

Explaining CEO Retention in Misreporting Firms

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ABSTRACT

We propose a framework that advances our understanding of CEO retention decisions in misreporting firms. Consistent with economic intuition, outside directors are more likely to fire (retain) CEOs when retention (replacement) costs are high relative to replacement (retention) costs. When the decision is ambiguous because neither cost dominates, outside directors are more likely to retain the CEO when they both benefit from selling stock in the misreporting period. We show that joint abnormal selling captures director-CEO alignment incrementally to biographical overlap. This new proxy operationalizes information sharing and trust, making it useful for studying economic decision-making embedded in social relationships.

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1. Introduction

This paper proposes a framework to better understand CEO retention decisions in firms with severe misreporting. Our framework accommodates CEO turnover rates as disparate as 29% (Leone and Liu 2010) and 88% (Karpoff, Lee, and Martin 2008). We predict and find that outside directors are most likely to fire (retain) CEOs when the magnitude of retention (replacement) costs is high relative to that of replacement (retention) costs.¹ Moreover, when the employment decision is difficult to make because neither cost dominates, our framework argues that outside directors exercise greater discretion in deciding the CEO employment outcome. In particular, we predict and find that outside directors are more likely to retain the CEO when their trading actions suggest a greater degree of alignment with the CEO.

The paper contributes to existing research in two ways. First, with one exception, prior work has not examined the costs of replacing CEOs following restatements. Rather, prior work has modelled CEO turnover at the time of restatements as a function of the severity of the restatement and the strength of corporate governance (e.g., Beneish 1999; Arthaud-Day, Certo, Dalton, and Dalton 2006; Desai, Hogan, and Wilkins 2006; Hennes, Leone, and Miller 2008; Karpoff et al. 2008; Burks 2010). The exception is Leone and Liu (2010) who show that founder-CEOs are less likely to be fired in misreporting firms. Leone and Liu's finding is consistent with founders having rich firm-specific human capital that makes them costly to replace, but as these authors recognize, it is also consistent with weaker governance to the extent that founder proxies for CEO power. We extend the analysis of the costs of CEO replacement in two ways. In addition to controlling for whether the CEO is a founder, we consider measures of within-industry relative

¹ We posit that outside directors trade off costs of replacing v. costs of retaining the CEO to minimize the total costs of the CEO employment decision. We define the costs of replacing the CEO as the costs of finding and hiring a new manager with equal or better managerial skill. Similarly, we define the costs of retaining the CEO as the higher litigation and bonding (auditing) costs borne by the firm, as well as the foregone opportunity to signal a commitment to restoring the reputation and legitimacy of the organization.

CEO performance that capture the CEO's pre-misreporting track record. We argue that the costs of finding and hiring a new CEO with equal or better skills are higher (lower) when CEOs perform well (poorly) relative to their peers in the pre-misreporting period. We thus predict that extreme good (poor) performance increases the likelihood that the CEO is retained (fired). We also consider whether the firm has a readily available internal replacement candidate on the board following evidence in Mobbs (2013) that the presence of certified inside directors (CIDs; executive directors who also hold outside board seats) reduces the cost of replacing CEOs.

Second, we extend research that shows that the economic behavior of managers and directors is affected when decisions are embedded in social interactions. Whereas this literature establishes social connections from biographical overlap or from survey responses, the new measure we propose identifies alignment among directors from their insider trading actions.² Specifically, our measure identifies instances where outside directors and the CEO are both abnormally selling during the restatement period. Relying on prior research, we infer that there is information sharing and trust between the CEO and outside directors when the latter emulate the CEO's trading. That is, prior research (1) argues that there is information asymmetry between officers and outside directors (e.g., Harris and Raviv 2008, Duchin, Matsusaka and Ozbas 2010), and (2) shows that the CEO and a firm's top officers possess more valuable information than outside directors (e.g., Seyhun 1998; Beneish and Vargus 2002; Armstrong, Guay, and Weber 2010). We infer from observing the joint selling that outside directors receive information from the CEO, and that they trust the CEO's judgment sufficiently to personally trade on the CEO's

² Because our measure is based on what directors do with their equity-contingent wealth rather than whom they know or where they have worked, it can be more broadly applied: it is less static than biographical data (e.g., Cohen, Frazzini, and Malloy 2008; Hwang and Kim 2009), and not specific to the survey's respondents (e.g., Uzzi 1996, 1999; Ingram and Roberts 2000; Westphal, Boivie, and Chng 2006).

private information.³ We thus propose that outside directors who benefit by actively selling contemporaneously with the CEO during the misreporting period are more likely to be aligned with the CEO. We label this behavior as ‘collusive abnormal selling’ and predict that outside directors have weaker incentives to replace the CEO. We view these weaker incentives as a manifestation of an embedded social relationship between the CEO and outside directors.

