

CEO-Director Connections and Corporate Fraud: Not just whether you are connected but *how*

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Abstract

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Abstract

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1 Introduction

The end of the dot com bubble in 2000 was punctuated by several high profile cases of fraud and otherwise rare events. These frauds raised suspicions that the governance systems in the U.S. had become dysfunctional and resulted in a swift and sweeping regulatory response in the form of the 2002 Sarbanes-Oxley Act (SOX). While the eleven titles of SOX targeted several stakeholders of firms, a key target was the board of directors. Frauds seem to reflect a basic failure of board oversight, perhaps due to excessively cozy relations between CEOs and boards. Accordingly, governance reforms aim to break the nexus between CEOs and boards, primarily by stressing director independence.¹

We examine the role of *social* ties between CEOs and boards in explaining corporate fraud. Current standards for director independence focus on the economic ties between directors and top executives.² We agree. However, we show that social ties are at least as important in explaining fraud. As remarkably, different types of social ties have different effects on fraud. Professional (“LinkedIn”) ties resulting from employment overlaps lower fraud probability, while nonprofessional (“Facebook”) ties increase the likelihood of fraud.³ The results are robust across multiple specifications and samples.

As motivation for our study, we briefly consider why social ties between CEOs and directors can explain fraud. The traditional focus on economic ties takes the view that financial quid pro quo compromises independent judgment. For instance, a director with lucrative consulting relationships set up by a CEO is less likely to monitor the CEO aggressively. Social ties operate through different channels of a non-pecuniary nature. For instance, they can alter the information flows in social

¹For instance, NYSE and NASDAQ listing rules require that at least 50% of directors are independent. See Beasley, Carcello, Hermanson, and Neal (2009) or Chhaochharia and Grinstein (2007), and Dahya and McConnell (2007) on the Cadbury commission norms in the U.K.

²See, for instance, NASDAQ Rule 4200 a(15), or Section 303A of NYSE listing rules for definitions of independence.

³We use the phrase “Facebook” and “LinkedIn” as metaphors. Facebook was formed in 2004 to establish ties between students at similar universities and is now a site connecting people based on informal family and friendship ties, mainly of a nonprofessional nature. LinkedIn establishes professional connections arising out of employment.

interactions or be a source of predispositions that compromise independent judgment. We expand on these points below.

To understand the mechanisms through which social ties can impact CEO-director relationships, it is useful to ask what exactly directors do. Section 2 in Adams, Hermalin, and Weisbach (2009) asks precisely this question and provides empirical evidence, survey data, and evidence from the field on this question. The central findings is that the main job of a director is to interact with and assess CEOs (see also Schwartz-Ziv and Weisbach (2013)). An influential body of work in sociology suggests that prior social ties both inform and influence the nature of these interactions and the resulting economic outcomes (e.g., Granovetter (1985), Granovetter (2005)).⁴ Thus, decision-making in the presence of ties can be different from decisions that come in an arms-length relationship. The change could be beneficial or harmful depending on whether ties constrain or facilitate opportunistic behavior.

The negative effects of social ties are stressed by an agency perspective of social ties. Cohen, Frazzini, and Malloy (2008, 2010) introduce this viewpoint to the finance context. They focus on ties derived from a common undergraduate alma mater. These ties operate in two ways. One is through personal friendships formed during years of common attendance (Hwang and Kim (2009)) or subsequently through interactions in alumni networks. Cohen et al. stress that social ties can arise even absent direct interactions. Individuals having similar backgrounds tend to exhibit homophily or affinity towards each other (Lazarsfeld and Merton (1954), Cohen (1977), or McPherson, Smith-Lovin, and Cook (2001)). For instance, a sense of trust and loyalty towards individuals from the same alma mater can compromise a director's ability to assess CEOs in an arms-length manner.

The agency perspective, however, draws no particular distinction between different *types* of ties. From its viewpoint, ties generate personal friendships or are a source of commonalities that generate loyalty and trust through a sense of kinship. This description is certainly apt for non-business ties such as the bonds from common schooling or joint service in the same charitable cause. However, *professional* ties originating in business interactions can have different – and potentially beneficial

⁴These are among the most influential articles relating social processes to economic outcomes with a a combined 5,611 Web of Science and 23,000 Google scholar citations. A well known application of social structure to corporate finance is Uzzi (1999).

– effects. We discuss three channels through which professional ties can have beneficial effects on corporate outcomes, viz., monitoring, advising, and director selection.

A director who has worked in the past with a CEO gains insights into how the CEO functions in a professional setting, which can help in assessment and ongoing monitoring of a CEO compared to an arms-length director unfamiliar with the CEO. The second channel is advising. Whether directors engage in advising CEOs – and whether they should – in matters of business strategy is an open question. At least some evidence suggests that directors play an advising and mentoring role.⁵ Past business ties can facilitate advising relationships as it provides a ready and familiar context for the director and the CEO to have conversations on business. Saint-Charles and Mongeau (2009) make a related point. They argue that advice networks, consisting of people or specialists consulted for work-related matters, are activated at different times relative to friendship networks. In particular, advice networks rely on an advisor’s perceived competence in work-related areas. A CEO is more likely to reach out and seek advice from directors known to her in a professional capacity. A final channel by which professional ties act is through director assessment of CEOs. A director who has worked with a CEO before is less likely to join a board when her prior assessment of the CEO indicates that malfeasance is likely. Thus, prior professional ties between CEOs and directors can serve as a signal that fraud is less likely.

Each of the three channels discussed above predicts a negative relation between fraud probability and the existence of professional CEO-director ties. However, we readily acknowledge that professional ties could result in personal friendships. For instance, colleagues in a finance department can become personal friends and the friendship can endure when one or the other moves on to another job and result in bias in the refereeing process. To the extent personal friendships are a result of professional interactions, business ties can create rather than mitigate agency problems. Whether the dark or bright side of professional ties dominates is an empirical question.

We obtain data on social ties from the BoardEx database compiled by Management Diagnostics Limited. We construct connection data from the employment histories of CEOs and directors. A professional tie exists if individuals had overlapping employment histories recorded in BoardEx. We

⁵Mace (1971) discusses board advising. Subsequent work includes Fischer (1982), Westphal (1999), Adams and Ferreira (2003), Adams (2005), Raheja (2005), Coles, Daniel, and Naveen (2014), Linck, Netter, and Yang (2009), and Coles, Daniel, and Naveen (2012).

later consider a refined definition that incorporates both the employment histories *and* the roles of the relevant individuals. For nonprofessional ties, we first follow Cohen, Frazzini, and Malloy (2008, 2010) and focus on ties through a common undergraduate alma mater. As they argue, such ties endow shared experiences, culture, and alumni networks, commonalities that can foster trust and create favorable predispositions. An interesting out of sample test for nonprofessional ties comes through “other activities” in BoardEx, which are non-business service of directors such as trusteeships on charities or foundations. While commonalities in these activities offer little professional expertise, they can reflect friendships and quid pro quo that compromise monitoring, as in the Enron case.⁶

We start by following existing work on social ties and treat all types of social ties symmetrically, aggregating them into a single connectedness index. We examine its relation to fraud after including an exhaustive set of controls suggested by the fraud literature. The results are unexpected and rather stark. The composite index representing all forms of CEO-director social ties are associated with *lower* fraud probability. These findings contradict the agency view, which predicts that social ties should increase fraud. They also contradict the thrust of virtually all board reforms in the wake of the dot com crisis. They argue that cozy relations between CEOs and directors are the source of fraud, and thus aim to distance CEOs from directors to promote independent decision-making. However, the baseline findings suggest that ties are associated with *less* fraud.

Our next specifications disentangle the effects of professional and nonprofessional ties. We include both forms of ties in many models – singly, jointly, with standard controls for fraud, with new controls that exploit new biographic data, in subperiods and using variations of these variables that give additional insights on how ties act. The robust finding is that professional ties are associated with the lower incidence of fraud. However, non-professional ties have the opposite effect: they are associated with an increase in fraud probability. Non-professional ties formed through non-business service are more robust than educational ties. Thus, the Enron example in footnote 6 is a feature of the broad data. Ties are also economically significant. They are second only to firm size and have greater economic effects than board independence in several specifications.

⁶Enron donated hundreds of millions of dollars to the M.D. Andersen Cancer Center, whose president John Mendelsohn sat on Enron’s board as an (ostensibly) independent director.

