# **CEO-Director Connections and Corporate Fraud**<sup>\*</sup>

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# **CEO-Director Connections and Corporate Fraud**

### ABSTRACT

We study the propensity of firms to commit financial fraud using a sample of SEC enforcement actions from 2000 to 2006. Controlling for several firm characteristics as well as year and Fama-French 48-industry effects, we find a significant relation between fraud probability and CEO-board connectedness. The nature of this relation depends on the institutional origin of the connection. While nonprofessional connectedness due to shared educational and non-business antecedents increase fraud probability, professional connections formed due to common prior employment decrease fraud. The positive effects of professional connectedness are pronounced only when individuals share service as executives. The impact of professional-connections persists after the 2002 Sarbanes-Oxley Act while nonprofessional connections lose significance after SOX. Our results suggest that social ties matter and they can have very different effects depending on the institutional context in which the ties are formed. The results suggest heterogeneity in monitoring even within the set of independent directors and support a complementary "collaborative board" perspective in which directors not only monitor but also provide advice and counsel to CEOs.

# 1 Introduction

The end of the dot com bubble in 2000 was punctuated by several cases of corporate fraud including high profile cases such as Enron and WorldCom. These frauds raised the suspicion 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 manifest a basic failure of the board oversight function, perhaps because of cozy CEO-director relationships, sinecure appointments and minimal oversight. Accordingly, regulators and institutions aimed to reform boards, and a primary focus of these measures was to break the nexus between CEOs and boards of directors of firms, mostly by stressing director independence.<sup>1</sup>

While directors can be nominally independent of the CEOs, they could have social connections to CEOs. These connections, which can arise out of shared education or employment experiences or shared service at non-business organizations, reflect social interactions of a type not captured in conventional measures of independence. We examine their relation to fraud. An extensive literature in economics argues that connectedness can affect economic outcomes. The net effect could be positive or negative based on whether connections facilitate or constrain opportunistic behavior.<sup>2</sup> For instance, a director with educational institution ties with a CEO may be more disposed towards favorable interpretations of CEO actions or monitor the CEO less, setting in motion a slide down a slippery slope towards fraud. On the other hand, prior employment connections can assist in monitoring because the director can better assess a CEO's actions and business choices. Likewise, they can facilitate greater professional interactions and closer advisory, collaborative business relationships, leading the CEO to avert opportunistic behavior. This role for directors is stressed in the "collaborative" board view discussed for instance by Westphal (1999), Adams and Ferreira (2003), and Adams (2005). Our study examines the relationship between the different types of CEO-director connections and corporate fraud.

Our fraud data is hand-collected and compiled by Karpoff, Lee, and Martin (2008a, 2008b) – henceforth KLM – who kindly supplied us an updated sample. Firms in the sample engage in

<sup>&</sup>lt;sup>1</sup>Besides the SOX based rules, other institutions imposed norms that stress independence. For instance, the NYSE required boards to comprise at least 50% outsiders and that the CEO recuse herself from nominations (see Chhaochharia and Grinstein (2007)). Dahya and McConnell (2007) discuss board norms advocated in the U.K. by the Cadbury commission.

<sup>&</sup>lt;sup>2</sup>See, e.g., Granovetter (1985), Coleman (1990), Uzzi (1996), Hochberg and Lu (2007), Cohen, Frazzini, and Malloy (2008), Cohen, Frazzini, and Malloy (2009), or Engelberg, Gao, and Parsons (2009).

financial misrepresentation, which is defined as a violation of the 1934 Securities Act as amended by the 1977 Foreign Corrupt Practices Act. The data on CEO-director connectedness are derived from the "Boardex" database compiled by Management Diagnostics Limited. Boardex contains biographic data on over 60,000 executives serving at over 76,000 private, public, and not-for-profit organizations. Each individual in the database is either a director or an executive officer named in the proxy statement of firms listed in the U.S. and Boardex extracts the biographic details from these filings and other sources as described on their website.

We construct a vector of connectedness measures based on the educational, professional, and not-for-profit service histories of CEOs and directors. More specifically, we classify connections as being of a *professional* ("LinkedIn") type or a *nonprofessional* ("Facebook") type.<sup>3</sup> We find that both measures of CEO-director connectedness are significantly related to fraud on a standalone basis and also relative to a broad set of control variables. Perhaps more interestingly, connections have economic effects that vary in sign: they can either increase or even decrease fraud probability depending on their origin. Nonprofessional connectedness tends to elevate fraud while professional connectedness decreases fraud probability. The attenuating role of professional connections is consistent with the collaborative board perspective in finance as well as behavioral research in management and sociology, which is reviewed in more detail in Section 2.

The attenuating role of professional connections is consistent with two complimenatry perspectives. Professional connections arise when the employment history of the CEO and the director indicate an overlap at the same company at the same point of time. Employment connections represent shared work experience and business relationships as professional colleagues. Working together with a CEO in a prior job can lead to better monitoring through better judgment of a CEO's professional actions. A second and complementary channel is that professional advising and counseling is more likely when the CEOs and directors have worked together in the past as discussed for instance in Fischer (1982), Rosen (1983), and Westphal (1999). This is consistent with the collaborative board perspective in finance as well as behavioral research in management and sociology, which is reviewed in more detail in Section 2. From both perspectives, the beneficial effect of professional connections should strengthen when the connected individuals serve as part of the same senior executive team. Different and likely weaker connections arise when one

 $<sup>^{3}</sup>$ We use the phrases "Facebook" and "LinkedIn" as metaphors. The social networking site 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 of mainly but not exclusively nonprofessional nature. LinkedIn establishes professional connections arising out of employment.

individual served as a director while the other was an executive, or when both individuals serve as directors. This motivates a further test. We examine not only whether professional connections have beneficial effects in preventing fraud but also whether the effects are pronounced when CEOs and directors have common prior service as executives. We report affirmative evidence.

The second category of CEO-director connections, the nonprofessional connections, arise out of educational or common service at not-for-profit institutions. For educational connectedness, we follow Cohen, Frazzini, and Malloy (2008) and Cohen, Frazzini, and Malloy (2009) and focus on whether CEOs and directors attend a common undergraduate institution. As Cohen et al. argue, shared experiences and a common culture arise from attending the same undergraduate school and being part of its alumni network. While these types of commonalities can facilitate teamwork in a positive sense, their effects could be less benign when the task is to monitor the CEO. Which of the two effects dominates is ultimately an empirical issue that we leave to the data to address. A second set of nonprofessional connections are formed through shared activities at not-for-profit organizations such as service as trustees on charities, non-profit organizations, universities, or even joint memberships of clubs. These are the "other activities" coded by BoardEx. We code individuals as having nonprofessional connections of this sort if they jointly served at the same time in the same institution. These connections have gained considerable notoriety in the popular press. For instance, in the well known case of Enron, the firm 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. Such an ecdotal evidence suggests that boards of directors with nonprofessional "Facebook" connections to the CEO could be associated with lower oversight of the CEO and elevate fraud probability. We report supportive evidence.

The possibility of dual effects arising from different forms of connections 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), p302 and Putnam (2000) who alludes to beneficial effects of social capital and then discusses its "dark side" (Chapter 22)). Our point is that different *types* of connections, e.g. professional and nonprofessional, could result in different economic outcomes. Empirical implications of this point follow. Recent research in finance treats different types of connections in an additive fashion to form an aggregate connectedness index. 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. Our results suggest that such additivity is not necessarily appropriate in all situations. Additive aggregation is not a generic property of different types of networks.

We present several other results on the determinants of fraud. The firm characteristics included in our study reaffirm or shed additional light on findings in prior work. Among firm characteristics, larger firms, growth firms, less profitable firms, and firms raising external finance are more likely to commit fraud. While the prior evidence on board independence is mixed (e.g., Beasley (1996), Agrawal and Chadha (2005), Karpoff, Lee, and Martin (2008a)), we find that it is significant and negatively related to fraud probability, in line with KLM. We find that busy directors who serve on multiple boards attenuate fraud probability. This is consistent with the idea that busy directors have greater incentives to protect their reputational capital (Ferris, Jagannathan, and Pritchard (2003), Yermack (2004), and Fich and Shivdasani (2007)). Following Agrawal and Chadha (2005), we also find that financial misconduct is less likely with the presence of financial expertise. However, expertise becomes insignificant when we add year fixed effects, suggesting that financial expertise has percolated across boards over time.

