

External Networking and Internal Firm Governance*

Cesare Fracassi
University of Texas - Austin
cesare.fracassi@mcombs.utexas.edu

Geoffrey Tate
UCLA
geoff.tate@anderson.ucla.edu

First Version: June 3, 2008
Current Version: September 24, 2009

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 and that such directors trade more like the CEO in company stock. Yet, companies with more connections between management and the board do fewer internally-prompted earnings restatements and engage in more value-destroying acquisitions, consistent with weaker board monitoring. Instrumenting for network connections, we find that these companies have lower market valuations, particularly in the absence of other governance mechanisms to substitute for board oversight.

*We would like to thank Avanidhar Subrahmanyam, Mark Grinblatt, Albert Sheen and seminar participants at Oregon, Tulane and UCLA for helpful comments. We acknowledge financial support from the Fink Center for Finance and Investments (UCLA) and the Price Center for Entrepreneurial Studies (UCLA).

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 existing network ties to the CEO. Consistent with closer ties to the CEO, these directors are more likely to buy company stock at the same time as the CEO, even though their trades do not predict strong future performance relative to other directors' trades. Moreover, their presence appears to be correlated with weaker monitoring: Firms with such directors are less likely to do internally-prompted earnings restatements, though the overall frequency of restatements is the same as other firms. They also make more frequent acquisitions. Their merger bids destroy \$407 million of shareholder value on average, \$293 million more than the bids of other firms. Moreover, these poor decisions result in lower overall market valuations, particularly in the absence of strong shareholder rights to substitute for board monitoring.

Following the wave of corporate scandals to begin the decade, 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

¹For 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).

²Subrahmanyam (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.

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 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 active members of the same non-professional organizations as the CEO (e.g. golf clubs or charities). We also consider the employees' 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 which sums the connections of all types between each director and the CEO.

As with independence, the direct impact of network ties to the CEO on firm performance is difficult to assess due to endogenous director selection. We take several steps to address this concern. Throughout the paper, we exploit the time series dimension of our data: We separate the impact of networked directors from latent firm (or board) characteristics by measuring how a firm's decisions change when director network ties to the CEO change. We also exploit exogenous changes in network ties due to director death or retirement.

We begin by conducting several tests at the director-level to sharpen the interpretation of our measure of network ties. First, we ask which firms are most likely to appoint new directors with ties to the CEO. As bargaining power over the selection process shifts toward the CEO, the choice of director should be more in line with the CEO's preferences (Hermalin and Weisbach,

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

⁴In 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.

1998). If directors with network ties to the CEO are more friendly to management, then firms with more powerful CEOs should add more connected directors to the board. We test this prediction using four measures of CEO power: consolidation of the titles CEO, chairman of the board, and president (Morck, Shleifer, and Vishny, 1989; Adams, Almeida, and Ferreira, 2005); CEO tenure (Hermalin and Weisbach, 1988); the entrenchment index (Bebchuk, Cohen, and Ferrell, 2004); and the ratio of CEO compensation to compensation of the next highest paid firm executive (Hayward and Hambrick, 1997; Bebchuk, Cremers, and Peyer, 2007). We find that firms with powerful CEOs 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 then ask whether the decision-making of connected directors differs from their colleagues on the board and, in particular, whether their choices are more aligned with the CEO. Specifically, we analyze directors' open market purchases of company stock.⁵ A firm's outside directors are likely to have similar individual incentives with respect to open market purchases. However, we find that directors with network ties to the CEO are significantly more likely than other outside directors to purchase stock within 5 days of a CEO stock purchase. The pattern also holds in aggregate: networked directors are more likely than other directors to be net buyers over the fiscal year if the CEO is a net buyer. The results are robust to controlling for director characteristics, like financial expertise, as well as year and firm fixed effects. We test whether the heightened correlation of trading decisions among networked directors and the CEO represents selective information flow within the board. We find no evidence of differences in the abnormal returns earned by networked directors and other outside directors over the 10, 30, 60, or 90 trading days following their transactions. However, the results confirm greater commonality between the decisions of CEOs and directors with whom they have network ties.

We then aggregate our measure of network ties to the board-level, using the percentage of independent directors with network ties to the CEO to measure the friendliness of the board to management. We use earnings restatements to test directly whether boards with closer ties to the CEO are weaker monitors. We find that the frequency of earnings restatement is not significantly different among firms with more directors who have network ties to the CEO; however, conditional on restating earnings, the action is significantly more likely to be

⁵Focusing on purchases removes the impact of scheduled selling or sales related to option expiration from our analysis and allows us to better isolate active director decisions.

prompted by outsiders, like auditors or the SEC, rather than the company itself.

Next, we analyze the impact of CEO-director ties on acquisition choices. 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 firm outcomes. 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 isolate the impact of changes in CEO-director network ties and when we restrict our attention to exogenous changes in those ties due to director deaths and retirements. We also measure the value consequences of the deals for shareholders. Excess acquisitiveness may represent an additional failure of monitoring: the CEO's friends on the board may be unwilling to oppose value-destroying policies which provide private benefits to the CEO. It could also represent a failure by the board to perform its advisory role: the CEO's friends may be less likely to bring distinct information to the policy debate. On the other hand, Adams and Ferreira (2007) argue that friends on the board could improve value through the advisory channel: shareholders may accept weaker board monitoring in exchange for better policy advice if CEOs are reluctant to share information with truly independent directors. Consistent with the former theories, 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. We also find that the value destruction is concentrated in firms with weak shareholder rights – measured by the Gompers, Ishii, and Metrick (2003) index (GIM) – suggesting that other forms of governance can substitute for board oversight.

Finally, we consider the impact of network ties between independent directors and the CEO on aggregate firm value, using shocks due to deaths and retirements for identification. We conduct our analysis both in an instrumental variables regression and in an event study framework, considering various windows around the death or retirement of a connected director. We also consider the difference between the value change around the death or retirement of a connected and unconnected director. In all cases, we find that firm value – measured using Tobin's Q – is lower when connectedness of the firm's independent directors to the CEO is higher. Moreover, as in the merger context, the effect is strongest when shareholder rights are weak.

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 which 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 on the propensity of firms to add such directors to their boards. Moreover, we find that firms which participated in the government's Troubled Asset Relief Program (TARP) in 2008 and 2009 had more connections between their independent directors and CEOs at the end of our sample period (2007) than other firms in their industries. 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 (1996a) 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 – i.e. whether the CEO has a pre-existing relationship with the candidate – and not just the policies for which 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. Hochberg, Ljungqvist, and Lu (2007) find that network connections based on business interactions increase performance in the venture capital industry. Cohen, Frazzini, and Malloy (2008) find that mutual fund managers invest more heavily and profitably in firms to which they are connected via education networks. And, Cohen, Frazzini, and Malloy (2009) find that analysts with school ties to senior executives make higher quality recommendations (prior to Regulation FD). In the corporate context, Fracassi (2008) finds greater correlation in investment policies

and higher ROA among firms which share more network connections through their leadership teams, consistent with value-increasing information flow. Kuhnen (2007), on the other hand, finds evidence of reduced performance in the mutual fund industry due to preferential hiring of directors who are connected to the advisory firm through other funds. Nguyen-Dang (2008) finds that CEOs with better external connections through cross-directorships are less likely to be fired following poor performance. In addition, several recent papers argue that network connections through cross-directorships lead to higher executive compensation (Larcker, Richardson, Seary and Tuna, 2005; Barnea and Guedj, 2007; Hwang and Kim, *forthcoming*).⁶

Our analysis builds on the latter set of literature, which analyzes the governance effects of network connections within the firm. We differ from prior analyses in several ways. First, we use a broader panel dataset than existing studies (2,083 firms; 8 years; 20,189 directors). The time series dimension allows us to better address the potential endogeneity of network ties: we identify network effects out of within-firm changes and using exogenous shocks to network ties due to director deaths and retirements. We also measure a broader set of network ties⁷, focusing not only on interlocking directorships, but also on current and past employment networks, other social activities, and education. Finally, we provide direct evidence on the value implications of network ties between directors and CEOs in large U.S. firms.

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 board selection and director decision-making. In Section III., we consider monitoring, real investment and firm performance. 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

⁶An earlier literature finds little evidence that director interlocks significantly increase CEO pay (Core, Holthausen and Larcker, 1999; Hallock, 1997).

⁷Fracassi (2008) uses definitions of network connections similar to those in our analysis.

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. We add information on insider trades from the Thomson Financial Database of Insider Filings. We limit our analysis to open market stock transactions with codes “P” or “S.” 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.

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 fiscal year closing stock price 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.

We obtain information on corporate earnings restatements from the Government Accountability Office (GAO), including the date of each restatement and the identity of the party who prompted it. The most common reason for restatements in our sample is improper cost accounting (43%). Other prominent reasons are improper revenue recognition (25%), errors related to the restructuring of assets or inventory (15%)⁸, and improper accounting for derivatives, warrants, stock options, and other convertible securities (14%). The three most common prompters in our data are the company (65%), auditors (14%), and the SEC (9%).

Finally, we retrieve two firm-level governance measures constructed using data from the Risk-Metrics Group: the GIM index, which essentially adds the number of anti-shareholder charter provisions, and the entrenchment index, which refines the GIM measure by considering only a subset of 6 charter provisions which 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 contains 108,770 director-year observations on 20,189 distinct directors. The average age in the sample is 59 and the average director tenure is 8 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 and provide the distribution of sample firms across the 12 Fama-French industry groups. 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 9 members, 69% of whom are independent.

