Rev Account Stud (2017) 22:320–360
DOI 10.1007/s11142-016-9381-z

Go before the whistle blows: an empirical analysis of director turnover and financial fraud

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Published online: 13 December 2016

Abstract This study investigates whether outside directors are aware of financial fraud. Our analysis focuses on the abnormal turnover of these directors *during* the fraud committing period, *before* fraud is discovered and *before* lawsuits are filed. Our empirical analysis shows that, during the fraud committing period, outside directors in fraud firms exhibit an abnormal level of turnover. Examining the characteristics of outside directors and boards at these fraud firms, we find strong evidence that female directors, directors who have greater stock ownership in the firm, and directors with multiple directorships at other firms are more likely to depart fraud firms. We also find some evidence that board size, number of meetings, and fraction of financial experts are related to abnormal turnover in fraud firms during the fraud committing period. We show that abnormal director turnover is significantly higher for fraud that is considered more egregious (i.e., involving fictitious transactions and disclosure problems). Lastly, directors are more likely to depart fraud firms with more serious fraud, as proxied by higher ex-post settlement amounts and longer fraud duration.

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Keywords Financial fraud · Board of director turnover · Director and board characteristics · Fictitious transaction · Disclosure problem

JEL classification G30 · G34 · K22 · M41

1 Introduction

Fama and Jensen (1983) note that an important function of the board of directors is to oversee firm operations on behalf of shareholders.[1] In particular, outside directors are traditionally viewed as better monitors (e.g., Weisbach 1988; Rosenstein and Wyatt 1990; Byrd and Hickman 1992; Brickley et al. 1994), especially in financial reporting issues (e.g., Klein 2002; Xie et al. 2003). These outside directors are generally assumed to be knowledgeable about financial reporting irregularities within the firm and could be held accountable upon the discovery of fraud, mostly through reputational damage (e.g., Srinivasan 2005; Fich and Shivdasani 2007) but sometimes through punitive penalties.[2]

The wave of financial reporting scandals during the last two decades (e.g., Enron, WorldCom, Xerox, AOL) has led investors to question the usefulness of such governance structures and has generated intensive debates among regulators and academics about whether outside directors can serve as effective monitors (Adams et al. 2010). Agrawal et al. (1999) argue that outside directors may not be able to successfully monitor and detect financial reporting fraud. They maintain that outside board members, who have no other relationship with the company, may not have sufficient time or incentives to familiarize themselves with firm operations or reporting practices. Furthermore, outside directors have an inherent disadvantage in gaining access to inside information because their exposure to the company is limited to the few board meetings they attend (Harris and Raviv 2008). Moreover, their ability to detect management fraud and to prevent its occurrence depends on the quality of the financial information they have (Kumar and Sivaramakrishnan 2008).

To provide new insights into whether outside directors are aware of financial fraud, we investigate the hitherto under-researched question of whether the turnover of outside directors is abnormally high *before* fraud is discovered. Prior studies have predominantly examined the effect of fraud on the board of directors *after* it is discovered (e.g., Agrawal et al. 1999; Srinivasan 2005; Fich and Shivdasani 2007), but not prior to its public disclosure. As a result, little is known about whether outside directors are able to detect fraudulent financial reporting prior to its discovery. Given that outside directors are subject to various forms of reputational penalties if fraud is discovered, we expect them to be more likely to depart fraud firms if they become aware of financial reporting irregularities *during* the time fraud is being committed but is not yet revealed to the public (i.e., the fraud committing period). We also expect these directors to be more

[1] Though this oversight has the potential to reduce principal–agent conflicts between managers and shareholders, Hermalin and Weisbach (2003) suggest that boards are endogenously determined institutions.

[2] However, Black et al. (2006) show that punitive penalties for outside directors are typically very small when financial reporting fraud is discovered by the U.S. Securities and Exchange Commission (SEC): In only 13 cases since 1980 have directors made a personal settlement or paid legal expenses. Brochet and Srinivasan (2014) show that only 11% of independent directors are named as defendants in litigation lawsuits.

likely to depart when their concerns about reputational and/or potential litigation risk are greater.[3] If we do not observe an abnormally high turnover of outside directors during this time period, this could imply that outside directors were unaware of the financial reporting failure, or that they decided to stay with the firm after suspecting irregularities, in the hope that the managers could be effectively disciplined by the board and that any irregularity would be corrected internally.

To assess the impact of fraud on outside director turnover during the fraud committing period *before* the fraud is discovered, we utilize a hand-collected sample of fraud companies that were the subjects of shareholder class action lawsuits from 1997 to 2007. The advantage of using this sample is that we can identify the fraud committing period based on the dates detailed in the litigation releases. This period lasts an average of 781 days for our sample firms, during which fraudulent financial reporting activities are presumed to be taking place but are not yet discovered. We then examine whether abnormal director turnover in fraud firms is especially high during the fraud committing period.[4] We compare the abnormal turnover of outside directors in the test sample of fraud firms with that in a control sample of non-fraud firms matched by industry, firm size, and fraud committing period. Our univariate analysis reveals that outside director abnormal turnover is significantly higher for the fraud firms than for the control firms. For instance, the abnormal turnover ratio of outside directors is 3.10% in fraud firms and 2.14% in matched non-fraud firms, and the proportion of firms that experience abnormal departure of outside directors is 19.49% for fraud firms versus 12.31% for non-fraud firms, with both differences statistically significant at the 5% level. Our results hold after we control for director characteristics, board governance features, and other firm factors in the multivariate analysis.[5] Our findings imply that at least some outside directors knew about the financial reporting irregularities *before* the public discovery of fraud, and that these directors chose to disassociate themselves by departing the firm, worrying about the potential repercussions if the problems became public information.

We have thus far established that, during the fraud committing period, director turnover is abnormally higher in fraud firms than in non-fraud firms. Still, it seems that only a handful of outside directors decide to depart the fraud firms. This fact suggests either that these directors are much better informed of a known fraudulent situation than the others are, or that they have greater potential losses and/or a higher aversion to litigation risk, which leads them to resign when suspecting a fraudulent situation. We further examine whether and how abnormal director turnover during the fraud committing period is influenced by director characteristics, and find several

[3] Despite the low likelihood of legal penalties (Black et al. 2006; Brochet and Srinivasan 2014), the fear of legal liability nonetheless serves as an effective deterrent for individuals serving as directors (Romano 1989; Sahlman 1990; Alexander 1991).

[4] Following the literature (e.g., Yermack 2004; Fahlenbrach et al. 2013), we define abnormal director turnover as the departure of outside directors who are below age 70 (i.e., non-retiring). In robustness analysis, we also consider total outside director turnover and include director age as an explanatory variable in the regression analysis. We obtain similar results and include the discussion in more details in Section 6.

[5] To alleviate the concern of potential endogeneity associated with the determination of corporate fraud and abnormal director departure, we alternatively construct a sample by matching the predicted likelihood (i.e., propensity score) of fraud for fraud firms with that of non-fraud control firms. Our results using the propensity score matching (PSM) sample (further discussed in Section 6) continue to show that abnormal director turnover is consistently higher in fraud firms, lending further support to our main findings.

interesting results. First, we find that female directors are more likely to depart fraud firms. Our findings provide interesting insights coinciding with the notion that female directors exert greater monitoring effort, are more vigilant about ethical standards, and are more risk averse, compared with male directors.[6] Second, we find that directors who own more of the company's shares are more likely to depart fraud firms. Prior studies provide evidence that blockholders with high financial stakes are better informed and, thus, better able to impose strong disciplinary actions on management (e.g., DeFond and Jiambalvo 1991; Holthausen and Larcker 1993; Jensen 1993). Our study suggests that directors who hold more of a company's shares tend to be better informed of fraudulent activities. However, our results are not consistent with the view that these directors exert strong disciplinary efforts to remediate the problems. Third, Fich and Shivdasani (2007) find that directors who hold multiple board seats at other companies have greater reputational concern. Consistent with their finding, our results reveal that these directors are more likely to depart fraud firms than non-fraud firms.

We next examine if outside directors become better informed in a good governance environment, and analyze how board governance affects director turnover within fraud firms. Overall, we find some evidence that board size is related to abnormal director turnover. We also find weak evidence that the number of board meetings and the presence of outside directors with financial expertise are positively associated with outside director abnormal turnover. However, we find no significant effect for other governance variables.

Lastly, we examine whether the abnormal turnover of outside directors is affected by the types and seriousness of the alleged fraud. Our assumption is that the more egregious and more serious the fraud is, the higher the likelihood is that outside directors will depart the fraud firms. We classify fraud firms by the type of fraud (Bonner et al. 1998; Dechow et al. 2011; Schrand and Zechman 2012). We find that abnormal director turnover is higher when the fraud involves fictitious transactions, consistent with our expectation that directors are more concerned when they discover more egregious wrongdoings. We also note that disclosure problems are significantly related to turnover decisions at fraud firms. Lastly, we find that abnormal director turnover is higher when the ex-post settlement amount is higher and the fraud duration is longer. These results reinforce our notion that outside directors' decision to depart is positively associated with the seriousness of the fraud.

Our study contributes to the literature in the following ways. First, while prior research has focused predominantly on the repercussions of fraud discovery on the board of directors *subsequent to* its public disclosure, our paper is, to the best of our knowledge, among the first to study outside director turnover *during* the fraud committing period, *prior to* the public discovery of fraud. Our finding is important because it suggests that certain outside directors are able to detect fraud but choose to disassociate themselves from the fraud firms rather than make an effort to fix the problems. The business press has noted that whistle blowing has significant negative consequences for top management (Bonime-Blanc 2013). Similarly, a director who suspects

[6] There is substantive literature examining the impact of gender on corporate management. For example, see Gul et al. (2008), Adams and Ferreira (2009), and Srinidhi et al. (2011) on monitoring effort; Bernardi and Arnold (1997) and Cohen et al. (1998) on ethical standards; and Jianakoplos and Bernasek (1998), Barber and Odean (2001), and Brooks and Zank (2005) on risk aversion.

financial irregularities may have little option but to resign (Association of Chartered Certified Accountants 2008). Prior studies in the law literature argue that the board of directors could remain silent about suspected fraudulent activities or could be under tremendous pressure to go along with proven wrongdoings for various reputational and networking reasons (e.g., Lin 1996; Fanto 2004). Our empirical findings complement this anecdotal evidence by showing that some directors do have knowledge of their companies' wrongdoings, yet choose to "vote with their feet."

Second, our study extends the literature on the relation between board governance and financial reporting fraud. Research on corporate governance (e.g., Klein 2002) offers the complementary view that the board of directors acts as the watchdog of the company and represents one of the most crucial safeguards of financial reporting. One would expect these directors to serve as effective monitors for fear of reputational damage and litigation risk. However, Laux (2010) shows that, theoretically, the effect of litigation risk on board oversight is ambiguous, since litigation risk can also lead to a lower level of board oversight. Our empirical evidence is in line with this alternative view, since it shows that at least some directors choose to walk away during the fraud committing period for fear of litigation and potential reputation loss.

Third, our research offers important policy implications for the SEC and other regulators on the role of outside directors in situations of financial reporting fraud. While recent regulatory changes (e.g., the Sarbanes–Oxley Act) have reinforced the importance of the board of directors in monitoring financial reporting, our study shows that monitoring cannot be totally effective because some directors may choose to quit the firm instead of working with management to remediate reporting irregularities.

The paper proceeds as follows. Section 2 reviews the related literature. In Section 3, we develop our main hypotheses. Section 4 describes the sample and data sources and presents descriptive statistics. Section 5 explains the research methods and presents the empirical findings. In Section 6, we perform additional tests. The final section concludes the paper.

2 Review of related literature

Our study is closely related to the fraud literature examining the behavior of boards of directors. Many studies examine the behavior of chief executive officers (CEOs) or top management in relation to alleged financial reporting fraud (e.g., Beneish 1999; Arthaud-Day et al. 2006; Desai et al. 2006; Erickson et al. 2006; Karpoff et al. 2008; Johnson et al. 2009; Feng et al. 2010; Agrawal and Cooper 2016),[7] but they pay relatively little attention to the impact of fraud on outside non-executive directors *before* the fraud is discovered. Their main focus is on CEO or executive turnover and the reputational penalties in the period *subsequent* to fraud discovery.