From a policy viewpoint, our results inform governance reforms that target board composition. These reforms were primarily initiated as a response to the many frauds in the post dot com era. Their primary goal is to distance directors from executives. This is certainly reasonable. Directors cherry picked by CEOs or who have financial interests due to a CEO are less likely to render independent judgment. Our point is that shareholders should pay attention to social ties between directors and the CEO, not necessarily in a negative manner. Some ties – such as professional ones – can facilitate better judgments rather than compromise it. Based on our evidence, professional ties based on past experience in working with a specific CEO can be an asset in this regard.

From an economic viewpoint, we make two points. One, we affirm a point made by influential sociologists such as Granovetter (1985, 2005) and Uzzi (1999) that social interactions are important determinants of economic outcomes. Our additional contribution is to point out that *type* of a social tie can matter. A second contribution is to the literature on “soft” information (e.g., Petersen and Rajan (1994) or Agarwal and Hauswald (2010) in banking or (Montgomery (1991) in labor economics). Our results suggest that social ties between CEOs and directors are a source of soft information. The soft’ information in non-business interactions is peripherally related to a director’s fiduciary duties and can signal predispositions, affiliations, or outside payoffs that may not be first best for shareholders. The soft information gleaned from interactions in business settings is different and potentially valuable for shareholders.

We consider endogeneity issues. Our key right-hand side variables are professional and non-professional CEO-director ties. These connections could matter because they are causal and induce behavioral changes that mitigate or increase fraudulent behavior. Alternatively, they may be non-causal, and serve as new signals correlated with unobservables that explain fraud, including aspects of CEO quality, director quality, the quality of the CEO-director match that are not picked up by other included variables. For instance, a board in which directors have nonprofessional ties may signal CEOs prone to cronyism or CEOs who associate with yes-men. Likewise, directors with prior professional ties with CEOs may get to know CEOs well and sign up to join boards only when CEOs are of high quality. Thus, professional ties may be significant because they serve as signals of an unobservable propensity to avoid fraud.

It is also possible that connections have a causal role. However, we do not attempt to disentangle causality through exogenous variations as the approach does not fit the characteristics of our dataset. There are two major issues. One is that the LHS variable, fraud, is a very rare event. When frauds occur they become headline-grabbing events and legislative clamp downs are quick to follow, perhaps because frauds undermine confidence in the capital markets. The key RHS variable, social connections, is formed over a period of time and is thus stable. Thus, identifying truly exogenous breaks in ties paired with variation in fraud is practically impossible. Even if some instances exist, the external validity of inferences beyond local variation is open to question.

In our view, the far more profitable route is to adopt the conservative non-causal interpretation that social ties pick up unobserved aspects of firm, CEO, or director quality such as the signal embedded in the decision of a connected director to join a board. We include a rich set of cross-sectional variables to rule out the possibility that social ties reflect something obvious. The key econometric issue in such an approach is whether the included suite of other explanatory variables is rich enough. We stack ties against all variables used in prior work on fraud and also add others motivated by specific hypotheses and that offer interesting insights in their own right as predictors of fraud. We discuss these choices in some detail.

Among the extra variables, the first set includes omitted CEO characteristics. A candidate CEO characteristic is whether the CEO is internally or externally hired. Internal CEOs likely hold fewer outside jobs and are thus (mechanically) less likely to be professionally connected to directors. Professional ties can also reflect CEOs from prestigious schools as these schools have more alumni in influential positions in corporate America. The quality of the undergraduate school can also proxy for unobserved CEO quality (Chevalier and Ellison (1999)), which may mitigate fraud. To the extent directors and CEOs exhibit unobserved forms of homophily, a prior social tie could also reflect the recruitment of co-opted directors who owe their appointments to the CEO (Yermack (2004), Coles, Daniel, and Naveen (2014)). Ties remain robust to each of these controls.

We next consider omitted director characteristics. A particular concern is that professional ties are more likely to be formed when directors have more external appointments (Fich and Shivdasani (2007)). Following Agrawal and Chadha (2005), director financial expertise can mitigate fraud. We control for both metrics of director quality. We add two other new controls that capture director

quality as related to CEO-director ties more directly. One control is whether a director comes from the top firms supplying directors to U.S. firms. These are prestigious firms such as GE, IBM, and McKinsey. Individuals from these “director factories” are (by definition) more likely to enjoy professional “LinkedIn” type of connections. Furthermore, given their professional expertise in the prestigious firms, the director factory variable could capture unobserved heterogeneity in director quality and thereby be correlated with lower fraud probability. Ties remain significant.

We consider time series and cross-sectional unobservables next. To control for unobserved *time-series* variation in fraud propensity, we include year dummy variables. Additionally, a particular focus of SOX was to achieve greater distance between CEOs and directors. This should result in lower economic effects for all types of ties, especially those contributing to board dysfunction. Consistent with this view, all types of connections have lower effects after SOX. Nonprofessional connections become insignificant while professional ties continue to be significant though the economic effects are reduced, like those of other explanatory variables. Professional ties remains second behind size in terms of economic significance with greater relative magnitude compared to the effect for firm size after SOX.

Controlling for *cross-sectional* unobservables is more challenging. Here, econometric identification requires substantial time series variation within firms. Fraud is a rare event and governance and board characteristics are also sticky variables that offer little within-variation but greater cross-sectional variation. Zhou (2001) points out that this data feature makes within-firm estimators poor modeling choices as they just lack power. Not surprisingly, the fraud literature does not estimate within specifications and we follow its lead. However, we do offer one innovation: we include director fixed effects to filter out unobserved skills inherent to directors. This approach holds the director quality constant and compares the fraud probability between firms with and without CEO-director ties. We lose about 20% of the sample because the usable sample of firms shrinks to the ones with directors sitting on multiple boards. Social ties remain significant, suggesting that they do not simply reflect director heterogeneity.

A final variable sheds more light on the channels through which professional ties act. Instead of considering just the commonality in employment, we consider both *whether* employment overlaps and the *roles* during the overlap. We divide the ties between the CEO and the director into those

formed when the CEO and the director were employed together in the firm and those formed when the pair served as director and employee. Employee-employee interactions are likely to yield more professional insights to the director about the CEO than director-executive interactions, which are fewer. These interactions also form only part of a larger slate of issues considered by directors during the board meeting times. Consistent with this intuition, prior professional ties are significant when both individuals work as employees rather than as director and employee. The result suggests that soft information and insights from professional ties come from the underlying social interactions.

While our results concerning ties remain robust to the new controls discussed above, we emphasize that it is not necessarily because we introduce irrelevant x variables. Many controls are significant and yield useful insights in their own right. For instance, having directors from top director supplying firms reliably lowers fraud. CEOs from highly ranked educational institutions are less likely to commit fraud, reflecting inherent quality differences as in Chevalier and Ellison (1999) or the greater social stigma they face if caught.⁷ We also find that prior professional ties matter when it is an employee-employee tie. The result suggests that soft information and insights from professional ties come from the underlying social interactions. We also report an interesting negative result. Whether a CEO has an MBA does not matter nor does the thickness of a CEO's rolodex.⁸ Our results are robust to these (and other) controls whether included singly or together. We also consider the impact of incentive compensation on fraud. While the sample now shrinks by over 60%, the results on connections remain robust.

In sum, we report three findings. One, social ties matter and do so in asymmetric ways depending on their genesis. Second, social ties matter at least as much as independence, the focus of board reforms. As the board literature points out, interactions with and assessments of CEOs are key functions of the board. The importance of social ties is consistent with the hypothesis that social ties shape the nature of these interactions and the resulting economic outcomes. Finally, we

⁷See Thorne and Anderson (2006) or Cohen-Cole and Duygan-Bump (2008) on social stigma and bankruptcy.

⁸Thus, the Enron fraud case in which the CEO and several executives are MBAs (from Harvard) does not generalize to large samples. The finding is relevant to debates on whether MBAs require ethics training for MBAs. See, e.g., "Economic Crisis Leads Business Schools to Meld Ethics Into MBA," (Jennifer Epstein, USA Today, May 5, 2010).

find that connections are not always harmful. Professional connections lower fraud probability and did so even before SOX when boards and connections faced relatively less scrutiny.

The rest of the paper is organized as follows. Section 2 reviews the related literature. Section 3 discusses the data. Sections 4 and 5 present the empirical results. We discuss several robustness tests, economic significance, and interpretation of the key results. Section 6 concludes.

2 Related Literature

We contribute to multiple streams of the finance literature. Hermalin and Weisbach (2007) and Adams, Hermalin, and Weisbach (2009) present recent surveys of the board of directors literature. An important question in this literature is whether boards matter, and if they do so, what aspects of boards matter. We offer new evidence on what dimensions of boards explain frauds. Readers often ask why we focus on fraud as opposed to other dependent variables. This is a legitimate and important question. We examine frauds, particularly in the post dot com era, because frauds are the major driver of U.S. governance reforms, particularly those targeting boards. The 2002 SOX is historically the most aggressive regulatory intervention into the structure of boards, and this was driven by the wave of frauds in the post dot com era.