Empirical leverage for our analyses comes from four sources. First, we control for several measures of restatement severity and for a number of firm and corporate governance characteristics. Second, although we rely on databases to identify sample restatements, we conduct extensive news media and SEC filing searches and hand-collect the date of the first public disclosure of a restatement and ascertain the beginning and end of the restatement period. This enables us to avoid some of the problems associated with using misreporting databases (Karpoff, Koester, Lee, and Martin 2014). Third, we are less likely to make the classification errors identified by Karpoff et al. (2008) because our analyses require us to identify CEOs starting from one year prior to the period in which accounting is questionable/fraudulent and ending two years subsequent to public discovery. Thus, we are less likely to miss the ousting of a CEO who is directly or indirectly responsible for its occurrence or to incorrectly attribute turnover to questionable accounting. Fourth, we allow for the fact that some founder CEOs’ ‘resignations’ appear to be window dressing exercises as the founder remains as chair or in another leadership position at the company.

Our results include the following. First, we find that 244 out of 427 CEOs associated with intentional misreporting retain their jobs (57%) after the market discovers the misreporting. Second, we are able to increase the explanatory power of the decision to retain/remove the CEO by

³ Although, it is possible that outside directors trade only because they observe the CEO’s trading, we argue that outside directors are implicitly informed because their interaction with the CEO enables them to distinguish between the CEO’s routine (liquidity or diversification sales) and informed selling.

43.4% relative to a benchmark model representative of models used in prior work. Third, results for the two new proxies for the cost of replacement that we consider are consistent with economic intuition: a poor track record increases the likelihood of a CEO being fired by 17.0% and the CEO is more likely to be fired when there is a readily available replacement candidate (marginal effect of 14.6%). Fourth, in terms of outside director-CEO alignment, we find that, when outside directors emulate CEOs' abnormal selling during the restatement period, they are 15.1% more likely to retain the CEO.

Our analyses also incorporate controls proposed in prior work. Consistent with prior research, we find that CEOs are more likely to be removed in firms with more severe accounting violations and greater performance deterioration, and more likely to be retained when the CEO is also a founder. These results are robust to incorporating the effect of sample selection: we estimate a Heckman selection model where restating firms are distinguished from the COMPUSTAT population using a model that captures risk, profitability, growth, and pricing characteristics. They are also robust to controlling for year and industry fixed effects.

This paper contributes to the literature on the board's response to misreporting by proposing a framework that integrates existing and new explanations of the CEO employment decision. In particular, we find that boards not only weigh how the retention and replacement costs affect shareholders' wealth, but also encompass the extent to which outside directors and CEOs are aligned.

Our evidence suggests that researchers consider directors' selling behavior as a relevant signal of agency conflicts. This observable measure of outside director-CEO alignment operationalizes information sharing and trust within the board of directors. Our measure differs from the proxies used in social embeddedness research. First, while social connections established

from survey responses have the benefit of representing relationships where there is direct sharing of information between relevant parties, survey-based analyses are limited to surveyed samples. In contrast, our measure infers information sharing between CEOs and outside directors based on their trading, but it can be operationalized in a broad sample of firms. Second, whereas the measure of social connections based on a biographical overlap is static, our measure based on the existence of collusive trading is period-specific, and thus has the potential to more finely capture the alignment between a CEO and outside directors. Our evidence that collusive selling explains CEO turnover incrementally to social connections determined via biographical overlap, makes this new construct useful for studying economic decision-making in the presence of embedded social relationships.

The remainder of the paper appears in five sections. In Section 2 we present a review of the literature and our empirical predictions. Section 3 describes the sample and the model. Section 4 presents the descriptive statistics and the results of our empirical tests. Section 5 tests the robustness of our results and Section 6 concludes.

2. Empirical framework

2.1. Prior research

Accounting scandals provide a laboratory in which we can analyze the response to a threat to the organizational legitimacy of the firm. While earlier studies examine CEO turnover and focus on labor market penalties (Agrawal, Jaffe, and Karpoff 1999; Beneish 1999; Karpoff et al. 2008), other studies examine changes in the composition of boards (Farber 2005), changes in the structure of CEO compensation (Cheng and Farber 2008), turnover in audit committee members after restatements (Srinivasan 2005), and auditor dismissals as a result of the restatement (Hennes, Leone, and Miller 2014). Hennes et al. (2008) use evidence of CEO and CFO turnover in a sample

of restatements to show the importance of distinguishing between errors and intentional misreporting, while Burks (2010) examines whether the employment consequences differ before and after the passage of the Sarbanes-Oxley Act, and Efendi, Files, Ouyyang, and Swanson (2013) examine CEO turnover in a sample of firms that restate to correct option backdating.

The nature of the questionable accounting in these studies varies from innocuous errors to deliberate, egregious cases of misreporting. Nevertheless, the majority of these studies suggest that many CEOs of misreporting firms retain their jobs, and that the likelihood of dismissal increases with the severity of the restatement and strength of corporate governance.⁴ The framework we propose builds on these earlier papers, and we select a base model that controls for restatement severity, corporate governance environment, and other firm characteristics typically used in prior work.