II. CEO-Director Network Connections

II.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), past 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

⁸Examples for this category include improper timing of asset write-downs or goodwill.

to qualify as connected (directorship is sufficient). Past 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 1 year of each other. Other activities connections are shared memberships in clubs, organizations, or charities.⁹ In our sample, directors have other activity ties to the CEO via 1,056 distinct organizations. Among organizations which 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.¹⁰ Also included, though typically less common, are professional organizations like the American Heart Association. In these cases, membership might capture a specific expertise, rather than a network tie between the director and CEO. To mitigate this concern, we require active membership in the organization in our definition of OA connections. Thus, for example, a director and CEO who are both members of the American Heart Association would not have an OA connection, but a director and CEO who are both officers would qualify.¹¹ 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.

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

⁹We 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.

¹⁰In the Online Appendix, we list the 50 organizations which generate the most CEO-director ties.

¹¹This 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.

(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 1 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.¹²

To conduct firm-level analysis, we compute the percentage of directors who have at least 1 network tie to the CEO.¹³ 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.

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 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.

In Table II, we provide a full accounting of the network ties between the CEO and directors of Citi Corp for the years 2001 and 2002, during the period in which Citi was assembling its “financial supermarket.” Consistent with the patterns in Table I, the bulk of the network ties occur through past employment and other activities. The example illustrates the substantial cross-sectional variation which exists in board composition across firms: 56% of the directors share a network tie with CEO Sandy Weill in 2001 and 47% in 2002, well above the sample

¹²In the Online Appendix, we confirm these patterns using pooled and fixed effects regressions.

¹³Our 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).

average of 15%, or the banking industry average of 14%. 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 which may be endogenous to firm policy, we also consider exogenous shocks due to director deaths and retirements.

Our main hypothesis is that network ties between (independent) directors and the CEO weaken corporate governance, resulting in worse policy choices and lower firm value. However, given the endogeneity of board composition, we begin by conducting tests at the director level to better understand the variation captured by our SNI measure and to clarify the mechanism by which SNI ties weaken corporate governance. In particular, we ask (1) whether firms with powerful CEOs are more likely to appoint directors with SNI ties to the CEO and (2) whether directors with SNI ties to the CEO make individual trading decisions which are more similar to the CEO than their peers on the board.

II.B. Director Selection

We begin by analyzing the firm's choice of new directors. If CEOs prefer to have their friends on the board because they expect weaker monitoring, then we should see more directors with network ties to the CEO added in firms in which the CEO is more powerful. In such firms, the CEO has more bargaining power over the director selection process. We test this prediction using four measures of CEO power: consolidation of the titles CEO, chairman of the board, and president (BOSS); CEO tenure; the entrenchment index; and the ratio of CEO compensation to compensation of the next highest paid executive in the firm. Notice in Panel B of Table I that all four measures have a 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 each of the four power measures, controlling for director age and independence and 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.

Columns 1 through 4 of Table III present the results. In all four specifications, connections are significantly more common in larger firms and among older directors. And, for three of the four power measures – BOSS, the entrenchment index, and the compensation ratio – we find that directors added to the board in firms with more powerful CEOs have more existing network ties to the CEO. The effect is also economically significant. SNI is 0.098 in firms for which BOSS = 0, evaluated at the mean of the independent variables. Increasing BOSS to 1 is associated with a roughly 20% increase in connectedness among newly appointed directors. For the fourth measure, CEO tenure, we do not find a significant impact on director SNI.

Since these measures are noisy proxies for CEO power, we also use principal component analysis on the correlation matrix of the four variables to construct an index measure of CEO power. This procedure first finds the linear combination of the variables with maximum variance (the first principal component). Then, it iteratively finds the linear combination with maximal variance which is orthogonal to all already chosen combinations, ending with a basis of eigenvectors for the space spanned by the input variables. In the Online Appendix, we tabulate the coefficients for each component as well as their eigenvalues and the proportion of variance explained. We use the directions of the components to help interpret the variation they capture. A CEO power index should be positively correlated with each individual power measure. The second principal component (which explains 27.4% of the variance) has positive coefficients on each measure (BOSS = 0.79; CEO tenure = 0.47; compensation ratio = 0.34; entrenchment index = 0.21). The remaining three components each have coefficients of the same sign on three measures, but an opposite sign on the fourth. Thus, we can interpret these components as capturing idiosyncratic variation with respect to a particular variable and the second principal component as capturing the common “power” component. A common rule of thumb when using principal components analysis to reduce the dimensionality of a dataset is to retain components with eigenvalues greater than 1. Thus, even though a clear argument can be made for retaining only the second component, we include both the first and second principal components as independent variables in our regressions. This choice does not affect our conclusions.

In Column 5 of Table III, we present the results of regressing SNI on the first two principal components of the four power measures and our set of controls. The coefficient on CEO power, measured by the second principal component, is significantly positive. In Column 6, we add fixed effects for the Fama-French 49 industry groups and in Column 7 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. The industry effects appear to dampen the coefficient on CEO power, though it remains positive and significant, while the year effects have little impact. Finally, in Column 8, we add a control for the percentage of directors who are already serving on the board at the time of the appointment who have SNI connections to the CEO. We also interact this control with the CEO power index. Consistent with our story, we find 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. In this case, the CEO not only has power to influence the selection process, but also has a friendly board already in place to minimize resistance.

Overall, our evidence supports the hypothesis that CEOs prefer to have their friends on the board to reduce the board’s diligence. Newly appointed directors are more likely to have network ties to the CEO in firms with powerful CEOs. One alternative interpretation of the evidence, however, is that connected directors and powerful CEOs have higher ability. Under this interpretation, they are more likely to have network connections because their services are in higher demand by outsiders. One piece of evidence that is less consistent with this interpretation is that our result holds even if we measure connections using *only* other activities in which both the CEO and director participate. In the Column 6 specification, for example, the coefficient on the second principal component is 0.017 with a t-statistic of 3.82 using other activity connections as the dependent variable. Thus, our result does not depend on including employment connections which may be contaminated by CEO or director ability.

II.C. Director Decision-making

Next, we test for a link between the decision-making of CEOs and the directors with whom they have network ties. To perform this test, we focus on individual insider trading decisions made by each of the company’s directors and the CEO and, particularly, on open market purchases

of company stock. Unlike insider sales which often occur on pre-determined schedules, open market purchases are active, discretionary decisions made by each individual director and executive. We focus on outside directors to control not only for differential access to firm information between executive and outside directors, but also for any restrictions the firm may place on executives' trades in company stock (relative to outside directors).

Outside directors all have similar incentives in making trading decisions. They should purchase stock if they believe that future performance will be strong and either (1) they wish to profit from expected future appreciation or (2) they wish to signal their beliefs to the market. In either case, these trades provide us the opportunity to measure whether the revealed beliefs of directors with network ties to the CEO are more in line with the beliefs of the CEO than other directors. We consider the subsample of outside director years in which the director made at least one open market transaction in company stock (either a sale or purchase). We exclude non-trading directors to separate the effect of ties with the CEO on the *timing* of trading from the (potential) effect of ties with the CEO on the propensity to trade.¹⁴

We construct an indicator variable which takes the value one if the outside director purchases company stock within 5 days of the CEO. We then run a logit regression with this indicator as the dependent variable and the SNI measure of network connections to the CEO as the independent variable. Column 1 of Table IV contains the results. Again, all standard errors are clustered at the firm level, to correct for (potential) correlation of purchase decisions at the firm level. Coefficients are presented as odds ratios.¹⁵ We find that social network ties to the CEO significantly increase the likelihood that the outside director will purchase stock within 5 days of the CEO: A director with one more SNI tie to the CEO than a peer director would have 1.36 times the odds of trading within 5 days of the CEO. In Column 2, we add director-level controls for age, tenure on the board, gender, and independence. We also include year effects to account for the possibility that all executives and directors trade together, but there are more directors with network ties on the board in times when the incentive to purchase is high. Not surprisingly, we find that independence significantly decreases the likelihood that the director will buy stock within 5 days of the CEO. Tenure on the board also has a negative effect. We still find that network ties increase the correlation between CEO and outside director trades.

¹⁴Our results still hold including non-trading directors in the control group.

¹⁵I.e., the odds that $y = 1$ for an observation with a one unit higher value of the independent variable relative to the baseline odds. Thus, an odds ratio of 1 indicates a zero effect.

In Column 3, we include firm fixed effects in the regression in addition to the full set of controls from Column 2. We use a conditional logit specification to avoid the incidental parameters problem and obtain consistent coefficient estimates. By including firm fixed effects, we identify the impact of SNI by comparing directors with (stronger) connections to the CEO to directors with no (weaker) connections to the CEO *within the same firm*. Thus, we remove the impact of firm-specific factors which do not vary at the director level, like “open windows” for insider trading or minimum director stock-holding requirements. We again find that directors with network ties are more likely to buy stock within 5 days of the CEO. Now, the odds of trading within 5 days of the CEO are 1.5 times higher for a director with one additional SNI connection.