Our findings add to a growing literature on fraud. Beasley (1996) presents early evidence that board independence explains fraud, based on a sample of 75 frauds between 1982 and 1991. Agrawal and Chadha (2005) find that independence is less relevant compared to financial expertise on boards. Erickson, Hanlon, and Maydew (2006), Cheng and Warfield (2005) and Burns and Kedia (2006) study the role of equity incentives on the likelihood of misreporting.⁹ We contribute to this literature by showing that social ties between CEOs and directors explain fraud. We also shed light on other board and personal attributes that matter. For instance, we show that fraud is less likely when directors have more external appointments, consistent with reputation channel (Ferris, Jagannathan, and Pritchard (2003), Yermack (2004), Fich and Shivdasani (2007)). In the fraud literature, a key issue is how to measure fraud. We use the SEC and DOJ actions dataset

⁹Other studies examining different dimensions of frauds include Bergstresser and Philippon (2006), Dechow, Sloan, and Sweeney (1996), Johnson, Ryan, and Tian (2009), Kedia and Philippon (2009), Li (2010), Peng and Roell (2008), Povel, Singh, and Winton (2007), and Wang (2008), Karpoff, Lee, and Martin (2008a, 2008b).

of Karpoff, Lee, and Martin (2008a),¹⁰ and echo their point and that of Hennes, Leone, and Miller (2008) about the need to be careful in defining fraud. For instance, Fracassi and Tate (2009) use GAO restatements as proxies for fraud but Hennes, Leone, and Miller (2008) suggest that 76% of GAO restatements are erroneous. Hennes et al suggest refinements that result in what is essentially our empirical strategy of focusing on enforcements.¹¹

Our findings contribute to a burgeoning literature on CEO social connections, much of it spawned by Cohen, Frazzini, and Malloy (2008) and Cohen, Frazzini, and Malloy (2010).¹² Like them, we find evidence for a dark side of alma mater ties and show that nonprofessional ties through service have similar effects. As importantly, we show that (professional) ties can have beneficial effects. This evidence supports findings in the M&A literature of Cai and Sevilir (2012) and Schmidt (2009), although their focus on M&As, the type of connection, and the channels by which they work are quite different from ours.

Our evidence that different types of connections have different effects is new to the literature. A good question is whether the findings are one-off results that we chance upon by accident or whether they presage future findings of this nature. This was difficult to tell in the early stages of developing our work. However, since our study, there are at least three subsequent studies that report differences for different types of connections. Gompers, Mukharlyamov, and Xuan (2012) discuss the differences between ability and non-ability based connections in venture capital, Bruynseels and Cardinaeles (2011) report the findings for audit committee effectiveness relating to earnings management, and most recently, Kang, Liu, Low, and Zhang (2012) present evidence on different board ties and their varying impact on corporate innovation.

Finally, we add to an emerging literature on heterogeneity *within* independent directors. This literature argues that it is important to move beyond measures that treat all independent directors symmetrically. Graham, Li, and Qiu (2012) and Coles and Li (2013) point out that a key issue in this literature is what traits to include to capture the heterogeneity between directors effectively.

¹⁰We thank them for graciously sharing their dataset with us.

¹¹Some studies have used class action lawsuits. However, class action suits are biased towards firms with deep pockets or frivolous lawsuits (Easterbrook and Fischel (1985), Thakor, Nielson, and Gulley (2005)). Hence we focus on SEC enforcements.

¹²Related work includes Westphal and Zajac (1995), Nguyen (2008), Subrahmanyam (2008), and Hwang and Kim (2009), Engelberg, Gao, and Parsons (2009), Fracassi and Tate (2011), and Liu (2009).

While different aspects likely matter for different outcomes, our work suggests that at least in matters relating to monitoring and interacting with the CEO, social ties can play an important role. The work on social ties is likely to grow as more biographic data on directors and executives and more detailed data on what boards do become available.

3 Data and Descriptive Statistics

Our primary data source on boards is the BoardEx database. The fraud data come from the SEC Enforcement action database of Karpoff, Lee, and Martin (2008a). As in the literature, we focus on the period around SOX because this was a time period when corporate fraud was more prevalent. In the data, the charges filed by the SEC against the firm identifies the “violation period,” i.e., the period over which the firm allegedly engaged in financial misconduct. We classify as fraud years the violation period in which the firm engaged in financial misconduct. Stock return and accounting data are from CRSP/COMPUSTAT while the Executive compensation data is from EXECUCOMP.

Table 1 provides descriptive statistics on the fraud years. Between fiscal years 2000 and 2006, there are 560 fraud years representing about 2.6% of the sample firm-years. The fraction of the firms subject to enforcement actions rises to about 5.68% in 2002 and then drops to less than 1% in 2006 after the 2002 Sarbanes-Oxley Act. Table 2 displays the variation in fraud across the Fama-French 48 industry categories. There seems to be variation in fraud across industries. For instance, industries 34-36, business services, computer hardware, and software, account for 20% of the observations but 30% of the fraud years.

3.1 CEO-Director Connections

Our dataset is the August 1, 2008 download from BoardEx. This has 61,119 individuals who have served as directors or disclosed earners with employment or service histories over a total of 76,572 unique organizations. The key firm identification variable for companies in BoardEx is *companyid*. Individuals are identified by *directorid* and educational institutions by *universityid*. BoardEx covers individuals who serve as officers or directors starting in the year 1999. The data coverage expands

significantly after 2002.¹³ We use the employment records in BoardEx to identify CEOs of firms and their employment dates. We track the employment records to identify individual officers and directors of firms, and further classify them as officers (who do not serve on boards but are disclosed earners), executive directors (executives on boards), or supervisory directors (outside directors not otherwise employed by the firm) based on the position description in BoardEx.

3.2 Professional and NonProfessional Connections

We classify a CEO as having a professional employment connection with an outside director if they are employed at the same time in a firm excluding the service at the current firm. The measure of CEO-director employment connections is PROF_FRAC, which is the fraction of individuals on the board of directors who were employed at the same firm and at the same time as the CEO prior to the CEO's current employment.¹⁴ We find that about 41.3% of firm years in our sample were classified as having an employment connection between the CEO and an outside director. As shown in Table 3, the average value of PROF_FRAC for misreporting firms is 8.44% which is significantly lower than the 13.61% for non misreporting firms.

Following Cohen, Frazzini, and Malloy (2008), our first proxy for nonprofessional connections is a common undergraduate alma mater. Identifying these commonalities requires considerable manual intervention because neither the name of the degree granting institutions nor the degree is coded consistently in BoardEx. EDU_FRAC is the fraction of board members with educational ties to the CEO. It is on average 1.37% for fraud firms versus 1.11% for others. Table 3 suggests that the univariate difference is not significant. While we focus on undergraduate degrees following Cohen et al., we examine and find that graduate degrees add little.

One issue with educational connections is about possible gaps in coverage by Boardex either because disclosures were less complete in earlier years or because transcription became more accurate over time. These gaps could induce bias, particularly for executives who are not covered in later

¹³BoardEx coverage is not complete for several firms prior to 2000. The list of complete coverage firms encompasses about 1,500-1,900 firms from 2000-2002, roughly corresponding to firms in the EXECUCOMP database, but expands to over 3,000 firms after 2003. We report results for the EXECUCOMP sample to ensure that this expansion of the data does not impact our empirical analysis.

¹⁴We considered overlaps without conditioning on dates of overlap. These represent less than 2% of the professional connections sample. Not surprisingly, this has little effect on our results.

years because they drop out as executives or directors. To some extent, this concern is mitigated because we follow Cohen et al. and rely on the *institution* but not the years of graduation. The undergraduate institution field is well populated. Additionally, while the later years have fewer gaps (and thus more power), we find that educational connections have *diminishing* effects after 2002. In balance, it is unlikely that measurement error in the education connections matters.¹⁵

Our holdout “out of sample” tests on nonprofessional connections is based on commonalities in non-business service activities such as service at not-for-profit organizations such as trusts, universities or clubs. As before we measure the fraction of board members with non business service ties to the CEO and refer to it as OTH_FRAC. As Table 3 shows, the average OTH_FRAC is 9.52% for misreporting firms versus 6.32% for other firms and the univariate difference is significant at 1%. We combine the connections arising from these two nonprofessional sources into one variable denoted as NONPROF_FRAC, which denotes the fraction of board members that have an educational or non-business tie to the CEO.