2.2. Explaining CEO retention in misreporting firms

We propose a framework to explain CEO retention decisions in misreporting firms that has three components: the magnitudes of the costs of CEO replacement and CEO retention, and the influence of the degree to which outside directors are aligned with the CEO. We view rational outside directors as trading off the costs of replacing the CEO (i.e., finding and hiring a new manager with equal or better managerial skill) against the costs of retaining the CEO [i.e., bearing

⁴ Numerous studies have documented CEO turnover rates following restatements, with estimates ranging from 29% to 88%. The length of the windows over which turnover is assessed and sample selection explain some of the variation in turnover rates across studies. For example, in studies involving firms charged with accounting fraud by the SEC, CEO turnover rates range from 36% of the CEOs in Beneish (1999)'s sample to 88% of CEOs named in the SEC's court filings in Karpoff et al. (2008), which examine turnover over longer windows. One year after the restatement, Land (2010) estimates that 45% of firms restating between 1996 and 1999 have CEO turnover, and Efendi et al. (2013) show forced CEO turnover of 36.2% among option backdating firms in 2006–2007. Two years after the restatement, Desai et al. (2006) find 51% of restating firms in 1997–1998 have turnover of their CEO, Chairman, or President, Hazarika, Karpoff and Nahata (2012) find 37% of restating firms in 1994–2004 have turnover of their CEO, and Arthaud-Day et al. (2006) observe CEO turnover in 43% for their 1998–1999 restatements. Although several of these studies do not distinguish restatements to correct errors from those to correct irregularities, the evidence in Hennes et al. (2008) that CEO turnover rates range from 8% for innocuous restatements to 49% for accounting irregularities implies that the nature of restatements included in the sample influences the observed turnover rate. Further, Leone and Liu (2010), who select firms with irregularities from recent IPOs to increase the likelihood that the firms were managed by a founder, show a turnover rate of 29% among CEOs that are also founders.

higher litigation and bonding (auditing) costs, and the foregone opportunity to signal the restoration of organizational legitimacy]. Even as they strive to make a CEO employment decision that minimizes these costs to the firm, outside directors are influenced by personal incentives stemming from their alignment with the CEO.

We depict the framework in Figure 1 and describe outside directors' minimization problem in three parts. First, the area to the right in Figure 1 corresponds to a high probability of CEO turnover: as the misreporting becomes more severe, the cost of retention becomes high relative to the cost of replacement. Nearly all prior studies model CEO turnover at the time of restatements as a function of the severity of the restatement and the strength of corporate governance (e.g., Beneish 1999; Arthaud-Day et al. 2006; Desai et al. 2006; Hennes et al. 2008; Karpoff et al. 2008; Burks 2010; Leone and Liu 2010). They argue that the cost of retaining the CEO is high (e.g., Point B) when the misreporting is severe because the firm is more likely to bear reputational damage in the market as well as more costly audit and litigation outcomes. The most striking evidence for this area of Figure 1 is the 88% CEO turnover rate found by Karpoff et al. (2008) in a sample of CEOs named in SEC court filings. This is the highest turnover rate found in a misreporting sample: it is consistent with boards firing CEOs when the costs of retention are high.

Second, the area to the left in Figure 1 corresponds to a low probability of CEO turnover because the cost of replacement is high (e.g., Point C) relative to the cost of retention. To our knowledge, Leone and Liu (2010) is the only study of restatements that explicitly takes into account the cost of replacing the CEO in the boards' executive employment decisions. Leone and Liu (2010) show that only 29% of founder-CEOs are removed, the lowest turnover rate found in a misreporting sample. Although it is possible that founder proxies for CEO power which weakens

directors' ability to monitor, it is likely that founders also have rich firm-specific human capital and that they are retained because their human capital is too costly to replace.

In the middle region, the outcome of the CEO employment decision is ambiguous to the extent that neither type of cost significantly outweighs the other. In this region, we propose that outside directors have more flexibility in deciding whether to fire or retain CEOs. We introduce a new measure of outside director-CEO alignment, and argue that the personal incentives of CEO-aligned outside directors make CEO retention more likely. In addition, we follow prior work that suggests a stronger corporate governance environment increases the likelihood of dismissal.

2.3. Costs of replacement

Economic intuition suggests that certain characteristics of CEOs make them more difficult and costly to replace. Prior work shows that founders are less sensitive to removal because of poor performance (Parrino 1997) or because their firm suffered from an accounting scandal (Leone and Liu 2010). Indeed, Leone and Liu (2010) show that boards are more likely to retain founder CEOs and sometimes shelter the CEO by using the CFO as a scapegoat. These researchers suggest their findings are consistent with two possible interpretations. First, founders are valuable executives with firm-specific human capital that is essential to the efficient operation of the firm, and second by virtue of their large share ownership founders have too much power over the board. Under the first interpretation, founder proxies for the costs of replacement and under the second, for weak governance oversight.