As another way to gauge the economic importance of the effect, we ask whether correlated trading with the CEO has a significant influence on the net changes in connected directors’ positions in company stock during the fiscal year. We report the results in Columns 4 to 6 of Table IV. We again restrict attention to directors who made at least one insider trade during the fiscal year. We identify a director (or the CEO) as a net buyer if the aggregate value of her open market purchases during the fiscal year exceeds the aggregate value of her sales.¹⁶ In Column 4, we regress the net buyer indicator on SNI, an indicator for whether the CEO is a net buyer during the fiscal year, and the interaction of SNI with the CEO net buyer indicator. We use an OLS specification to estimate the regression (despite the binary dependent variable) to obtain an estimate of the interaction effect which is independent of the other covariates and coefficient estimates. We find that outside directors are more likely to be net buyers if the CEO is also a net buyer of company stock during the fiscal year. However, the effect is significantly more pronounced if the director has network ties to the CEO (0.52 vs. 0.42). In the remaining columns, we add the controls from Columns 2 and 3, in levels and interacted with the CEO net buyer indicator.¹⁷ Mirroring Columns 1 and 2, none of the interactions of the controls with the net buyer variable are significant in both regressions. However, among the level effects of the controls, tenure has a strong negative impact on the likelihood of being a net buyer and independence a positive impact. In both regressions, we confirm that outside directors with network ties to the CEO are particularly likely to be net buyers when the CEO is a net buyer, though the result is insignificant when we include firm fixed effects interacted

¹⁶We obtain similar results if we define net buyer using the number of purchases minus the number of sales or the number of shares purchased minus the number of shares sold.

¹⁷In Column 6, we omit CEO Net Buyer to avoid collinearity with the firm fixed effect interactions.

with the net buyer indicator (Column 6).

Overall, the results suggest a stronger correlation between the decisions of CEOs and outside directors with whom they have network ties. One interpretation is that the CEO selectively shares profitable information about the firm with his friends on the board. A related, and more problematic, story is that, like the CEO, directors in the firm who have network ties to the CEO generally have more external network ties than the average director. Then, correlated trading might reflect better access to information about market conditions rather than the internal dynamics of the board. Under either story, we would expect the trades of connected directors to perform better than the trades of their board peers. We test this prediction using 10, 30, 60, and 90 day cumulative abnormal returns beginning the day after directors' purchases. We measure daily abnormal returns as the difference between the daily stock return and the daily return on the CRSP value-weighted index. We find no evidence of differences – economically or statistically – in the cumulative abnormal returns following purchases by directors with network ties to the CEO and other outside directors over any of the four horizons.¹⁸ The results are similar adding controls for director age, tenure, gender, independence and financial education as well as indicators for accountants, lawyers, academics, doctors, and engineers. They are also similar if we add year and firm fixed effects. Thus, our findings are difficult to reconcile with information stories.

Another possibility is that similar underlying preferences or biases, rather than communication or relationships, determine the trading decisions of CEOs and connected directors. For example, the most connected individuals in the corporate world may be more optimistic, particularly if success breeds optimism. Under this hypothesis, CEOs and connected directors would tend to trade in the same direction (e.g. they would be persistently bullish), giving rise to the correlated trading we observe in Table IV. To test this hypothesis, we replicate the specification from Column 6 of Table IV, but remove all the interaction terms. We find an insignificant relation between SNI and the net buyer indicator (coefficient estimate = -0.0084 ; p-value = 0.52). Thus, the correlation in the trading decisions of CEOs and directors to whom they have network ties does not arise because of a shared bias in the direction of their trades. Instead, our evidence appears most consistent with heightened communication between CEOs and their friends on the board, the type of relationships which could hinder monitoring and

¹⁸By focusing on the difference in CARs between connected and unconnected directors, we mitigate the joint hypothesis problem, assuming measurement error in expected returns affects both groups equally.

weaken corporate governance. In the remainder of the paper, we test this hypothesis at the firm level: linking CEO-director network ties to financial restatements, acquisition policies, and, ultimately, shareholder value.

III. Network Ties and Firm Outcomes

III.A. Financial Restatements

The decision-making of outside directors with network ties to the CEO appears to be less independent of the CEO than the decision-making of other outside directors. Next we ask whether these relationships affect the diligence with which directors monitor management. We use data from the GAO to identify fiscal years in which sample firms did financial restatements and the party who prompted the restatement. We then test whether the fraction of directors with network ties to the CEO predicts (1) the frequency with which the firm does earnings restatements and (2) the frequency with which a restatement is internally prompted.

We include several firm-, board-, and CEO-level controls in our analysis. At the firm level, we control for firm size, Q, cash flow, and market leverage. At the board level, we control for board size, the number of independent directors, the number of directors with financial education, and the number of accountants. And, at the CEO level, we control for tenure, financial education, and accounting expertise. Building on findings from the accounting literature (e.g., Aier, Comprix, Gunlock, and Lee, 2005), we also include controls for CFO tenure, finance education, and accounting expertise. Because we only have information on CFO expertise for companies in which the CFO is one of the top five disclosed earners, we estimate specifications with and without CFO controls. Since restatements may cluster in time, particularly in the wake of the Enron and Worldcom scandals, we include year fixed effects to control for correlation of this clustering with time patterns in our measure of CEO-director ties.

First, we run a set of logit regressions on the full sample of firm years with a binary dependent variable indicating an earnings restatement during the next fiscal year and the percentage of the firm's independent directors with network ties to the CEO as the explanatory variable of interest. We find no significant differences in the likelihood of financial restatement as the percentage of independent directors with network ties to the CEO changes. The result holds

with and without controls and in specifications including and excluding firm fixed effects (see the Online Appendix).

Next, we test for differences in the parties who prompt the restatements. We restrict the sample to firm years in which we observe a restatement. We then run a logit regression with a binary dependent variable indicating that the restatement was internally prompted. All standard errors are clustered at the firm level. In Column 1 of Table V, we include the full set of firm, board, and CEO controls as well as year fixed effects. Among the controls, we find that restatements are more likely to be prompted internally when cash flow is low or the CEO is an accountant. But, restatements are less likely to be prompted internally when the percent of independent directors with network ties to the CEO is high. Economically, the odds of an internally prompted restatement are 0.75 times as high in a company with a one standard deviation higher percentage of connected independent directors (0.20). In Column 2, we add CFO controls to the regression. The controls have little explanatory power or impact on the coefficient of interest. In Columns 3 and 4, we add fixed effects for the 49 Fama-French industry groups to the specifications from Columns 1 and 2, respectively. Because there are relatively few restatements per industry, we estimate the regressions using conditional logit to avoid bias due to the incidental parameters problem.¹⁹ We, again, find similar results.

Our results provide direct evidence of weaker monitoring by boards with more network ties to the CEO. Insiders are less likely to prompt financial restatements when directors are more connected to the CEO, but this lower frequency of internally-prompted restatements does not reflect an overall lower frequency of restatement. The value implications of these results, however, depend on the relation between director ties to the CEO and the true frequency of accounting errors, which is unobserved. One possibility is that outsiders bridge the gap in internal monitoring. In this case, director ties to the CEO weaken board monitoring, but do not ultimately destroy value for shareholders. Another possibility is that the implied higher frequency of externally-prompted restatements in firms with many CEO-director connections indicates a higher overall frequency of mistaken financial statements. In this case, weaker internal monitoring – indicated by the lower frequency of internally-prompted restatements –

¹⁹We cannot identify the networking variable in a specification including firm fixed effects because there are not enough firms in which we observe at least 2 restatements coupled with variation in the percentage of independent directors with network ties to the CEO. However, it is unclear what characteristics – apart from the CEO, CFO, and board characteristics among our controls – could account for firm-level differences not in the propensity to restate earnings, but in the propensity for insiders to prompt restatements.

allows more fraud to go unreported. Such misbehavior could have negative value consequences for shareholders. In either case we confirm our main hypothesis: Network ties between directors and the CEO weaken board monitoring. In the next sections, we analyze directly the impact of CEO-director network ties on firm policies and shareholder value.

III.B. Real Investment

In addition to monitoring management, directors can influence firm policy, both directly and by providing advice to company management. In the latter role, independence may be particularly valuable since it can increase the flow of distinct and unbiased information to company executives. Conversely, a board in which independent directors are tied to the CEO may produce less diversity of opinion or dissent, to the detriment of claimholders.

In this section, we test whether network ties between independent directors and the CEO affect the firm's acquisition decisions. We analyze acquisitions for several reasons: First, acquisitions are often initiated by the CEO, but require board approval. Second, we find that directors with external network ties to the CEO are over-represented on the executive committee (Table I). Major investment projects, such as acquisitions, fall within the purview of this committee. Finally, acquisitions have observable announcement dates and project characteristics, which allow us to connect decisions to firm value changes in an event study framework.

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. 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 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 Table II). Or, firms may add directors with lots of network connections (including, potentially, to the CEO) in anticipation

of pursuing future acquisitions and utilizing information they can gather through those network conduits. We take several approaches to isolate the causal impact of CEO-director ties on the firm's acquisition policies. First, as in prior sections, we introduce firm fixed effects in a conditional logit regression. The fixed effects capture time-invariant differences across firms in acquisitiveness. This specification addresses the concern that there are more network ties between independent directors and the CEO in certain firms due to differences in the type of firm, e.g., firms which grow by acquisition versus firms which grow through internal investment. We report the results in Column 3. We also add common time-varying determinants of merger decisions as controls: firm cash flow, Q , market leverage, and board size and independence. 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.

