Exec. Com. Connected < Median		-0.0013				
		(183; 0.28)				
Difference	-0.0096	-0.0083	-0.0071	-0.0095	-0.0029	-0.0157
	(601; 1.87)*	(305; 1.37)	(262; 0.79)	(339; 1.66)*	(293; 0.39)	(308; 2.11)**

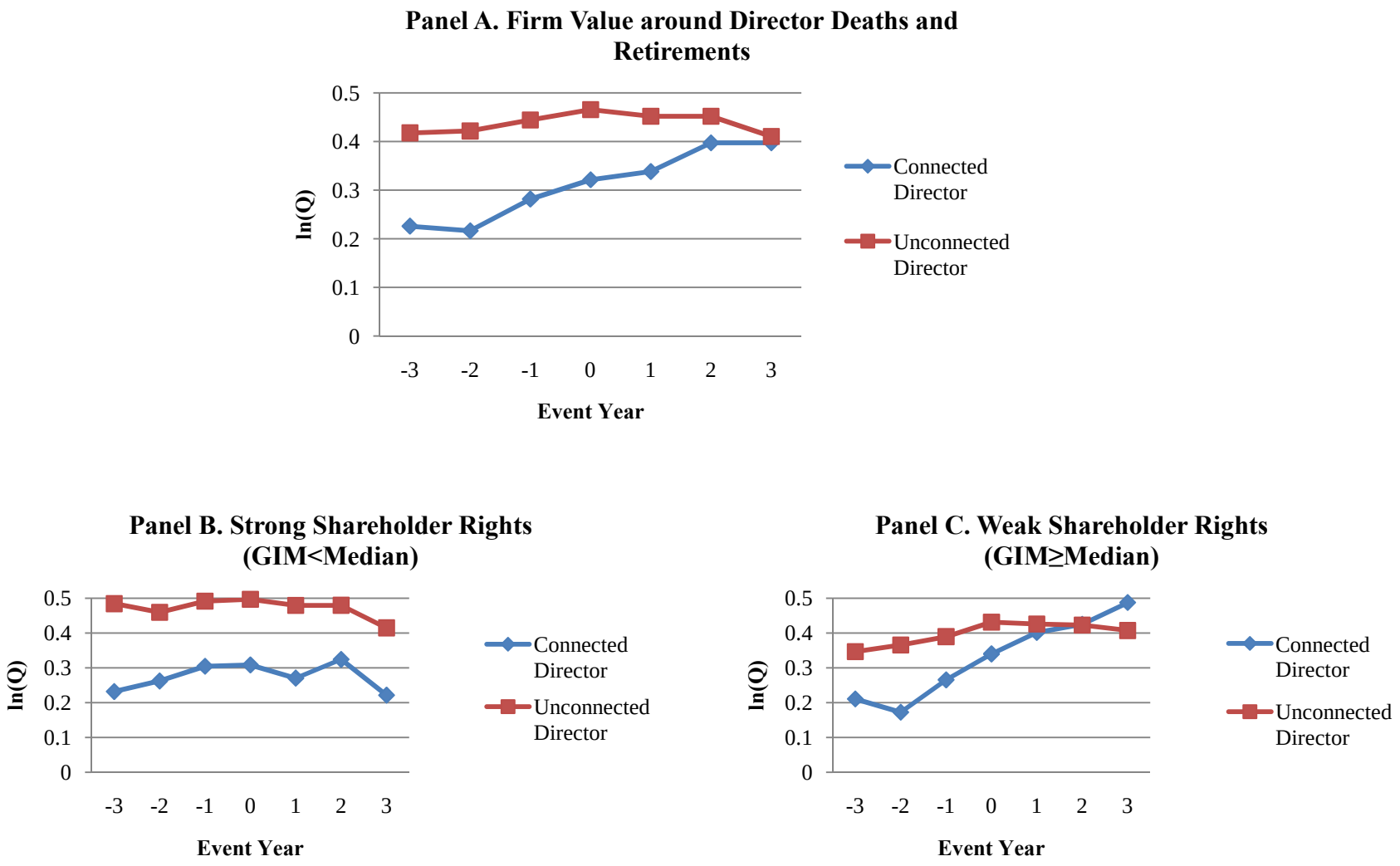


Figure 1. Firm value around director deaths and retirements. *Tobin's Q* is measured as the natural log of the ratio of the market value of assets to the book value of assets. "Connected" means a value of the *Social Network Index (SNI)* greater than or equal to one, where *SNI* is defined for independent directors as the sum of *Current Employment Connection* , *Prior Employment Connection* , *Education Connection* , and *Other Activity Connection* . *Current Employment Connection* indicates that both the director and CEO currently serve externally in at least one common firm. *Prior Employment Connection* indicates that the director and CEO both served in at least one common company in the past, excluding prior roles in the company in question. *Education Connection* indicates that the director and CEO attended the same school at the same time. *Other Activity Connection* indicates that the director and CEO share active membership in at least one nonprofessional organization. *GIM* is the Gompers, Ishii, and Metrick (2003) governance index. Year 0 is the fiscal year during which the director death or retirement occurs.