We control for the effect of founder, and consider alternative measures for the costs of replacing the CEO following the revelation of financial misrepresentation. First, we use two indicators to identify CEOs that underperform or outperform relative to their peers. Prior work frequently uses firm performance as a proxy for CEO ability, and shows that poorly (well)

performing CEOs are more (less) likely to be dismissed (e.g., Weisbach 1988; Morck, Shleifer, and Vishny 1989; Gibbons and Murphy 1990; Kaplan and Minton 2012; Jenter and Kanaan 2015). Performance in these studies is typically measured relative to that of industry peers to remove the effect of exogenous shocks. That is, if the CEO's performance is poor (good) relative to peers, and the board infers low (high) ability, the costs of replacing the CEO are lower (higher) as there is a larger (smaller) pool of potential replacement candidates that have better managerial skill. We measure performance relative to industry peers over the period that intersects the accountable CEO's tenure and the 24-month period before the misreporting begins. We posit that performance is only likely to play a role when it is extreme, and use the top decile and bottom quintile of industry-adjusted return performance to create extreme positive and negative performance indicators.⁵ We use these measures to test, in alternative form, the following hypotheses:

H_{1A}. All else equal, the probability a CEO is fired as a result of the misreporting is higher when the CEO under-performs relative to industry peers during the pre-misreporting period.

H_{1B}. All else equal, the probability a CEO is fired as a result of the misreporting is lower when the CEO out-performs relative to industry peers during the pre-misreporting period.

A CEO is also more costly to replace if there are no readily available internal candidates. Research has long recognized that the availability of qualified internal candidates who are ready to run the business makes CEO replacement less costly (e.g., Hermalin and Weisbach 1988), but identifying such candidates ex ante has proven difficult, because of scarce data on succession planning and difficulty in validating a candidate's qualifications. Recent studies by Masulis and Mobbs (2011) and Mobbs (2013) propose that such validation occurs when inside directors also hold outside board seats (certified inside directors or CIDs). The evidence in these studies

⁵ We select the top decile to increase the likelihood that we are capturing extreme good performance because the distribution of our sample firms in terms of industry-adjusted stock performance is negatively skewed relative to that of CRSP firms, such that our sample is over- (under-) represented in the bottom (top) quintile of the distribution.

suggests that CIDs can be associated with greater CEO turnover either because their presence improves the quality of monitoring or because their presence reduces the costs of CEO replacement. On one hand, Masulis and Mobbs (2011) show that the presence of CIDs improves the quality of monitoring and advising by the board of directors: firms with CIDs make better investment, financing, and reporting decisions, and have better operating performance. On the other hand, evidence in Mobbs (2013) is consistent with the presence of a CID lowering replacement costs. Mobbs (2013) shows that CEO turnover is more sensitive to performance in firms with CIDs, and that a significantly greater percentage of CIDs replace the CEO at the firm where they are a CID (9.23%) compared to non-certified inside directors (5.52%). This effect is more pronounced in our sample: out of the 39 firms in our sample that had a CID candidate and CEO turnover, 15 (38%) of the replacement CEOs were CIDs, whereas only 5 (13%) of the 39 removed CEOs were replaced by a non-certified inside director. Although we cannot rule out an improved monitoring explanation, we conduct additional tests and find that insiders are significantly more likely to replace the CEO in firms with CIDs as compared to firms without CIDs.⁶ This evidence makes it more likely that the higher turnover rates in restatement firms stem from CIDs providing boards of directors with a valuable low-cost replacement option. We propose, in alternative form:

H₂. All else equal, the probability a CEO is fired as a result of the misreporting is higher when there is at least one certified inside director.

⁶ We use data on CEO replacements to show that insiders are significantly more likely to replace the CEO in firms with CIDs as compared to firms without CIDs. We were able to identify the CEO replacement in 159 cases out of the 183 firms that fired the CEO. For the remaining 24 firms we were unable to determine whether an internal or external candidate replaced the CEO either because firms were acquired or went bankrupt and stopped filing with the SEC. We thus conduct two analyses that yield similar results. That is, first we assume that the CEO replacement in the 24 firms is an external candidate, and second we limited the analysis to the 159 firms for which internal and external replacement candidates can be identified. Conditional on whether the firm has CIDs, we find that insiders are significantly more likely to replace the CEO in firms with CIDs (20 of 39 or 51.3%) as compared to firms without CIDs (43 of 144 or 29.9%). The results are similar if we limit the analysis to the 159 firms: insiders are significantly more likely to replace the CEO in firms with CIDs (20 of 34 or 58.8%) as compared to firms without CIDs (43 of 125 or 34.4%).

2.4. *Outside director-CEO alignment*

Outside directors are the final arbiters on issues of CEO compensation and employment where agency problems are significant (Fama and Jensen 1983). In a world where outside directors have incentives to build good reputations to retain their current directorships or increase the number of boards on which they serve in the future, outside directors would weigh the costs of replacement and the costs of retention so as to make the CEO employment decision that maximizes shareholder wealth. Yet, there is increasing evidence suggesting that when outside directors deviate from these value maximizing decisions, they do not suffer significant wealth and reputational penalties.⁷ Further, recent findings suggest personal connections between outside directors and CEOs matter in terms of turnover-performance sensitivity (Hwang and Kim 2009).