We investigate other specifications that shed more light on the connectedness variable, specifically whether it picks up omitted CEO characteristics or endogenous choices made by the CEO in picking pliable board appointees. These additional tests not only serve as robustness tests but are also of independent interest in their own right as they shed light on the channels through which connectedness act. To consider whether connectedness reflects CEO characteristics or ability, we include a vector of CEO characteristics in the logit equation. While conventional attributes such as CEO age and tenure are insignificant, CEO educational background matters. CEOs who attend prestigious undergraduate institutions (defined in Section 3) are less likely to commit fraud. Following Chevalier and Ellson (1999), such individuals have higher ability and have less need to commit fraud. Alternatively, these individuals could have a greater aversion to the penalties – perhaps the non-pecuniary aspects such as the social stigma associated with fraud. Bertrand and Schoar (2003) argue that CEOs with MBAs tend to follow on average aggressive strategies. One question is whether such aggression leads them to cross the line into fraudulent behavior especially as the business school background of MBAs may better equip them to understand - hence manipulatefinancial statements. Alternatively, MBAs are perhaps not as sensitive to ethical concerns as they should be and may be more likely to commit fraud. These assertions are not supported by the data. We find that having an MBA is not significantly associated with the probability of committing fraud and the coefficient is negative, suggesting that if an effect exists, it is to reduce the probability of fraud.<sup>4</sup>

We conduct two tests with regard to educational connections. First, we further condition the connections by the prestige of the institution, whose empirical definition is made precise in Section 3. We find no evidence that more prestigious (or less prestigious) connections matter more. Second, we consider educational connections in which graduation dates or CEO-director age differences (for connected directors) are within a 2 year span. These have little effect. In our view, the results are not particularly surprising. Our results support the view of Cohen, Frazzini, and Malloy (2008) and Cohen, Frazzini, and Malloy (2009) that the important component of educational ties, the ones that matter the most, relate to cultural origins from belonging to similar institutions and sharing similar alumni networks. Direct friendship effects may be reflected better in overlaps in both institution and time period during undergraduate education, but these ties seem to matter less in our sample.<sup>5</sup>

We also investigate employment connections along two dimensions. First, we probe and condition professional connectedness by the roles played by the individuals when the connections were formed as mentioned before. The strongest effects come from relationships formed when directors overlap as employees rather than the more distant director-director or director-employee connections. We also examine the possibility that professional connections perhaps pick up the preponderance of individuals who have served at prestigious companies. Because firms such as GE, IBM, or McKinsey tend to be breeding grounds for talent in corporate America, professional connections may simply pick up the greater presence of individuals who have worked at these high quality "director factories." Having board members from these firms does attenuate the probability of fraud but leaves intact the results on professional connectedness.

An alternate explanation for the results is that the CEOs with intent to commit malfeaseance coopt amenable directors, who may monitor the CEO less, and appoint them to the board. We model this endogenous choice of the CEO by examining the portion of the board that was appointed by the current CEO. The appointments made after a CEO assumes office should pick up any primary

<sup>&</sup>lt;sup>4</sup>Thus, while it may be tempting to draw conclusions from the Enron fraud case in which the CEO and several executives are Harvard MBAs, neither the "Harvard" nor the "MBA" moniker seems to be a significant feature of frauds. This finding may be of interest given the increasing stress on ethics education by several business schools in the wake of the financial crisis. See, e.g., "Economic Crisis Leads Business Schools to Meld Ethics Into MBA," (Jennifer Epstein, USA Today, May 5, 2010).

<sup>&</sup>lt;sup>5</sup>As a colleague points out, even students with similar graduation years do not necessarily share close friendships, so year overlaps are likely noisy proxies for any social effects arising out of "friendship."

or residual effects from the influence a CEO has in appointing directors, in the spirit of Yermack (2004), Shivdasani and Yermack (1999), or Coles, Daniel, and Naveen (2007). We find that this variable has little empirical effect on its own. More importantly, it does not alter the impact of nonprofessional or professional connectedness. We also examine the effect of directors appointed after a CEO assumes office *and* connected to the CEO. This variable also has little effect and does not change the other coefficients. It is not noting that we control for CEO and director quality and therefore these are also unlikely to be alternate explanations of our results. We discuss these and other potential endogeneity concerns in Section 5.7.

Burns and Kedia (2006) argue that equity and options compensation is a significant predictor of fraud, and this variable is often implicated in the 2008 financial crisis (Faulkender, Kadyrzhanova, Prabhala, and Senbet (2010)). Thus, we consider equity-based compensation as a predictor of fraud. The compensation data come from EXECUCOMP, whose coverage of firms is more limited than that of BoardEx. As a result, the sample size shrinks substantially and the sample is pruned by close to 60%. The role of connectedness does not change in these tests as well. Finally, the passage of the Sarbanes-Oxley Act (SOX) in 2002 allows us to set up a difference-in-difference test on the effects of professional and nonprofessional connections. The SOX provisions with respect to directors aimed to increase the distance between CEOs and boards, by emphasizing director independence and director accountability. Nonprofessional directors who might have been more lax prior to SOX are therefore likely to cut less slack in the post-SOX period when they are subject to more scrutiny. This should weaken the effect of nonprofessional connectedness on fraud in the post-SOX period. On the other hand, there is no reasons to expect a similar increase in the attenuation effect of professional connectedness. We find evidence consistent with this asymmetry. Professional connections continue to be beneficial while the effects of nonprofessional connections vanish in the post-SOX world. This differential effect of SOX on nonprofessional and professional ties supports the view that these ties operate through different channels, monitoring and advising respectively.

The remainder 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 including several robustness tests and a detailed discussion of alternate interpretations of our key results. Section 6 concludes.

# 2 Related Literature

Our study adds to the literature on financial fraud. Karpoff, Lee, and Martin (2008a, 2008b) review the evidence and point out the significant variations in sample sizes, time periods, and specification and offer a careful taxonomy of fraud. They construct a fraud sample comprising firms subject to SEC and/or DOJ enforcement actions in which regulators believe at least one person acted with deliberate intent to misrepresent financial statements. They find that perpetuators of misconduct face significant disciplinary actions and document significantly large losses to firms in their reputational capital from financial misrepresentation (see also Agrawal, Jaffe, and Karpoff (1999)). KLM also examine several cross-sectional determinants of fraud suggested by the literature.<sup>6</sup>

Along with SEC enforcements, other proxies for fraud include financial restatements, class action litigation suits, or accruals. In the spirit of KLM, it is useful to consider the economic and empirical merits of focusing on enforcements. The original GAO restatement dataset ends in June 2002 and does not have sufficient overlap with the Boardex data. A newer GAO restatements database from 2002 to 2006 captures several technical errors and misclassifications rather than malfeasance intent. Hennes, Leone, and Miller (2008) find that no more than perhaps a quarter of the restatements involve intent to commit fraud. In fact, they suggest using the presence of an SEC enforcement as an indicator to identify fraud within the universe of restatements, making their list close to ours. Class action litigations have the limitation that lawsuits could be biased towards firms with deep pockets or frivolous lawsuits (Easterbrook and Fischel (1985) and Thakor, Nielson, and Gulley (2005)). Lastly, earnings management through accruals is within GAAP and different from wrongdoing that crosses legal lines, which is the focus of our study. The SEC enforcement sample though few in number represent cases of clear misrepresentation and allow us to study the effect of CEO director connections on egregious fraud. The effect on other milder and legal forms of earnings management is left for future study.

Our data set is a version of the sample constructed by KLM updated to September 2009. We add to their analysis in several ways. We expand the cross-sectional variables to include CEOdirector connections, the nexus at the center of the efforts to revamp boards in SOX and in the post-SOX era. We also establish that it is not only the existence of connectedness but also the *type* of connectedness that matters. We demonstrate the variation in the impact of connections before

<sup>&</sup>lt;sup>6</sup>The literature includes Bergstresser and Philippon (2006), Burns and Kedia (2006), Dechow, Sloan, and Sweeney (1996), Johnson, Ryan, and Tian (2009), Li (2008), Lennox and Pittman (2010), Peng and Roell (2008), Povel, Singh, and Winton (2007), Wang (2008).

and after SOX. Finally, we also examine and offer evidence on new cross-sectional determinants of fraud such as the personal attributes of the CEO.

Our findings also contribute to the literature on boards (for a survey, see Hermalin and Weisbach (2007)). While regulations to deter fraud have been enacted in 1990, 1991, and 1995, the 2002 passage of SOX (and related measures by institutions such as NYSE) stands out in its focus on revamping boards. In fact, it represents perhaps the most aggressive regulatory intervention into structure of the boards of directors of public corporations. For instance, the post-SOX measures include mandates that at least 50% of boards be independent, that boards possess sufficient financial expertise, that CEOs not participate in the nominating committee and recuse themselves from the director nomination process, and that there is independent oversight of the auditing function. These measures attempt to improve board effectiveness in deterring fraud by prescribing norms for different attributes of boards. What board attributes empirically matter in deterring fraud is an interesting question. We review some of the evidence in this area to offer a perspective of our contributions to this debate.

Early evidence on the role of boards in frauds is presented by Beasley (1996), who examines a sample of 75 firms that were subject to SEC enforcement actions from 1982 to 1991. He finds that higher fraction of outside directors and smaller board size is associated with a lower likelihood of financial representation. Agrawal and Chadha (2005) study firms that restate their financial statements from 1997 to 2002 and do not find any significant effect of outsiders or board size on the propensity to misreport. On the other hand, they find that the presence of financial experts on the board mitigates the propensity to restate. KLM attribute the differences in the two studies to substantial differences in sample sizes and the use of different proxies for financial misconduct. Our study adds to this debate not only by reassessing the role of board independence in fraud but also by pointing out a different dimension of the CEO-board nexus that matters, viz., connectedness through educational background or professional and nonprofessional activities.