Finally, we combine all CEO director connections, arising from both professional and non professional ties, to form a measure of total social connectedness (TOT_FRAC). The average (TOT_FRAC) is 19.21% for fraud firms versus 21.20% for other firms and the univariate difference is significant at 1%. Thus, social ties in the aggregate are associated with a *lower* fraud probability although nonprofessional ties are greater in fraud firms. We develop this distinction further in the multivariate specifications.

3.3 Other Explanatory Variables

We control for firm size using log of total assets (COMPUSTAT item data6). To control for profitability, we include the ratio of EBITDA (earnings before interest, taxes, and depreciation, COMPUSTAT item data13) to total assets. Leverage, a proxy for closeness to debt covenant violations or financial distress, may be more likely to be associated with fraud. We define leverage as the ratio of Total Liabilities (Compustat item data 181) to total assets. Following Povel, Singh, and Winton (2007), we control for growth by including Q. Firms with a greater need to access

¹⁵We thank (without implicating in any way) David Yermack for motivating the investigation of these data issues.

external capital markets are more likely to misreport in order to reduce the cost of external financing (Dechow, Sloan, and Sweeney (1996) and Beneish (1999)). We include ISSUANCE, which is 1 if the firm issues stock or debt (COMPUSTAT item data108 or data111 > 0) and zero otherwise.

Among the board characteristics BSIZE is board size, INDEP_FRAC is the fraction of supervisory directors on the board, and following Fich and Shivdasani (2007), BUSY is the number of other directorships held by each director of the firm, averaged over the board to create a firm-level variable. Following Agrawal and Chadha (2005), we create a variable FINEXP, which takes the value one when the board has a director who is classified as a financial expert and zero otherwise. Following Chevalier and Ellison (1999), we control for CEO education through a dummy variable CEOIVY that is one if the CEO attended a high quality undergraduate institution defined by Zowel (2005). We also create a dummy variable CEOMBA that controls for whether a CEO has an MBA.

The univariate statistics in Table 3 suggest that size is a significant predictor of misreporting. Leverage and issuance also matter, perhaps due to correlation with size. Misreporting firms have about one more board member, about the same degree of independence, greater outside appointments, and lesser financial expertise. Correlation with size confounds unconditional comparisons, so we turn to multivariate models next.

4 Logit Estimates

4.1 Baseline Specification

Model 1, Table 4 displays estimates of baseline logit models that include firm and board characteristics studied in prior work. Motivated by the results in Table 1 and 2, we also include industry and year fixed effects. Among firm characteristics firm size and growth are positively related to fraud. Firm profits and external financing are significant while leverage is insignificant. The other variables included in model (1) represent selected board characteristics based on prior work. Board independence matters: more outside directors tend to reduce fraud probability. The value of the multivariate specification is worth stressing. Board size matters in the univariate results but is insignificant in the logit. Conversely, independence matters only in the logit model that includes size. Little can be read into the univariate comparisons absent controls for size.

Among the other board variables, we find that fraud is less likely when outside directors have more external appointments. The results support the view in Yermack (2004) and Fich and Shivdasani (2007) that reputational concerns matter for individuals active in the market for directors. We find that coefficient for financial expertise on boards is insignificant. As financial expertise on the board has increased over time, its effect is likely absorbed by year fixed effects.

We also introduce CEO personal attributes to the fraud literature. The first proxy is a dummy variable for the quality of the degree-granting undergraduate institution attended by the CEO as listed by Zawel (2005). CEOs attending high quality undergraduate institutions are less likely to commit fraud. These CEOs appear to have greater ability or have greater concerns for the social stigma and reputation losses from fraud. A second variable is CEOMBA, which is a dummy for whether the CEO has an MBA degree. The coefficient for CEOMBA is negative but insignificant. There is no evidence that CEOs with MBAs are especially prone to fraud.¹⁶

4.2 Connections

Our first specification adds all types of social ties between CEOs and directors into a single index, TOT_FRAC and tests if it is related to fraud. Specification (2) in Table 4 gives the results. Aggregate connections have a negative and significant coefficient, suggesting that social ties lower the probability of fraud, a counterintuitive result that we unpack next.

Model 3 disaggregates the social ties between CEOs and directors into nonprofessional connections. The coefficient for NONPROF_FRAC is positive and significant. Non-business connections *increase* fraud probability. The results are in line with an agency view in which ties create a favorable predisposition towards the CEO, which can compromise monitoring. The coefficient for PROF_FRAC is negative and significant at 1%, so professional connectedness between CEOs and boards lowers the likelihood of fraud. The beneficial effect could reflect better monitoring capacity of a director who has worked with a CEO before, better advisory relationships between individuals who have worked together before, or because directors' private assessments of a CEO cause them

¹⁶We also experimented with conventional attributes such as CEO tenure and age, which can reflect horizon effects. Neither variable is significant.

to join boards where the probability of fraud is low. While professional ties can result in personal friendships and result in lax monitoring, this is clearly not the dominant effect in the data.

We assess a more mechanical explanation for the effects of professional connectedness based on whether the CEO is internally hired or not. CEOs hired from within a firm can have few outside connections. Thus, the lower propensity to commit fraud of professionally connected CEOs could manifest the greater likelihood of fraud committed by internally hired CEOs. We find that internally hired CEOs are less likely to commit fraud and the coefficient for professional connections remains significant even after including the internal CEO control. We disaggregate nonprofessional connections into educational ties and non business service ties. The results are displayed in Model 4. Both the coefficients for educational ties (EDU_FRAC) as well as that for non business service ties (OTH_FRAC) are positive and significant. Disaggregating non professional ties does not impact the results for professional ties which continues to be negative and significant.

In unreported results, we further investigate CEO-director educational ties. We condition the connections by the prestige of the institution. We also require graduation dates or CEO-connected director age differences within a 2-year span, in the spirit of Hwang and Kim (2009). These have little effect.¹⁷ As Cohen, Frazzini, and Malloy (2008) and Cohen, Frazzini, and Malloy (2010) point out, the important component of educational ties likely relate to cultural origins from belonging to similar institutions and sharing similar alumni networks. Finally, we also examine connections between CEOs and directors formed during graduate school either by virtue of (a) common school; (b) common school and program; or (c) common school, program, and +/-2 years. These are insignificant and affect neither the signs nor the significance of the different forms of connectedness. These results do not rely on a particular configuration of explanatory variables.

¹⁷A definition of connectedness based on the same institution *and* graduating within a +/-2 year cohort may be argued to capture personal friendships rather than cultural origins picked up by common alma mater. As a proxy for personal friendships, it is both excessively inclusive (given the average cohort size of several thousand students per year) and simultaneously too exclusive because it does not capture personal friendships formed outside the college context. Whether it is a useful proxy or not is an empirical issue: it has little effect on its own and changes little else.

5 More Tests

To further explore the robustness of our results, we consider several additional specifications that incorporate new controls and subsamples that shed additional light on why connections explain fraud. We close by offering an overall perspective of the results.

5.1 Strength of Professional Connectedness

Besides commonality in employment, we consider the *type* of the overlap between CEOs and directors when they worked together. We classify the professional connections as being formed when the CEO and directors were executives or into connections formed when the pair served as directors at another firm (or one was a director while the other was an executive). Interactions between individuals employed as executives at the same firm are likely to be more substantive. These likely involve more frequent discussions on substance, and under environments varying in the levels and nature of the professional issues facing firms. This type of involvement is likely to lead to a greater understanding of an executive’s knowledge and style of functioning. In contrast, directors at the same firm tend to meet less frequently and the interactions are unlikely to be at the same depth. Thus, the effects of professional connection are likely to be the most pronounced when it is derived through common service as executives of the same team. Model (1) of Table 5 supports this view. Connections formed at the executive level (PROF_FRAC_E) have a significant negative effect on misconduct while those formed through shared directorships (PROF_FRAC_D) are insignificant.

5.2 Heterogeneity in Director Quality

We next consider the possibility that professional connections are a proxy for director quality. Firms such as GE, IBM, and McKinsey are key breeding grounds for quality executive talent (see, e.g., “Breeding Grounds for New CEOs” in *BusinessWeek*, April 30, 2009). We control for the presence of directors from these “director factories.” We define a firm as a director factory if the number of executives with employment histories in these firms are among the top 10% of all firms. We proxy for board quality as the fraction of directors from these director factories. Model (2) in Table 5 shows that the greater the fraction of directors from director factories (FRAC_FACTORIES), the

lower the fraud probability but professional connections remain significant. A dummy for whether the CEO is from a director factory (CEOFACTORY), is insignificant.¹⁸

We consider the fraction of the board appointed after the incumbent CEO assumes office, AFTER_CEO_FRAC. Following Yermack (2004) and Coles, Daniel, and Naveen (2014), these directors can be viewed as co-opted, or are pliable directors appointed by CEOs with intent to commit fraud. As seen in model (3) of Table 5, co-option is not significant and it does not alter the coefficient for professional connections. Model (4) shows that there is little change when we use the fraction of the board appointed after the CEO takes office and have nonprofessional connections.