[7] There is another small stream of literature that looks into other players in the process of fraud discovery. For example, Dyck et al. (2010) look into the role of employees, the media, and industry regulators as whistleblowers. Bowen et al. (2010) examine the characteristics of firms subject to employee allegations of corporate fraud.

Agrawal et al. (1999) examine firms suspected of or charged with fraud and find little evidence of unusually high turnover among their directors and senior managers after the fraud discovery. Similarly, Helland (2004) finds that directors and officers do not pay any reputational penalty when they sit on the board of a company charged with fraud. However, Gerety and Lehn (1997) find that the directors suffer reputational losses in terms of the number of other board seats held in the three years after SEC charges with disclosure violations. Srinivasan (2005) examines the penalties for outside directors, particularly the members of the audit committees of firms that had their earnings restated. The author finds that directors experience labor market penalties, as reflected in significantly higher turnover in the three years after a restatement and larger losses in the number of board positions held at other companies. Fich and Shivdasani (2007) examine the reputational impact on outside directors of firms facing shareholder class action lawsuits. They find no abnormal turnover of directors on the boards of the sued firms, but the number of other board seats held by these directors declines significantly.

Our study is also related to research that examines the determinants of director turnover. Prior studies show that director turnover is associated with poor performance, negative market signals, or lower compensation (e.g., Hermalin and Weisbach 1998; Yermack 2004; Asthana and Balsam 2007; Agrawal and Chen 2009; Gupta and Fields 2009; Dewally and Peck 2010). The focus of our study is on the effect of *litigation risk* on director turnover. Our study adds to the scant literature that examines director departure *prior* to an adverse event. Fahlenbrach et al. (2013) show that outside directors have incentives to resign right before a firm discloses bad news such as underperformance, earnings restatements, or federal class action lawsuits. Bar-Hava et al. (2013) investigate outside directors' reasons for resigning and find that, while the resignations are associated with poor subsequent firm performance and future litigation, the reasons for resignation have no incremental information content. The major difference between these two studies and ours is that we examine outside director turnover *during* the much longer period when fraud is being committed, instead of in the short window *just* prior to litigation lawsuits. While the other two studies focus on news disclosure and purport to understand director departure decisions with the assumption that the directors *already* have knowledge of the wrongdoings at the company just before the release of bad news, our research focuses on directors' innate ability to uncover financial reporting irregularities well in advance (when fraud is being committed). We show that this fraud committing period could last for years until fraud discovery.

Finally, our study is related to the voluminous research that looks into the overall board characteristics of fraud firms. One strand of research shows that the lack of certain board features (i.e., outside members, financial experts, Big 4 audits, non-staggered boards) is apparent in fraud firms (e.g., Dechow et al. 1996; Beasley 1996; Farber 2005; Skousen and Wright 2006; Zhao and Chen 2008). The other strand of research shows that corporate governance structure, as in independent boards and the provision of an audit committee, is unrelated to the probability of a firm committing fraud (e.g., Gerety and Lehn 1997; Ferris et al. 2003; Agrawal and Chadha 2005; Schrand and Zechman 2012). Our study extends these lines of research by examining the impact of director characteristics as well as board features on the monitoring effectiveness of *individual* outside directors.

3 Hypothesis development

3.1 Outside director turnover prior to fraud discovery

Outside directors are held accountable and face different forms of penalties (but mainly reputational loss) for their failure to discover financial fraud (e.g., Fich and Shivdasani 2007). Outside directors therefore have incentives to monitor financial reporting. The mandate of the American Institute of Certified Public Accountants (AICPA) states that one of the main functions of a board of directors (and its audit committee) is to exercise active oversight on management to create a culture with zero tolerance for fraud. In particular, the board should implement proper measures to deter, prevent, detect, and report any fraudulent activities. However, the effectiveness of monitoring by outside directors may be constrained because they have only limited access to inside information about firm operations and financial reporting. Hence, it is questionable whether outside directors are sufficiently well informed to detect any financial reporting irregularities.

Even if fraud is suspected, some outside directors may choose to stay in the hope that management will take corrective action or that the fraud will never be discovered. In an effort to avoid the expected penalties, other outside directors may choose to depart the firm in the fraud committing period (before the fraud is discovered) if they have a reasonable suspicion of managers' wrongdoings. One can therefore conjecture that if outside director turnover is abnormally high for fraud firms during the alleged fraud committing period, certain directors *must* have had some knowledge about fraudulent activities during that time and decided to "go before the whistle blows." To provide systematic evidence on this unexplored issue, we test the following hypothesis.

> H_1: During the fraud committing period, before fraud is discovered by regulators or the public, outside director abnormal turnover is higher for fraud firms than for matched non-fraud firms, all else being equal.

3.2 Do director characteristics matter?

Different directors have differing characteristics, such as innate capabilities, past experience, and time invested in the company. These director characteristics can affect their ability to monitor management and to detect financial fraud. Moreover, some directors may have more to lose from a class action lawsuit and thus greater aversion to litigation risk. We therefore expect that some directors are more likely to depart fraud firms than others. To the extent that the characteristics of these directors influence their ability to detect financial fraud *and* reduce their tolerance toward litigation risk, one can expect these characteristics to impact directors' decision to depart fraud firms. To provide empirical evidence on this issue, we test the following hypothesis.

> H_2: Abnormal director turnover in fraud firms during the fraud committing period is associated with various director characteristics, all else being equal.

To test H_2, we examine the effects of various director characteristics, such as gender and tenure, which are known to influence director turnover (e.g., Yermack 2004). In the last two decades, female directors have become an important feature, and their numbers have been increasing in corporate boards (Rosener 2003; Cohn 2006). Adams and Ferreira (2008) find that female directors attend more board meetings than male directors and are also more likely to be members of the monitoring committee. Other studies show that companies with female board members have higher earnings quality (Srinidhi et al. 2011) and more stringent monitoring via auditing efforts than those with no female board members (Gul et al. 2008). An implication of these studies is that female directors are more active in monitoring financial reporting. Moreover, gender differences could also be attributed to female directors being more conservative (e.g., Bernardi and Arnold 1997; Cohen et al. 1998) and more risk averse (e.g., Jianakoplos and Bernasek 1998; Barber and Odean 2001; Brooks and Zank 2005) than male directors. Drawing on the findings of these previous studies, we predict that female directors are better able to sense the possibility of financial fraud and, being more conservative and risk averse, are more likely to depart fraud firms.

Director tenure may have an ambiguous effect on outside directors' ability to detect financial reporting fraud. On the one hand, longer tenure provides outside directors with more time and opportunities to become familiar with the firm, so they become better monitors based on their accumulated knowledge of the firm and management (e.g., Buchanan 1974). On the other hand, when outside directors serve on the board for an extended period, they may develop a close relationship with management and, thus, may not act in the interests of shareholders (e.g., Vafeas 2003). One could also argue that outside directors with longer tenure become more lax in monitoring firm management. In these situations, directors with longer tenure may choose to stay on the board without reporting fraudulent activities or may simply overlook such management misbehavior. We therefore do not offer any directional prediction on the association between director tenure and abnormal turnover in fraud firms.

Members of the audit committee may suffer greater financial and reputational penalties once fraud is discovered, because they are supposed to be the watchdogs of the financial reporting process. Srinivasan (2005) finds that reputational loss, in the form of directorships lost at other companies, is greater for members of the audit committee of fraud firms than for directors not serving on the audit committee. Brochet and Srinivasan (2014) show that a whopping 54% of outside directors named as defendants in a litigation lawsuit have served on an audit committee. Given that audit committee members face greater reputational penalties, we predict that outside directors with audit committee membership exhibit higher abnormal turnover in fraud firms.

Since 2003, major U.S. stock exchanges require at least one member of the audit committee to have financial expertise. DeFond et al. (2005) find that audit committee members with financial expertise are better able to detect financial reporting irregularities. We therefore expect outside directors with financial expertise to exhibit higher abnormal turnover in fraud firms. Following Duchin et al. (2010), we classify directors into those with and without financial expertise.[8] We expect that, within fraud firms,

[8] Though not tabulated here for brevity, we also consider outside directors with corporate expertise or certain academic qualifications, such as doctoral degrees and professorships, and obtain findings similar to those reported.

outside directors with financial expertise tend to exhibit higher abnormal turnover than those without financial expertise.

DeFond and Jiambalvo (1991), Holthausen and Larcker (1993), and Jensen (1993) all show that blockholders play a significant monitoring role because they have large financial stakes in their firms. On the one hand, one could argue that blockholder directors are powerful enough to exercise disciplinary action on management rather than simply walk away when they perceive potential fraudulent activities. In such a case, it is unlikely that a significant difference in abnormal director turnover exists between outside blockholder directors and other outside directors when these blockholder directors, who are presumed to be better informed of fraudulent activities, choose to stay and take corrective action. Alternatively, outside blockholder directors are more likely to be motivated to extract private control benefits at the expense of other stakeholders, compared with non-blockholding outside directors. Hence, these outside blockholder directors may sell shares of the fraud firm and depart the firm before the discovery of fraud.[9] We therefore do not offer a directional prediction on the effect of blockholding on abnormal director turnover.

Fich and Shivdasani (2007) find that outside directors of fraud firms lose about half of their directorships at other companies in the three years after the fraud is uncovered. A key explanation for this phenomenon is the reputational effect: outside directors of fraud firms suffer reputational losses and are less likely to be reappointed at other companies. We therefore conjecture that reputational concerns give outside directors with multiple directorships stronger incentives to depart fraud firms when they sense the possibility of fraud.[10] In this case, one can expect a positive relation between directors with multiple directorships and abnormal turnover in fraud firms. However, one can also argue that directors with multiple seats at other companies are too busy to exert due diligence in monitoring those companies in which they hold directorships. Fich and Shivdasani (2006) find that companies with more directors who hold multiple directorships tend to have lower market valuation.[11] Hence, we may not observe any significant relation between the number of directorships and abnormal turnover. We therefore do not make any directional prediction with respect to the effect of multi-seat directors on abnormal director turnover.

Lastly, we examine whether there is any difference in abnormal turnover between outside affiliated directors and independent directors over the fraud committing period.[12] Affiliated directors are interesting, since they may have better knowledge of the company yet may not want to disassociate themselves from their firms for reasons such as family ties. In contrast, independent directors

[9] We conduct additional analysis to examine the trading behavior of departing directors and discuss the results in Section 6.

[10] In additional analysis, we consider the reputational loss of departing multi-seat directors compared to that of departing non–multi-seat directors and staying directors at fraud firms. We discuss the results of the analysis in Section 6.

[11] Other studies argue that firms with directors of multiple board seats have better performance (e.g., Ferris et al. 2003), since these directors are motivated to better monitor their companies (Adams et al. 2010).

[12] Affiliated directors are those with potential conflicts of interest, such as consulting arrangements, family relationships, or interlocking board memberships (Srinivasan 2005).

may have less knowledge about fraud firms but may be more likely to depart the firm once they perceive financial fraud. Overall, it is unclear whether affiliated directors are more likely to depart their firms; hence, we do not offer any directional prediction.

3.3 Do corporate governance features matter?

We investigate whether and how board governance structure affects the ability of outside directors to detect management fraud by examining the impact of board governance on abnormal director turnover. Firms with better governance structure should allow directors to monitor financial reporting irregularities more effectively (e.g., Zhao and Chen 2008). Prior research shows that better board governance is associated with a lower likelihood of fraud (e.g., Beasley 1996; Dechow et al. 1996). These studies imply that improved board structure helps directors detect management fraud or that corporate governance structures serve as an effective deterrent mechanism. Drawing on the above discussions, we predict that corporate governance mechanisms are associated with abnormal director turnover in fraud firms to the extent that these mechanisms help directors detect management fraudulent behavior. We therefore test our third hypothesis.