Our study also examines and highlights the importance of a different attribute of the board of directors, viz. the number of external appointments held by board members. Following Ferris, Jagannathan, and Pritchard (2003), Yermack (2004), or Fich and Shivdasani (2007), reputational concerns are important in the director market, particularly for directors with multiple board appointments. This suggests that busy directors with more external appointments may be particularly vigilant for fraud. The biographic data on directors allows us to construct measure of how busy the directors are and examine its effect on corporate misconduct. We find that busy boards are less likely to be associated with fraud. Thus, reputational concerns of directors appear to be important and our findings show that these concerns affect directors' on-job performance as related to fraud.

Our work contributes to a burgeoning literature on CEO social networks. Much of the recent work is spawned by the initial forays by Cohen, Frazzini, and Malloy (2008) and Cohen, Frazzini, and Malloy (2009). These papers focus on connections arising out of common undergraduate institutions. They report that having a common undergraduate alma mater facilitates information flows between boards of directors and mutual fund managers and between executives of a firm and analysts following the firm's stock. In a smaller cross-section of Fortune 100 firms drawn from 1996-2005, Hwang and Kim (2009) find that the presence of connected CEOs is associated with greater CEO compensation. Unlike the Cohen et al. studies, Hwang and Kim study connections in which CEOs and directors attend the same school and when their graduation years are within +/-2 years, thus relying on friendships formed during undergraduate years. The Cohen et al. view relies more on commonalities and cultural similarities arising out of a common alma mater. Our findings tend to lean towards the latter view. A related point is that while we show that connections matter, so do individual attributes and conventional measures of economic determinants of fraud. Thus, as Brass, Butterfield, and Skaggs (1998) discuss, neither the undersocialized view, in which individuals and their incentives matter but connections are irrelevant, nor the oversocialized view in which only social connections matter is the right descriptor of fraud. Individual attributes, economic incentives, and connectedness all appear to matter in understanding fraud.

Other work employing connectedness as a RHS variable includes Cai and Sevilir (2009), Ishii and Xuan (2009), and Schmidt (2009), who study the role of connectedness in mergers and acquisitions activity and announcement effects, and Fracassi and Tate (2009) who study insider trading, mergers and acquisitions, and accounting restatements in relation to connectedness. Our study complements and differs from these studies by focusing on financial frauds, in identifying the separate effects of professional and nonprofessional connections and the varying grades of these connections, and finally, the different effects of connections before and after SOX.

Finance papers on social networks tend to focus on structural metrics of networks such as closeness, betweenness, and degree centrality. These measures are used by Hochberg and Lu (2007) in the context of venture capital. More recently, Engelberg, Gao, and Parsons (2009) and Liu (2009) analyze the role of the "rolodex" in the context of CEO compensation and turnover. Our contribution to this work is to establish that besides the existence of connections, the nature of the *economic relation* generating the connection matters. Thus, what matters is not just the fact that a person (or institution) is connected to another occupying a different node, but the kind of relation between the dyad, a point often stressed by sociologists (see e.g. Granovetter (2005)). In this respect, our point complements the work of Lin, Prabhala, and Viswanathan (2009), who examine the effect of social networks on outcomes in peer to peer lending. They discuss how the type of friendship rather than the mere existence of friends influences economic outcomes.

It is worth considering in greater detail why the nature of the relationship underlying connections matter. In other words, why should professional and nonprofessional connections have different effect on fraud? One view is offered by the "collaborative board" perspective of Westphal (1999), who argues that besides monitoring, boards also play a role in providing expert advice and counsel to CEOs (see also Adams (2005), Adams and Ferreira (2003) and Raheja (2005)). The sociology literature suggests that different types of networks are activated in different situations and may therefore have different effects on the board's monitoring and advising roles. Saint-Charles and Mongeau (2009) show that "advice networks," consisting of people or specialists that are consulted for work-related matters are activated at different times relative to "friendship networks." In particular, "advice networks," based on "competence trust" are called upon at times of organization uncertainty, and such networks are more readily accessible when the board comprises professional colleagues. Plickert, Ct, and Wellman (2007) suggest that a notion of reciprocity might also be at work. Having professional peers on board may more likely be associated with professional quid pro quo rather than non-pecuniary kinship utility that might be derived from having nonprofessional friends on boards that permit lax monitoring of CEOs.

It is perhaps also useful to consider the mechanisms by which frauds arise to assess where professional networks can play a beneficial role. While gross fraudulent intent may be plausible purely in principle, we consider it unlikely that the CEO asks his board for advice on whether he should commit fraud or not (and receives affirmative assent). Indeed, we know of no such cases where boards are actively and willfully complicit in this manner. A possible alternate perspective is that most fraud begin small. For example, in the case of the fraud by the company Satyam Inc, the CEO, Mr. Raju says "...what began as a small discrepancy continued to grow over the years."<sup>7</sup> The first and possibly minor misstep is less likely when there is an active counsel and advising relation with back and forth between the CEO and directors. This initial counsel is facilitated when there are professionally connected directors whose business judgment the CEO respects. Active professional

<sup>&</sup>lt;sup>7</sup>See "Satyam Chief admits huge fraudby Heather Timmons and Bettina Wassener, *The New York Times*, January 7, 2009.

advising in boards in which CEOs and directors have prior professional connections may thus make undetected missteps towards fraud less likely. A complementary view emerges when we consider the possibility that even within the set of independent directors, there could be heterogeneity in monitoring capability. Peers who have worked with the CEO in a professional capacity in the past may able better monitors of CEOs as they may find it easier to judge a CEO's professional choices or the content of information flows from the CEO. Thus, the misstep and the snowballing effect culminating in fraud is averted.

# **3** Data and Descriptive Statistics

The primary data source on the Board of Directors and the CEO is the BoardEx database provided by Management Diagnostic Limited. Fraud data is from the SEC Enforcement action database compiled by Karpoff, Lee, and Martin (2008a, 2008b). Stock return and accounting data are from CRSP/COMPUSTAT while the Executive compensation data is from EXECUCOMP. We discuss the datasets and some descriptive statistics next.

## **3.1** SEC Enforcement Actions

The KLM data on SEC enforcement action includes all enforcement actions initiated by the SEC and Department of Justice till September 2009 for violation of one or both provisions of Securities and Exchange Act of 1934, as amended by the Foreign Corrupt Practices Act of 1977. KLM discuss the merits of using this sample relative to others such as restatements studied by the General Accounting Office (GAO) that contain errors arising out of misapplication of accounting rules rather than a deliberate intent to commit fraud. Most enforcement actions have a "trigger event" like restatements, auditor departure or self-disclosure that draws the SEC's scrutiny. The trigger event leads the SEC to inquire into the firm, after which the SEC could choose to proceed with a regulatory filing. 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.

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 is 5.07% in 2000, rising to about 5.68% in 2002 and dropping to less than 1% in 2006. The declining rate of misrepresentation after 2002 could be due to

tighter regulatory framework under Sarbanes-Oxley Act of 2002. A small fraction of fraud in 2006 might also be due to the fact that firms that were choosing to misrepresent in 2006 may have not been discovered by September 2009, the last date for data collection. The data suggest that year fixed effects are necessary to control for secular variation in fraud probabilities and we include these in our analysis. Table 2 displays the variation in frauds across the Fama-French 48 industry categories. There is some evidence on industry effects in fraud. For instance, fraud appears more likely in computer hardware sector. These data suggest that industry fixed effects may be needed as controls while predicting fraud and we do so in the empirical analysis.

We next develop the variables used in our anlysis. Table 3 shows the descriptive statistics for the fraud and non-fraud sample for variables described below.

### 3.2 **CEO-Director Connectedness**

BoardEx collects biographical information of corporate directors and senior managers from a wide variety of public domain sources. We sort and code the data at the individual officer and director level and then aggregate data at the firm level for each fiscal year. The raw data needs to be filtered for screening out errors and inconsistencies and needs to be manually matched with the other databases that we use. We describe this process in detail before turning to the distribution of the connectedness variables and various attributes and characteristics used in the empirical analysis.

BoardEx covers all individuals who have ever been an officer or a director, i.e. a disclosed earner, in US and European public firms since 1999. The biographical data included in BoardEx covers educational qualifications, employment history including the type of service (director or executive or both), as well as service on not-for-profit organizations. The personal biographical information collated by BoardEx dates back to as early as 1926. Our base dataset consists of two main files, containing the employment records and education records respectively, downloaded from BoardEx on August 1, 2008. The key firm identification variable in BoardEx is *companyid*, the key individual identification variable is *directorid*, and the key variable to identify educational or certifying institutions attended by individual officers and directors is *universityid*. The August 1, 2008 download from BoardEx 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.