The structure of the board of directors facilitates a sociological network that can align directors through a sense of familiarity, loyalty, trust, and information sharing. We draw on research that shows that economic behavior is affected when economic actions are embedded in social interactions.⁸ On the positive side, embeddedness enhances the availability of credit and improves the terms of lending (Uzzi 1999), and mutual-fund managers enjoy an informational advantage via their education networks (Cohen et al. 2008). On the other hand, socially connected

⁷ For example, Agrawal et al. (1999) find no evidence of increased director turnover. Although Srinivasan (2005) documents outside director turnover at firms with restatements, those same directors are not removed from other boards on which they serve. The evidence is also inconclusive in samples of firms with lawsuits. Helland (2006) finds that outside directors in sued firms experience an **increase** in the number of other board seats held following a lawsuit, and Fich and Shivdasani (2007) show that outside directors do not face abnormal turnover on the board of the sued firm, but experience a decline in other board seats held. Further, Marshall (2015) finds that dissenting directors--ostensibly a characteristic of stronger monitoring--experience a **net loss** in board seats and that director compensation decreases following their resignation due to board disputes.

⁸ Further, a literature on social embeddedness exists which describes features of mixing economically motivated decisions and non-economically (socially influenced) motivated decisions among groups of individuals, which can be paralleled within the context of the organizational structure of the board of directors. Granovetter (1985, 2005) describes (i) how social networks can affect economic outcomes through the flow and quality of information, (2) the effect of rewards and punishments within the network, and (3) the trust and confidence with which members of the group make decisions in the interest of the group.

boards overpay CEOs and are less likely to remove them for poor performance (Hwang and Kim 2009).

The extant literature measures social embeddedness relying either on survey responses to establish connections between economic agents, or on identifying personal links using publicly available biographical information on managers and corporate directors (e.g., social ties through overlapping employment, academic study, military service, and professional or social clubs).⁹ We provide an alternative measure that draws on the definition of embeddedness: the transfer of granular information between embedded parties and the implicit trust that exists between such parties. Our alternative measurement of embeddedness assesses directors' trading decisions over the test period, which is defined as the intersection of the restatement period minus one year and the tenure period of the CEO who is accountable for the misreporting (see Figure 2). We allow the test period to begin one year prior to the beginning of the restatement period following Beneish (1999) who shows abnormally high levels of insider selling before earnings are manipulated.

There is evidence that CEOs sell their equity-contingent wealth at abnormally high levels during periods in which earnings are overstated, and profit by doing so in advance of the public discovery (e.g., Beneish 1999; Li and Zhang 2006; Leone and Liu 2010). We examine whether the trades of outside directors and CEOs are concordant. Prior work has long recognized an 'information hierarchy' where officers possess more valuable information than outside directors and large shareholders (Basel and Stein 1979; Lin and Howe 1990; Seyhun 1998; Beneish and

⁹ In terms of surveys for example, Uzzi (1996) conducts interview surveys with CEOs and various employees of New York apparel companies to assess inter-firm cooperation and provides evidence of that social embeddedness positively affects economic outcomes. Uzzi (1999) interviews relationship managers at eleven mid-market banks in Chicago and finds that their social connection to clients increases the availability of funds and reduces the cost of borrowing. Ingram and Roberts (2000) survey 51 of Sydney Australia's high-end international niche hotels and find that informal friendships with competitors improves firms' economic performance through cooperation in attracting large conventions, recommending overflow customers, and sharing of information on market conditions. Finally, Westphal, Boivie, and Chng (2006) survey a random sample of 600 large and medium sized US firms on the Forbes industrial and service index to examine CEOs' friendship ties to other firms' top managers. They find that CEOs maintain informal ties to other leaders to reduce uncertainty regarding supply, customer demand, and availability of capital.

Vargus 2002; Armstrong et al. 2010; Armstrong, Core, and Guay 2014). We argue that if outside directors emulate CEOs' selling and benefit from the misstated accounting, they are more likely to have received information from the CEO. Consequently, if outside directors are more likely to be aligned with the CEO, they are less likely to remove the CEO.¹⁰ Because the CEO and outside directors both benefit by selling at higher prices (relative to post-restatement share values), we label this behavior as 'collusive abnormal selling' and describe the computation and the various measures we use to estimate abnormal selling in the Appendix. We thus view contemporaneous abnormal selling by the CEO and outside directors as a form of alignment and, in alternative form, predict that:

H₃. All else equal, the probability a CEO is fired as a result of the misreporting is lower if both the accountable CEO and outside directors engage in abnormal insider selling over our test period.

3. Sample and model

The primary sources for the accounting restatements consist of the combination of Accounting and Auditing Enforcement Releases (AAER), General Accounting Office (GAO), and Audit Analytics databases. Stock return and accounting data are from the Center for Research in Security Pricing (CRSP) and COMPUSTAT respectively, and various measures of corporate governance are from BoardEx, Compact Disclosure, and SEC Filings.