> H_3: Abnormal director turnover in fraud firms during the fraud committing period is associated with various corporate governance mechanisms, all else being equal.

Specifically, we examine the effects on abnormal director turnover of various governance mechanisms, including board size, board independence, number of board meetings, size of the audit committee, and percentage of financial experts on the audit committee. Prior literature shows that board size can have a negative effect on governance effectiveness (e.g., Yermack 1996; Eisenberg et al. 1998; Dalton et al. 1999). An independent board is supposed to be a more effective monitor (Dechow et al. 1996; Klein 2002); however, independent directors may have less access to company inside information. Hence, we do not offer any directional prediction for this variable. Intuitively, more board meetings give outside directors more opportunities to gain private knowledge about the firm. Research has also shown that the number of board meetings is positively associated with governance effectiveness (e.g., Vafeas 1999). We therefore predict a positive association between abnormal director turnover and the number of board meetings. The existence of an audit committee is important to governance effectiveness. We therefore predict that the size of the audit committee and the percentage of financial experts on the audit committee are positively related to abnormal director turnover during the fraud committing period for firms with actual fraud occurrences.[13]

[13] Slightly different from Agrawal and Chadha (2005), we use the fraction of financial experts on the audit committee because almost all firms in our sample have at least one financial expert on the audit committee. In addition, our results are robust to using the presence of financial experts instead of the fraction of financial experts.

3.4 Do the types of fraud matter?

Bonner et al. (1998) show that auditors are more likely to be held accountable when fraud is of a common variety or arises from fictitious transactions. Similarly, we argue that some incidents of fraud could be viewed by the SEC and the public as more serious failures on the part of directors exercising their fiduciary duties. For instance, directors could be blamed more for failing to detect fake sales through round-trip-related party transactions than sales that actually occurred but with altered shipment dates. Certain types of fraud could have more negative consequences to outside directors. We therefore predict that outside directors who are aware of these types of wrongdoings are more likely to depart fraud firms. To provide evidence on this prediction, we propose and test our fourth hypothesis.

> H_4: Abnormal director turnover in fraud firms during the fraud committing period is associated with various fraud types, all else being equal.

We examine whether different types of fraud are associated with the early departure of directors. First, we follow the fraud taxonomy of Bonner et al. (1998) and classify fraud into frequent fraud (premature revenue recognition, overvalued assets, and undervalued expenses/liabilities) and fictitious fraud (fictitious revenue, fictitious assets and/or reductions of expenses/liabilities, and fictitious related-party sales). The authors argue that auditors ought to be better at detecting events that occur more frequently, which translates to greater responsibility for failure to detect common types of fraud. The authors also argue that fraud that involves fictitious transactions is viewed by judges, juries, and the business press as more egregious. Hence, we predict a positive association between abnormal director turnover and these types of fraud. Second, we include an additional fraud category to those of Bonner et al. (1998), i.e., omitted or improper disclosure, since it represents a substantial proportion of fraud cases for Bonner et al. (1998) and in our sample. Because it is more difficult to ascertain the seriousness of a disclosure problem, we offer no directional prediction on this type of fraud. Third, it is possible that directors will be held more responsible when the fraud involves the misstatement of important accounts. Dechow et al. (2011) conduct a detailed analysis of SEC Accounting and Auditing Enforcement Releases (AAERs) on accounting misstatements and develop 11 categories of misstatements.[14] We expect higher abnormal director turnover when directors suffer more potential losses through fraud that involves accounting misstatements. Lastly, Schrand and Zechman (2012) examine misstatement cases and separate these cases into fraud and misstatement, based upon whether the case involves a primary motive of personal gain. In their study, cases with a motive of personal gain and a requirement to disgorge funds by top management are referred to as fraud, since they are more egregious. We follow this definition but call fraud cases with personal gain (e.g., through insider trading, option backdating, or bonus allocations) self-dealing. We predict a positive association between abnormal director turnover and self-dealing.

[14] These categories include revenue misstatements, misstatements of other expense/shareholder equity accounts, the capitalization of costs as assets, accounts receivable misstatements, inventory misstatements, misstatements of costs of goods sold, liability misstatements, reserve account misstatements, misstatements of allowance for bad debts, misstatements of marketable securities, and misstatements of payables.

3.5 Does the seriousness of fraud matter?

Fich and Shivdasani (2007) show that a director's reputational penalty is greater for more serious fraud. Brochet and Srinivasan (2014) show that the chance of a director being held accountable in lawsuits is also greater when the fraud firm is accused of more serious allegations. We posit that when outside directors face greater potential losses, higher abnormal director turnover should be observed in fraud firms plagued with more serious allegations. We therefore hypothesize the following in alternative form.

> H5: Abnormal director turnover during the fraud committing period is higher in fraud firms with more serious allegations, all else being equal.

We use two proxies to measure the seriousness of fraud: the settlement amount of the litigation lawsuits and the length of the fraud committing period. Though not a perfect proxy, we believe that the amount of settlement should be highly correlated with the seriousness of the fraud. Alternatively, we use the length of the fraud committing period. We predict a positive association between abnormal director turnover and these two proxies.

4 Data and descriptive statistics

We manually collected a sample of fraud firms over the period 1997–2007 from the Securities Class Action Clearinghouse (SCAC) at Stanford Law School. These firms are publicly listed companies that became the subject of class action litigation. From January 1, 1997, to December 31, 2007, we identify a total of 2527 cases, with 1153 cases settled by November 2009 (the others were dismissed or still ongoing). Our empirical analysis starts with the 1153 settled cases because dismissed and unsettled cases were lacking the settlement information.[15]

As explained in Table 1, among the 1153 settled fraud cases, we find 832 firms with financial data available from Compustat and the Center for Research in Security Prices (CRSP). We match these firms to the Corporate Library, which provides directorship data essential for our test of the second hypothesis. We eliminate 401 firms that are not covered by the Corporate Library[16] and another 229 firms with no data during the fraud committing period.[17] Finally, we exclude another seven fraud firms with no directorship

[15] For firms with multiple litigation cases, we treat each case as a separate firm–fraud observation. Our results are not affected if we delete firms with multiple litigation cases.

[16] Corporate Library data start in 2001 with initial coverage on only Standard & Poor's (S&P) 1500 firms. The coverage increases to 2000 firms (including Fortune 1000 and Russell 1000) in 2003 and 3000 firms (including Fortune 1000 and Russell 3000) in 2006. The large number of firms dropped in the sample selection process is due to the fact that the Corporate Library only covers relatively large firms listed in the S&P 1500, Fortune 1000, and Russell 3000 indexes.

[17] We do not require that a firm's coverage in the Corporate Library completely span the entire fraud committing period, because such a requirement would further reduce our final sample size due to the limited time coverage of the Corporate Library. Therefore, our measure of abnormal director turnover is likely to be understated, especially for fraud firms, which introduces a conservative bias *against* our findings.

Table 1 Sample selection

Total number of settled cases	1153
Less: not covered in Compustat/CRSP	(321)
Fraud firms with information in Compustat/CRSP	832
Less: not covered in the Corporate Library	(401)
Less: no directorship information around the fraud period in the Corporate Library	(229)
Fraud firms with directorship information in the Corporate Library	202
Less: no directorship information around the fraud period for control firms	(7)
Final sample	195

data around the fraud committing period for the control firms. This leaves us with a final sample of 195 fraud firms.

We construct a sample of control firms following procedures similar to those used by Barber and Lyon (1996) and Feng et al. (2010, 2011). We search all firms in our sample in the same two-digit Standard Industrial Classification (SIC) industry with data covered by the Corporate Library. We then choose the firm with assets closest to the fraud firm in the fiscal year prior to the class action beginning date to be the matched non-fraud firm. However, our approach differs from that of Barber and Lyon (1996) and Feng et al. (2010) in two aspects. First, for each fraud firm, we check the top 10 closest (non-fraud) firms' data availability in the Corporate Library.[18] We then keep the fraud firm in the sample as long as at least one of the closest matched control firms is covered by the database. Second, while the aforementioned studies require the matched non-fraud firm to have an asset size within a certain range of the sample firm, we keep a matched firm even if its assets are outside the arbitrary 80%–120% range.[19] We are able to find a matched non-fraud firm for each of 195 fraud firms.

For each (settled) class action lawsuit against the listed firms, we hand-collect information about the type of fraud, legal sanctions (monetary settlement), and, importantly, information about the following key dates: (1) the class action beginning date (the date when the alleged fraud occurred), (2) the class action ending date (the date when the alleged fraud ended), (3) the trigger event date (the date when the firm caught the attention of investors or the SEC that resulted in a class action lawsuit),[20] (4) the first class action complaint filing date, usually soon after the trigger event date, and (5) the final date, with the concluded status of the case. The fraud committing period is defined as the period from (1) the class action beginning date to the earlier of (2) the class action ending date and (4) the first filing date, since some cases have first filing dates before the class action

[18] Using the more stringent requirement while considering only the top three firms yields similar results.

[19] However, it should be noted here that matched non-fraud firms in the control sample are still among the top 10 closest firms to fraud firms in terms of asset size. In untabulated robustness tests, we also find that our main results are qualitatively unaffected by a reduced sample when we require the matched control firms to be within the 80–120% range.

[20] Examples of trigger events include restatements and the firing of auditors (Karpoff et al. 2008).

ending dates and we want to ensure director departures really occur before the whistle has been blown.[21]

Table 2 provides information about the fraud cases in our sample. Panel A of Table 2 shows the types of fraud. Of the 195 fraud cases, we show that most fraud involves omitted or improper disclosure (61% of cases). Frequent and fictitious fraud accounts for 51% and 32% of cases, respectively. Accounting misstatements represent 55% of cases, and 35% of cases involve self-dealing.[22] Panel B of Table 2 shows that the mean of the fraud length is 781 days. The sample of settled cases has a mean settlement amount of about $130 million and takes slightly more than three years (mean of 1194 days) to settle.

When examining the impact of accounting fraud on the probability of outside directors departing their firms, we consider a number of variables, which can be classified into two categories: (1) director characteristics, which include *Female*, *Tenure*, *Audit Committee Member*, *Financial Expertise*, *Block Holder*,[23] *# Board Seats*, and *Independent*, and (2) board governance features, which include *Board Size*, *% Outside Directors*, *# Meetings*, *Size of Audit Committee,* and *Fraction of Financial Experts*. We also control for firm-level factors, including *LAssets* (log of assets), *ROA* (return on assets), *Leverage* (the ratio of the book value of debt to the market value of equity), *Return Volatility* (standard deviations of monthly stock returns), and *Institutional Holdings* (percentage of institutional ownership).[24]

Table 3 presents the descriptive statistics of director characteristics, board governance features, and firm-level control variables, separately, for the test sample of fraud firms and the control sample of matched non-fraud firms. For our test sample of fraud firms, the following director characteristics emerge: About 11% of outside directors are female; outside directors have a mean

[21] Karpoff et al. (2008) illustrate the sequence of events for a typical enforcement action case. In our sample, the timeline usually goes sequentially from (1) the class action beginning date through (5) the final status date, though in some special cases the first class action filing dates may be a few days before the class action ending dates. We use the class action ending dates or the first filing dates instead of trigger event dates because the trigger event dates are not disclosed for every case. Nonetheless, we consider trigger event dates and other possible news event dates in the robustness tests reported in Section 6. Our results remain unchanged.

[22] Admittedly, the classification of fraud involves some subjectivity. We compare our frequencies of types of fraud with those of prior research. Overall, we observe similar patterns. Consistent with Bonner et al. (1998), we show that omitted or improper disclosure is the most frequent type and that fictitious fraud is the least frequent type. Though Dechow et al. (2011) focus only on misstatements identified upon AAER and we focus on all financial frauds, we find that our misstatement subsample bears similar percentages for the misstatement of individual accounts as in Dechow et al. (2011). Finally, Schrand and Zechman (2012) find that a quarter of their sample firms engage in self-dealing, which is comparable to (though a bit less than) our sample observations. Note that the sum of the percentages of fraud types is not equal to one since one fraud case can have multiple types.