BoardEx coverage includes public, private, and non-profit companies in the US and foreign countries. Since our unit of analysis is a firm, we begin by identifying publicly listed US firms, both active and inactive. BoardEx provided us a field for whether the coverage of a firm is complete or not. We found that BoardEx coverage is not complete for several firms prior to 2000. Several individuals in the BoardEx database have employment histories prior to 2000 but BoardEx has not necessarily updated its data to reflect *all* executives and directors for firms in those years. Thus, our analysis focuses on the time period from 2000 to 2006, when there is a sizable universe of firms with complete coverage. The list of complete coverage firms encompasses about 1,500-1,900 firms from 2000-2002, roughly corresponding to firms in the EXECUCOMP database, and expands significantly to incorporate small firms after 2003. We match the CUSIP, ticker and name of each company in BoardEx to CUSIP, ticker and company names in the merged CRSP-COMPUSTAT database to get GVKEY and PERMNO identifiers.

For each firm for which we have a valid GVKEY and PERMNO, we first identify the CEO for the firm. The employment records in BoardEx give the starting and ending dates of each job in the employment history of the officer and director. We use the dates to identify the individual serving as the CEO at the end of the fiscal year. We next identify an annual snapshot of all officers and directors at the end of the fiscal year for a given firm. We scroll through the employment records for each individual officer and director and determine whether they were employed by the firm and whether the fiscal year end of the company falls between the start and end dates for a job with the firm. If the individual was employed by the firm at fiscal year-end, we further mark 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.

## 3.2.1 Professional "LinkedIn" Connections

We classify a CEO as having a professional employment connection with an outside director if they have a prior history of being employed at the same time in a firm excluding the service at the current firm. Empirically, we define professional connectedness between the board and the CEO in a firm, PROF\_FRAC, as the fraction of the board of directors that is connected to the CEO through prior common employment antecedents. 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. We grade these connections further in the multivariate analysis by the nature of the underlying professional job and by the type of firm at which the connections were formed. We return to this point after introducing the main logit results.

### 3.2.2 Nonprofessional "Facebook" Connections

Nonprofessional connections between CEOs and directors can arise from two sources, either based on common educational antecedents or from common service at not-for-profit institutions. We obtain data on these connections and develop metrics on each separately and combined together.

For inferring educational institution connectedness, we identify the educational institution attended and the degree or certificate received. The names of the degree granting institutions are not necessarily coded in a consistent way. We manually match the names of educational institutions taking care to identify multiple versions of the names (e.g. Harvard University and Harvard). For each university, we assign a *universityid* to uniquely identify the institution. There is a similar variation in the specification of the degrees earned by the officer and director in the biographies. We manually sort through the degrees received and categorize them into the following six categories: Bachelors, Masters, MD, MBA, JD, and PhD. Given our focus on nonprofessional connections, we examine connections derived from a common undergraduate alma mater rather than graduate connections (which turn out to add very little). We also do not emphasize common years of attendance. Thus, our "weak" definition of education ties captures shared beliefs, common culture and a sense of belonging, as in Cohen, Frazzini, and Malloy (2008).<sup>8</sup> The fraction of board members with educational ties to the CEO is referred to as EDU\_FRAC. The average EDU\_FRAC is is 1.37% for misreporting firms versus 1.11% for other firms and the univariate difference is not significant as shown in Table 3.

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 years because they drop out as executives or directors. Two factors mitigate this concern in our study. First, as discussed above, we rely on the institution from which the executive obtains an undergraduate degree and not the year of graduation. We find that the undergraduate institution

<sup>&</sup>lt;sup>8</sup>The stronger definition of connectedness based on the same institution *and* graduating within a +/-2 year cohort may be argued to capture social friendships more precisely. However, this proxy is likely to be too noisy to be reliable. It is both excessively inclusive (given the average cohort size of several thousand students per year, ascribing friendship based on common years seems implausible) and simultaneously too exclusive because social friendships formed during these years may also form outside the college context. Not surprisingly, this variable has little effect on the main results.

field tends to be well populated. A second factor is that to the extent the data gaps reduce over time, educational connectedness should have stronger effects in subsamples drawn from later years. In contrast, we find diminishing effects in the post-SOX period after 2002, as discussed in Section 5.5, so it is unlikely that measurement error in the eduction connections drives our results.

BoardEx classifies non-business activities of individuals as "other" activities. Based on the data for individual directors and officers, we develop data with respect to common service by the CEO and directors at not-for-profit organizations such as trusts, universities, clubs and other non-business associations. As before we measure the fraction of board members connected with educational ties to the CEO and refer to it as OTH\_FRAC. As Table 3 shows, the average OTH\_FRAC is 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. NONPROF\_FRAC denotes the fraction of board members that have an educational tie or a tie arising from other non-business but common service at not-for-profits. The average NONPROF\_FRAC is is 10.85% for misreporting firms versus 7.39% for other firms and the univariate difference is significant at 1%.

## 3.3 Other Explanatory Variables

We control for firm size using log of total assets (COMPUSTAT item data6). Profitable firms may have less need to commit fraud. 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. Povel, Singh, and Winton (2007) show that high-growth firms facing reduced growth opportunities are most likely to engage in financial misrepresentation. To control for growth opportunities, we include Q, following Davis, Fama, and French (2000). Firms with a greater need to access 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 proxy for this construct using the dummy variable ISSUANCE that equals 1 if the firm issues stock (COMPUSTAT item data108 > 0) or increases debt (COMPUSTAT item data111 > 0) and zero otherwise. The univariate statistics in Table 3 suggest that size is the most significant predictor of misreporting. Leverage and issuance also matter, perhaps due to correlation with size. We disentangle these effects subsequently in the multivariate logit specification. Among the board characteristics are board size BSIZE, which is the number of directors on the board and INDEP\_FRAC, which is the ratio of outside or supervisory directors to board size. Following Fich and Shivdasani (2007), we count the number of other directorships held by each director of the firm. We then average across all directors to create a measure BUSY that captures the incidence of busy directors at the firm level. BoardEx carries information on whether a director is classified as a financial expert. Following Agrawal and Chadha (2005), we also create a financial expertise variable FINEXP, which takes the value one when the board has a director who is classified as a financial expert and zero otherwise. On a univariate basis, misreporting firms have about one more board member, an equal degree of independence, slightly greater outside appointments, and lesser financial expertise. While the univariate comparisons are useful descriptors, little can be inferred from them alone because of correlations between variables. This is more than a mere theoretical possibility. For instance, large firms with large boards may be more likely to employ directors holding more outside appointments so any differences in BUSY might reflect differences in firm size.

We also consider some elements of CEO educational background, following Chevalier and Elllson (1999). We create the variable CEOIVY, which is a dummy variable that takes the value one when the CEO attended a high quality undergraduate institution, which is the "Ivy" definition proposed by Zawel (2005). Following Chevalier and Elllson (1999), this could serve as a proxy for quality or it could reflect the need to preserve reputation by a CEO. 27.48% of CEOs are classified as having an Ivy league degree in misreporting firms versus 25.22% in non-misreporting firms. We also create a variable CEOMBA, which takes the value of 1 if the CEO has an MBA degree. 26.4% of misreporting firms have MBA CEOs compared to 22.7% in non-misreporting firms. We examine these and the other univariate differences using a logit specification that controls for all explanatory variables simultaneously.

# 4 Logit Estimates

In this section we present the main logit estimates that explain fraud. The dependent variable is a dummy variable that equals 1 if the firm misreports during the year and zero otherwise. The explanatory variables are introduced sequentially. Section 4.1 begins with a baseline model that incorporates firm and board characteristics studied in prior work. Sections 4.2 and 4.3 expand the specification to include CEO-director connectedness.

### 4.1 Baseline Specification

Table 4 displays estimates of baseline logit models to explain financial fraud. Among firm characteristics, firm size is significant in all specifications and is positively related to fraud, consistent with prior work such as Karpoff, Lee, and Martin (2008a, 2008b). Growth firms are more likely to commit fraud, as predicted by Povel, Singh, and Winton (2007) and Wang (2008). Profitable firms are less likely to misrepresent while leverage is insignificant. Firms that access external capital markets are more likely to engage in fraud, consistent with the view that one motivation for fraud is to temporarily inflate security prices and lower costs of external finance.