3.1. Restatement sample

We draw our sample from three sources of accounting restatements. The first source includes firms that are charged with GAAP violations by the Securities and Exchange Commission

¹⁰ It is also possible that firing the CEO can attract the attention of regulators or the plaintiff's bar to directors' own selling transactions. Our reading of lawsuit filings suggests that directors are rarely sued, and only named in complaints when they 'bail out' in periods of declining prices. Although this is consistent with arguments in Srinivasan (2005) and Brochet and Srinivasan (2014), the latter surprisingly report that SEC actions and accounting manipulations reduce the likelihood of lawsuits against directors (Brochet and Srinivasan 2014, Table 3 and page 437).

in Accounting and Auditing Enforcement Releases. The second source consists of the subset of restatements related to irregularities from the GAO database. We rely on Hennes et al. (2008) to identify restatements due to accounting irregularities from the GAO database. The third source consists of the subset of restatements related to irregularities from Audit Analytics where we again implement the technology from Hennes et al. (2008) to identify irregularities. As such, all restatements in our sample involve intentional misstatements.

Panel A of Table 1 reveals that we identify 739 misstatements from the AAER, GAO, and Audit Analytics databases. We drop 173 firms that are not in COMPUSTAT, 120 firms with missing announcement returns in CRSP, and 19 firms that are not in the Thomson Financial Insider Trading database. Our final sample consists of 427 restatements of intentional misreporting over the period 1993 to 2007.

3.2. CEO turnover

Firms often initiate investigations into accounting irregularities months before the restatement announcement is made. As a result, the firm could make a turnover decision before the restatement is made public. Identifying the correct CEO is important, and prior work has shown that focusing on the officers in place at the time of the announcement can lead to the erroneous conclusion that the board failed to terminate the CEO when in fact the previous CEO had been replaced before the restatement was made public (Karpoff et al. 2008).

We hand collect CEO turnover data from proxy, 8-K, and 10-K filings with the SEC and from media articles found in Factiva. For each sample firm, we track CEOs from one year prior to the beginning of the restatement period to two years subsequent to public discovery. If the CEO is dismissed in the 18-month window (-6, +12) relative to the restatement announcement month, we treat the CEO as the accountable CEO (if the CEO “resigns” we require the resignation to be

related to the restatement). Outside of that window, we require that 8-K filings, court documents, or media articles specify that the termination or resignation is related to the restatement. In the affirmative, we code those CEOs as accountable and dismissed.¹¹ In cases where multiple CEOs' tenures overlap the restatement period, we designate as accountable the CEO who has the largest overlap and who has departed closest to the announcement date of the restatement.

In addition to CEO turnover, we seek to identify 'real' turnover. We propose that a founder-CEO, who also serves as Board Chair, could be more willing to 'resign' as CEO so long as he/she remains on the board. In these cases, the founder effectively remains at the helm of the firm and we view these founder-chairman-CEO 'resignations' where founders remain on the board as window-dressing exercises.¹² These instances provide the appearance of effective monitoring, but the dismissal of the CEO leaves the leadership of the firm unchanged, suggesting that CEO turnover as conventionally measured misclassifies these founder-chairman-CEO 'resignations.' We use this measure of adjusted CEO turnover in all subsequent tests.

In Panel B of Table 1, we report the frequency of restatements and the associated turnover rates. The incidence of turnover is in line with prior work: In our sample, CEO turnover is 46.1%, adjusted CEO turnover is slightly lower at 42.9%, and CFO turnover is 62.8%. In addition, the pattern of decreasing CEO and CFO turnover over time is consistent with Burks (2010) who notes that CEO turnover in firms with restatements decreases after 2002 and suggests that more recent restatements are less severe.

¹¹ We identify nine cases outside of the (-6, +12) window: in 3 cases the culpable CEO was fired after the stated window in months (+14, +15, +16) and in 6 cases the culpable CEO was fired prior to the stated window (two each in months -7 and -8, one in month -13, and one in month -20).

¹² Recent findings are consistent with the notion that founder-CEO resignations are window-dressing exercises when founders stay on the board. Evans, Nagarajan, and Schloetzer (2010) study firms that removed CEOs from the CEO position but retained them on the board for an extended period. They show that in such firms, new CEOs are less experienced and weaker in bargaining power. Moreover, Fahlenbrach, Minton, and Pan (2011) show that founders who resign from the CEO position but stay on the board are more likely to return as CEO when firm performance deteriorates. These empirical findings corroborate the theory that a founder lingering on the board not only influences the new CEO but also actually retains control at the firm.

In Panel C, we compare our sample firms to the universe of firms in COMPUSTAT in terms of accounting performance and firm characteristics. We assign each firm in our restatement sample a percentile rank by comparing them to all firms in COMPUSTAT in the same year. The comparison shows that restating firms appear to be slightly larger and have higher sales growth, but have significantly poorer accounting performance (measured by return on assets and cash flow to price) in the year prior to the announcement of the accounting restatement. Figure 2 shows the timeline for the typical accounting restatement and CEO retention decision. The average restatement period covers 2.5 years. If the board decides to fire the CEO, the average departure date is 2.5 months following the public announcement of the accounting restatement.