Finally, we consider *unobserved* heterogeneity in director quality. Here, we hold the director constant and examine variation in outcomes, i.e., fraud, between firms in which CEOs and directors have social ties relative to firms with no CEO-board ties. This specification obviously restricts us to directors who hold multiple appointments, shrinking the set of usable firms and likely leading to loss of power. Nevertheless, model (5) in Table 5 shows that professional connections lower fraud.

5.3 Compensation

The structure of executive compensation can affect the propensity for financial misconduct. For instance, Bergstresser and Philippon (2006), Burns and Kedia (2006), Cheng and Warfield (2005), and Erickson, Hanlon, and Maydew (2006) examine the effect of equity incentives on discretionary accruals and restatements. We include incentive measures from EXECUCOMP as additional controls. Perhaps the biggest issue with the compensation subsample is that the sample size shrinks by more than 50% to 7,595 observations. Additionally, the sample is concentrated among larger firms that comprise the EXECUCOMP database.

Specification (1) in Table 6 presents logit estimates. Following Karpoff, Lee, and Martin(2008b), non-cash compensation is the ratio of the compensation paid through non-cash means (i.e., excluding salary and bonus) to the total direct compensation (TDC1 in ExecuComp). We find that noncash compensation is positively associated with fraud. The key connectedness variables re-

¹⁸We also examine whether the connections formed between the CEO and directors at “director factories” are special. These connections have a negative but insignificant coefficients, so the the benefit of professional connections is not exclusive to connections formed at director factories. Relatedly, following Engelberg, Gao, and Parsons (2009), we examine if the CEO’s rolodex “centrality” matters. Our main results are robust.

main significant and maintain their signs in the compensation subsample.¹⁹ The restriction to the compensation subsample and including the compensation variable has little effect.

5.4 SOX

Our sample period spans the passage of the Sarbanes Oxley Act in 2002. The Act aimed to put distance between CEOs and boards by tilting boards towards independent directors and diminishing executive roles in key aspects of board functioning. These measures, coupled with intense public scrutiny, increased the pressure on boards to act independently. While captured directors might have felt comfortable asking few questions of a CEO prior to 2002, the passage of SOX may make such support less forthcoming. If so, nonprofessional connectedness could have weaker effects after 2002. A more arm's length regime could create greater distance between *all* directors and the CEO, lowering the beneficial effects of professional connections.

To test for the SOX effects, we examine the effect of connections, both nonprofessional and professional on the propensity of misconduct before and after the passage of SOX. We estimate logit models separately for the pre-SOX period, defined as years 2000-2002 and the post-SOX period, defined as years 2003-2006 given the possibility of a structural break due to SOX. As before, both forms of connectedness matter in the pre-SOX period. The coefficient for non-professional connections declines by 50% in the post-SOX period and it is not significant, compared to a 17% decline for the professional connections coefficient, which remains significant. Thus, while SOX does distance CEOs from boards, it does not eliminate the beneficial effects of professional connectedness.²⁰

5.5 Marginal Effects

In this section, we examine the logit marginal effects. Table 7 reports the marginal effect estimates and significance for the logit estimates reported in Table 6. For discrete variables such as CEOMBA or CEOIVY the marginal effects show the effect on logit probability of changing the variable from

¹⁹Other specifications of the compensation variable (e.g., compensation delta) do not alter these conclusions.

²⁰BoardEx increases data coverage over this period so there are several new firms in the post SOX period. As BoardEx coverage of large firms, i.e., those covered in ExecuComp is steady over this period, our tables report the SOX results for the ExecuComp sample. The results are materially unchanged if we use the full sample.

zero to one and for continuous variables, we report the effect of a one standard deviation change. To put the marginal effects in perspective, the overall probability of fraud in the Table 7 sample is 3.94%. While fraud attracts significant attention from regulators and policy makers, and has motivated aggressive intervention into governance of public corporations, it is relatively rare.

As in prior work, firm size has the largest marginal effect. Model (1) shows that it has a (one standard deviation) marginal effect of 1.93%. Of the remaining variables, professional connectedness is the most significant with a (one standard deviation) marginal effect of -0.81%. Perhaps the more interesting comparison is between professional connections and board independence, which has been a major focus of received regulations. Board independence has a marginal effect of -0.35%, so professional connections have roughly twice the marginal effect of independence in attenuating fraud. Nonprofessional connections also matter and model (1) suggests that these marginal effects also exceed that of board independence in the full sample. In sum, social connections matter at least as much as and perhaps more than board independence in explaining fraud.

The marginal effects for all variables decline after SOX, consistent with the lower fraud probability in the post-SOX period reported in model (3). For instance, the marginal effect for size declines from 4.16% to 1.04%. As in Table 7, there is an asymmetric decline across the different types of connectedness. Nonprofessional connectedness declines from 1.11% to 0.22%. The economic effect of professional connectedness declines from 1.59% to 0.60%. It is also informative to compare the economic effect of connections to those of firm size. The economic effect of non-professional connectedness is about 25% of size in the pre-SOX period and about 21% in the post-SOX period. However, the effect of professional connections is about 60% of size after SOX, up from about 40% of the size effect in the pre-SOX period.

It is interesting that professional connections remain important after SOX. The Act, the related pressure from the press, and pressures from the political sector, imposed significant scrutiny, regulations, and discipline on directors. While these could substitute for and render other effects redundant, professional connections continue to have detectable beneficial effects after SOX.

5.6 Discussion

In a nutshell, our main results are that social ties matter, and do so in asymmetric ways. Non-professional connections are positively related to fraud, while professional connections lower the probability of fraud. The asymmetric effects of different types of connections, and particularly, the results on a bright side of connections, are new. To the extent these variables are significant, there is a case for including them in future studies of fraud. At the minimum, connections are an informative signal about latent unobservable latent propensities for fraud, and they are quite robust to a large suite of other x variables, many new, not considered in the literature, significant and of economic interest in their own right.

Some readers ask us about fraud detection. Our dependent variable is a compound probability, that of committing fraud p_f and of detecting this committed fraud p_d . Thus, our estimates must be divided by the probability of fraud detection to arrive at the probability of committing fraud. Full econometric estimation with cross-sectional variables in both probabilities is attempted by Li (2010). She finds that to a first order, *no* cross-sectional variable is materially altered by modeling detection but each probability is scaled *up* as the composite probability must be divided by the probability of fraud detection to estimate committed fraud. The true probabilities and the marginal effects are likely even greater than what our estimates indicate. It also seems economically implausible that boards with professional connections may aid and abet fraud by helping CEOs hide fraud and that this effect continues even after the stringent restrictions imposed after SOX, or that nonprofessional connections aid detection.²¹ Finally, there is no evidence that the SEC detection technology depends on connectedness and that we are picking up this dependence. This would require that the SEC looks closer at firms with professional connected CEO-boards while looking askance at firms in which the CEO and directors have nonprofessional connections. We are unaware of any evidence to this effect.

To summarize, CEO-director connections matter even after including an exhaustive set of variables used in the governance literature. In particular, professional connections appear to have a beneficial effect in all specifications, suggesting a bright side to this particular source of connec-

²¹In fact, the Enron case cited in the introduction suggests the opposite.

tions. It is unlikely that connections are a proxy for detection, CEO ability, director ability or CEO influence over the board. Thus, at a minimum, our results indicate that CEO-director connections pick up an orthogonal dimension of governance that conventional variables do not, and they do so with asymmetric signs for connections that have professional and nonprofessional origins. Perhaps more importantly, the results suggest the need to go beyond independence. While independence does matter, social ties are more important than independence in virtually all the models. Thus, independence is perhaps just a good starting point for reform. Variation within independent directors that speaks to a director's professional knowledge can also matter, and matters more than independence per se in our models.

6 Conclusion

The high profile cases of fraud at the end of the dot com era have led to one of the most sweeping regulatory interventions into corporate America, the 2002 Sarbanes Oxley Act (SOX). At the center of the financial misconduct are the CEO and the firm's board of directors who have fiduciary responsibility towards shareholders. Frauds seem to reflect a failure of this basic governance function of boards, perhaps because directors are compromised through their nexus to CEOs. Thus, breaking the CEO-board nexus has been a key focus of regulators, policy makers, and institutional investors.