The other variables included in model (1) represent selected characteristics of a firm's board of directors, largely motivated by prior work. Although board size is significant in the univariate comparisons of Table 3, it is insignificant in all logit models. The explanatory power of board size is essentially absorbed by firm size. In contrast, board independence matters in all specifications. More outside directors tend to reduce the probability of fraud, consistent with prior work such as Beasley (1996) and Karpoff, Lee, and Martin (2008b). The differences between the logit estimates and the univariate comparisons in Table 3 are worth stressing. Board size matters in the univariate results but is insignificant in the logit, while independence is insignificant in univariate comparisons but matters in the logit model. The differences in results largely reflect the confounding effect of size. Little can be read into the univariate comparisons absent a control 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. In line with Agrawal and Chadha (2005), we find that financial expertise on the board reduces the probability of financial misrepresentation. This result is however not robust to the inclusion of year fixed effects. Including these makes the coefficient for financial expertise insignificant, as shown in specification (2). The likely explanation for this difference is that financial expertise on boards has increased over time so its impact on fraud is largely absorbed by year fixed effects. Consistent with Table 1, the year fixed effects are themselves significant for each year after 2002 and have a negative sign, indicating a reduction in fraud in the post-SOX period. Finally, motivated by the industry patterns noted in Table 2, we include industry fixed effects in specification (3). Several of these are significant so we include them in all the logit specifications to follow. However, industry fixed effects do not alter the significance of the other explanatory variables in Table 4.

### 4.2 CEO-Director Connectedness: Nonprofessional Connections

The next set of specifications explore the relation between CEO-director connectedness and fraud. We start by examining the effects of nonprofessional connections. In Table 5, specification (1) introduces nonprofessional CEO-director ties derived through non-business activities such as common memberships of clubs or shared service at trusts, universities or other not-for-profit organizations. The effect of these types of connections is captured by the variable OTH\_FRAC, which represents the fraction of board members connected to the CEO through such non-business activities. In Table 5, the coefficient for OTH\_FRAC is positive and significant at 5%, indicating that non-business connectedness between the CEO and the board elevates fraud probability.

We also introduce CEO personal attributes to the first specification in Table 5. 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, consistent with these CEOs having greater ability, having greater concerns for reputation that preclude them from carrying out fraud, or more generally, having greater aversion to the penalties due to fraud. A second variable is CEOMBA, which is a dummy for whether the CEO has an MBA degree. The coefficient for CEOMBA is negative although it is not significant. Thus, while frauds have been followed by a call for greater ethics training or ethics sensitivity for MBAs (see, for instance, "A Promise To Be Ethical In An Era of Immorality," *The New York Times*, May 29, 2009), it is not clear that MBAs are especially prone to ethics lapses represented by fraud. To the extent an MBA education matters, it has a negative sign, so it is associated with a lower probability of fraud despite MBAs having better training in dissecting (and perhaps manipulating) accounting statements. Our statement is not intended to decry the need for ethics training for MBAs. Rather, our point is that MBAs are not especially prone to fraudulent behavior and perhaps less prone to it compared to non-MBA CEOs.<sup>9</sup>

Specification (2) in Table 4 introduces nonprofessional connections arising out of common educational antecedents. Following Cohen, Frazzini, and Malloy (2008) and Cohen, Frazzini, and Malloy (2009), the measure of CEO-director education connectedness is EDU\_FRAC, i.e., the fraction of the board that comes from the same undergraduate institution as the CEO. The coefficient for EDU\_FRAC is positive so educational overlaps tend to increase fraud probability, but the coefficient falls short of being significant at conventional levels (t-statistic = 1.55, p=0.12). Specification

<sup>&</sup>lt;sup>9</sup>We also experimented with conventional attributes such as CEO tenure or CEO age, perhaps because reputation building concerns might drive the need to commit financial fraud (or avoid it). Neither variable matters empirically.

(3) in Table 5 aggregates the educational and non-business connections to form an index of nonprofessional connections between board members and the CEO. The variable NONPROF\_FRAC denotes the fraction of the board that is either connected to the board through educational alma mater or non-business activities. The coefficient for NONPROF\_FRAC is positive and significant.

We further investigate potential causes for the somewhat modest role played by CEO-director educational connectedness. One possibility is that cultural ties as measured through common alma mater are weak ties. Perhaps stronger ties are manifest when the individuals are not only educated at the same institution but also overlap in time at the institution, in the spirit of Hwang and Kim (2009). We consider such a proxy. We label the educational connection as "strong" if the CEO and director attend the same undergraduate institution and graduated within +/-2 years of each other. In unreported results, we find that strong undergraduate connections have little effect on their own and have little impact on the other included variables. This is not surprising. There are relatively few firms where CEO and directors have these "strong" undergraduate ties. Moreover, even when such commonality exists, it need not translate into social relationships or close friendships between the individuals in the dyad, given the large class sizes each year at undergraduate schools. Thus, school-plus-year ties are potentially very noisy indicators of the friendship construct sought by such measures. Finally, besides undergraduate ties, we also examine connections between CEOs and directors formed during graduate school either by virtue of a common school, or a common school and program, or a common school, program, and year. These connections have little independent explanatory power and do not affect the other coefficients. To the extent educational connections matter, the important ones are those derived via a common undergraduate alma mater.

## 4.3 CEO-Director Connectedness: Professional Connections

The next tests examine the role of professional connections between CEOs and directors. The measure of CEO-director employment connections is PROF\_FRAC, which is the fraction of individuals on the board of directors who were professionally employed at the same firm as the CEO at some point of time in the past, prior to the CEO's current employment. Table 6 explores its relation to fraud. The coefficient for PROF\_FRAC is negative and significant at 1%, so professional connectedness between CEOs and boards appears to lower the likelihood of misconduct, in marked contrast to the nonprofessional connectedness, which tends to increase fraud probability. As discussed in Section 2, the different effects of professional connections is consistent with the idea that these types of connections manifest greater advice-seeking by CEOs and/or collaborative

functioning between board members that lessen the likelihood of missteps leading to fraud. On the other hand, nonprofessional connectedness seem to manifest the traditional agency notions of insufficient monitoring by boards or board capture by CEOs.

We assess a more mechanical explanation for the effects of professional connectedness. Specifically, we test the hypothesis that the professional connectedness effect is really the effect of whether the CEO is internally or externally sourced. CEOs who build their career within a firm may have few outside professional 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 in fact less likely to commit fraud. Furthermore, the coefficient for professional connections remains significant even after including a dummy variable for internal hires, CEOINTERNAL.

Specification (2) in Table 6 examines whether the impact of professional connectedness of the CEOs and directors is diluted when we add the nonprofessional connectedness between the CEOs and directors. Nonprofessional connectedness has little effect on the coefficients for professional connectedness has little effect on the coefficients for professional connectedness remain consistent across specification and do not rely on a particular configuration of explanatory variables. The divergent effects of the two types of connectedness are seen in the univariate results, after being added to the logit models individually or together. The basic result appears to be a robust feature of the full sample.

# 5 Additional Tests

Section 4 presents the main results of the paper concerning different types of connectedness and fraud. In this section, we consider several additional tests that clarify the main results or assess their robustness to extra controls and in different datasets. In Section 5.1, we characterize the strength of professional connections and find that stronger professional connectedness simply picks up the greater preponderance of directors supplied by more prestigious firms that breed talent. Section 5.3 examines the potential effect of captured directors appointed by the CEO. Section 5.4 controls for equity based compensation. Finally, Section 5.5 considers the variation induced by the 2002 Sarbanes-Oxley Act (SOX). Section 5.6 discusses marginal effects. Section 5.7 is a discussion of the results and the implications for further research on the determinants of fraud.

## 5.1 Strength of Professional Connectedness

Our basic finding is that professional connections derived from common prior employers mitigate the probability of fraud, perhaps by facilitating greater counsel and advice between CEOs and directors. An additional implication of this view is that stronger professional connections should have greater effects in mitigating fraud. We examine evidence for or against this view next.

To examine the impact of the strength of professional connections, we first study whether employment connections were formed with the CEO and directors were executives of another firm or when they were directors at another firm (or one was a director while the other was an executive). BoardEx captures employment of individuals based on service as top executives. At this level, interactions between individuals at the same firm are likely to be frequent, substantive, and under environments varying in the levels and nature of the professional issues facing firms. In contrast, directors at the same firm tend to meet less frequently and the interactions are likely to be less substantive and with less variation in the professional circumstances. Thus, the interactions between individuals is likely to be the most meaningful when they serve as executives in the same firm. Thus, to the extent professional connections mitigate fraud, the effects are likely to be the most pronounced when the CEO-board connectedness is derived through common service as executives of the same team. Model (1) of Table 7 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 are insignificant.<sup>10,11</sup>

# 5.2 Director Factories

Our next variable picks up the effect of the quality of firms at which boards of directors have prior executive experience. In the business press, several firms such as General Electric, Pepsico, Procter and Gamble, or IBM are vaunted breeding grounds for executives (see, e.g., "Breeding Grounds for New CEOs" in BusinessWeek, April 30, 2009). These firms tend to attract some of the top management talent in the U.S. Professional connections are more likely when executives have prior

<sup>&</sup>lt;sup>10</sup>In unreported results, we consider the time spent on a job together. We include a variable, OVERLAP\_TIME, which is defined as the average number of years spent by a CEO with all directors in prior employment. This variable is not significant in its own right and has little effect on the sign or significance of PROF\_FRAC, the fraction of the board with employment overlaps with the CEO

<sup>&</sup>lt;sup>11</sup>Following Engelberg, Gao, and Parsons (2009), we examine if the CEO's rolodex or the overall connectedness of the CEO subsumes the CEO-board professional and nonprofessional connections. Our main results remain essentially unaltered to several measures of overall connectedness including betweenness, closedness, and centrality.

work experience at these firms, so professional connectedness may in fact be picking up executives with employment origins in these storied firms. As an empirical proxy for such high quality firms, we identify firms as "director factories" if the number of executives with employment histories in these firms are among the top 10% of all firms. The director factory firms in our sample include familiar firms such as IBM, GE, consulting firms such as Ernst and Young, Andersen, and McKinsey as well as financial firms such as Goldman Sachs.