3.3. Model

We model the probability that a CEO is fired by the board of directors by considering the hypothesized proxies for the costs of replacement, outside director-CEO alignment, and costs of retention, while controlling for the governance environment and firm characteristics that have been documented in prior work as we detail below (e.g., Palmrose, Richardson, and Scholz 2004; Hennes et al. 2008; Burks 2010; Leone and Liu 2010):

$P(\text{CEO Fired}=1) = 1/(1+e^{-Y})$, where

$Y = a_0$

Costs of Replacement

+ a_1 CEO Under-Performance + a_2 CEO Out-Performance + a_3 Certified Inside Director
+ a_4 Founder-CEO

Outside Director-CEO Alignment

+ a_5 Collusive Abnormal Selling

Costs of Retention

+ a_6 AAER + a_7 Restatement Anncmt. Return + a_8 Litigation + a_9 Annual + a_{10} Subsidiary

Governance Environment

+ a_{11} Board Ownership + a_{12} Board Independence + a_{13} Small Board + a_{14} Old Board
+ a_{15} CEO Retirement Age + a_{16} CEO/Chairman Duality + a_{17} CEO/Director Social Ties

Firm Controls

+ a_{18} Log of Sales + a_{19} Prior Stock Performance + a_{20} Cash from Operations

+ error,

(1)

where:

CEO Under-Performance	= Indicator that, during the accountable CEO's tenure, the firm's stock performance is in the bottom quintile relative to its industry within the 24-month period before the misreporting begins
CEO Out-Performance	= Indicator that, during the accountable CEO's tenure, the firm's stock performance is in the top decile relative to its industry within the 24-month period before the misreporting begins
Certified Inside Director	= Indicator that at least one executive director serves on the board of directors of another public company at the time of the CEO turnover decision
Founder-CEO	= Indicator that the CEO is the founder (or co-founder) of the firm
Collusive Abnormal Selling	= Indicator that the accountable CEO and outside directors are abnormal sellers in our test period
AAER	= Indicator that the firm is subject to an accounting and auditing enforcement action by the SEC
Restatement Annncmt. Return	= Market-adjusted three-day return from day -1 to +1 of the restatement announcement date
Litigation	= Indicator that 10b-5 litigation (related to the corresponding accounting restatement) was filed
Annual	= Indicator that an annual report (10-K) was restated rather than a 10-Q
Subsidiary	= Indicator that the firm's restatement occurred at the subsidiary level
Board Ownership (%)	= Fraction of stock owned by the board of directors in the year prior to the restatement announcement.
Board Independence	= Fraction of (conventionally) independent directors
Small Board	= Indicator that the number of directors is less than that of the median firm
Old Board	= Fraction of directors known to be over 69 years old
CEO Retirement Age	= Indicator equal to 1 if the CEO is of retirement age (age 63 through 66) at the time the fraud is discovered
CEO/Chairman Duality	= Indicator that the CEO is also the Chairman of the Board
CEO/Director Social Ties	= Indicator that the percentage of social connections between the CEO and other current members of the board is greater than that of the median firm
Log of Sales	= Log of sales
Prior Stock Performance	= Market-adjusted monthly return from month -24 to 0 of the restatement announcement date
Cash from Operations	= Cash flow from operations divided by lagged total assets

3.4. Restatement severity, governance environment, and firm controls

Although all of the restatements in our sample involve intentional misstatements, there is variation in restatement severity that can affect the extent to which the board is able to exercise discretion in making the CEO turnover decision. We control for severity in five ways. First, we argue that restatements that lead to an AAER are particularly severe, given that the SEC is highly selective in pursuing enforcement actions (Beneish 1999; Karpoff et al. 2008). Next, we use four severity proxies proposed by prior studies including, the restatement announcement return (among others, Palmrose et al. 2004, Hennes et al. 2008; Burks 2010), whether there was subsequent litigation (Burks 2010), whether the restatement affected an annual v. quarterly report (Hennes et al. 2008), and whether the misreporting occurs at the subsidiary level given evidence that such irregularities are less likely to lead to CEO removal (Hennes et al. 2008).

Corporate governance measures have been shown to affect CEO turnover in firms with poor performance. Prior research suggests that the sensitivity of CEO replacement to poor performance is higher in firms with lower ownership stakes by officers and directors (Denis, Denis, and Sarin 1997), a higher proportion of outside directors (Weisbach 1988; Jenter and Lewellen 2016), smaller boards (Yermack 1996; Jenter and Lewellen 2016), younger board members (NACD 1996), and after the passage of Sox (Kaplan and Minton 2012; Burks 2010). As well, CEOs who are of retirement age, have longer tenure, hold the Chairman position, and who have higher ownership are less likely to be fired (Jenter and Kanaan 2015). We also control for firm size (log of sales) and firm performance characteristics (prior return performance and cash from operations).