We also 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. One obstacle to this test is that we must restrict our sample to companies which have an identifiable executive committee, lowering the power of our analysis. Nevertheless, Column 3 reports the results of the conditional logit analysis using the percentage of independent directors on the executive committee with network ties to the CEO as the explanatory variable. We also add additional controls for the size and independence of the executive committee. Consistent with our hypothesis, we find an economically stronger positive impact of networked directors on merger frequency. 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.

The fixed effects specifications, however, do not rule out the possibility that firms add directors with more external network ties, and therefore also more ties to the CEO, leading up to acquisitions. To address this possibility, we consider shocks to the ties between independent directors and the CEO due to director deaths and retirements. We count the number of independent directors with network ties to the CEO who have died during the sample period up to the current fiscal year. Because we use the instrument only in regressions which include firm fixed effects, our estimates use the changes in network ties around death "events" for

identification. We exclude the deaths of CEOs, even though they also sever network ties to independent directors. The death of either a director or an executive is likely to be exogenous in the sense that it is not caused by the firm’s acquisition policy (or any other ex ante firm characteristic). CEOs, however, are responsible for the day-to-day operations of the firm. Thus, a CEO death is likely to affect decisions inside the firm – including acquisitions – regardless of whether the death severs ties with the firm’s independent directors. 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 of an independent director with a network tie to the CEO is less likely to create operational upheavals which 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. Of course, older directors are at higher risk to die and firms with larger boards are more likely to experience a director death. Because these traits may themselves correlate with firms’ acquisition policies (e.g. older, long-tenured directors may prefer less aggressive policies), we include controls for board size and the distribution of director age and tenure in our specification.

We also construct a second instrument by counting the retirements of directors with network ties to the CEO. We define a director departure as a retirement if the director is at or beyond the company’s retirement age. The logic of this instrument is similar to director death. However, some directors remain on the board beyond the scheduled retirement year, even though companies set a mandatory retirement age. Thus, before proceeding with the instrumental variables estimation, we explore the extent to which the timing of director retirement is non-random. We estimate logit regressions at the firm level using a binary indicator of at least one director retirement during the fiscal year as the dependent variable. As regressors, we include proxies for firm profitability (cash flow), investment opportunities (Q), and financial status (leverage). We also include board size, board independence, and the minimum, median, and maximum of director age and tenure. We estimate the regression on the pooled sample, including year fixed effects, and including both year and firm fixed effects. We tabulate the regressions in the Online Appendix. There is little correlation of profitability or opportunities with director retirement in any specification. Moreover, several characteristics – most notably leverage – appear to have some predictive power for retirement in the cross-section, but not when we include firm fixed effects, once again highlighting the importance of our within-firm identification strategy. As expected, the strongest predictors of retirement are board size and

maximum director age, for which we will control.²⁰

In Columns 4 and 5, we report the results from the instrumental variables specification. We use two-stage least squares to estimate the regression, so the coefficients 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. We also 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.²¹ As expected, both 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).

Our results on merger frequency have several possible interpretations. 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 is optimal, since it removes a roadblock toward implementing value-improving projects. In the absence of frictions leading to underinvestment, however, extra mergers may represent empire-building overinvestment by the CEO, to the detriment of shareholders. In this case, stricter analysis of potential deals by an independent board might improve investment decisions. To distinguish these possibilities, 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 is at least 10% of the acquirer's market capitalization

²⁰Firm size also appears to significantly predict retirement in the firm fixed effects regression (though not in the cross-section). We do not include firm size in our main specification of the IV regression since the within-firm relation between mergers and firm size is hard-wired. However, including firm size among the controls has little impact on the coefficient of the network measure.

²¹We 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.

at the beginning of the fiscal year in which the deal takes place.²² We measure daily abnormal returns as the return to the acquirer’s stock minus the same day return on the CRSP value-weighted index. We report cumulative abnormal returns 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 cumulative abnormal returns 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. We find in Column 1 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 (64 basis points over three days). Among firms with few or no connections, on the other hand, the mean CAR is positive (35 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 Online Appendix, we verify that this short-term loss is not reversed in the long run.

We also do 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

²²Many prior studies instead use a 5% threshold (see, e.g., 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.

²³Since 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.

between the CEO and executive committee. Mirroring Panel A, the value destruction in firms with many executive committee connections (81 basis points) is larger than the value destruction in firms with many board-level connections, though the 1% difference between connected and unconnected firms is nearly equal to 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 (1.2%) 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 over-investment 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 \$407 million in shareholder value, \$293 million more than the average bid in the low connections group.²⁴

III.C. Shareholder Value

Having established a link between network ties and value destruction at the project level, we ask next whether such ties reduce firm value in aggregate. Following prior literature, we measure firm value using the natural logarithm of Tobin's Q.²⁵ A direct regression of firm value on SNI is particularly problematic to interpret due to endogeneity concerns: poorly performing firms may alter board composition (including the percentage of directors with ties to the CEO).

²⁴The value destruction among high connections 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.

²⁵See, e.g., Morck, Shleifer, and Vishny (1988) or Villalonga and Amit (2006).

To mitigate this concern, we again exploit changes in the network ties between independent directors and the CEO due to director deaths and retirements.

We begin by measuring the impact of director deaths and retirements on firm value in an event study framework.²⁶ In Figure 1, we graph the natural logarithm of 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.²⁷ 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 unexpected changes in board composition. Among connected directors we observe a noticeable improvement in firm value over the event window. However, firm value appears to be flat around the deaths and retirements of unconnected directors. 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 Panel A of Table VII, we quantify the changes in firm value over various windows and compute the difference in the value changes around the exits of connected and unconnected directors. We begin by computing value changes relative to the last fiscal year to end prior to the director death or retirement (year -1).²⁸ We cluster standard errors at the firm level to account for overlapping windows in firms with multiple death or retirement events. We find that firm value significantly increases over the $[-1, +1]$ and $[-1, +2]$ windows around the death or retirement of a connected director. There appears to be little additional change from year +2 to +3.²⁹ However, we find no significant changes over any window around the death or retirement of unconnected directors. The difference in differences over the three year horizon ($[-1, +2]$) is significant at the 10% level. Alternatively, we compare changes in the mean of Q for the two (or three) years after the shock relative to the two (or three) years prior to the shock. This approach removes some of the noise in year-to-year changes in Q . We find similar results. Over both windows, there is a significant increase in mean firm value around the death

²⁶ Q is more conducive to such an approach than merger frequency since it is continuous (rather than binary) and observed annually in all sample firms.

²⁷Even in the case of director death, for which we know the exact date of passing, there is some noise in the identification of the event year. A director who passes away early in a fiscal year may have been incapacitated in the months leading up to his or her death. In such a case, the “true” event year would be -1.

²⁸Using -1 as the base year minimizes contamination with pre-event confounding factors.

²⁹Sample size shrinks as we lengthen the windows because we cannot use death and retirement observations which occur after 2005 for windows ending in year +2 (or 2004 for +3) due to unavailability of Q after 2007.

or retirement of a connected director. Using this approach, we also find a significant change in value around the death or retirement of unconnected directors. Thus, it is important to consider the difference in differences. Again, for the window ending 2 years after the shock, this difference is statistically significant. As a robustness check, we compare changes in mean Q over $[-2,+2]$ (and the change in Q over $[-1, +2]$) for firms with connected directors who die or retire to firms with connected directors who do not die or retire. We use a nearest neighbor matching estimator to correct for differences in beginning of window Q and we exact match on the number of connected directors at the time of the shock. We use the matching estimator and bias adjustment procedure from Abadie and Imbens (2007). The estimated average treatment effect for the treated is similar to the differences in differences in Table VII. (See the Online Appendix.)

We also analyze the impact of CEO-director network ties on firm value in an instrumental variables regression framework, mirroring our approach in Section III.B.. These specifications identify the impact of CEO-director ties using within-firm changes in value around a director death or retirement, comparing mean value for all firm-years after the shock to mean value for all firm-years before the shock. Thus, the “event window” differs across firms depending on when during the sample period a death or retirement occurs, but is at most seven years in length. In the final row of Panel A, we present a reduced form computation of this difference. Again, we find that the death or retirement of a connected director is associated with an increase in firm value. We also go a step further, making the same computation for unconnected directors and computing the difference in differences. In both cases, we confirm our prior results: our estimates do not capture a general phenomenon surrounding shocks to board composition, but instead capture the specific impact of severing network ties. In Panel B of Table VII, we report the regression results. In Column 1, we report a pooled OLS regression of the natural logarithm of Q on the percentage of independent directors with network ties to the CEO. We include controls for board size and independence, firm size, market leverage and the GIM index. We also include year effects to capture aggregate business cycle fluctuations. Standard errors adjust for clustering at the firm level. Confirming prior literature, firms with larger boards, less independence, weaker governance, and more leverage have significantly lower valuations. And, confirming the pattern in Table I, more CEO-director network ties are associated with lower valuations. In the remaining columns, we use the death and retirement instruments in firm fixed effect instrumental variable regressions to address the endogeneity of

CEO-director ties. Columns 2 and 3 report the first and second stage estimations, respectively, on the full sample of firm years. Because it has limited within-firm variation over our seven year sample, we exclude the GIM index from these regressions. In addition to the remaining controls from Column 1, we add the controls for director and CEO age and tenure from Table VI, to control for the impact of age and experience on the likelihood of death or retirement. We confirm that a higher percentage of connected independent directors predicts 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 Column 1 of Panel A. 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 find that the implied improvement in firm value from removing a connected director is stronger in the subsample of firms with high index values, or weak shareholder rights. Thus, as in the context of merger choices, network ties between management and the board appear to be most problematic in the absence of other governance mechanisms to substitute for board monitoring.