To examine the impact of having directors from director factories, we include a variable that measures the fraction of directors that are from these director factories in our empirical specification. To control for CEOs who also originate from one of the director factories, we also include a dummy for whether the CEO is from a director factory. Model (2) in Table 7 reports the results. We find that greater the fraction of directors from director factories the smaller is the likelihood of misconduct. The CEO's being from a director factory is not significant, possibly because we have already controlled for CEO ability by the inclusion of the CEOIVY dummy, which continues to be significant. More interestingly, the effect of professional connections remains significant even after including proxies for the director background. This result suggests that professional connections in all forms attenuate fraud probability regardless of – or more precisely, in addition to – the professional origins of the directors.<sup>12</sup>

### 5.3 Unmeasured Board Capture

Our results thus far indicate that the CEO-director connectedness and its genesis explain fraud. However, some part of our results may reflect the existence of directors who are lax monitors because they are obligated to the CEO for their appointment. Following Yermack (2004) and Coles, Daniel and Naveen (2007), we proxy for these elements of captured directors as the fraction of the board appointed after the current CEO assumes office. We estimate the fraction of the board that was appointed after the CEO took office, denoted it as AFTER\_CEO\_FRAC, and include the variable in our regressions. As seen in model (3) of Table 7, AFTER\_CEO\_FRAC has little significant affect on misconduct. We also note that the estimated coefficient and significance of both professional and nonprofessional CEO-director connectedness are virtually unchanged when we include this variable. As a further refinement of this test, we also estimate the fraction of the board of directors who

 $<sup>^{12}</sup>$ As a related and parenthetical note, we also examined whether the *connections* formed between the CEO and directors at "director factories" are special. These connections have a negative but insignificant coefficients. Thus, the beneficial effect of connections is not confined to the "prestigious" connections but holds for all forms of connections.

are appointed after the CEO takes office and have nonprofessional connections. Model (4) includes this additional variable. The variable is not significant and it does not affect the other coefficients in any material way. There is little evidence that the directors appointed by the CEO, who may pick up elements of board capture, affect the probability of fraud or that the connectedness effects relating to fraud are proxies for these appointments by the CEO.

## 5.4 Compensation

Existing literature finds that the structure of executive compensation significantly impacts the propensity for financial misconduct. In particular, Burns and Kedia (2006) and Bergstresser and Philippon (2006) find that a higher use of stock options is associated with a greater likelihood of restating and greater use of discretionary accruals respectively. Karpoff, Lee, and Martin(2008b) report that the fraction of compensation paid through non-cash means, which primarily comprises equity grants and stock options, is positively associated with fraud. We reconsider our connected-ness results in the light of these findings.

We obtain compensation data from the ExecuComp database. Perhaps the biggest issue with this subsample is the shrinkage in sample. The requirement for compensation data restricts our sample size to the subset that has compensation data available on ExecuComp. Our sample shrinks by more than 50% to 7,595 observations. Moreover, the sample is concentrated among larger firms tracked in the EXECUCOMP database, which focuses on a firm that comprise (or comprised) the largest S&P 1,500 firms. We replicate all our tests in this subsample to see if our results are robust to the variation in sample and control for compensation structure.

Specification (1) in Table 8 presents the logit estimates for the full logit specification reported in Table 6 plus non-cash compensation variable. Following Karpoff, Lee, and Martin(2008b), noncash 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 other variables are not materially altered by the restriction to the compensation subsample or by the inclusion of the compensation variable. As before, we find that fraction of outside directors is associated with lower fraud probability. CEO attributes also matter. CEOs attending prestigious undergraduate programs and those with an MBA degree are less likely to be associated with fraud as are internally hired CEOs. The key connectedness variables remain significant. Professional connectedness mitigates fraud while nonprofessional CEO-director connections are positively related to fraud. Both measures matter as much as conventional measures of independence. The number of outside directorships held loses significance in this sample perhaps due to the lack of variation when the sample is constrained to include only the larger firms with ExecuComp data. In any event, the main conclusion is that controlling for compensation does not materially impact our main results that CEO-director connections are related to the likelihood of financial fraud as much as conventional board measures such as independence and board size, or that the different types of connectedness have different effects on fraud probability.

### 5.5 SOX

Our sample period 2000 to 2006 spans the passage of the Sarbanes Oxley Act in 2002 that aimed among other things at making board monitoring more effective. SOX took aim at restructuring boards and in its wake, institutions such as the NYSE also aimed to reform board structure and functioning by redefining acceptable board structures and putting some distance between CEOs and board composition and 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 the CEO prior to 2002, the passage of SOX may make such support less forthcoming. Thus, it is interesting to examine the effect of SOX on the relation between connectedness and fraud. If nonprofessional connections undermine monitoring we would expect to see this effect being stronger prior to the passage of SOX. On the other hand, if professional connections mitigate misconduct by facilitating counsel between the CEO and directors, this effect is unlikely to be equally impacted by SOX.

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. Specification (2) and (3) of Table 8 present the logit estimates for the pre-SOX and the post-SOX period, respectively.<sup>13</sup>

As before, both forms of connectedness matter in the pre-SOX period but in the post-SOX period, nonprofessional connections lose significance while professional connections continue to be

<sup>&</sup>lt;sup>13</sup>Boardex increases its data coverage over this period leading to the inclusion of several new firms especially in the post SOX period. A proper examination of the effect of SOX requires us to observe the firm both before and after the passage of SOX. As BoardEx coverage of large firms, i.e., those covered in ExecuComp is steady over this period we report the SOX results for the ExecuComp sample. The results are materially unchanged if we use the full sample.

significant. Thus, even though SOX aimed to distance CEOs from boards, it does not eliminate the beneficial effects of professional connectedness on fraud deterrence. This differential effect of SOX on nonprofessional and professional ties also supports our hypothesis that these ties, with different institutional origins, operate through different channels, i.e., monitoring and advising respectively.

# 5.6 Marginal Effects

In this section, we examine the logit marginal effects. Table 9 reports the marginal effect estimates and significance for the logit estimates reported in Table 8. For discrete variables such as CEOMBA or CEOIVY the marginal effects show the impact on logit probability of changing the variable from 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 9 sample is 3.94%. While fraud attracts significant attention from regulators and policy makers and has resulted in some of the most expansive intervention into corporative governance of public corporations, it is a relatively rare event.

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 sigma marginal effect of 0.81%. It is useful to compare the marginal effect of professional connections relative to the traditional board variables targeted by regulators in SOX and in the aftermath of SOX. 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 the marginal effects also exceed that of board independence in the full sample. A similar ranking emerges for the pre-SOX estimates reported in model (2), in which both forms of connectedness have higher marginal effects, perhaps because of higher fraud probability prior to SOX.

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 4.14% to 1.67%. As in Table 8, there is an asymmetric decline across the different types of connectedness. While nonprofessional connectedness are insignificant and have a marginal effect of 0.20%, professional connectedness is significant in the post-SOX period with a marginal effect of -0.60%. Its continued significance is interesting in view of the significant scrutiny and discipline imposed upon directors in the wake of SOX, which could substitute for and render the effects of other fraud mitigation mechanisms redundant. Nevertheless professional connections continue to matter. Finally, CEO attributes also matter in Table 9. The significance of the marginal effects of CEOMBA and CEOIVY suggest the importance of considering CEO attributes in a broader discussion of fraud and perhaps board composition and effectiveness.

### 5.7 Discussion

We consider the collective implications of our results for other variables that can potentially explain fraud. A candidate explanation for the beneficial effects of professional connections is that they reflect CEO ability. Perhaps more able CEOs are less likely to commit fraud and professional connectedness is simply a proxy for CEO ability. It is worth noting that we do control for CEO ability through the quality of the undergraduate institution. This proxy matters and has the right sign but it does not subsume connectedness. Furthermore, CEO ability is manifest in stronger rolodexes and better overall connectedness. Our results are robust to the inclusion of overall CEO connectedness. Additionally, if professional and nonprofessional connections do capture CEO ability, it is unclear why they have opposite effects on fraud.

We turn to the role played by fraud detection. Our dependent variable is a compound probability, that of committing fraud  $p_f$  and that 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 (2008). She finds that to a first order, there is a pure scale effect with little cross-sectional shift in coefficients. In fact, *no* cross-sectional variable is materially altered by modeling detection. The bottom line is that 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.<sup>14</sup> 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.