[23] There is little consensus in the literature as to the amount of stock holdings that makes a blockholder. For example, DeFond and Jiambalvo (1991) treat stock ownership above 5% as blockholdings, while Jensen (1993) finds that stock ownership for management and board members is quite low, with a mean and median of 2.7% and 0.2%, respectively. Thus, in the main analysis, we define an outside director as a blockholder (*Block Holder*) if the director holds at least 5% of outstanding shares. In robustness checks, we also consider 1% stock ownership, and our results are unaffected.

[24] All firm-level control variables except *Institutional Holdings* are measured at the fiscal year-end prior to the class action beginning date, while *Institutional Holdings* is measured at the last quarter-end prior to the class action beginning date. We alternatively measure these variables in the year of director turnover (or year of fraud discovery for staying directors) and obtain similar results.

Table 2 Summary statistics of fraud cases

Panel A: Types of fraud cases

Fraud Type	# Cases	% of All Cases
Frequent	99	50.77
Fictitious	63	32.31
Omitted or improper disclosure	118	60.51
Accounting misstatements	107	54.87
Self-dealing	68	34.87
Total	195	100

Panel B: Time between dates (number of days) and settlement amount (millions of dollars)

	Mean	SD	p25	Median	p75
Length of fraud (beginning to end)	780.92	575.23	279.00	595.00	1,190.00
Time from end to final settlement	1,194.06	446.91	879.50	1,143.00	1,511.00
Settlement amount	129.66	708.54	4.90	12.00	40.00

(median) tenure of 8.12 years (6 years); about 37% of outside directors are audit committee members; and about 29% are considered financial experts. On average, the percentage of outside directors who are blockholders is quite low (only around 3%).[25] The outside directors of fraud firms in our sample have an average of 2.26 seats at the boards of public companies, and 85% of them are independent (non-affiliated) directors. The t-statistics for the mean differences between the test sample of fraud firms and matched non-fraud firms reveal that outside directors of fraud firms have slightly shorter tenure and are slightly less likely to be independent directors. Overall, other characteristics of directors are not substantially different between the two subsamples.

Fraud and non-fraud firms appear to differ in certain board features. We find that fraud firms in our test sample have a larger board (mean 12.74 directors and median 12 directors), a lower percentage of outside directors (mean 74% and median 78%), and more board meetings (mean 8.72 and median 8) than matched non-fraud firms in our control sample.[26] Interestingly, however, we find that the mean differences in the size of the audit committee and the fraction of financial experts between fraud and non-fraud firms are not significant.

Lastly, we find no significant mean or median differences in asset size, return on assets, and leverage between fraud and non-fraud firms. We find, however, that the

[25] Untabulated results show that the average stock holdings of outside directors in our fraud and non-fraud control firms are 1% and less than 1%, respectively.

[26] Compared to prior studies, the average board size in our sample is quite similar to that of Fich and Shivdasani (2007), whose mean board sizes for fraud and control firms are 13.4 directors and 12.6 directors, respectively. We also observe a similar but slightly higher number of board meetings in our sample relative to their sample (7.63 and 7.55 for fraud and control firms, respectively); however, the fraction of outside directors in our sample is significantly higher than in theirs (52% and 55% for fraud and control firms, respectively). These differences are reasonable, since their sample coverage is from 1998 to 2002 while ours is concentrated in the period after 2001.

fraud firms have greater return volatility and higher institutional holdings than the matched non-fraud firms.

5 Empirical procedures and results

5.1 Univariate analysis

Following Fahlenbrach et al. (2013), we assume the departure of an outside director if the director was present in the previous proxy statement but is no longer listed in the current proxy statement.[27] We also assume that the date of the current proxy statement is the departure date.[28] To determine whether an outside director departed during the fraud committing period, we require the director to have been present in the proxy statement just prior to the class action beginning date and examine whether the director left during the fraud committing period (i.e., before the earlier of the class action ending date and the first filing date). We follow the same procedures in defining the departure of an outside director for matched non-fraud firms in the same period as the fraud committing period of the fraud firms.

Table 4 provides a univariate comparison of outside director turnover between fraud firms and matched non-fraud firms during the fraud committing period. For fraud firms, 63 outside directors (3.49% of 1805) departed the firms during the fraud committing period, while 50 outside directors (2.81% of 1778) departed the non-fraud control firms during the matching time period. However, this difference in turnover ratio is insignificant.[29] Since directors can depart due to normal turnover (i.e., retirement), we are more concerned about atypical director turnover during the fraud committing period. Following the literature (e.g., Yermack 2004; Fahlenbrach et al. 2013), we exclude departing directors who are over 70 years old because they are more likely to depart for retirement. We define all directors aged less than 70 who departed the firms during the fraud committing period as abnormal turnover (or surprise turnover). We find that, on average, 3.10% of non-retiring outside directors departed fraud firms during the fraud committing period, while 2.14% of such directors departed non-fraud control firms during the matching time period. This difference in the abnormal turnover percentage (3.10% versus 2.14%) is significant at the 5% level. We next compare the number of fraud firms with an abnormal outside director departure with the number of matched non-fraud firms with an abnormal outside director departure. We find even more

[27] The Corporate Library does have a variable called date retiring; however, it has mostly incomplete information and is not updated in a timely manner. Effective since August 23, 2004, the SEC requires firms to file director departures and elections in Form 8 K, Section 5.02, no later than four days after the event. Unfortunately, this information is not available for most of our sample. Hence, we follow the literature (e.g., Fahlenbrach et al. 2013), using the proxy statement to define director departure.

[28] Our assumption is relatively conservative since our assumed date of director departure would most likely be later than the actual date of director departure. For a few fraud firms (e.g., Enron), there were no future proxy statements once the fraud was discovered, because the firm was then in the bankruptcy process. To determine the departure dates of directors in such cases, we also take the conservative approach and assume that theses directors departed one year after the final proxy date. This approach will undercount the number of departing directors.

[29] Our turnover rates are comparable to those of Fich and Shivdasani (2007), who find that 5.6% of outside directors depart fraud firms in the first year after the class action filing dates.

Table 3 Comparison of director, board, and other firm characteristics between fraud and non-fraud Firms

	Fraud Firms		Non-Fraud Firms			
	Mean	Median	Mean	Median	t-Stat for Mean Differences	Z-Stat for Median Differences
Director characteristics						
Female	0.11	0.00	0.12	0.00	-1.10	-1.10
Tenure	8.12	6.00	8.55	6.00	-1.70*	-0.72
Audit Committee Member	0.37	0.00	0.38	0.00	-0.73	-0.73
Financial Expert	0.29	0.00	0.28	0.00	0.52	0.53
Block Holder	0.03	0.00	0.02	0.00	1.39	1.39
# Board Seats	2.26	2.00	2.28	2.00	-0.34	-0.56
Independent	0.85	1.00	0.87	1.00	-1.81*	-1.81*
Board governance features						
Board Size	12.74	12.00	11.58	11.00	2.49**	2.04**
% Outside Directors	0.74	0.78	0.78	0.80	-3.17***	-2.29**
# Meetings	8.72	8.00	7.43	7.00	2.80***	2.36**
Size of Audit Committee	3.42	3.00	3.48	3.00	0.31	-0.30
Fraction of Financial Experts	0.74	0.67	0.67	0.50	1.12	1.83*
Firm-level controls						
LAssets	7.74	7.64	7.63	7.56	0.50	0.41
ROA	0.10	0.11	0.09	0.11	0.54	0.10
Leverage	0.82	0.28	0.56	0.20	1.56	1.69
Return Volatility	15.53	12.42	13.47	11.01	1.82*	1.59
Institutional Holdings	0.66	0.67	0.62	0.64	1.72*	1.53
# Firms	195		195			

This table compares outside director, board, and firm characteristics between the test sample of fraud firms and the matched control sample of non-fraud firms. The variables are as defined in the appendix. The last two columns provide t-statistics for the mean comparison and the Z-statistics for Wilcoxon rank sum tests of the median difference. The superscripts ***, **, and * denote significance at 1%, 5%, and 10% confidence levels, respectively, based on two-sided tests

remarkable differences between the two samples: 38 out of 195 fraud firms report a non-retiring, abnormal departure, while only 24 out of 195 non-fraud firms report a non-retiring, abnormal departure. The difference between fraud and non-fraud control firms is once again statistically significant at the 5% level. Though only suggestive of the underlying relations, the univariate results presented in Table 4 are in line the prediction in our main hypothesis (H_1) that outside directors of fraud firms are more likely to depart the firms during the fraud committing period than are those of non-fraud firms.

5.2 Regression analysis

To examine whether abnormal outside director turnover during the fraud committing period is positively associated with fraud (H_1) and whether this association is

conditioned upon director characteristics (H_2) and board governance features (H_3), we specify the following model:

$$\begin{aligned}\Pr(\text{AbnormalDirectorTurnover}) &= \beta_0 + \beta_1\,\text{Fraud} + \beta_2\,\text{Director Characteristics} + \beta_3\,\text{Board Governance Features} \\ &+ \beta_4\,\text{Fraud*}\,\text{Director Characteristics} + \beta_5\,\text{Fraud*}\,\text{BoardGovernance Features} \\ &+ \beta_6\,\text{Firm Level Controls} + \beta_7\,\text{Fraud*}\,\text{Firm Level Controls}\end{aligned}$$

where the dependent variable, *Pr(Abnormal Director Turnover)*, refers to the ex-ante likelihood of an outside director departing the firm for non-retirement reasons during the fraud committing period. This indicator variable is ex-post coded as one if an outside director below age 70 departs either a fraud or non-fraud firm during the fraud committing period and zero otherwise. The key variable of interest, *Fraud*, is an indicator variable that equals one for fraud firms and zero for non-fraud firms. We control for director characteristics, board governance features, and other firm-level factors by including relevant proxies for these variables into the above regression model. The appendix provides detailed definitions of three different sets of variables representing *Director Characteristics*, *Board Governance Features*, and *Firm-Level Controls*.

We include the interaction terms *Fraud * Director Characteristics* and *Fraud * Board Governance Features* to test whether and how the impact of fraud on abnormal turnover is conditioned upon director characteristics (H_2) and board governance features (H_3). Here, we are interested in the potential channels through which fraud impacts the likelihood of abnormal outside director turnover. For example, a positive coefficient of β_4 implies that outside directors with specific characteristics are more likely to depart a fraud firm during the alleged fraud committing period. Similarly, a negative coefficient of β_5 implies that outside directors who serve on a board with certain governance features are less likely to depart a fraud firm during the same fraud committing period. Stated differently, a positive coefficient for β_4 (β_5) suggests that

Table 4 Comparison of director turnover between fraud and non-fraud firms

	Fraud Firms		Non-Fraud Firms		t-Stat for Mean Differences
	#	%	#	%	
Outside director departure	63	3.49	50	2.81	1.16
Outside director non-retirement, abnormal departure	56	3.10	38	2.14	1.81**
Total # outside directors	1,805		1,778		
Firms with outside director departure	41	21.03	31	15.90	1.30*
Firms with outside director non-retirement, abnormal departure	38	19.49	24	12.31	1.94**
Total # firms	195		195		

This table compares outside director turnover between the test sample of fraud firms and the matched control sample of non-fraud firms. The fraud committing period is from the class action beginning date to the earlier of the class action ending date and the first filing date. The last column provides t-statistics for mean comparison tests. The superscripts ***, **, and * denote significance at the 1%, 5%, and 10% confidence levels, respectively, based on one-sided tests

certain director characteristics (board governance features) increase the likelihood of abnormal outside director turnover for a fraud firm.

We conduct a probit regression analysis and present the results in Table 5. Due to possible multiple fraud cases for a single firm and multiple directors at each firm, standard errors are clustered by firms in all regressions. Column (1) reports the effects of *Fraud* on the likelihood of abnormal turnover with firm-level control variables, and the coefficient of *Fraud* is highly significant (at the 5% level), with an expected positive sign. This result is consistent with H_1 and suggests that outside director turnover during the fraud committing period is abnormally high for fraud firms, compared with the corresponding turnover for non-fraud firms. We obtain similar results when we control for both director characteristics and board governance features in column (2).