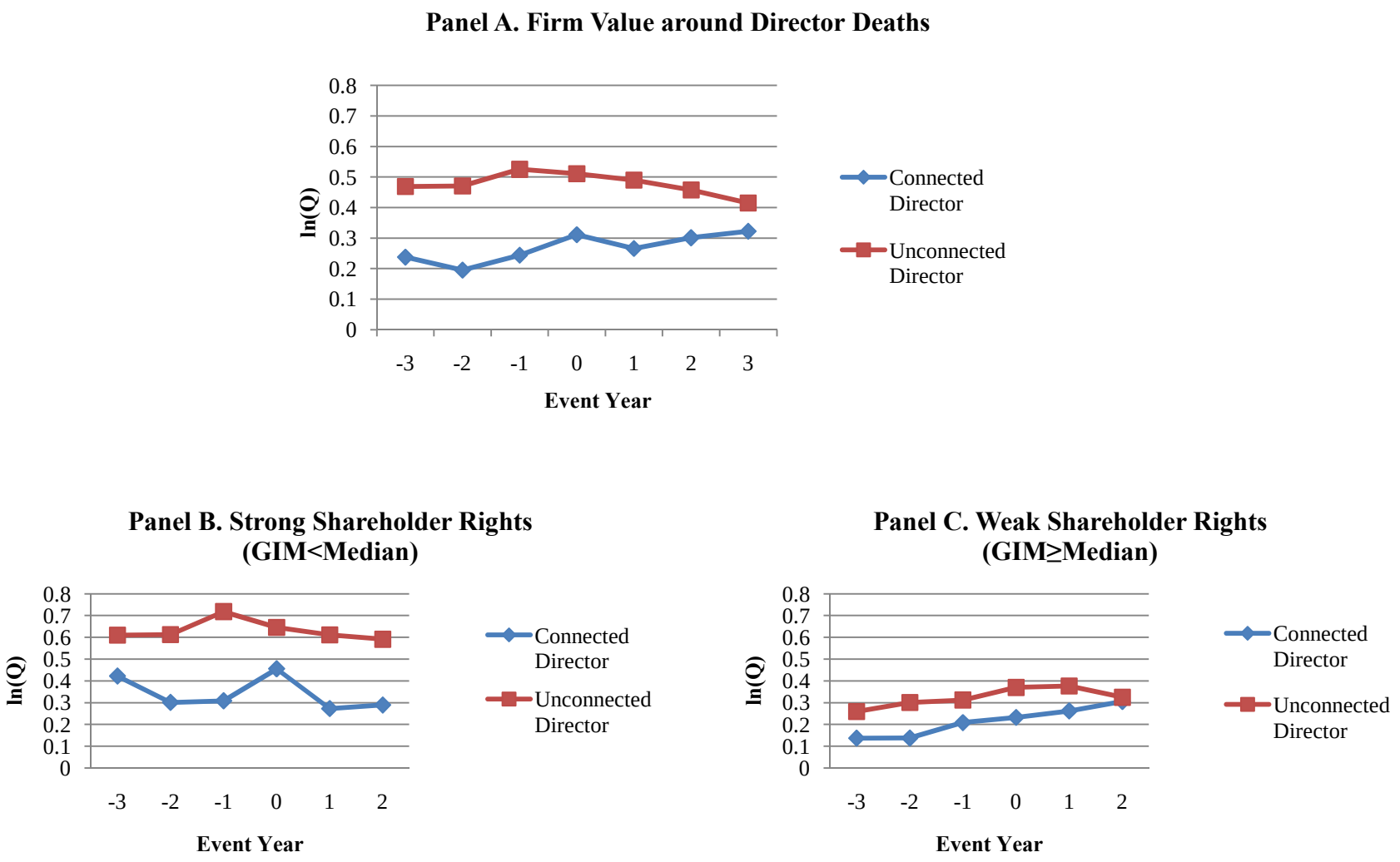
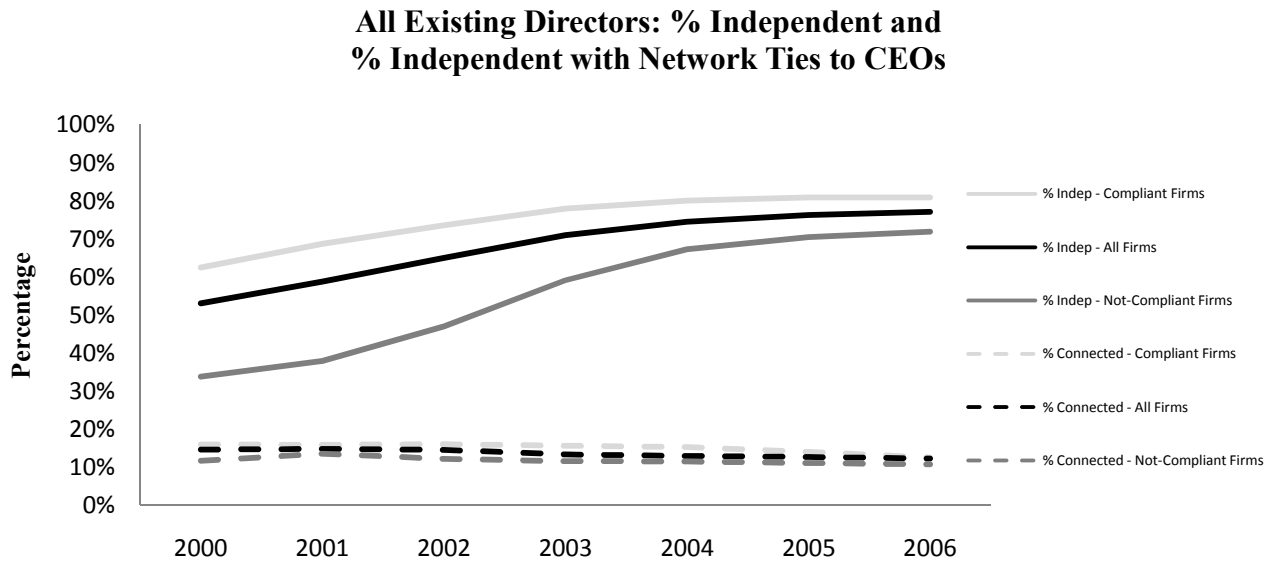