Yet another perspective is that professional connections are somehow picking up proxies for director ability. Perhaps professional connections between CEOs and directors reflect the supply-

<sup>&</sup>lt;sup>14</sup>In fact, the Enron example cited in the introduction suggests the opposite.

side effects of well regarded firms that spawn large numbers of directors. In this vein, we do find that firms with directors from director factory firms are associated with lower fraud probability. However, this control does not affect the impact of CEO-director connections. Another perspective is that the connectedness The connectedness results also survive controls for CEO board capture. Directors appointed after a CEO assumes office may be less assiduous monitors because they are beholden to the CEO but including this variable has little effect on the connectedness measure.

In summary, it is unlikely that our results on the role of CEO director connections examined here are a proxy for detection, CEO ability, director ability or CEO influence over the board. We clearly cannot rule out every possible omitted variable for which the CEO-director connections could be a proxy. However, our results do suggest that if there is one, it faces non-trivial hurdles. The variable needs to have an asymmetric relation to professional and nonprofessional connections, which have opposite signs in explaining fraud. Making this even less likely is the need for the relation to vary in an asymmetric manner across time, with greater weakening for the relation with nonprofessional connections than with professional connections after SOX.

# 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 firms 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.

Our study contributes new evidence to the debate by investigating the relation between fraud and a broad vector of board attributes. While we incorporate the role of traditional measures such as board independence and board size on fraud, our focus is on newer metrics based on CEO-director connectedness. Using an extensive dataset on executive biographies, we find that the CEO-director connectedness matters. It explains fraud beyond conventional board metrics such as board size, independence, and financial expertise and is robust to controls for year effects, Fama-French 48industry effects, firm characteristics, and equity incentives. In fact, connectedness is at least as important as other board characteristics such as independence studied in prior work.

We add texture to the connectedness variable by focusing on the institutional origins of the CEO-director connections. We find that different types of connections have distinctive economic effects. Nonprofessional connections between the CEO and directors due to commonalities in educational alma mater and non-business activities tend to elevate fraud probability, consistent with the view that these types of connections compromise monitoring. On the other hand, the likelihood of fraud is attenuated when CEO-board connectedness has professional origins, consistent with the "collaborative board" perspective wherein professional connections foster collaborations and advice seeking that avert the initial missteps that lead down a slippery slope towards full blown fraud. As further evidence for the collaborative view, the beneficial effects of professional connections are concentrated in connections formed through common service as part of the executive team. In addition, the pernicious effect of nonprofessional connections is essentially insignificant after SOX but professional connections continue to show detectable positive effects even in an environment of tight scrutiny in the post-SOX world. The broader point made by these results is that connections with different institutional origins could operate through different channels and have different economic effects. Additionally, the evidence also supports the view that board tasks are multidimensional in nature and encompass both monitoring and advice-counsel functions. Our evidence suggests that measures to reform boards should consider their effects on both roles of boards.

Our dataset also permits us to examine other interesting attributes of CEOs that could be related to fraud. Having an MBA degree does not increase the probability of fraud – in fact it has a negative and often significant coefficient in all specifications. If an MBA effect exists, it is to reduce fraud probability, indicating that CEOs with MBAs tend to not transgress into the domain of fraudulent behavior. Fraud is less likely when firms have CEOs that are internally hired and are educated at more reputed schools. Fraud is also less likely when there are board members with more external appointments or with board members drawn from prestigious "director factory" firms that have historically been a breeding ground for executive talent in corporate America.

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 board connectedness. Our results certainly support the growing consensus that CEO-board connections deserve closer scrutiny as part of the governance process, but also suggest that the mere existence of connectedness does not necessarily indicate unhealthy boards or governance systems in dysfunction. The genesis of the connections matters.

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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	Non-Fraud	Total	% Fraud
	not firms	firms	firms	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 displays the distribution of firms in the fraud and non-fraud sample for the 48 Fama-French industries in the period from 2000-2006.

Industry	Industry	Non-Fraud	Fraud	% Fraud
	Name	Firms	Frims	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	$\frac{1}{2}$	0.3%
13	Pharmaceutical Products	1.301	$\frac{-}{20}$	1.5%
14	Chemicals	382	6	1.5%
15	Bubber & Plastic Products	113	4	3.4%
16	Textiles	30	4 0	0.4%
10	Construction Material	294	2	0.07%
18	Construction	234	2 14	5.1%
10	Stool works ote	240	14	0.470
19	Fabricated Draduate	230	0	0.07
20	Fabricated Froducts	41	10	0.070
21	Machinery	571	40	0.5%
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	$\frac{20}{97}$	2.5%
42	Betail	303	5	$\frac{2.070}{1.5\%}$
40 44	Rost Hotols & Motols	929 9594	0 91	0.80%
44 15	Deplin	2,004	$\frac{21}{97}$	0.070 9.407
40 46	Danking Incompany	(00	∠( F	<b>3.</b> 4% 4.4%
40	Insurance	108	0 10	4.4%
47	Keal Estate	1,292	16	1.2%
48	Trading	103	0	0.0%

### 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 Zawel (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 <sup>c</sup>, <sup>b</sup>, and <sup>a</sup> indicate significance at the 10%, 5% and 1% levels, respectively, using robust standard errors.

Variable	Non-	Fraud	Frε	ud	t-statistic	Wilcoxon $z$
Professional Connec	tions					
PROF_FRAC	13.61%	0.00%	8.44%	0.00%	$5.342^{a}$	$2.817^{a}$
Education and Other	r Connect	ions				
NONPROF_FRAC	7.39%	0.0%	10.85%	0.0%	$-6.42^{a}$	$-5.95^{a}$
EDU_FRAC	1.11%	0.00%	1.37%	0.0%	-1.360	-1.507
OTH_FRAC	6.32%	0.00%	9.52%	0.0%	$-6.54^{a}$	$-5.68^{a}$
Firm Characteristics	3					
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		$-3.396^{a}$	
CEO and Board cha	racteristic	cs				
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  $c^{c}$ ,  $b^{b}$ , and  $a^{a}$  indicate significance at the 10%, 5% and 1% levels, respectively, using robust standard errors.

	Model 1	Model 2	Model 3
LSIZE	$0.414^{a}$	$0.405^{a}$	$0.471^{a}$
	(14.436)	(13.641)	(14.509)
TOBINQ	$0.055^{**}$	$0.05^{b}$	0.037
	(2.384)	(2.184)	(1.382)
EBITDA	$-0.700^{a}$	$-0.807^{a}$	$-0.714^{a}$
	(3.434)	(3.767)	(2.825)
LEVERAGE	-0.263	-0.266	0.018
	(1.439)	(1.469)	(0.105)
ISSUANCE	$1.138^{b}$	$1.094^{b}$	$1.051^{**}$
	(2.241)	(2.164)	(2.067)
BSIZE	-0.013	-0.03	-0.015
	(0.598)	(1.402)	(0.676)
INDEP_FRAC	$-1.028^{a}$	-0.451	$-0.938^{b}$
	(2.948)	(1.224)	(2.417)
BUSY	$-0.088^{c}$	$-0.125^{b}$	$-0.143^{a}$
	(1.725)	(2.432)	(2.71)
FINEXP	-0.253	0.033	0.058
	$(2.815)^a$	(0.318)	(0.539)
INTERCEPT	$-6.263^{a}$	$-6.076^{a}$	$-3.553^{a}$
	(11.456)	(10.831)	(5.424)
Year Fixed Effects	No	Yes	Yes
Industry Fixed Effects	No	No	Yes
# Observations	18,503	18,503	17,712
Pseudo- $R^2$	0.068	0.099	0.149

### Table 5: Financial Misconduct and CEO-Director Nonprofessional 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. 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. EDU\_FRAC denotes the number of supervisory directors who attended the same undergraduate school as the CEO, and 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. All connectedness variables are scaled by board size. 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
LSIZE	$0.474^{a}$	$0.476^{a}$	$0.473^{a}$
	(14.2)	(14.215)	(14.188)
TOBINQ	0.041	0.04	0.041
	(1.553)	(1.527)	(1.53)
EBITDA	$-0.705^{a}$	$-0.693^{a}$	$-0.697^{a}$
	(2.705)	(2.631)	(2.662)
LEVERAGE	0.012	0.016	0.016
	(0.069)	(0.088)	(0.089)
ISSUANCE	$1.02^{b}$	$1.016^{b}$	$1.02^{b}$
	(2.011)	(2.013)	(2.017)
BSIZE	-0.017	-0.017	-0.018
	(0.779)	(0.755)	(0.787)
INDEP_FRAC	-1.013	-1.02	-1.022
	$(2.518)^{b}$	$(2.529)^b$	$(2.539)^b$
BUSY	$-0.142^{a}$	$-0.141^{a}$	$-0.144^{a}$
	(2.643)	(2.622)	(2.677)
FINEXP	0.061	0.063	0.062
	(0.563)	(0.583)	(0.572)
OTH_FRAC	$0.756^{b}$	$0.706^{b}$	
	(2.108)	(1.961)	
EDU_FRAC		1.636	
		(1.554)	
NONPROF_FRAC			0.839
			$(2.515)^{b}$
CEOMBA	-0.165	-0.162	-0.163
	(1.567)	(1.539)	(1.554)
CEOIVY	-0.272 <sup>b</sup>	$-0.288^{a}$	$-0.281^{a}$
	(-2.593)	(-2.732)	(2.68)
INTERCEPT	$-3.328^{a}$	$-3.373^{a}$	$-3.331^{a}$
	(5.111)	(5.177)	(5.124)
Year Fixed Effects	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes
# Observations	$17,\!363$	$17,\!363$	$17,\!363$
Pseudo- $R^2$	0.152	0.153	0.153

### Table 6: Financial Misconduct and CEO-Director Professional Connectedness

Table 6 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. 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. Coefficients for time and industry fixed effects are not shownThe superscripts c, b, and a indicate significance at the 10%, 5% and 1% levels, respectively, using robust standard errors.