To test whether and how abnormal director turnover at fraud firms varies with director characteristics (H_2) and board governance features (H_3), we include the director interaction term (*Fraud*Director Characteristics*) in column (3), the board interaction term (*Fraud*Board Governance Features*) in column (4), and both sets of interaction terms in column (5) of Table 5. Once again, we show that the coefficients of *Fraud* remain consistently positive and significant at the 5% level.

With regard to director characteristics in columns (3) and (5) in Table 5, we find that the coefficients of *Female* are significantly negative, while the coefficients of *Fraud*Female* are significantly positive (at the 1% level). The finding suggests that female directors are less likely to depart non-fraud firms (*Fraud* = 0) but more likely to depart fraud firms (*Fraud* = 1). Our interpretation is as follows: female directors could be more effective in monitoring financial reporting activities (Gul et al. 2008) and may therefore be better able to detect fraud, and they are more conservative (e.g., Bernardi and Arnold 1997; Cohen et al. 1998) and risk averse (e.g., Jianakoplos and Bernasek 1998; Barber and Odean 2001; Brooks and Zank 2005). Thus, they may be more likely to depart fraud firms upon public discovery of fraud.

We find that the coefficients of *Tenure* are negative at the 10% level in both columns (3) and (5) of Table 5, indicating directors with longer tenure are less likely to depart a firm. However, we find no significance for the interaction term *Fraud*Tenure*.

We also find that the coefficients of both *Audit Committee Member* and *Financial Expertise* interacting with *Fraud* are insignificant, indicating that outside directors who serve on the audit committee or who have financial expertise are not more likely to depart fraud firms compared with other directors. We interpret our somewhat surprising findings as follows: outside directors who are audit committee members can suffer from greater reputational losses (Fich and Shivdasani 2007), and such directors are more likely to be named defendants in class action lawsuits (Brochet and Srinivasan 2014). Hence, these directors might not help themselves by departing the fraud firms, since they are more likely to be held responsible for firms' wrongdoings despite their departure decisions.

We find that the coefficients of *Block Holder* are significantly negative, while the coefficients of the interaction term *Fraud*Block Holder* are significantly positive. This finding indicates that outside directors who are blockholders are less likely to depart non-fraud control firms but more likely to depart fraud firms. We interpret the result as follows: Since blockholders have large financial stakes in the firms, they are more

Table 5 Probit regression of director turnover on fraud

	(1)	(2)	(3)	(4)	(5)
Intercept	-4.389***	-3.571**	-3.285**	-7.490**	-6.241**
	(-3.331)	(-2.344)	(-2.006)	(-2.358)	(-2.058)
Fraud	3.202**	3.880**	3.789**	8.364**	7.224**
	(2.239)	(2.455)	(2.417)	(2.526)	(2.208)
Director Characteristics					
Female		0.085	-4.063***	0.155	-3.921***
		(0.281)	(-11.688)	(0.500)	(-6.118)
Tenure		-0.006	-0.036*	-0.003	-0.038*
		(-0.331)	(-1.908)	(-0.188)	(-1.899)
Audit Committee Member		-0.087	0.296	0.018	0.369
		(-0.317)	(1.016)	(0.065)	(1.147)
Financial Expertise		-0.529*	-0.765**	-0.508*	-0.729**
		(-1.820)	(-2.398)	(-1.767)	(-2.509)
Block Holder		-0.235	-4.232***	-0.032	-4.440***
		(-0.539)	(-8.572)	(-0.093)	(-9.094)
# Board Seats		0.032	-0.244**	0.049	-0.183**
		(0.526)	(-2.418)	(0.790)	(-2.061)
Independent		-0.701***	-0.627**	-0.793***	-0.776***
		(-3.144)	(-2.151)	(-3.166)	(-2.896)
Board Governance Features					
Board Size		0.021	0.017	0.279*	0.240
		(0.773)	(0.606)	(1.717)	(1.611)
% Outside Directors		-1.848*	-1.949	-0.866	-1.260
		(-1.705)	(-1.604)	(-0.470)	(-0.626)
# Meetings		-0.067	-0.059	-0.262	-0.242
		(-1.089)	(-1.012)	(-1.549)	(-1.623)
Size of Audit Committee		0.254	0.285	0.440	0.399
		(1.271)	(1.336)	(1.018)	(0.928)
Fraction of Financial Experts		0.573*	0.645*	-0.177	-0.031
		(1.948)	(1.896)	(-0.386)	(-0.061)
Interactions of Fraud with Director Characteristics					
Fraud*Female			4.532***		4.409***
			(8.182)		(5.847)
Fraud*Tenure			0.044		0.047
			(1.597)		(1.530)
Fraud*Audit Committee Member			-0.611		-0.608
			(-1.139)		(-1.102)
Fraud*Financial Expertise			0.455		0.433
			(0.853)		(0.804)
Fraud*Block Holder			3.981***		4.547***
			(6.614)		(8.106)

Table 5 (continued)

	(1)	(2)	(3)	(4)	(5)
Fraud*# Board Seats			0.387***		0.328***
			(3.187)		(3.079)
Fraud*Independent			-0.240		-0.152
			(-0.536)		(-0.297)
Interactions of Fraud with Board Governance Features					
Fraud*Board Size				-0.307*	-0.277*
				(-1.815)	(-1.789)
Fraud*% Outside Directors				-1.621	-1.487
				(-0.649)	(-0.541)
Fraud*# Meetings				0.283	0.281*
				(1.636)	(1.820)
Fraud*Size of Audit Committee				-0.235	-0.123
				(-0.492)	(-0.244)
Fraud*Fraction of Financial Experts				0.966*	0.888
				(1.689)	(1.275)
Firm Controls	YES	YES	YES	YES	YES
Fraud*Firm Controls	YES	YES	YES	YES	YES
Observations	1,601	1,601	1,601	1,601	1,601
Pseudo-R^2	0.171	0.301	0.357	0.359	0.404

This table presents probit regressions of Director Non-retirement, Abnormal Departure on *Fraud* and various director, board, and firm characteristics, where Director Non-retirement, Abnormal Departure is a dummy variable with value one if an outside director departs the firm before age 70 and zero otherwise. The fraud committing period is from the class action beginning date to the earlier of the class action ending date and the first filing date. All other variables are defined in the appendix. The superscripts ***, **, and * indicate significance at the 1%, 5%, and 10% confidence levels, respectively

likely to stay as long as no fraud is being committed. On the other hand, because blockholders have stronger incentives to monitor these firms due to their larger stock holdings, they are better informed and more likely to detect financial fraud. Interestingly, however, these blockholder directors will act in their self-interest rather than in the interest of shareholders and, hence, are more likely to depart these firms (and sell shares).

We also find that the coefficients of *#Board Seats* are significantly negative, while the coefficients of *Fraud*#Board Seats* are significantly positive. This finding suggests that outside directors who hold multiple directorships at other companies are also less likely to depart non-fraud firms but more likely to depart fraud firms. This result is consistent with the reputational effect hypothesis: Outside directors with more directorships at other companies have greater incentives to engage in active monitoring. Therefore, these directors are better able to detect financial fraud. However, because they are likely to suffer from larger reputational losses once the fraud is uncovered by regulators and/or the public, these multi-seat directors have a greater tendency to depart fraud firms rather than stay and work with management to fix the problem.

Finally, we find that the coefficients of *Independent* are significantly negative, while the coefficients of *Fraud*Independent* are insignificant. This finding suggests that, contrary to our expectations, independent directors tend to have lower turnover than affiliated directors, and the impact of fraud on the likelihood of abnormal director turnover remains the same, irrespective of whether outside directors are independent or affiliated.

Regarding board governance features and their interaction terms with *Fraud* in columns (4) and (5) of Table 5, one consistent finding is that the interaction of *Board Size* and *Fraud* is negative and marginally significant at the 10% level, indicating abnormal director departure is more likely to occur when the fraud firm has a smaller board. We find that the coefficient of *Fraud*#Meetings* is positive and weakly significant at the 10% level in column (5). The finding provides some evidence that outside directors are better able to detect fraud with more frequent board meetings and, thus, more likely to depart fraud firms prior to the public discovery of fraud. Lastly, we find that the interaction of *Fraction of Financial Expert* and *Fraud* is positive and significant at the 10% level in column (4). We find, however, that the interaction terms of *Fraud* with the other two governance variables are insignificant, suggesting that the likelihood of abnormal outside director turnover is unaffected by these governance variables. Overall, our results suggest that outside directors seem to have knowledge about the firms' fraudulent activities in the fraud committing period, as evidenced by their higher turnover. Moreover, individual director characteristics are important determinants of turnover decisions. Board governance features have some effect, albeit weak, on turnover decisions.

Though not tabulated here for brevity,[30] we also include a set of firm-level controls (asset size, return on assets, leverage, return volatility, and percentage of shares held by institutional investors) and the interaction effect of *Fraud* with these firm variables in an attempt to control for potential differences inherent in these firm characteristics between fraud and non-fraud firms.

Next, we test whether outside directors are more likely to depart when they face certain types of more egregious fraud (H_4). We re-estimate our regression replacing the *Fraud* variable with variables representing each of the various types of fraud (i.e., *Frequent Fraud*, *Fictitious Fraud*, *Improper Disclosure*, *Accounting Misstatements*, *Self-Dealing*), while controlling for director characteristics, board governance features, and other firm-level factors. Table 6, Panel A, reports the regression results using the baseline model before including the interaction terms for director characteristics and board governance features. We find the coefficients of *Fictitious Fraud*, *Improper Disclosure*, and *Self-Dealing* are significant (at the 5% levels) while the other two fraud types are insignificant. The results suggest that fraud involving fictitious transactions, which poses more serious concerns of litigation (Bonner et al. 1998), increases the probability of directors being held responsible and prompts outside directors to depart fraud firms. Similarly, Schrand and Zechman (2012) argue that fraud with the intent to extract personal gain ends

[30] Since it is not the focus of our paper to examine the impact of these firm-level variables on abnormal director turnover, we do not discuss these coefficients in detail, so as to keep our manuscript and the tables at a manageable length. Nonetheless, the results are available from the authors upon request.

Table 6 Probit regression of director turnover on fraud – using fraud type variables

Panel A: Using the Baseline Model					
Fraud Type	**(1) Frequent**	**(2) Fictitious**	**(3) Improper disclosure**	**(4) Accounting misstatements**	**(5) Self-dealing**
Intercept	-1.467	-2.081**	-2.937**	-1.457	-2.974**
	(-1.485)	(-2.084)	(-2.304)	(-1.481)	(−2.419)
Fraud Type	0.549	1.500**	1.827**	0.526	2.019**
	(0.638)	(2.007)	(2.298)	(0.597)	(2.515)
Director Characteristics					
Female	0.100	0.102	0.092	0.109	0.090
	(0.346)	(0.351)	(0.313)	(0.374)	(0.301)
Tenure	-0.009	-0.009	-0.006	-0.009	-0.004
	(-0.554)	(-0.555)	(-0.367)	(-0.560)	(-0.270)
Audit Committee Member	-0.112	-0.106	-0.084	-0.116	-0.116
	(-0.423)	(-0.395)	(-0.297)	(-0.440)	(-0.426)
Financial Expertise	-0.507*	-0.524*	-0.551*	-0.507*	-0.540**
	(-1.788)	(-1.802)	(-1.851)	(-1.785)	(-1.983)
Block Holder	-0.160	-0.125	-0.200	-0.171	-0.151
	(-0.393)	(-0.302)	(-0.444)	(-0.418)	(-0.342)
# Board Seats	0.016	0.027	0.028	0.017	0.022
	(0.255)	(0.444)	(0.487)	(0.274)	(0.367)
Independent	-0.671***	-0.674***	-0.688***	-0.671***	-0.638***
	(-3.197)	(-3.166)	(-2.980)	(-3.196)	(-2.717)
Board Governance Features					
Board Size	0.029	0.025	0.016	0.030	0.006
	(1.098)	(0.949)	(0.586)	(1.106)	(0.232)
% Outside Directors	-1.505	-1.688	-2.258**	-1.571	-1.849