We contribute new evidence to the debate by investigating the relation between fraud and a broad vector of board attributes. While we control for traditional board measures, our focus is on newer metrics based on CEO-director *social* ties. CEO-director ties matter and are at least as important as – and typically more important than – board independence. Perhaps more interestingly, different types of connections have different-signed effects. Connections of non-business origins such as those from common alma mater and non-business activities elevate fraud probability. This is the traditional agency viewpoint of connections. However, fraud probability is reliably lower when CEOs and directors have professional connections originating in shared employment experiences, especially when the connected individuals serve as employees rather than as directors or director and employee. The result on the bright side of connections is new to the finance literature.

We also examine several other attributes that could explain fraud. Having an MBA degree does not increase and sometimes significantly decreases fraud probability. We find that fraud is less likely when CEOs are internally hired, educated at reputed schools, when board members have more external appointments, or when they are drawn from prestigious “director factory” firms. The last result suggests that there is value in the training realized at firms that have historically been a breeding ground for executive talent in corporate America.

Our results reinforce the value of studying the “multiplex” of connections in social network analysis. Connections with different institutional origins operate through different channels and have different economic effects. The possibility of different effects is worth stressing. Sociologists and social network researchers argue that any *one* type of network could have positive or negative effects (see, e.g., Coleman (1990), p. 302 and Putnam (2000), chapter 22). Our point is that different *types* of connections could result in different economic outcomes. It is therefore not always appropriate to sum the different types of connections to form a single aggregate connectedness index. We do not say that this practice is always incorrect. When all types of connections contribute similarly (and positively), e.g. in searching for merger targets, summing up connections may be reasonable and even desirable to gain statistical power. However, this practice may not be empirically appropriate when different connections have different-signed effects on economic outcomes.

Finally, our study also informs a broader debate on board design. The evidence suggests that the commonly studied attributes of board effectiveness such as board size, independence, or financial expertise can be enriched by incorporating broader metrics related to CEO-board connections. Our results certainly support the growing consensus that CEO-board connections deserve closer scrutiny as part of the governance process. However, the mere existence of connectedness is not bad. Connections do not necessarily indicate unhealthy boards or governance systems in dysfunction. The genesis of the connections matters. The more general point emphasized by our results is that not all independent directors are equal. Thus, independence is reasonable but only a useful first step. Researching the heterogeneity *within* independent directors is a profitable avenue for further investigation. We regard our research as one step in this direction.

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Table 1: Distribution of Fraud and Non Fraud Firms

Table 1 displays the distribution of firms in the fraud and the non-fraud sample over the period 2000-2006. Firms in the fraud sample are those that were subject to SEC enforcement actions for misreporting their financials. Firms in the non-fraud sample consist of all other firms that have complete data on board of directors in BoardEx and coverage in CRSP/Compustat.

Year	Fraud not firms	Non-Fraud firms	Total firms	% Fraud Firms
2000	1,424	76	1,500	5.07%
2001	1,739	102	1,841	5.54%
2002	1,809	109	1,918	5.68%
2003	3,443	104	3,547	2.93%
2004	4,226	87	4,313	2.02%
2005	4,514	55	4,569	1.20%
2006	4,138	27	4,165	0.65%
Total	21,293	560	21,853	2.6 %

Table 2: Industry Distribution of Financial Fraud

Table 2 displays the distribution of frauds by the 48 Fama-French industries between 2000-2006.

Industry	Industry Name	Non-Fraud Firms	Fraud Frims	% Fraud Firms
1	Agriculture	37	11	22.9%
2	Food products	260	17	6.1%
3	Soda	36	0	0.0%
4	Beer	61	0	0.0%
5	Smoke	32	0	0.0%
6	Toys & Recreation	114	5	4.2%
7	Fun Entertainment	261	2	0.8%
8	Printing & Publishing	97	6	3.0%
9	Household Consumer Goods	255	3	1.2%
10	Clothes Apparel	266	1	0.4%
11	Healthcare	353	1	3.0%
12	Medical equipment	670	2	0.3%
13	Pharmaceutical Products	1,301	20	1.5%
14	Chemicals	382	6	1.5%
15	Rubber & Plastic Products	113	4	3.4%
16	Textiles	39	0	0.0%
17	Construction Material	294	2	0.7%
18	Construction	246	14	5.4%
19	Steel works etc	236	0	0.0%
20	Fabricated Products	41	0	0.0%
21	Machinery	571	40	6.5%
22	Electrical Equipment	285	4	1.4%
23	Automobiles and Trucks	262	15	5.4%
24	Aircraft	106	5	4.5%
25	Shipbuilding & Railroad Equip.	47	6	11.3%
26	Defense	38	0	0.0%
27	Precious Metals	32	0	0.0%
28	Non Metallic & Metal mining	57	0	0.0%
29	Coal	60	0	0.0%
30	Petroleum and Natural gas	722	14	1.9%
31	Utilities	637	21	3.2%
32	Communication	574	17	2.9%
33	Personal Services	226	5	2.2%
34	Business Services	2,387	73	3.0%
35	Computer Hardware	760	50	6.2%
36	Computer Software	1,298	52	3.9%
37	Electronic Equipment	460	11	2.3%
38	Measuring & Control Equip.	229	4	1.7%
39	Business Supplies	64	0	0.0%
40	Shipping Containers	482	13	2.6%
41	Transportation	621	25	3.9%
42	Wholesale	1,011	27	2.6%
43	Retail	323	5	1.5%
44	Rest., Hotels & Motels	2,584	21	0.8%
45	Banking	760	27	3.4%
46	Insurance	108	5	4.4%
47	Real Estate	1,292	16	1.2%
48	Trading	103	0	0.0%
	Total	21,293	560	2.6%

Table 3: Descriptive Statistics

Table 3 displays summary statistics for explanatory variables for firms in the fraud and non-fraud samples from fiscal 2000 to fiscal 2006. PROF_FRAC denotes the number of supervisory directors who worked together professionally at a firm prior to the CEO's current assignment. NON_PROF_FRAC denotes the number of directors who either share a common undergraduate alma mater or who share service in a nonprofessional capacity with the CEO. EDU_FRAC denotes the number of supervisory directors who attended the same undergraduate school as the CEO. OTH_FRAC is the number of directors that share nonprofessional service with the CEO. All connection variables are scaled by the number of directors in the firm's board. SIZE denotes the book value of assets, TOBINQ is market value to book value. EBITDA is earnings before interest, taxes, and depreciation scaled by total assets. ISSUANCE equals 1 if the firm issues equity or debt in the fiscal year and zero otherwise. BSIZE, board size, is the number of directors and INDEP_FRAC is the percentage of outside directors on the board. BUSY is the average number of other directorships held by directors, FINEXP equals 1 if the board has a designated financial expert and zero otherwise. CEOMBA equals 1 if the CEO has an MBA and zero otherwise. CEOIVY equals 1 if the CEO's undergraduate degree is from a prestigious school as defined in Zowel (2005) and zero otherwise. The table presents the mean and median for each sample, the t-statistic for the difference in the mean, and the Wilcoxon-z statistic for the difference in the median. The superscripts ^c, ^b, and ^a indicate significance at the 10%, 5% and 1% levels, respectively, using robust standard errors.

Variable	Non-Fraud		Fraud		t-statistic	Wilcoxon z
<i>Total Connections</i>						
TOT_FRAC	21.20%	0.00%	19.21%	0.00%	1.688 ^c	-0.882
<i>Professional Connections</i>						
PROF_FRAC	13.61%	0.00%	8.44%	0.00%	5.342 ^a	2.817 ^a
<i>Education and Other Connections</i>						
NONPROF_FRAC	7.58%	0.0%	10.80%	0.0%	-5.849 ^a	-5.323 ^a
EDU_FRAC	1.09%	0.00%	1.37%	0.0%	-1.483	-1.528
OTH_FRAC	6.50%	0.00%	9.46%	0.0%	-5.912 ^a	-4.996 ^a
<i>Firm Characteristics</i>						
SIZE	,6607	658	39,991	2,213	-15.34 ^a	-14.35 ^a
TOBINQ	2.113	1.492	2.169	1.424	-0.659	1.180
EBITDA	6.23%	9.32%	8.7%	9.44%	-2.402 ^a	-1.706 [*]
LEVERAGE	22.21%	17.05%	25.3%	22.54%	-2.956 ^a	-4.299 ^a
ISSUANCE	0.97		0.99		-3.396 ^a	
<i>CEO and Board characteristics</i>						
BSIZE	8.58	8.00	9.39	9.00	-6.849 ^a	-6.349 ^a
INDEP_FRAC	79.56%	83.33%	79.73%	83.33%	-0.339	-0.176
BUSY	1.43	1.00	1.60	1.0	-4.926 ^a	-5.030 ^a
FINEXP	2.93%		1.78%		-5.629 ^a	
CEOMBA	22.7%		26.4%		0.490	0.498
CEOIVY	25.22%		27.48%		1.473	1.470