Finally, we use the Column 3 estimates to compute the economic magnitude of the effect. The median firm in the regression sample has total assets of \$2.422B.³⁰ Since median Q is 1.51, this implies assets have a market valuation of \$3.653B. Then, 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 Section III.B., the decline in overall firm value is roughly 1.2 times the mean value destroyed by an acquisition in a firm with abnormally high CEO-director connections (\$407M).

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 which affect

³⁰We 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).

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 which 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. We also find direct evidence of weaker monitoring: Given a financial restatement, the action is less likely to be prompted internally (and more likely to be prompted by an auditor or SEC) if there are more ties between the firm’s CEO and independent directors. At the director level, directors with more ties to the CEO have buying patterns in company stock which more closely match the CEO than other directors in the firm. And, firms with more powerful CEOs are more likely to appoint new directors with pre-existing network ties to the CEO, consistent with powerful CEOs exploiting 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 which 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 corpo-

rate 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 which 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 which 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 which were not. Confirming the patterns in Duchin, Matsusaka, and Ozbas (2007), 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 which were compliant with SOX prior to its passage and firms which 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 2). Thus, network ties between independent directors and the CEO remain an important issue for optimal board composition and corporate governance design. 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. By monitoring management-driven changes in corporate strategy, an effective board of directors may have an opportunity to avert crisis.

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 the year 2000). They then constructed a historical profile of each executive and director. These profiles contain detailed information on the individual’s work history, education, non-business 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 2007.³¹ Given the specifications of the BoardEx database, it is not possible to construct exhaustive data on board composition in U.S. firms prior to the year 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 which are themselves part of the BoardEx universe after 2000. Thus, constructing a “panel” dataset on board composition prior to the year 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 datasets. Restricting the time period to

³¹Because Management Diagnostics began their data collection in 2003, firms which 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 which delisted between 2003 and 2007. Our key estimations include firm fixed effects in part to correct any biases related to this sample selection.

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 non-business 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 either reported 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.

Indeed, our sample data appears to be reasonably comprehensive. We observe information on education for approximately 82% of directors. The missing data is not randomly distributed through 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 non-business activities among 29,983 directors and disclosed earners in sample firms, for an average of approximately 3 activities per individual. Roughly one quarter of directors do not have any included non-business 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 non-business activities. The latter finding suggests that lower data quality for activities which 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 tenure, which may both predict firm outcomes and correlate with data quality.

References

- [1] Abadie, Alberto and Guido W. Imbens, 2007, Bias corrected matching estimators for average treatment effects, Mimeo.
- [2] Adams, Renee, Heitor Almeida and Daniel Ferreira, 2005, Powerful CEOs and their impact on corporate performance, *Review of Financial Studies* 18, 1403-1432.
- [3] Adams, Renee and Daniel Ferreira, 2007, A theory of friendly boards, *Journal of Finance* 62, 217-250.
- [4] Aier, Jagadison, K., Joseph Comprix, Matthew T. Gunlock and Deanna Lee, 2005, The financial expertise of CFOs and accounting restatements, *Accounting Horizons* 19(3), 123-135.
- [5] Avery, Christopher, Judith A. Chevalier and Scott Schaefer, 1998, Why do managers undertake acquisitions? An analysis of internal and external rewards for acquisitiveness, *Journal of Law, Economics, and Organization* 14(1), 24-43.
- [6] Barnea, Amir and Ilan Guedj, 2007, CEO compensation and director networks, Mimeo.
- [7] Bebchuk, Lucian Arye, Alma Cohen and Allen Ferrell, 2004, What matters in corporate governance? Harvard Law School John M. Olin Discussion Paper No. 491.
- [8] Bebchuk, Lucian Arye, Martijn Cremers and Urs Peyer, 2007, CEO centrality, NBER Working Paper No. 13701.
- [9] Bhagat, Sanjai and Bernard Black, 2000, Board independence and long-term firm performance, University of Colorado working paper.
- [10] Cohen, Lauren, Andrea Frazzini and Christopher Malloy, 2008, The small world of investing: Board connections and mutual fund returns, *Journal of Political Economy* 116(5), 951-979.
- [11] Cohen, Lauren, Andrea Frazzini and Christopher Malloy, 2009, Sell side school ties, Mimeo.
- [12] Core, John E., Robert W. Holthausen and David F. Larcker, 1999, Corporate governance, chief executive officer compensation, and firm performance, *Journal of Financial Economics* 51, 371-406.
- [13] Duchin, Ran, John G. Matsusaka and Oguzhan Ozbas, 2007, When are outside directors effective? Mimeo.
- [14] Fracassi, Cesare, 2008. Corporate finance policies and social networks. Mimeo.
- [15] Gompers, Paul, Joy Ishii and Andrew Metrick, 2003, Corporate governance and equity prices, *Quarterly Journal of Economics* 118(1), 107-155.
- [16] Guner, A. Burak, Ulrike Malmendier and Geoffrey Tate, 2008, Financial expertise of directors, *Journal of Financial Economics* 88(2), 323-354.

- [17] Hallock, Kevin F., 1997, Reciprocally interlocking boards of directors and executive compensation, *Journal of Financial and Quantitative Analysis* 32(3), 331-344.
- [18] Hayward, Matthew and Donald Hambrick, 1997, Explaining the premiums paid for large acquisitions: Evidence of CEO hubris, *Administrative Science Quarterly* 42, 103-127.
- [19] Hermalin, Benjamin and Michael Weisbach, 1988, The determinants of board composition, *Rand Journal of Economics* 19(4), 589-606.
- [20] Hermalin, Benjamin and Michael Weisbach, 1991, The effects of board composition and direct incentives on firm performance, *Financial Management* 20(4), 101-112.
- [21] Hermalin, Benjamin and Michael Weisbach, 1998, Endogenously chosen boards of directors and their monitoring of the CEO, *American Economic Review* 88, 96-118.
- [22] Hermalin, Benjamin and Michael Weisbach, 2003, Boards of directors as an endogenously determined institution: A survey of the economic literature, FRBNY Economic Policy Review.
- [23] Hochberg, Yael, Alexander Ljungqvist and Yang Lu, 2007, Whom you know matters: Venture capital networks and investment performance, *Journal of Finance* 62(1), 251-301.
- [24] Hwang, Byoung-Hyoun and Seoyoung Kim, *forthcoming*, It pays to have friends, *Journal of Financial Economics*.
- [25] Janis, Irving L., 1972, *Victims of groupthink: A psychological study of foreign policy decisions and fiascoes*. Houghton Mifflin.
- [26] Kilduff, Martin and Wenpin Tsai, 2003, *Social Networks and Organizations*. Sage Publications.
- [27] Kuhnen, Camelia, 2007, Social networks, corporate governance and contracting in the mutual fund industry, Mimeo.
- [28] Larcker, David, Scott Richardson, Andrew Seary and Irem Tuna, 2005, Back door links between directors and executive compensation, Mimeo.
- [29] Laumann, Edward, 1973, *Bonds of Pluralism: The Form and Substance of Urban Social Networks*. Wiley.
- [30] Marsden, Peter, 1987, Core discussion networks of Americans, *American Sociological Review* 52, 122-131.
- [31] Masulis, Ronald W. and Shawn Mobbs, 2009, Are all inside directors the same? Do they entrench CEOs or facilitate more informed board decisions? ECGI working paper no. 241.
- [32] McPherson, Miller, Lynn Smith-Lovin and James Cook, 2001, Birds of a feather: homophily in social networks, *Annual Review of Sociology* 27, 415-444.
- [33] Morck, Randall, Andrei Shleifer and Robert Vishny, 1988, Management ownership and market valuation: An empirical analysis, *Journal of Financial Economics* 20, 293-315.

- [34] Morck, Randall, Andrei Shleifer and Robert Vishny, 1989, Alternative mechanisms for corporate control, *American Economic Review* 79, 842-852.
- [35] Morck, Randall, Andrei Shleifer and Robert Vishny, 1990, Do managerial objectives drive bad acquisitions? *Journal of Finance* 45(1), 31-48.
- [36] Nguyen-Dang, Bang, 2008, Does the rolodex matter? Corporate elite's small world and the effectiveness of boards of directors, Mimeo.
- [37] Romano, Roberta, 2005, The Sarbanes-Oxley Act and the making of quack corporate governance, *Yale Law Review* 114, 1521-1611.
- [38] Subrahmanyam, Avaniidhar, 2008, Social networks and corporate governance, *European Financial Management* 14(4), 633-662.
- [39] Villalonga, Belen and Raphael Amit, 2006, How do family ownership, control and management affect firm value? *Journal of Financial Economics* 80, 385-417.
- [40] Watts, Duncan, 2003, *Six Degrees: The Science of a Connected Age*. W.W. Norton & Company.
- [41] Westphal, James D. and Edward J. Zajac, 1995, Who shall govern? CEO/board power, demographic similarity, and new director selection, *Administrative Science Quarterly* 40(1), 60-83.
- [42] Zajac, Edward J. and James D. Westphal, 1996, Director reputation, CEO-board power, and the dynamics of board interlocks, *Administrative Science Quarterly* 41(3), 507-529.