Table 6 (continued)

	(-1.384)	(-1.517)	(-2.074)	(-1.445)	(-1.627)
# Meetings	-0.044	-0.050	-0.057	-0.044	-0.074
	(-0.940)	(-1.004)	(-0.992)	(-0.934)	(-1.166)
Size of Audit Committee	0.223	0.238	0.283	0.225	0.272
	(1.204)	(1.267)	(1.488)	(1.188)	(1.353)
Fraction of Financial Experts	0.473*	0.523**	0.537*	0.486*	0.717**
	(1.874)	(2.004)	(1.751)	(1.940)	(2.225)
Firm Controls	YES	YES	YES	YES	YES
Fraud Type*Firm Controls	YES	YES	YES	YES	YES
Observations	1,601	1,601	1,601	1,601	1,601
Pseudo-R^2	0.262	0.275	0.301	0.264	0.296
Panel B: Using the Complete Model					
Intercept	-2.167	-3.338**	-4.860**	-2.145	-3.787**
	(-1.604)	(-2.339)	(-2.231)	(-1.597)	(-2.006)
Fraud Type	1.133	2.642**	3.583**	1.082	2.945
	(0.968)	(1.975)	(2.114)	(0.937)	(1.321)
Director Characteristics					
Female	-0.863***	-0.794**	-7.759***	-0.812***	-8.353***
	(-2.949)	(-2.530)	(-10.142)	(-2.838)	(-10.503)
Tenure	-0.009	-0.004	-0.036	-0.009	-0.027
	(-0.613)	(-0.240)	(-1.575)	(-0.636)	(-1.545)
Audit Committee Member	0.057	0.059	0.391	0.050	0.226
	(0.203)	(0.200)	(1.153)	(0.178)	(0.777)
Financial Expertise	-0.462	-0.431	-0.593**	-0.461	-0.924***
	(-1.566)	(-1.466)	(-2.010)	(-1.567)	(-2.648)

Table 6 (continued)

Block Holder	-0.793	-0.670	-4.552***	-0.839	-8.674***
	(-1.542)	(-1.273)	(-9.588)	(-1.585)	(-8.719)
# Board Seats	-0.181**	-0.178**	-0.181**	-0.177**	-0.069
	(-2.229)	(-2.242)	(-1.971)	(-2.096)	(-0.913)
Independent	-0.541**	-0.429*	-0.814***	-0.553**	-0.599**
	(-2.343)	(-1.800)	(-2.859)	(-2.392)	(-2.550)
Board Governance Features					
Board Size	0.081	0.098	0.157*	0.085	0.105
	(1.269)	(1.487)	(1.757)	(1.329)	(1.354)
% Outside Directors	-0.830	-0.863	-1.419	-0.980	-0.744
	(-0.469)	(-0.495)	(-0.757)	(-0.565)	(-0.441)
# Meetings	-0.129	-0.130	-0.207*	-0.129	-0.179*
	(-1.519)	(-1.423)	(-1.663)	(-1.505)	(-1.671)
Size of Audit Committee	0.241	0.259	0.502	0.238	0.218
	(0.841)	(0.857)	(1.258)	(0.822)	(0.690)
Fraction of Financial Experts	0.067	0.075	0.269	0.082	0.276
	(0.154)	(0.165)	(0.500)	(0.188)	(0.603)
Interactions of Fraud Type with Director Characteristics					
Fraud Type*Female	0.906**	0.815**	4.366***	0.828**	4.693***
	(2.528)	(2.019)	(9.092)	(2.293)	(7.195)
Fraud Type*Tenure	-0.001	-0.009	0.030**	-0.002	0.023
	(-0.036)	(-0.422)	(2.182)	(-0.087)	(1.108)
Fraud Type*Audit Committee Member	-0.102	-0.127	-0.488*	-0.103	-0.437
	(-0.282)	(-0.347)	(-1.901)	(-0.301)	(-1.610)
Fraud Type*Financial Expertise	-0.008	-0.108	0.149	0.006	0.472
	(-0.021)	(-0.280)	(0.598)	(0.017)	(1.611)

Table 6 (continued)

Fraud Type*Block Holder	0.847*	0.773*	2.219***	0.903*	4.288***
	(1.872)	(1.693)	(7.777)	(1.904)	(5.472)
Fraud Type*# Board Seats	0.229***	0.247***	0.180***	0.224***	0.097
	(3.045)	(2.985)	(3.201)	(3.027)	(1.385)
Fraud Type*Independent	-0.406	-0.593**	0.002	-0.408	-0.145
	(-1.448)	(-2.030)	(0.007)	(-1.574)	(-0.612)
Interactions of Fraud Type with Board Governance Features					
Fraud Type*Board Size	-0.049	-0.064	-0.129*	-0.049	-0.081
	(-1.071)	(-1.278)	(-1.913)	(-1.043)	(-0.936)
Fraud Type*% Outside Directors	-0.329	-0.374	-1.508	-0.187	-1.369
	(-0.269)	(-0.262)	(-0.893)	(-0.154)	(-0.543)
Fraud Type*# Meetings	0.133**	0.127*	0.128*	0.137**	0.179**
	(1.974)	(1.817)	(1.812)	(1.963)	(2.155)
Fraud Type*Size of Audit Committee	0.014	0.015	-0.092	0.044	0.155
	(0.058)	(0.061)	(-0.382)	(0.195)	(0.493)
Fraud Type*Fraction of Financial Experts	0.652*	0.640	0.350	0.639	0.648
	(1.658)	(1.466)	(0.860)	(1.522)	(1.138)
Firm Controls	YES	YES	YES	YES	YES
Fraud Type*Firm Controls	YES	YES	YES	YES	YES
Observations	1,601	1,601	1,601	1,601	1,601
Pseudo-R^2	0.347	0.361	0.411	0.346	0.397

This table presents probit regressions of Director Non-retirement, Abnormal Departure on Fraud Type variables and various director, board, and firm characteristics, where Director Non-retirement, Abnormal Departure is a dummy variable with value one if an outside director departs the firm before age 70 and zero otherwise. The fraud committing period is from the class action beginning date to the earlier of the class action ending date and the first filing date. *Frequent, Fictitious, Improper disclosure, Accounting misstatements* and *Self-dealing* take value 0 for control firms, value 1 for fraud firms without the specific type, and 2 for fraud firms with the specific type. All other variables are defined in the appendix. The superscripts ***, **, and * indicate significance at the 1%, 5%, and 10% confidence levels, respectively

up with more serious allegations in court. We find that directors are more likely to depart fraud firms when self-dealing is involved. Disclosure problems also seem to catch the attention of directors and affect their turnover decisions. Outside directors are not particularly effective in detecting other types of fraud (*Frequent Fraud*, *Accounting Misstatements*) or do not feel the urgency to resign from fraud firms when such fraud occurs.[31]

Panel B of Table 6 reports the regression results of the complete model, including the interaction terms for director characteristics and board governance features. We continue to find the coefficients of *Fictitious Fraud* and *Improper Disclosure* highly significant (at the 5% levels), though *Self-Dealing* is no longer significant. Interestingly, we find that female directors, directors who are blockholders, and directors with multiple directorships at other firms still have higher likelihood to depart fraud firms, irrespective of the type of fraud. We also show consistent evidence that a higher number of board meetings increases the likelihood of abnormal director turnover for all types of fraud. Overall, the results in Table 6 reinforce the notion that outside directors seem to have knowledge of fraud and that certain outside directors are better at detecting it. Moreover, their turnover decisions depend on how egregious the type of fraud is, related to the seriousness of the allegation if and when the fraud is discovered.

Lastly, we test whether the abnormal turnover of outside directors is higher in fraud firms with more serious repercussions (H_5). We re-estimate our regression after replacing the indicator variable, *Fraud*, with *Settlement Amount* and *Fraud Length* to capture the seriousness of the consequences of the alleged financial reporting fraud. However, note that only fraud firms will have a settlement amount and a fraud duration, which could create a potential selection bias in our analysis. To alleviate this concern, we estimate a selection model following the same procedures as Chaney et al. (2004) and Lennox et al. (2012). In the first stage, we compute the inverse Mills ratio for each of our sample firms using the probit regression results reported in Dechow et al. (2011). In the second stage, we include the inverse Mills ratio obtained from the first-stage probit regression.

Table 7 presents the second-stage regression results. We find that the coefficients of *Settlement Amount* are positive and significant at less than the 5% level. This finding suggests that outside directors tend to depart a firm with financial fraud, and that this tendency increases with the seriousness of the fraud. The coefficients of *Fraud Length* are also positive and significant at the 5% level. We also find the coefficients of the interaction terms of *Female*, *Block Holder*, *# Board Seats*, and *Board Size* significant and consistent with our main findings. Overall, the results reported in Table 7 buttress and enrich our earlier finding; that is, the more serious the alleged fraud, the greater the likelihood of outside directors choosing to depart the firm before the public discovery of fraud.

[31] Bonner et al. (1998) also show that fraud that involves the misstatement of important accounts does not lead to greater risk of auditor litigation. However, they do find frequent fraud more likely leads to auditor litigation. We attribute the difference in our findings to the fact that auditors may be held more responsible than directors in cases of frequent fraud, many of which involve accounting manipulation, such as premature revenue recognition, which auditors should be better able to detect given their qualifications.

Table 7 Probit regression of director turnover on settlement amount and fraud length – using selection correction

Fraud Severity	(1) Settlement amount	(2) Settlement amount	(3) Fraud length	(4) Fraud length
Intercept	-4.956***	-9.258**	-2.969**	-5.251**
	(-2.984)	(-2.343)	(-2.291)	(-2.293)
Fraud Severity	0.430***	0.654**	0.522**	0.913**
	(2.940)	(2.391)	(2.426)	(2.034)
Director Characteristics				
Female	0.095	-0.781	0.096	-1.367***
	(0.304)	(-1.494)	(0.304)	(-2.785)
Tenure	0.011	-0.018	0.006	-0.026
	(0.703)	(-0.768)	(0.390)	(-1.194)
Audit Committee Member	-0.282	-0.004	-0.282	-0.073
	(-1.036)	(-0.011)	(-1.061)	(-0.241)
Financial Expertise	-0.772*	-1.086**	-0.764*	-1.196**
	(-1.767)	(-2.277)	(-1.756)	(-2.305)
Block Holder	-0.317	-1.202***	-0.282	-6.097**
	(-0.732)	(-3.402)	(-0.692)	(-2.115)
# Board Seats	0.035	-0.271***	0.032	-0.352***
	(0.474)	(-2.749)	(0.433)	(-2.972)
Independent	-0.550***	-0.454**	-0.601***	-0.425**
	(-2.641)	(-2.161)	(-2.752)	(-2.052)
Board Governance Features				
Board Size	0.058	0.331**	0.036	0.242*
	(1.437)	(2.031)	(1.041)	(1.941)
% Outside Directors	-1.238	2.479	-1.286	1.554
	(-1.169)	(1.193)	(-1.143)	(0.790)
# Meetings	-0.055	-0.217	-0.040	-0.161
	(-0.888)	(−1.546)	(-0.686)	(-1.290)
Size of Audit Committee	0.307	0.186	0.322	0.215
	(1.547)	(0.465)	(1.604)	(0.584)
Fraction of Financial Experts	0.376	-0.216	0.380	-0.357
	(1.094)	(-0.390)	(1.247)	(-0.704)
Interactions of Fraud Severity with Director Characteristics				
Fraud Severity*Female		0.072*		0.279***
		(1.742)		(2.827)
Fraud Severity*Tenure		0.003		0.008
		(1.439)		(1.537)
Fraud Severity*Audit Committee Member		-0.015		-0.041
		(-0.434)		(-0.448)
Fraud Severity*Financial Expertise		0.031		0.088
		(0.768)		(0.710)

Table 7 (continued)