Table 4: Base Model For Financial Misconduct

Table 4 displays estimates of logit models. The dependent variable is 1 if the firm engages in fraud in the fiscal year and is zero otherwise. The data are from 2000 to 2006. LSIZE is the logarithm of the book value of assets, TOBINQ is the ratio of firm market value to book value, EBITDA is earnings before interest, taxes, and depreciation scaled by total assets, ISSUANCE equals 1 if the firm issues equity or debt in the fiscal year and zero otherwise, BSIZE is the number of total directors on the board, INDEP_FRAC is the percentage of outside directors on the board, BUSY is the average number of other directorships held by directors, FINEXP is a dummy which is equal to 1 if the board has a designated financial expert. CEOMBA equals 1 if the CEO has an MBA and zero otherwise. CEOIVY equals 1 if the CEO's undergraduate degree is from a prestigious school as defined in Zawel (2005) and zero otherwise. Coefficients for time and industry fixed effects are not shown. The superscripts ^c, ^b, and ^a indicate significance at the 10%, 5% and 1% levels, respectively, using robust standard errors.

	Model 1	Model 2	Model 3	Model 4
LSIZE	0.493 ^a (14.648)	0.500 ^a (14.611)	0.487 ^a (14.399)	0.490 ^a (14.428)
TOBINQ	0.042 (1.611)	0.045 (1.727)	0.039 (1.483)	0.039 (1.484)
EBITDA	-0.688 ^a -2.627	-0.723 ^a -2.708	-0.722 ^a -2.683	-0.717 ^a -2.654
LEVERAGE	0.027 (0.151)	0.003 (0.017)	0.030 (0.164)	0.031 (0.170)
ISSUANCE	1.038 ^b (2.049)	0.980 ^c (1.939)	0.995 ^b (1.973)	0.992 ^b (1.970)
BSIZE	-0.012 (-0.526)	-0.009 (-0.385)	-0.016 (-0.720)	-0.016 (-0.689)
INDEP_FRAC	-0.951 ^b (-2.443)	-0.918 ^b (-2.282)	-0.879 ^b (-2.185)	-0.876 ^b (-2.174)
BUSY	-0.136 ^a (-2.600)	-0.114 ^b (-2.151)	-0.104 ^c (-1.969)	-0.101 ^c (-1.920)
FINEXP	0.055 (0.519)	0.065 (0.601)	0.072 (0.669)	0.074 (0.681)
INTERNAL	-0.257 ^a (-2.652)	-0.284 ^a (-2.897)	-0.362 ^a (-3.633)	-0.360 ^a (-3.613)
CEO_MBA	-0.172 ^c (-1.651)	-0.165 (-1.575)	-0.172 ^c (-1.618)	-0.171 (-1.609)
CEO_IVY	-0.262 ^b (-2.515)	-0.255 ^c (-2.449)	-0.287 ^b (-2.720)	-0.292 ^b (-2.762)
TOT_FRAC		-0.408 ^c (-2.168)		
NONPROF_FRAC			0.993 ^a (2.932)	
PROF_FRAC			-1.443 ^a (-5.060)	-1.439 ^a (-5.049)
EDU_FRAC				1.670 (1.595)
OTH_FRAC				0.876 ^b (2.387)
INTERCEPT	-3.517 ^a -5.395	-3.553 ^a -5.407	-3.418 ^a -5.162	-3.453 ^a -5.207
N	17592	17363	17363	17363
Pseudo-R_Sq	0.152	0.154	0.159	0.159

Table 4-Litigation: Base Model For Financial Misconduct

Table 4 displays estimates of logit models. The dependent variable is 1 if a law suit is filed against the firm and the case period falls within the fiscal year and is zero otherwise. The data are from 2000 to 2006. LSIZE is the logarithm of the book value of assets, TOBINQ is the ratio of firm market value to book value, EBITDA is earnings before interest, taxes, and depreciation scaled by total assets, ISSUANCE equals 1 if the firm issues equity or debt in the fiscal year and zero otherwise, BSIZE is the number of total directors on the board, INDEP_FRAC is the percentage of outside directors on the board, BUSY is the average number of other directorships held by directors, FINEXP is a dummy which is equal to 1 if the board has a designated financial expert. CEOMBA equals 1 if the CEO has an MBA and zero otherwise. CEOIVY equals 1 if the CEO's undergraduate degree is from a prestigious school as defined in Zawal (2005) and zero otherwise. Coefficients for time and industry fixed effects are not shown. The superscripts ^c, ^b, and ^a indicate significance at the 10%, 5% and 1% levels, respectively, using robust standard errors.

	Model 1	Model 2	Model 3	Model 4
LSIZE	0.307 ^a (11.387)	0.308 ^a (11.246)	0.303 ^a (11.068)	0.299 ^a (10.881)
TOBINQ	0.044 ^b (2.370)	0.046 ^b (2.527)	0.044 ^b (2.406)	0.045 ^b (2.423)
EBITDA	-0.294 (-1.475)	-0.291 (-1.436)	-0.301 (-1.496)	-0.306 (-1.527)
LEVERAGE	-0.306 (-1.59)	-0.304 (-1.579)	-0.286 (-1.494)	-0.293 (-1.523)
ISSUANCE	1.674 ^a (2.849)	1.637 ^a (2.786)	1.626 ^a (2.769)	1.64 ^a (2.792)
BSIZE	-0.047 ^b (-2.180)	-0.043 ^c (-1.930)	-0.047 ^b (-2.129)	-0.049 ^b (-2.219)
INDEP_FRAC	-0.681 ^b (-2.114)	-0.571 ^c (-1.693)	-0.555 ^c (-1.651)	-0.57 ^c (-1.702)
BUSY	-0.185 ^a (-3.457)	-0.162 ^a (-2.99)	-0.154 ^a (-2.835)	-0.159 ^a (-2.922)
FINEXP	-0.131 (-1.436)	-0.131 (-1.428)	-0.123 (-1.338)	-0.122 (-1.329)
INTERNAL	-0.332 ^a (-3.754)	-0.352 ^a (-3.925)	-0.386 ^a (-4.273)	-0.393 ^a (-4.353)
CEO_MBA	-0.079 (-0.846)	-0.081 (-0.853)	-0.082 (-0.866)	-0.083 (-0.873)
CEO_IVY	0.023 (0.252)	0.040 (0.434)	0.019 (0.207)	0.03 (0.316)
TOT_FRAC		-0.485 ^b (-2.461)		
NONPROF_FRAC			0.374 (1.103)	
PROF_FRAC			-1.03 ^a (-3.812)	-1.042 ^a (-3.86)
EDU_FRAC				-1.717 ^c (-1.692)
OTH_FRAC				0.719 ^c (1.882)
INTERCEPT	-17.326 ^a (-23.674)	-17.42 ^a (-27.091)	-17.355 ^a (-27.414)	-17.249 ^a (-25.326)
N	17984	17756	17756	17756
Pseudo R-Sq	0.083	0.083	0.085	0.085

Table 5: Robustness of Professional Connectedness

Table 5 displays estimates of logit models. The dependent variable is 1 if the firm engages in fraud in the fiscal year and is zero otherwise. The data are from 2000 to 2006. Control variables that are included but whose coefficients are suppressed include LSIZE, TOBINQ, EBITDA, LEVERAGE, ISSUANCE, BSIZE, FRAC_INDEP, BUSY, and FINEXP. CEOINTERNAL equals 1 if the CEO is internally hired and zero otherwise. CEO_MBA equals 1 if the CEO has an MBA and zero otherwise. CEO_IVY equals 1 if the CEO's undergraduate degree is from a prestigious school as defined in Zavel (2005) and zero otherwise. NONPROF_FRAC denotes the number of supervisory directors who either share a common undergraduate alma mater or who share service in a nonprofessional capacity with the CEO. PROF_FRAC denotes the number of supervisory directors who worked together professionally at a firm prior to the CEO's current assignment. PROF_FRAC_E denotes the same quantity but where the prior employment is such that both the CEO and the director were employed as executives, PROF_FRAC_D denotes these connections derived from common directorships at the same board, CEOFACTORY and FRAC_FACTORIES denote a CEO or the fraction of a board formerly employed by one of the top 10% of suppliers of directors, respectively. AFTER_CEO_FRAC denotes the proportion of directors appointed after the CEO assumes office, and AFTER_CEO_FRAC_NONPROF denotes the subset of such directors with a prior nonprofessional overlap with the CEO. All connectedness variables are scaled by board size. Model 5 is a director-level specification with director fixed effects. Coefficients for time and industry fixed effects are not shown. The superscripts ^c, ^b, and ^a indicate significance at the 10%, 5% and 1% levels, respectively, using robust standard errors.