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)													
	<u>Full Sample</u>				<u>Connected Boards</u>				<u>Unconnected Boards</u>				
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
<u>Fama-French 12 Industry Groups</u>													
Consumer Nondurables	0.056	Telecommunications		0.017	Con. Non.	0.044 Tel.		0.024	Con. Non.	0.067	Tel.		0.011
Consumer Durables	0.023	Utilities		0.048	Con. Dur.	0.015 Util.		0.077	Con. Dur.	0.030	Util.		0.022
Manufacturing	0.083	Shops		0.000	Man.	0.080 Shops		0.000	Man.	0.088	Shops		0.000
Energy	0.038	Health		0.085	En.	0.043 Health		0.075	En.	0.033	Health		0.095
Chemicals	0.026	Finance		0.179	Chem.	0.027 Fin.		0.235	Chem.	0.026	Fin.		0.126
Business Equipment	0.184	Other		0.262	Bus. Eq.	0.152 Other		0.230	Bus. Eq.	0.212	Other		0.291
Panel C. Pairwise Correlations (p-values in parentheses)													
	<u>Director-Level Data</u>					<u>Firm-Level Data</u>							
	SNI	CE	PE	ED	OA	% SNI	% CE	% PE	% Ed	% OA			
Social Network Index (SNI)	1					1							
Current Employment Connection (CE)	0.3561 (0.00)	1				0.4053 (0.00)	1						
Prior Employment Connection (PE)	0.7246 (0.00)	0.0946 (0.00)	1			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		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	0.6221 (0.00)	0.1574 (0.00)	0.0871 (0.00)	0.0642 (0.00)	1			

Table II
SNI Connections at Citi Corp in 2001 and 2002

The table contains only employment and activity information which is shared between the CEO and at least one company director. Changes in Connections between Sanford Weill (Citi Chairman and CEO) and company directors are indicated in blue (2001) and red (2002). Connections are measured as of the end of fiscal years 2001 and 2002 for Citi. Reported years for employment experience are calendar years.

Name	Role	Current Emp.	Past Employment	Other Activities
Sanford Weill	Chairman/CEO	United Technologies (Director 1999-2003), AT&T (Director 1998-2002), Dupont (Director 1998-2001)	AT&T (Director 1998-2002), Travelers Group (Chairman/CEO 1994-1998), Dupont (Director 1998-2001)	Carnegie Hall Corp (Chairman), National Academy Foundation (Board Member), Cornell University (Trustee Emeritus), Memorial Sloan Kettering Cancer Center (Board Member)
Robert Rubin	Executive Officer			
C Michael Armstrong	Indep. Director	AT&T (Chairman/CEO 1997-2002)	AT&T (Chairman/CEO 1997-2002), Travelers Group (Director 1993-1998)	Carnegie Hall Corp (Trustee)
Alain Belda	Indep. Director	Dupont (Director 2000-2007)	Dupont (Director 2000-2007), Travelers (Director 1997-1998)	
Kenneth Bialkin	Director		Travelers (Director 1986-1998)	Carnegie Hall Corp (Secretary)
George David	Indep. Director	United Technologies (CEO 1988-Present)		Carnegie Hall Corp (Trustee), National Academy Foundation (Board Member)
Kenneth Derr	Indep. Director	AT&T (Director 1995-2005)	AT&T (Director 1995-2005)	Cornell University (Trustee Emeritus)
John Deutch	Indep. Director			
Alfredo Helu	Director			
Roberto Ramirez	Director			
Ann Jordan	Indep. Director		Travelers (Director 1989-1998)	Memorial Sloan-Kettering Cancer Center (Board Member)
Robert Lipp	Director		Travelers (Director 1995-1998)	Carnegie Hall Corp (Trustee)
Reuben Mark	Indep. Director			
Michael Masin	Director		Travelers (Director 1997-1998)	Carnegie Hall Corp (Trustee)
Dudley Mecum II	Indep. Director		Travelers (Director 1986-1998)	
Richard Parsons	Indep. Director			
Andrall Pearson	Indep. Director		Travelers (Director 1986-1998)	
Franklin Thomas	Indep. Director			
Arthur Zankel	Indep. Director		Travelers (Director 1994-1998)	Carnegie Hall (Vice-Chairman)

Table III
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 non-professional organization. BOSS is a dummy equal to 1 if the CEO is also Chairman of the Board and President. CEO Tenure is measured in years. Entrenchment Index measures anti-shareholder charter provisions and is defined and constructed by Bebchuk, Cohen, and Ferrell (2004). Compensation Ratio is the ratio of CEO total compensation to the total compensation of the next highest paid executive in the firm, taken in log form. First (Second) Principal Component is the first (second) factor from a principal components analysis of BOSS, CEO Tenure, Entrenchment Index, and Compensation Ratio. Age is the director's age, measured in years. Independence is an indicator variable equal to 1 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. % SNI is the percentage of already serving directors who have SNI ties to the CEO. ROA, Q, Firm Size, and % SNI 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.

	OLS (1)	OLS (2)	OLS (3)	OLS (4)	OLS (5)	OLS (6)	OLS (7)	OLS (8)
BOSS	0.0182 (1.75)*							
CEO Tenure		0.0013 (1.30)						
Entrenchment Index			0.0155 (3.50)***					
Compensation Ratio				0.0313 (2.30)**				
First Principal Component					0.0091 (1.50)	0.0023 (0.38)	0.0026 (0.42)	0.0037 (0.62)
Second Principal Component					0.0177 (2.97)***	0.0119 (2.02)**	0.0118 (1.99)**	-0.0014 (0.22)
(Second Principal Component) * (% SNI)								0.0565 (1.66)*
% SNI								0.2252 (6.01)***
Age	0.0025 (4.44)***	0.0026 (4.36)***	0.0028 (3.88)***	0.0027 (4.32)***	0.0029 (3.78)***	0.0026 (3.37)***	0.0028 (3.54)***	0.0027 (3.47)***
Independence	0.0251 (2.04)**	0.0249 (1.97)**	0.0239 (1.56)	0.0338 (2.25)**	0.0195 (1.18)	0.025 (1.43)	0.035 (1.90)*	0.0374 (2.01)**
ROA	-0.0083 (0.55)	-0.0125 (0.82)	-0.0175 (0.29)	0.0109 (0.84)	-0.0482 (0.74)	-0.0355 (0.52)	-0.0347 (0.51)	-0.042 (0.62)
Q	-0.0033 (0.32)	-0.0010 (0.09)	-0.0114 (0.85)	-0.0017 (0.15)	-0.0077 (0.54)	0.0032 (0.22)	0.0014 (0.10)	0.0038 (0.27)
Firm Size	0.0158 (5.54)***	0.0159 (5.46)***	0.0177 (5.13)***	0.0126 (3.74)***	0.0173 (4.79)***	0.0123 (3.20)***	0.0125 (3.12)***	0.0086 (2.28)**
Industry Fixed Effects	no	no	no	no	no	yes	yes	yes
Year Fixed Effects	no	no	no	no	no	no	yes	yes
Observations	5,736	5,484	4,562	5,267	4,163	4,119	4,119	4,119
R-squared	0.01	0.01	0.02	0.01	0.02	0.04	0.04	0.06

Robust t statistics in parentheses. Constant included. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table IV
Director Network Ties to the CEO and Insider Trading

The sample is restricted to fiscal years in which non-executive directors made at least one open market transaction in firm stock. The dependent variable in Columns (1) - (3) is a binary indicator which takes the value 1 if the director purchased company stock within 5 days of the CEO. The dependent variable in Columns (4) - (6) is a binary indicator which takes the value 1 if the aggregate value of company stock the director purchased in the year exceeds the aggregate value of company stock sold. Social Network Index (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 non-professional organization. CEO Net Buyer is a binary indicator which takes the value 1 if the aggregate value of company stock the CEO purchased in the year exceeds the aggregate value of company stock sold. Age and Tenure are measured in years. All standard errors are clustered at the firm level. Coefficient estimates in Columns (1) - (3) are presented as odds ratios.