Fraud Severity	(1) Settlement amount	(2) Settlement amount	(3) Fraud length	(4) Fraud length
Fraud Severity*Block Holder		0.072***		0.899**
		(2.616)		(2.038)
Fraud Severity*# Board Seats		0.026***		0.084***
		(3.781)		(3.945)
Fraud Severity*Independent		-0.023		-0.112
		(-0.640)		(-0.939)
Interactions of Fraud Severity with Board Governance Features				
Fraud Severity*Board Size		-0.022**		-0.042**
		(-2.057)		(-2.020)
Fraud Severity*% Outside Directors		-0.306*		-0.526
		(-1.728)		(-1.237)
Fraud Severity*# Meetings		0.015*		0.036
		(1.656)		(1.518)
Fraud Severity*Size of Audit Committee		0.013		0.027
		(0.465)		(0.335)
Fraud Severity*Fraction of Financial Experts		0.063		0.199
		(1.124)		(1.417)
Firm Controls	YES	YES	YES	YES
Fraud Seveirty*Firm Controls	YES	YES	YES	YES
Inverse Mills Ratio	YES	YES	YES	YES
Observations	1,199	1,199	1,199	1,199
Pseudo-R^2	0.306	0.415	0.278	0.407

This table presents probit regressions of Director Non-retirement, Abnormal Departure on Settlement Amount and Fraud Length and various director, board, and firm characteristics after adjusting for selection bias, where Director Non-retirement, Abnormal Departure is a dummy variable with value one if an outside director departs the firm before age 70 and zero otherwise. Mills Ratio is computed from the first stage estimation based on Dechow et al. (2011). All other variables are defined in the appendix. The superscripts ***, **, and * indicate significance at the 1%, 5%, and 10% confidence levels, respectively

6 Additional analysis

6.1 Endogeneity: the PSM approach

As in many other studies on director turnover, one cannot completely rule out the possibility that our analysis suffers from potential endogeneity associated with the relation between corporate fraud and director turnover. For example, the departure of an experienced director who serves as an effective monitor could be the cause of financial fraud. To alleviate concerns about potential endogeneity—particularly endogeneity from reverse causality—we apply the PSM approach. We construct a control sample of non-fraud firms by matching fraud firms with non-fraud firms using the predicted likelihood, or propensity score, of fraud. We first compute the

predicted likelihood of fraud, using the estimated coefficients of the accounting misstatement model of Dechow et al. (2011).[32] Then we match each fraud firm to a non-fraud firm in the same industry with the closest predicted probability of fraud within 0.5% of the fraud firm.[33]

In Table 8, we present the results of our regressions using the PSM sample.[34] Overall, these results are consistent with our main results. The coefficient of *Fraud* remains positive and significant at the 1% level in column (1), implying that the likelihood of abnormal director turnover is significant for fraud firms. We report results of different types of fraud on abnormal director departure in columns (2) to (6). As shown in columns (3) and (4), we find that the coefficients of *Fictitious Fraud* and *Improper Disclosure* continue to be significant, suggesting that directors are more likely to depart fraud firms when they suspect these frauds. As shown in column (6), we also find that, for the PSM sample, directors are more likely to depart fraud firms when self-dealing is involved. Lastly, as presented in columns (7) and (8), we continue to find that abnormal turnover of outside directors is significantly higher for fraud firms with higher *Settlement Amount* and longer *Fraud Length*, respectively. Overall, the results using the PSM approach reconfirm our earlier results, indicating that our main findings are unlikely to be driven by potential endogeneity associated with reverse causality.

6.2 Evidence from stock trading activities

As further analysis, we now examine outside directors' (insider) trading behavior during the fraud committing period, before the discovery of fraud by securities regulators and/or the public. If outside directors have private knowledge about financial fraud, they are more likely to sell their shares of the fraud firms and depart before the whistle blows. Hence, we compare the stock trading patterns of outside directors who departed fraud firms versus those who stayed at fraud firms and those who departed non-fraud control firms. We conjecture that the share-selling incentive of departing

[32] We compute the predicted probability of financial fraud as

$$p(\text{Fraud}) = \frac{exp(\text{PredictedValue})}{[1 + exp(\text{PredictedValue})]}$$

$$\text{Predicted Value} = -7.893 + 0.79*\text{rsst\_acc} + 2.518*\text{d\_rec} + 1.191*\text{d\_inv} + 1.979*\%\text{soft\_at} + 0.171*\text{d\_cs} - 0.932*\text{d\_roa} + 1.029*\text{issue}$$

where *rsst_acc* is total accruals; *d_rec*, *d_inv*, *d_cs*, and *d_roa* are changes in receivables, inventory, cash sales, and return on assets (*ROA*), respectively; *%soft_at* is the percentage of soft assets (i.e., assets on the balance sheet that are neither cash nor property, plant, and equipment); and *issue* is a dummy variable that equals one if a firm issues equity or debt and zero otherwise. All variables are defined exactly as reported in Table 7 of Dechow et al. (2011).

[33] We require the asset size of non-fraud control firms to be no less than 20% and no more than five times that of the fraud firms. Since we apply a relatively generous matching criterion for firm size, our PSM approach should not be considered a size-based matching method. Nonetheless, matching based on firm size is conducted as a robustness analysis and the results remain similar.

[34] Since the PSM sample has a much smaller sample size as compared to our size-matched sample, it makes estimation of the interaction model difficult. Thus, we estimate only the baseline model for the PSM sample.

Table 8 Probit regression of director turnover on fraud – PSM approach

Fraud Variable	(1) Fraud	(2) Frequent	(3) Fictitious	(4) Improper disclosure	(5) Accounting misstatements	(6) Self dealing	(7) Settlement amount	(8) Fraud length
Intercept	-5.133***	-4.751***	-5.151***	-3.895***	-4.718***	-4.410***	-5.020***	-5.242***
	(-4.077)	(-4.097)	(-4.137)	(-3.105)	(-4.125)	(-3.124)	(-4.483)	(-4.261)
Fraud Variable	3.588***	1.125	1.358*	1.710**	1.083	1.808**	0.320***	0.605***
	(2.789)	(1.614)	(1.719)	(2.418)	(1.579)	(2.265)	(2.966)	(2.819)
Director Characteristics								
Female	0.472	0.556*	0.557*	0.445	0.556*	0.423	0.656**	0.501
	(1.433)	(1.687)	(1.700)	(1.384)	(1.691)	(1.328)	(2.092)	(1.525)
Tenure	0.013	0.015	0.015	0.010	0.014	0.011	0.017	0.013
	(0.944)	(1.132)	(1.192)	(0.700)	(1.114)	(0.880)	(1.177)	(0.973)
Audit Committee Member	-0.149	-0.203	-0.203	-0.155	-0.202	-0.176	-0.239	-0.148
	(-0.582)	(-0.737)	(-0.733)	(-0.637)	(-0.731)	(-0.639)	(-0.850)	(-0.582)
Financial Expertise	-0.158	-0.065	-0.061	-0.178	-0.064	-0.118	-0.093	-0.161
	(-0.645)	(-0.250)	(-0.233)	(-0.770)	(-0.247)	(-0.464)	(-0.327)	(-0.655)
Block Holder	-0.261	-0.292	-0.269	-0.288	-0.292	-0.311	-0.259	-0.267
	(-0.764)	(-0.924)	(-0.876)	(-0.855)	(-0.915)	(-0.976)	(-0.671)	(-0.784)
# Board Seats	0.018	0.000	-0.003	0.023	-0.001	0.019	-0.025	0.014
	(0.294)	(0.001)	(-0.048)	(0.372)	(-0.010)	(0.303)	(-0.339)	(0.219)
Independent	-0.677**	-0.732**	-0.725**	-0.688**	-0.733**	-0.704**	-0.512*	-0.706**
	(-2.086)	(-2.329)	(-2.304)	(-2.175)	(-2.337)	(-2.283)	(-1.663)	(-2.180)
Board Governance Features								
Board Size	0.045	0.094**	0.100**	0.028	0.094**	0.030	0.058	0.047
	(1.425)	(2.203)	(2.208)	(0.909)	(2.181)	(0.995)	(1.195)	(1.438)

Table 8 (continued)

Fraud Variable	(1) Fraud	(2) Frequent	(3) Fictitious	(4) Improper disclosure	(5) Accounting misstatements	(6) Self dealing	(7) Settlement amount	(8) Fraud length
% Outside Directors	0.976	2.070*	2.423*	0.092	2.056	0.373	0.420	1.438
	(0.720)	(1.659)	(1.918)	(0.067)	(1.644)	(0.283)	(0.283)	(1.063)
# Meetings	-0.057	-0.072	-0.073	-0.059	-0.071	-0.052	-0.086	-0.064
	(-0.651)	(-0.820)	(-0.838)	(-0.700)	(-0.813)	(-0.664)	(-0.892)	(-0.727)
Size of Audit Committee	0.126	0.074	0.047	0.187	0.076	0.169	0.290	0.147
	(0.925)	(0.462)	(0.308)	(1.308)	(0.474)	(1.101)	(1.435)	(1.035)
Fraction of Financial Experts	0.540*	0.485	0.483	0.516*	0.490	0.554*	1.198***	0.605*
	(1.713)	(1.512)	(1.544)	(1.735)	(1.524)	(1.817)	(3.201)	(1.846)
Firm Controls	YES	YES	YES	YES	YES	YES	YES	YES
Fraud*Firm Controls	YES	YES	YES	YES	YES	YES	YES	YES
Observations	1,152	1,152	1,152	1,152	1,152	1,152	1,152	1,152
Pseudo-R^2	0.267	0.285	0.288	0.249	0.285	0.248	0.316	0.277

This table presents the probit regressions of Director Non-retirement, Abnormal Departure on *Fraud* and various director, board, and firm characteristics, where Director Non-retirement, Abnormal Departure is a dummy variable with value one if an outside director departs the firm before age 70 and zero otherwise. All other variables are defined in the appendix. The superscripts ***, **, and * indicate significance at the 1%, 5%, and 10% confidence levels, respectively

Table 9 Stock trading by outside directors before departure

	Fraud Firms		Non-Fraud Firms		t-Stat: Fraud – Non-Fraud	
	# Shares	% Shares	# Shares	% Shares	# Shares	% Shares
Staying Directors	-1,669.40	-0.074	-2,117.00	-0.094	0.32	0.30
Non-retire Departing Directors	-21,892.68	-0.284	479.17	0.044	-1.67**	-1.28
t-stat: Departing - Staying	-1.51*	-0.81				

This table compares stock trading by outside directors during the fraud committing period. We focus on the open market buying and selling activities of directors, with positive signs for shares purchased and negative signs for shares sold in open markets. For departing directors, stock trading is computed over the three-month period prior to departure. For staying directors, the stock trading is computed over the three-month period prior to the end of the fraud committing period. The results of the mean comparison are based on one-sided tests that stock selling is higher for departing directors or in fraud firms. The superscripts ***, **, and * indicate significance at the 1%, 5%, and 10% confidence levels, respectively

directors at fraud firms is stronger than for those who depart non-fraud firms. We also conjecture that the share selling incentive is stronger for departing directors at fraud firms than for (non-departing) directors who stay at fraud firms. Here we implicitly assume that the former have better knowledge about the company's wrongdoings than the latter.

For this empirical analysis, we merge our sample with the insider trading data from Thomson Reuters. We focus on the open market buying and selling activities of directors, with a *positive* sign for shares purchased and a *negative* sign for shares sold in the open market. For each departing director, we compute the aggregate stock trading over the three-month period before the director's departure date. For each staying director, we compute the aggregate stock trading over the three months before the end of the fraud committing period, since there is no departure date for these directors. We then compare the average stock trades (number of shares traded and percentage of shares traded)[35] of staying and departing directors.

Table 9 presents our results. We find consistent evidence that departing directors in fraud firms sell more shares than either departing directors in non-fraud firms or staying directors in fraud firms. The average number of shares and percentage of shares sold by a departing director in a fraud firm are 21,893 and 28.4% of initial holdings, respectively. The number of shares sold is significantly higher for departing directors at fraud firms than for departing directors at non-fraud firms (at the 5% level) as well as for staying directors at fraud firms (at the 10% level). Overall, Table 9 provides evidence that complements our main results, since we show that departing directors in fraud firms sell more shares than departing directors in non-fraud firms and staying directors in fraud firms. The findings suggest that at least some outside directors have private knowledge about the fraud, which triggers their departure decision and abnormal trading behavior before their departure.