	Model 1	Model 2	Model 3	Model 4	Model 5
CEOINTERNAL	-0.335 ^a (3.33)	-0.358 ^a (3.58)	-0.354 ^a (3.53)	-0.356 ^a (3.55)	-0.165 ^b (-2.35)
CEOMBA	-0.154 (1.46)	-0.149 (1.39)	-0.148 (1.37)	-0.146 (1.35)	-0.103 (-1.34)
CEOIVY	-0.305 ^a (2.89)	-0.28 ^a (2.66)	-0.282 ^a (2.66)	-0.282 ^a (2.66)	-0.161 ^b (-2.06)
NONPROF_FRAC	0.914 ^a (2.70)	1.082 ^a (3.21)	1.074 ^a (3.17)	1.198 ^a (3.22)	1.060 ^a (4.35)
PROF_FRAC		-1.439 ^a (-5.06)	-1.433 ^a (-5.04)	-1.439 ^a (-5.06)	-1.212 ^a (-4.97)
FRAC_FACTORIES		-0.841 ^a (-3.53)	-0.844 ^a (-3.55)	-0.843 ^a (-3.55)	-1.431 ^a (-6.26)
PROF_FRAC_E	-3.075 ^a (3.589)				
PROF_FRAC_D	0.198 (0.20)				
CEOFACTORY		0.007 (0.23)	0.008 (0.26)	0.008 (0.27)	
AFTER_CEO_FRAC			0.056 (0.34)	0.071 (0.43)	
AFTER_CEO_FRAC_NONPROF			-0.758 (0.72)		
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes
# Observations	17,363	17,363	17,363	17,363	13,842
Pseudo-R ²	0.157	0.161	0.161	0.161	0.290

Table 6: Compensation Subsample and SOX

Table 6 displays results of Logit estimations where the dependent variable is a dummy that takes the value one when the firm engages in fraud. The data are from 2000 to 2006. LSIZE is the log of total assets, TOBINQ is the ratio of firm market value to its book value, EBITDA is scaled by Total Assets, ISSUANCE is a dummy variable if the firm issues equity or debt in the fiscal year, BSIZE is the number of total directors on the board, INDEP_FRAC is the percentage of outside directors on the board, BUSY is the average number of other directorships held by directors, FINEXP is a dummy which is equal to 1 if the board has a designated financial expert, NONCASH is the percentage of non-cash compensation in the pay packages of the firm's executive team as reported in the ExecuComp database, CEOMBA is a dummy variable that equals one when the CEO has an MBA degree, CEOIVY area is a dummy variable that equals one if the CEO has an Ivy League undergraduate, CEOINTERNAL equals 1 if the CEO is internally hired and zero otherwise, NONPROF_FRAC is the fraction of the board that have nonprofessional, i.e., education or other social connections with the CEO, and PROF_FRAC is the fraction of the board that has employment connections with the CEO. Time and Industry fixed effects not shown for brevity. The superscripts ^c, ^b, and ^a indicate significance at the 10%, 5% and 1% levels, respectively, using robust standard errors.

	Full Sample	Pre-SOX	Post-SOX
LSIZE	0.464 ^a (9.16)	0.631 ^a (8.073)	0.311 ^a (4.609)
TOBINQ	-0.055 (1.279)	-0.087 (1.23)	0.066 (0.925)
EBITDA	-1.377 ^a (3.175)	-2.912 ^a (2.909)	-1.195 ^a (2.658)
LEVERAGE	0.592 ^c (1.849)	0.759 ^a (2.145)	0.622 (1.375)
ISSUANCE	0.541 (0.984)	0.227 (0.362)	0.842 (0.849)
BSIZE	-0.029 (0.988)	-0.052 (1.356)	0.00 (0.01)
INDEP_FRAC	-1.462 ^a (2.656)	-1.434 ^a (2.061)	-1.238 (1.244)
BUSY	-0.098 (1.555)	-0.13 (1.532)	-0.047 (0.456)
FINEXP	0.066 (0.493)	-0.033 (0.178)	0.27 (1.166)
NONCASH	0.72 ^b (2.518)	0.178 (0.505)	1.399 ^a (3.048)
CEOMBA	-0.327 ^b (2.456)	-0.134 (0.736)	-0.563 ^a (2.738)
CEOIVY	-0.493 ^a (3.666)	-0.709 ^a (3.734)	-0.31 (1.582)
CEOINTERNAL	-0.417 ^a (3.372)	-0.502 ^a (2.943)	-0.356 ^a (1.931)
NONPROF_FRAC	1.435 ^a (3.726)	1.952 ^a (3.757)	0.954 (1.546)
PROF_FRAC	-1.826 ^a (5.167)	-2.122 ^a (4.171)	-1.765 ^a (3.5)
INTERCEPT	-1.731 ^b (2.012)	-2.376 (2.148)	-3.559 (2.551)
Year Fixed Effects	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes
# Observations	7,595	2,545	4,682
Pseudo-R ²	0.165	0.188	0.146

Table 7: Marginal Effects

Table 7 displays marginal effects of logit estimates. The dependent variable is 1 if the firm engages in fraud in the fiscal year and is zero otherwise. The full sample is from 2000-2006 and the pre-SOX and post-SOX periods cover subperiods until 2000 and after 2003, respectively. LSIZE is the logarithm of the book value of assets, TOBINQ is the ratio of firm market value to book value, EBITDA is earnings before interest, taxes, and depreciation scaled by total assets, ISSUANCE equals 1 if the firm issues equity or debt in the fiscal year and zero otherwise, BSIZE is the number of total directors on the board, INDEP_FRAC is the percentage of outside directors on the board, BUSY is the average number of other directorships held by directors, FINEXP is a dummy which is equal to 1 if the board has a designated financial expert. CEOINTERNAL equals 1 if the CEO is internally hired and zero otherwise. CEOMBA equals 1 if the CEO has an MBA and zero otherwise. CEOIVY equals 1 if the CEO's undergraduate degree is from a prestigious school as defined in Zawel (2005) and zero otherwise. NONPROF_FRAC denotes the number of supervisory directors who either share a common undergraduate alma mater or who share service in a nonprofessional capacity with the CEO. PROF_FRAC denotes the number of supervisory directors who worked together professionally at a firm prior to the CEO's current assignment. All connectedness variables are scaled by board size. NONCASH is equity compensation to total compensation for the top 5 executive officers. Coefficients for time and industry fixed effects are not shown. Superscripts ^c, ^b, and ^a indicate significance at the 10%, 5% and 1% levels, respectively using robust standard errors.

	Full Sample	Pre-SOX	Post-SOX
LSIZE	1.93% ^a (9.52)	4.16% ^a (8.80)	1.04% ^a (5.08)
TOBINQ	-0.15% (-1.06)	-0.54% (-1.26)	0.13% (-0.74)
EBITDA	-0.48% ^a (-4.70)	-1.14% ^a (-2.89)	-0.34% ^a (-3.33)
LEVERAGE	0.18% (1.28)	0.57% ^c (1.78)	0.00% (-0.02)
ISSUANCE	0.95% (1.16)	0.73% (0.36)	0.97% (1.11)
BSIZE	-0.17% (-0.91)	-0.59% (-1.32)	0.00% (0.00)
INDEP_FRAC	-0.35% ^b (-2.44)	-0.64% ^b (-1.98)	-0.18% (-0.98)
BUSY	-0.21% (-1.52)	-0.50% (-1.52)	-0.06% (-0.39)
FINEXP	0.17% (0.53)	-0.11% (-0.15)	0.48% (1.33)
NONCASH	0.56% ^b (2.34)	0.14% (0.40)	0.93% ^a (2.95)
CEOMBA	-0.72% ^a (-2.54)	-0.50% (-0.74)	-0.92% ^a (-2.92)
CEOIVY	-1.05% ^a (-4.01)	-2.43% ^a (-4.15)	-0.49% (-1.56)
INTERNAL	-0.96% ^a (-3.32)	-1.88% ^a (-2.92)	0.62% ^c (-1.86)
NONPROF_FRAC	0.47% ^a (3.68)	1.11% ^a (3.61)	0.22% (1.46)
PROF_FRAC	-0.81% ^a (-4.93)	-1.59% ^a (-3.94)	-0.60% ^a (-3.34)
Year Fixed Effects	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes
# Observations	7,595	2,545	4,682