	Buy within 5 Days of CEO			Net Buyer		
	Logit (1)	Logit (2)	Logit (3)	OLS (4)	OLS (5)	OLS (6)
SNI	1.3614 (2.69)***	1.3277 (2.37)**	1.5028 (2.92)***	-0.0173 (1.22)	-0.0102 (0.70)	-0.0156 (0.86)
SNI * CEO Net Buyer				0.0963 (2.99)***	0.0718 (2.39)**	0.0561 (1.55)
CEO Net Buyer				0.4217 (20.46)***	0.504 (4.74)***	
Age		1.0018 (0.28)	0.9971 (0.46)		0.0009 (1.26)	-0.0010 (1.40)
Tenure		0.9123 (6.00)***	0.9758 (1.93)*		-0.0158 (16.21)***	-0.0192 (15.69)***
Female		0.8528 (0.61)	0.9257 (0.35)		0.0381 (1.74)*	-0.0326 (1.58)
Independent		0.7614 (2.49)**	0.9631 (0.30)		0.099 (7.64)***	0.0943 (6.18)***
Age * CEO Net Buyer					-0.0018 (1.08)	0.0024 (1.55)
Tenure * CEO Net Buyer					-0.0049 (2.10)**	0.0009 (0.28)
Female * CEO Net Buyer					0.0195 (0.47)	0.0992 (2.51)**
Independent * CEO Net Buyer					-0.0109 (0.34)	-0.0134 (0.38)
Year Fixed Effects	no	yes	yes	no	yes	yes
Year * CEO Net Buyer Effects	no	no	no	no	yes	yes
Firm Fixed Effects	no	no	yes	no	no	yes
Firm * CEO Net Buyer Effects	no	no	no	no	no	yes
Observations	19,504	18,423	3,389	11,291	10,773	10,773
R-squared				0.15	0.25	0.56

Robust t-statistics in parentheses in Columns (4) - (6). Robust z-statistics in parentheses in remaining columns. Constant included. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table V
Director Network Ties to the CEO and Earnings Restatements

The dependent variable is an indicator equal to 1 if the firm did a financial restatement prompted by the company itself. The sample is restricted to observations for which there is a financial restatement in the next fiscal year. Social Network Index (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 non-professional organization. % Independent SNI is the percentage of independent directors with SNI connections to the CEO. Board Size is in numbers. Board Independence, Financial Education, and Accountants are the number of directors with each trait. Firm Size is the natural logarithm of assets. Q is the natural logarithm of the ratio of the market value of assets to the book value of assets. Cash Flow is net income plus depreciation scaled by the lag of total assets. Market Leverage is total debt plus debt in current liabilities, divided by the numerator plus market equity. CEO (CFO) Financial Education and CEO (CFO) Accountant are indicators equal to 1 for CEOs (CFOs) with each trait. CEO (CFO) Tenure is measured in years. Financial Education is an indicator equal to 1 if the director is an MBA, CPA, CFA, or has a degree in Economics, Management, Accounting, or Business. Standard errors in columns (1) and (2) are clustered at the firm level; standard errors in columns (3) and (4) are clustered at the industry level. Industries are measured using the Fama-French 49 industry groups. Coefficients are presented as odds ratios.

	Logit (1)	Logit (2)	Conditional Logit (3)	Conditional Logit (4)
% Independent SNI	0.2448 (2.15)**	0.2099 (1.95)*	0.2438 (3.36)***	0.2355 (2.46)**
Board Size	1.0653 (0.79)	1.1171 (1.17)	1.0231 (0.23)	1.0796 (0.56)
Board Independence	0.9772 (0.28)	1.0042 (0.04)	1.0045 (0.04)	1.0273 (0.19)
Board Financial Education	1.0705 (0.74)	1.0712 (0.67)	1.0213 (0.20)	1.0322 (0.25)
Board Accountants	1.0944 (0.44)	1.3285 (1.13)	1.1837 (0.67)	1.3199 (1.04)
Firm Size	0.9427 (0.55)	0.8912 (0.86)	1.026 (0.22)	1.0083 (0.06)
Q	1.1482 (0.28)	0.8745 (0.22)	0.5557 (1.04)	0.4094 (1.17)
Cash Flow	0.0155 (2.30)**	0.0025 (1.97)**	0.0195 (2.08)**	0.0009 (1.95)*
Market Leverage	0.5612 (0.73)	0.325 (1.24)	0.519 (0.55)	0.1619 (1.39)
CEO Financial Education	0.8448 (0.59)	0.5967 (1.51)	0.703 (1.35)	0.493 (2.40)**
CEO Accountant	3.1704 (1.76)*	4.6666 (2.23)**	2.6127 (1.36)	4.2075 (1.87)*
CEO Tenure	0.9766 (1.02)	0.9802 (0.82)	0.9814 (0.64)	0.9855 (0.50)
CFO Financial Education		1.4784 (0.91)		1.5384 (0.82)
CFO Accountant		0.8200 (0.51)		0.7861 (0.51)
CFO Tenure		1.0145 (0.29)		1.0241 (0.66)
Year Fixed Effects	yes	yes	yes	yes
Industry Fixed Effects	no	no	yes	yes
Observations	354	257	321	228

Robust z statistics in parentheses. Constant included. * significant at 10%; ** significant at 5%; *** significant at 1%.

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 1 if the firm did at least 1 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 non-professional 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 1 year of leaving the board, up to the current fiscal year. Coefficients in columns (1) - (3) are presented as odds ratios. Standard errors are clustered at the firm level. 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 daily returns on the CRSP value-weighted index. 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 Metrick (2003) governance index. Standard errors are clustered by event date.

Panel A. Merger Frequency

	<u>IV Regression</u>				
	Logit (1)	Conditional Logit (2)	Conditional Logit (3)	First Stage (4)	Second Stage (5)
% Independent SNI	1.5889 (2.67)***	1.9541 (1.66)*			0.7912 (1.67)*
% Exec. Com. Ind. SNI			3.1953 (2.37)**		
Board Size		0.9989 (0.03)	1.0554 (0.87)	0.004 (1.66)*	-0.0031 (0.45)
Executive Committee Size			0.8598 (1.60)		
Cash Flow		9.7121 (3.35)***	10.2351 (2.13)**	-0.0065 (0.32)	0.3565 (4.54)***
Q		1.3659 (1.58)	1.2612 (0.67)	0.0037 (0.37)	0.0394 (1.26)
Market Leverage		0.0912 (3.71)***	0.08 (2.78)***	0.0172 (0.57)	-0.3543 (3.66)***
Independence		0.9282 (1.63)	0.937 (0.92)	-0.006 (2.06)**	-0.0074 (0.91)
Exec. Com. Independence			1.1181 (1.13)		
Maximum Ind. Director Age				0.0002 (0.26)	-0.0024 (0.65)
Maximum Ind. Director Tenure				-0.0015 (1.57)	0.0010 (0.35)
CEO Age				0.0036 (3.47)***	-0.0023 (0.96)
CEO Tenure				0.0018 (1.59)	-0.0060 (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	-0.0014 (601; 0.54)	-0.0024 (305; 0.72)	-0.0180 (262; 4.02)***	0.0115 (339; 3.98)***	0.0009 (293; 0.24)	-0.0036 (308; 0.99)
% Connected ≥ Median	-0.0064 (299; 1.92)*		-0.0213 (136; 3.86)***	0.0060 (163; 1.64)	-0.0003 (141; 0.06)	-0.0118 (158; 2.77)***
% Exec. Com. Connected ≥ Median		-0.0081 (122; 2.03)**				
% Connected < Median	0.0036 (302; 0.91)		-0.0146 (126; 2.04)**	0.0165 (176; 3.73)***	0.0020 (152; 0.37)	0.0051 (150; 0.86)
% Exec. Com. Connected < Median		0.0015 (183; 0.32)				
Difference	-0.0099 (601; 1.94)*	-0.0096 (305; 1.60)	-0.0067 (262; 0.75)	-0.0105 (339; 1.80)*	-0.0023 (293; 0.32)	-0.0169 (308; 2.27)**

Robust t-statistics in parentheses in Columns (4) & (5) of Panel A. Robust z-statistics in parentheses in remaining columns. Constant included. In Panel B, number of observations and robust t-statistics in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Table VII
Director Network Ties to the CEO and Market Value

In Panel A, Δ indicates changes, with the window over which changes are measured indicated in brackets. Events are the death or retirement of a connected (column 1) or unconnected (column 2) independent director. 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 non-professional organization. The dependent variable in Columns (1), (3), (5), and (7) of Panel B 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) of Panel B is % Independent SNI. In columns (1) - (4), % Independent SNI is the percentage of independent directors with SNI connections to the CEO. All independent variables are measured at the beginning of the fiscal year. Board Size (Independence) count 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 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 1 year of leaving the board, up to the current fiscal year. All standard errors are clustered at the firm level.