[35] The percentage of shares traded is computed as the number of shares traded divided by shares held by the director.

6.3 Evidence of subsequent reputation loss

One interesting question is whether outside directors who choose to depart do indeed experience lower reputation losses than those who choose to stay with the firms. To examine this question, we collect information about the number of directorships held by a director from year 0 to year 3 relative to the earlier of the class action ending date and the first filing date (year 0) and report the results in Table 10. Consistent with prior findings (e.g., Fich and Shivdasani 2007), for staying directors, there is a significant decrease in the number of directorships in the three years after fraud discovery. We find that staying directors in fraud firms have an average of 2.40 directorships in year 0 and 2.05 directorships in year 3, with the difference significant at the 1% level. When we partition our sample into busy and non-busy directors based upon the median of # *Board Seats,* we find that, for busy directors (i.e., directors with a number of board seats above the median), staying at the fraud firms implies greater reputational loss, with a decrease in the average number of directorships from 3.82 to 3.08. This decrease is significant at less than the 1% level and more significant than for non-busy staying directors at fraud firms (i.e., a decrease from 1.41 to 1.30, significance at the 10% level). In contrast, we find that, for departing directors, the drop in the number of directorships is insignificant, and the results are similar for both non-busy and busy directors. This finding suggests that (non-retirement) departing directors tend to suffer less reputational loss than staying directors.

Our findings provide evidence that departing directors seem to suffer from less significant reputational loss than staying directors. Furthermore, for staying directors, reputational loss mainly affects busy directors with more director seats held at other

Table 10 Number of directorships held by outside directors after departure

	Year Relative to Fraud Date	Fraud Firms		
		All	Non-busy	Busy
Staying Directors	0	2.40	1.41	3.82
	1	2.34	1.46	3.56
	2	2.20	1.40	3.26
	3	2.05	1.30	3.08
t-stat: Year 3-Year 0		-4.71***	-1.72*	-6.19***
Non-retire Departing Directors	0	3.41	2.64	3.81
	1	3.33	3.09	3.50
	2	3.33	3.00	3.60
	3	3.00	2.39	3.40
t-stat: Year 3-Year 0		-0.77	-0.21	-0.58

This table compares number of directorships held by outside directors after the fraud event dates. We focus on the year when fraud is discovered to three years after. For both staying and departing directors, the relative years are determined based on the fraud event dates. For both staying and departing directors, we differentiate between non-busy (with # Board Seats below sample median) and busy (with # Board Seats above sample median) directors. The results of the mean comparison are based on two-sided tests for departing (or staying) directors in year 0 and 3. The superscripts ***, **, and * indicate significance at the 1%, 5%, and 10% confidence levels, respectively

companies. This result is consistent with our main findings, suggesting that busy directors with multiple directorships are more likely to depart fraud firms due to their concerns about relatively large reputational losses.

6.4 Restatement and other trigger events

Our analyses thus far use the private litigation lawsuit dataset because it allows us to define a fraud committing period based on class action beginning and ending dates. A possible weakness in using litigation lawsuit data is that a negative firm event could be revealed internally to the directors or externally to the public before the ending date of the fraud committing period (class action ending date or first filing date). For instance, this could happen if directors are privately informed of an earnings restatement by company management well before the news is revealed to the public or a restatement occurs before the class action ending date or the first filing date and leads to an SEC investigation. Hence, some directors could depart before the class action ending dates or the first filing dates, but at their departure dates, the fraud has already become unraveled to other stakeholders.

To address this issue, we conduct several additional analyses. First, we repeat our analysis using only director departures that occurred six months before the class action ending date or the first filing date (whichever is earlier), since these turnover decisions are less likely to be due to an early warning of internally revealed fraud. Second, the fraud ending dates (i.e., class action ending or first filing dates) could occur after the trigger event dates, in which case directors could learn of the problems of the firms through public news disclosures. To address this issue, we redefine the fraud committing period as the class action beginning date to the trigger event date whenever the trigger event date has been disclosed in the litigation release and is before our ending date. Third, since restatements represent significant events that could affect director turnover decisions, we merge our litigation data with financial restatement data from the U.S. General Accounting Office (GAO). Of the 195 fraud firms in our final sample, we find that 29 firms are associated with a restatement before the end of the fraud committing period; that is, their restatement date is within the six-month period prior to the class action ending date or first filing date, whichever is earlier. If the fraud is associated with a restatement that is earlier than both the class action ending date and the first filing date, we use the restatement date as the new ending date of the fraud. Fourth, we consider other negative news events in addition to restatements. We use Factiva to search for negative news events for each of the 195 fraud firms (including possible accounting violations, doubt over going concerns, restatements, management turnover, missed filing deadlines, debt covenant concerns, lawsuits against the company, and whistle blowing events) that happened within the six-month period prior to our ending dates in the litigation releases (the class action ending or first filing date, whichever comes earlier), and find that 48 firms have bad news in the six-month period. For these firms, we replace the fraud committing period ending date with the date of the bad news release. We repeat our analysis using these alternative definitions of the fraud committing period. Though not tabulated for brevity, overall we find similar results with respect to abnormal director turnover in fraud firms.[36]

[36] These untabulated results are available from the authors upon request.

6.5 Other robustness checks

Our baseline regressions do not include the locations of fraud cases. The location of the court is important, since it affects the likelihood of class action lawsuits, as well as the severity of penalties. We replicate our regression analysis after including the location of the court as an additional control variable. Untabulated results show that the inclusion of this additional control does not alter our main results. We also find that litigation lawsuits filed in New York or California are associated with a higher likelihood of abnormal outside director turnover than those filed in other states.

We perform additional tests to ensure that our reported results are robust to alternative definitions of outside director turnover and to the inclusion of additional proxies for director and board characteristics. In our sample, we define abnormal director turnover as the departure of non-retiring directors. We now use total director turnover in lieu of abnormal director turnover but include the director's age in the regression analysis. Untabulated results show the interaction between *Fraud* and *Age* is insignificant. We note that a few firms have multiple fraud cases in our sample. As a sensitivity check, we repeat our empirical procedures after deleting firms with multiple fraud cases and find that our untabulated results are robust to their exclusion. Lastly, we also consider other director and board characteristics, such as whether an outside director is a member of the compensation committee and whether the CEO is also the chair of the board. Untabulated results show that including these additional director characteristics and board governance features in our regressions does not alter our main results.[37]

7 Concluding remarks

This study proposes and tests the hypothesis that outside directors depart fraud firms during the period *before* the public discovery of fraud. Using a unique dataset of class action litigation lawsuits, we find that outside director turnover is significantly higher in fraud firms during the fraud committing period than in non-fraud firms. The findings remain robust in multivariate analysis when we control for various director, board, and firm-specific characteristics. Further, we test whether the strength of the turnover–fraud association differs across firms with different director and board characteristics. We find that female directors and directors with large stock ownership and more directorships at other companies are more likely to depart fraud firms during the fraud committing period. We also find some evidence that outside directors of fraud firms are more likely to depart when the board is smaller, meets more frequently, or has a higher fraction of financial experts. We further classify our fraud firms by types of fraud and find that abnormal director turnover is significantly higher in the presence of more egregious fraud involving fictitious transactions and when disclosure problems are present. Finally, we show that directors are more likely to depart when the fraud entails higher ex-post settlement amounts and a longer duration of fraud. Overall, the findings suggest that some outside directors have the ability and incentive to detect financial fraud before its public discovery and will choose to dissociate themselves from firms when

[37] The results in this section are not tabulated for brevity but are available from the authors upon request.

fraud is suspected, especially when the potential costs to them are higher, should the fraud be discovered by the public or security regulators.

On the one hand, our study provides academic researchers, regulators, and practitioners with evidence that outside directors *could* be effective monitors with the ability to uncover possible management misconduct. On the other hand, the results of our study also suggest that the monitoring role of outside directors is limited because their concerns over reputational losses in the case of fraud discovery motivate them to depart the firm rather than stay and make an effort to address and/or remediate the fraud or related financial reporting problems by working with management. Collectively, the results of our study imply that outside director turnover prior to the public discovery of fraud can serve as a significant predictor of class action lawsuits in relation to financial fraud. Stated another way, outside director turnover could signal financial reporting irregularities of firms *ex-ante,* namely, *before* fraud is reported and discovered by the SEC and/or the public. An important implication of our findings is that better procedures should be in place to govern outside directors in general and to protect them from reputational losses subsequent to fraud discovery, so that they will not "vote with their feet" and "go before the whistle blows."

Acknowledgements We appreciate the valuable comments from Patricia Dechow (the editor), an anonymous referee, David Farber, Weili Ge, and Oliver Li. Earlier versions of the paper were presented at the 2013 AAA Western Regional Meeting, the 2013 CAAA Annual Conference, the 2013 ATINER International Conference on Accounting, and the 2014 AAA Annual Meeting. We thank participants and discussants of the aforementioned conferences as well as doctoral seminar participants at City University of Hong Kong, Fudan University, and University of Waterloo for their comments and suggestions. We gratefully acknowledge financial support from the City University of Hong Kong, Fonds de Recherche du Québec – Société et Culture, and McGill University. All errors are, of course, ours.

Appendix

Table 11 Variable definitions

Director turnover variables	
Director Departure	A dummy variable with value one if an outside director departs the company in the fraud committing period and zero otherwise.
Director Non-retirement, Abnormal Departure (Abnormal Director Turnover)	A dummy variable with value one if an outside director departs the company in the fraud committing period for non-retirement reasons (age below 70) and zero otherwise.
Fraud variables	
Fraud	A dummy variable with value one (zero) if a company is a fraud (control) firm.
Frequent	An indicator variable with value zero for non-fraud firms, value one for fraud firms without frequent fraudulent activities, and value two for fraud firms with frequent fraudulent activities.
Fictitious	An indicator variable with value zero for non-fraud firms, value one for fraud firms without fictitious fraudulent

Table 11 (continued)

Director turnover variables	
	activities, and value two for fraud firms with fictitious fraudulent activities.
Improper disclosure	An indicator variable with value zero for non-fraud firms, value one for fraud firms without improper disclosures, and value two for fraud firms with improper disclosures.
Accounting misstatements	An indicator variable with value zero for non-fraud firms, value one for fraud firms without accounting misstatements, and value two for fraud firms with accounting misstatements.
Self-dealing	An indicator variable with value zero for non-fraud firms, value one for fraud firms without self-dealing activities, and value two for fraud firms with self-dealing activities.
Settlement Amount	Final settlement amount of the case, in millions of dollars.
Fraud Length	Length of time from the class action beginning date to the earlier of the class action ending date and the first filing date.
Director characteristics	
Female	A dummy variable with value one (zero) for female (male) directors.
Tenure	Number of years as a director in the current company.
Audit Committee Member	A dummy variable with value one if a director is a member of the audit committee and zero otherwise.
Financial Expertise	A dummy variable with value one if a director has ever been a CPA, chief financial officer, or financial consultant and zero otherwise.
Block Holder	A dummy variable with value one (zero) if a director's holdings of company stock are above (below) 5% of shares outstanding.
# Board Seats	Number of directorships held by a director in other companies.
Independent	A dummy variable with value one (zero) if a director is an independent (affiliated) outside director.
Board governance features	
Board Size	Log value of the number of directors on the board.
% Outside Directors	Fraction of outside directors on the board.
# Meetings	Number of board meetings in the last fiscal year.
Size of Audit Committee	Number of directors on the audit committee.
Fraction of Financial Experts	Fraction of financial experts on the audit committee.
Firm-level controls	
LAssets	Log value of total assets (in millions of dollars).
ROA	Return on assets.
Leverage	Book value of debt divided by the market value of equity.
Return Volatility	Standard deviations of monthly stock returns (in percentage).
Institutional Holdings	Fractions of shares held by institutional investors.

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