Figure 2. Firm value around director deaths. *Tobin's Q* is measured as the natural log of the ratio of the market value of assets to the book value of assets. "Connected" means a value of the *Social Network Index (SNI)* greater than or equal to 1, where *SNI* is defined for independent directors as the sum of *Current Employment Connection* , *Prior Employment Connection* , *Education Connection* , and *Other Activity Connection* . *Current Employment Connection* indicates that both the director and CEO currently serve externally in at least one common firm. *Prior Employment Connection* indicates that the director and CEO both served in at least one common company in the past, excluding prior roles in the company in question. *Education Connection* indicates that the director and CEO attended the same school at the same time. *Other Activity Connection* indicates that the director and CEO share active membership in at least one nonprofessional organization. *GIM* is the Gompers, Ishii, and Metrick (2003) governance index. Year 0 is the fiscal year during which the director death occurs.



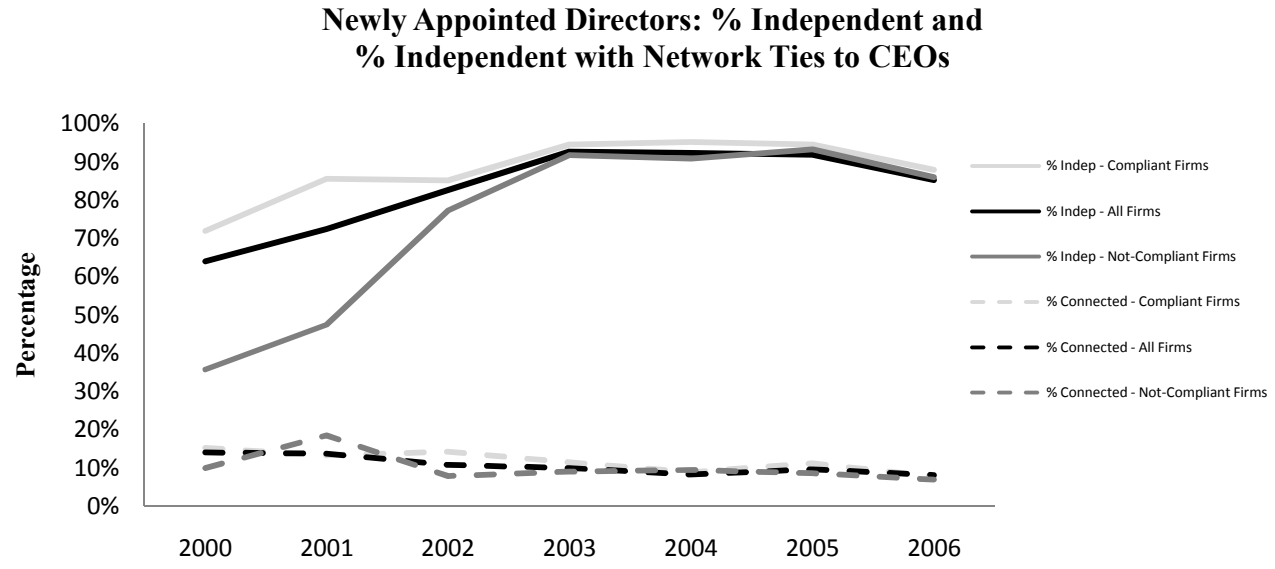


Figure 3. Frequency of social ties between directors and the CEO. Connected is defined using the *Social Network Index (SNI)*. *SNI* is the sum of *Current Employment Connection*, *Prior Employment Connection*, *Education Connection*, and *Other Activity Connection*. *Current Employment Connection* indicates that both the director and CEO currently serve externally in at least one common firm. *Prior Employment Connection* indicates that the director and CEO both served in at least one common company in the past, excluding prior roles in the company in question. *Education Connection* indicates that the director and CEO attended the same school at the same time. *Other Activity Connection* indicates that the director and CEO share active membership in at least one nonprofessional organization.