Panel A. Event Studies

	Connected (1)	Unconnected (2)	Difference (3)
$\Delta Q [-1,1]$	0.0372 (111; 1.91)*	0.0113 (623; 1.09)	0.0259 (734; 1.2)
$\Delta Q [-1,2]$	0.0811 (77; 2.64)***	0.0232 (391; 1.51)	0.0579 (468; 1.73)*
$\Delta Q [-1,3]$	0.0805 (38; 1.38)	0.0341 (197; 1.31)	0.0464 (235; 0.73)
$\Delta \text{mean } Q [-2,-1;1,2]$	0.1091 (77; 4.29)***	0.0418 (390; 3.07)***	0.0673 (467; 2.43)**
$\Delta \text{mean } Q [-3,-1;1,3]$	0.0962 (38; 2.20)**	0.0451 (194; 2.07)**	0.0511 (232; 1.06)
$\Delta \text{mean } Q [\text{before};\text{after}]$	0.0985 (82; 3.69)***	0.0433 (419; 3.62)***	0.0552 (501; 1.97)**

Panel B. Regression Analysis

	OLS (1)	Full Sample		IV Regression GIM < Median		GIM \geq Median	
		First Stage (2)	Second Stage (3)	First Stage (4)	Second Stage (5)	First Stage (6)	Second Stage (7)
% Independent SNI	-0.1069 (3.14)***		-0.6593 (2.77)***		-0.3587 (1.91)*		-0.8099 (2.30)**
Board Size	-0.0131 (2.89)***	0.0029 (1.25)	0.0054 (1.43)	0.0047 (1.41)	0.0006 (0.13)	0.0016 (0.48)	0.0081 (1.49)
Independence	0.0084 (1.78)*	-0.0055 (1.96)*	-0.0031 (0.75)	-0.0057 (1.52)	0.002 (0.36)	-0.0057 (1.28)	-0.006 (1.04)
Firm Size	0.0037 (0.52)	0.0138 (1.46)	-0.173 (9.00)***	0.0065 (0.51)	-0.1681 (7.31)***	0.0264 (1.74)*	-0.1620 (4.72)***
Market Leverage	-1.3258 (28.31)***	0.0069 (0.27)	-0.3107 (6.06)***	0.0101 (0.27)	-0.2781 (3.51)***	-0.0075 (0.20)	-0.3347 (5.13)***
GIM	-0.0060 (1.90)*						
Maximum Ind. Director Age		0.0000 (0.04)	-0.0012 (0.68)	0.0005 (0.51)	0.0015 (0.73)	-0.0008 (0.42)	-0.0058 (1.76)*
Maximum Ind. Director Tenure		-0.0015 (1.57)	-0.0013 (1.03)	-0.0028 (1.70)*	-0.0009 (0.51)	-0.0005 (0.43)	-0.0016 (0.88)
CEO Age		0.0036 (3.58)***	0.0029 (2.21)**	0.0042 (2.93)***	0.0024 (1.66)*	0.0029 (1.90)*	0.0018 (0.99)
CEO Tenure		0.0016 (1.47)	0.0006 (0.46)	0.0011 (0.73)	0.0006 (0.38)	0.0023 (1.38)	0.0022 (0.98)
Retired Director		-0.0799 (5.57)***		-0.0979 (4.83)***		-0.0701 (3.16)***	
Deceased Director		-0.0928 (3.93)***		-0.1098 (5.74)***		-0.0988 (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
R-squared	0.39						

In Panel A, number of observations and robust t-statistics in parentheses. In panel B, robust t statistics in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1%.

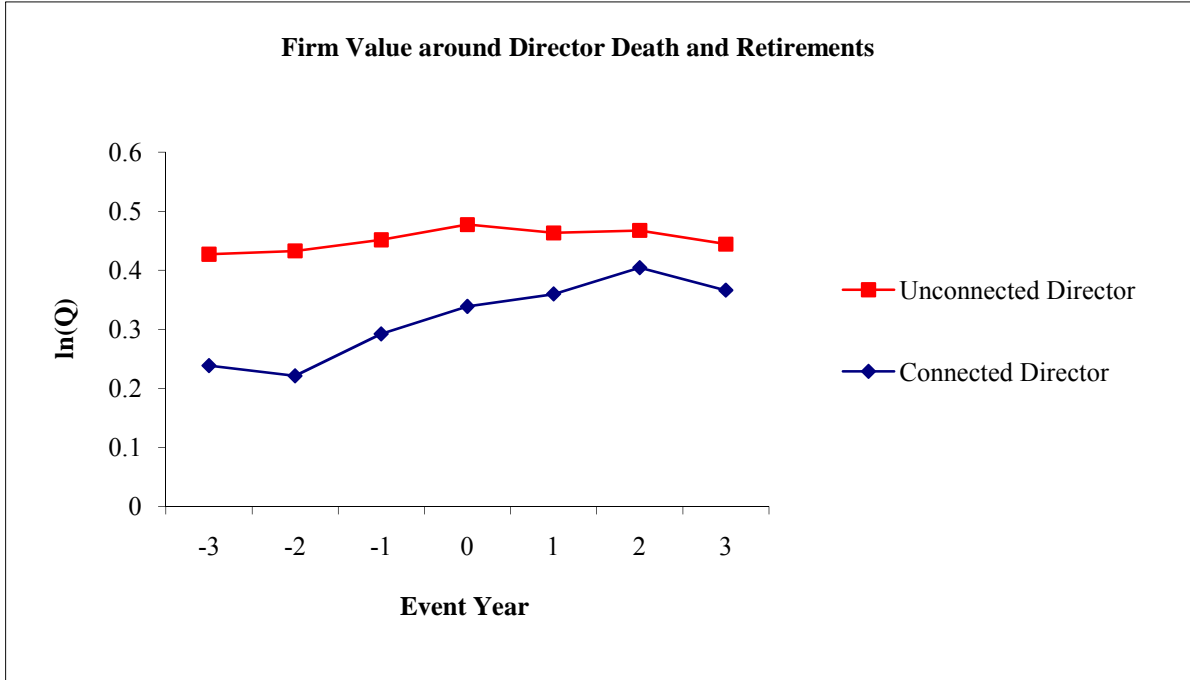


Figure 1. Firm Value around Director Deaths and Retirements. Tobin's Q is measured as the natural log of the ratio of the market value of assets to the book value of assets. "Connected" means a value of the Social Network Index (SNI) greater than or equal to 1, where SNI is defined for independent directors 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 non-professional organization. Year 0 is the fiscal year during which the director death or retirement occurs.

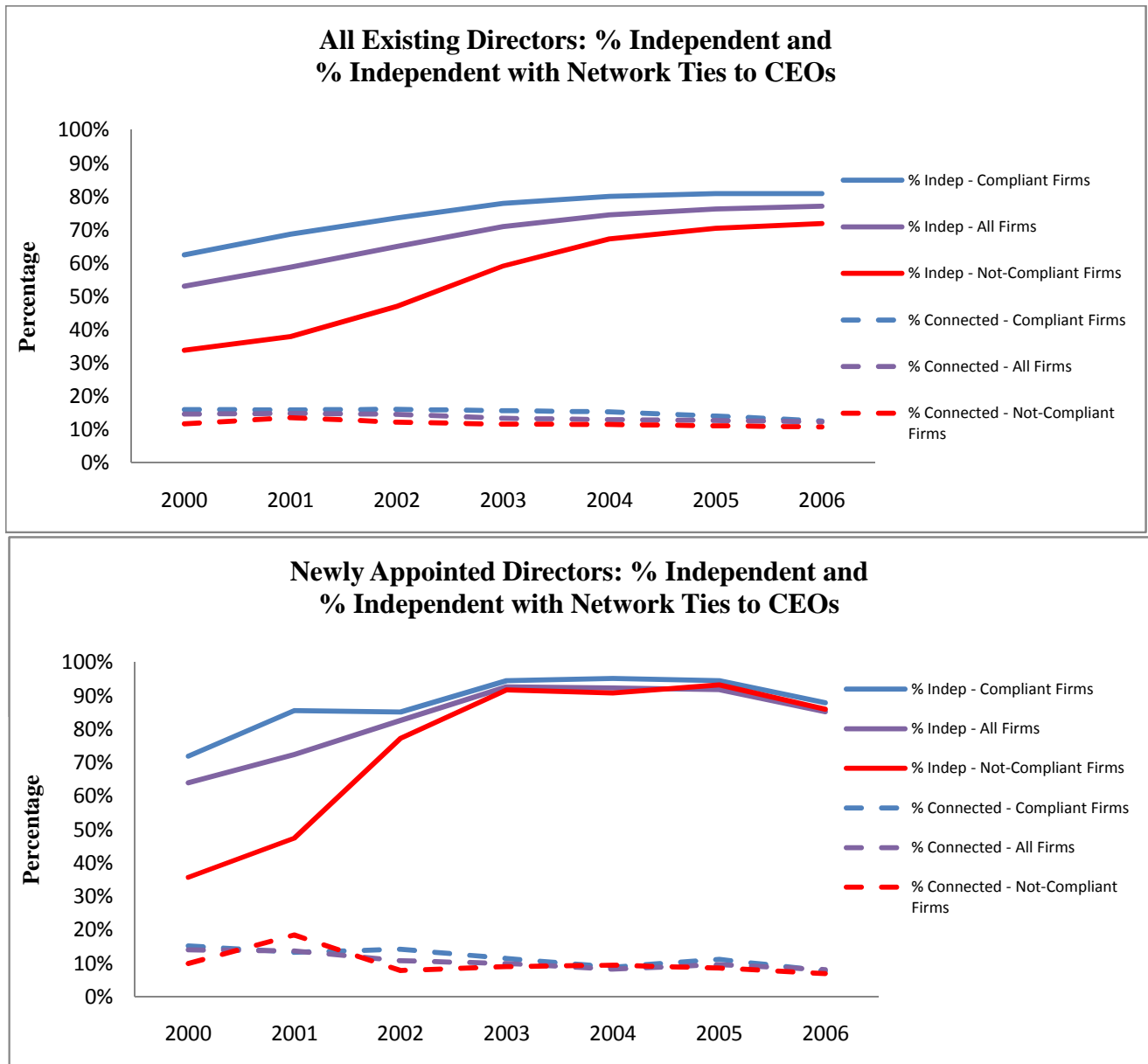


Figure 2. Frequency of Social Ties between Directors and the CEO. Connected is defined using the Social Network Index (SNI). SNI is the sum of Current Employment Connection, Prior Employment Connection, Education Connection, and Other Activity Connection. Current Employment Connection indicates that 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 non-professional organization.