	Model 1	Model 2
LSIZE	$0.473^{a}$	$0.487^{a}$
	(14.524)	(14.399)
TOBINQ	0.034	0.039
	(1.248)	(1.483)
EBITDA	$-0.757^{a}$	$-0.722^{a}$
	(3.002)	(2.683)
LEVERAGE	0.018	0.03
	(0.1)	(0.164)
ISSUANCE	$1.034^{b}$	$0.995^{b}$
	(2.035)	(1.973)
BSIZE	-0.019	-0.016
	(0.84)	(0.72)
INDEP_FRAC	$-0.804^{b}$	$-0.879^{b}$
	(2.061)	(2.185)
BUSY	$-0.098^{c}$	$-0.104^{b}$
	(1.885)	(1.969)
FINEXP	0.066	0.072
	(0.612)	(0.669)
CEOINTERNAL		$-0.362^{a}$
		(3.633)
CEOMBA		-0.172
		(1.618)
CEOIVY		$-0.287^{a}$
		(2.72)
NONPROF_FRAC		$0.993^{a}$
	4 4 40 9	(2.932)
PROF_FRAC	$-1.149^{a}$	$-1.443^{a}$
	(4.126)	(5.06)
INTERCEPT	$-3.606^{a}$	$-3.418^{a}$
	(5.471)	(5.162)
Year Fixed Effects	Yes	Yes
Industry Fixed Effects	Yes	Yes
# Observations	17,708	17,363
Pseudo- $R^2$	0.152	0.159

# Table 7: Robustness Tests: Professional Connectedness

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 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 Table 7 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, 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 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 BUSY, and FIINEXP. CEOINTERNAL equals 1 if the CEO is internally hired and zero otherwise. CEOMBA equals 1 if the CEO has an MBA and zero otherwise. board size. 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.

	NT dol 1			Model A
	T IADOIN	7 Ianoia	INDUEL 3	F Ianoial
CEOIN'I'ERNAL	$-0.335^{a}$	$-0.358^{a}$	$-0.354^{u}$	$-0.356^{a}$
	(3.333)	(3.582)	(3.532)	(3.549)
CEOMBA	-0.154	-0.149	-0.148	-0.146
	(1.464)	(1.387)	(1.37)	(1.347)
CEOIVY	$-0.305^{a}$	$-0.28^{a}$	$-0.282^{a}$	$-0.282^{a}$
	(2.888)	(2.659)	(2.657)	(2.656)
NONPROF_FRAC	$0.914^{a}$	$1.082^{a}$	$1.074^{a}$	$1.198^{a}$
	(2.702)	(3.21)	(3.172)	(3.223)
PROF_FRAC_E	$-3.075^{a}$			
	(3.588)			
PROF_FRAC_D	0.198			
	(0.201)			
PROF_FRAC		$-1.439^{a}$	$-1.433^{a}$	$-1.439^{a}$
		(5.06)	(5.037)	(5.062)
FRAC_FACTORIES		$-0.841^{a}$	$-0.844^{a}$	$-0.844^{a}$
		(-3.531)	(-3.548)	(-3.547)
CEOFACTORY		0.007	0.008	0.008
		(0.237)	(0.263)	(0.272)
AFTER_CEO_FRAC			0.056	0.071
			(0.345)	(0.434)
AFTER_CEO_FRAC_NONPROF				-0.761
				(0.722)
Year Fixed Effects	$\mathbf{Y}_{\mathbf{es}}$	$\mathbf{Yes}$	Yes	$\mathbf{Y}_{\mathbf{es}}$
Industry Fixed Effects Yes	$\mathbf{Y}_{\mathbf{es}}$	$\mathbf{Yes}$	$\mathbf{Y}_{\mathbf{es}}$	
# Observations	17,363	17,363	17,363	17,363
$Pseudo-R^2$	0.157	0.161	0.161	0.161

### Table 8: Compensation Subsample and SOX

Table 8 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	$0.464^{a}$	$0.631^{a}$	$0.311^{a}$
	(9.16)	(8.073)	(4.609)
TOBINQ	-0.055	-0.087	0.066
	(1.279)	(1.23)	(0.925)
EBITDA	$-1.377^{a}$	$-2.912^{a}$	$-1.195^{a}$
	(3.175)	(2.909)	(2.658)
LEVERAGE	$0.592^{c}$	$0.759^{a}$	0.622
	(1.849)	(2.145)	(1.375)
ISSUANCE	0.541	0.227	0.842
	(0.984)	(0.362)	(0.849)
BSIZE	-0.029	-0.052	0.00
	(0.988)	(1.356)	(0.01)
INDEP_FRAC	$-1.462^{a}$	$-1.434^{a}$	-1.238
	(2.656)	(2.061)	(1.244)
BUSY	-0.098	-0.13	-0.047
	(1.555)	(1.532)	(0.456)
FINEXP	0.066	-0.033	0.27
	(0.493)	(0.178)	(1.166)
NONCASH	$0.72^{b}$	0.178	$1.399^{a}$
	(2.518)	(0.505)	(3.048)
CEOMBA	$-0.327^{b}$	-0.134	$-0.563^{a}$
	(2.456)	(0.736)	(2.738)
CEOIVY	$-0.493^{a}$	$-0.709^{a}$	-0.31
	(3.666)	(3.734)	(1.582)
CEOINTERNAL	$-0.417^{a}$	$-0.502^{a}$	$-0.356^{a}$
	(3.372)	(2.943)	(1.931)
NONPROF_FRAC	$1.435^{a}$	$1.952^{a}$	0.954
	(3.726)	(3.757)	(1.546)
PROF_FRAC	$-1.826^{a}$	$-2.122^{a}$	$-1.765^{a}$
	(5.167)	(4.171)	(3.5)
INTERCEPT	$-1.731^{b}$	-2.376	-3.559
	(2.012)	(2.148)	(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 9: Marginal Effects

Table 9 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	$1.93\%^{a}$	$4.16\%^{a}$	$1.04\%^{a}$
	(9.52)	(8.80)	(5.08)
TOBINQ	-0.15%	-0.54%	0.13%
	(-1.06)	(-1.26)	(-0.74)
EBITDA	$-0.48\%^{a}$	$-1.14\%^{a}$	$-0.34\%^{a}$
	(-4.70)	(-2.89)	(-3.33)
LEVERAGE	0.18%	$0.57\%^c$	0.00%
	(1.28)	(1.78)	(-0.02)
ISSUANCE	0.95%	0.73%	0.97%
	(1.16)	(0.36)	(1.11)
BSIZE	-0.17%	-0.59%	0.00%
	(-0.91)	(-1.32)	(0.00)
INDEP_FRAC	$-0.35\%^{b}$	$-0.64\%^{b}$	-0.18%
	(-2.44)	(-1.98)	(-0.98)
BUSY	-0.21%	-0.50%	-0.06%
	(-1.52)	(-1.52)	(-0.39)
FINEXP	0.17%	-0.11%	0.48%
	(0.53)	(-0.15)	(1.33)
NONCASH	$0.56\%^b$	0.14%	$0.93\%^a$
	(2.34)	(0.40)	(2.95)
CEOMBA	$-0.72\%^{a}$	-0.50%	$-0.92\%^{a}$
	(-2.54)	(-0.74)	(-2.92)
CEOIVY	$-1.05\%^{a}$	$-2.43\%^{a}$	-0.49%
	(-4.01)	(-4.15)	(-1.56)
INTERNAL	$-0.96\%^{a}$	$-1.88\%^{a}$	$0.62\%^c$
	(-3.32)	(-2.92)	(-1.86)
NONPROF_FRAC	$0.47\%^{a}$	$1.11\%^{a}$	0.22%
	(3.68)	(3.61)	(1.46)
PROF_FRAC	$-0.81\%^{a}$	$-1.59\%^{a}$	$-0.60\%^{a}$
	(-4.93)	(-3.94)	(-3.34)
Year Fixed Effects	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes
# Observations	$7,\!595$	2,545	$4,\!682$