3.5. Sample characteristics

In Table 2, we compare firms that fire the CEO with firms that retain the CEO along several dimensions. Panel A compares the subsamples in terms of costs of replacement and

outside director-CEO alignment. Consistent with economic intuition, firms fire CEOs when CEOs are less costly to replace. Thus, firms are more likely to fire CEOs who have under-performed their peers prior to the restatement (e.g., performance in the bottom quintile 25.7% v. 15.6%). Further, firms are less likely to fire CEOs who have out-performed their peers prior to the restatement (e.g., performance in the top decile 6.0% v. 13.1%). In addition, firms are more likely to fire the CEO when there are more certified inside directors (21.3% v. 8.2%), fewer founder-CEOs (24.6% v. 42.6%), fewer founder-CEO-chairmen (18.7% v. 29.2%), and CEOs with shorter tenures (6.6 v. 11.3 years).

In terms of alignment within the board, we compare subsamples with respect to insider selling. Boards that fire the CEO are less likely to have sold their equity-contingent wealth over the restatement period (59.6% v. 73.8%). They are also less likely to have both outside directors and the CEO jointly selling (34.4% v. 45.0%) or abnormally selling (25.7% v. 36.5%) their equity-contingent wealth contemporaneously.¹³ However, there is no difference across subsamples when outside directors and the CEO are jointly abnormally buying, abnormally selling, or abstaining from trading.

The remaining comparisons relate to various characteristics of firms and of restatements examined in prior work that we use as controls in our multivariate analyses. The comparison reveals that firms that fire the CEO have more severe accounting restatements: they are more likely to be the subject of SEC enforcement actions (50.3% v. 19.3%), have more negative three-day announcement returns (-15.6% v. -7.2%), are more likely to be under litigation (68.9% v. 44.7%), are less likely to be subsidiary related (10.9% v. 18.0%), and are more likely to fire the CFO (83.6% v. 47.1%). In addition, firms that fire the CEO also have boards with fewer outside

¹³ In the Appendix, we describe how these insider trading measures are constructed, and discuss three alternative measures of abnormal selling based on John and Lang (1991), Beneish and Vargus (2002) and Cohen, Malloy and Pomorski (2012).

directors (64.0% v. 70.5%), fewer social ties (15.3% v. 27.0%), worse accounting and return performance (e.g., ROA is -11.2% v. -5.2%; 2-year prior stock performance is -56.7% v. -18.2%), greater risk of information asymmetry as measured by monthly stock return volatility (0.049 v. 0.040), and greater analyst coverage (55.5% v. 43.4%).

Overall, these comparisons suggest effects that are consistent with the direction of our three hypotheses and with the economic relationships shown in prior work. Firms that fire the CEO have lower costs of replacement (their CEOs have worse track records, are less likely to be founders, and it is likely that there is an internal replacement candidate serving on the board). CEOs who manage to keep their jobs appear to be more directly aligned with outside directors (there is a higher frequency of abnormal selling collusion between the CEO and outside board members). Firms that retain the CEO also have lower costs of retention (they are less likely to be the subject of an SEC enforcement action or to be involved in 10b-5 litigation proceedings).

On one hand, boards appear to take into account the cost of replacing and retaining the CEO following the discovery of accounting irregularities. This can explain why some boards decide to retain the CEO even though the latter could have facilitated the misreporting. On the other hand, these results suggest that boards of restating firms potentially have dis-incentives to remove CEOs due to a conflict of interest. We thus consider these possibilities jointly and control for alternative explanations offered in prior research including firm performance, the severity of misreporting, and conventional corporate governance characteristics.

Correlations between all variables used in the subsequent regression analyses can be found in Table 3. Generally speaking, the correlations between CEO turnover and various independent variables confirm the comparisons discussed in Table 2. For example, the correlation between CEO turnover and (1) CEO under-performance is positive (0.125), (2) CEO out-performance is

negative (-0.117), and (3) the availability of a certified insider director as a replacement is positive (0.188). The correlations between CEO turnover and our measure of outside director-CEO alignment is negative [collusive abnormal selling (-0.115)]. In addition, correlations between CEO turnover and our proposed measures for costs of replacement and for outside director-CEO alignment are statistically significant and in the expected direction.

There are also a number of correlations between independent variables that are large. Because these measures tend to capture the same underlying concept, we do not use them in the same regression — e.g., variables (9) and (10) on collusive selling (0.823), variables (13) and (14) on litigation (0.668) or variables (11) and (21) because firms became more careful to avoid enforcement actions (AAERs) after the passage of SOX (-0.474). Founder and tenure of the CEO, (6) and (8), also appear to be substitutes as they are highly correlated (0.448), and CEO tenure (8) captures the quality of the manager as it is positively correlated with the CEO out-performance indicator (4) (0.172), stock returns (26) (0.211), and accounting return (28) (0.220). Other independent variables measuring different attributes have significant correlations greater than 0.20 (in absolute value). As such, we examine variance inflation factors, and find no evidence that particular independent variables or groups of variables are inflating the variance of the parameter estimates.

4. Empirical results

4.1. CEO turnover

Table 4 presents the results of four logistic regressions in which the dependent variable identifies CEOs fired as a result of the misreporting. The four specifications present the following progression. Specification (1) presents a base model drawn from variables commonly used in prior work to capture restatement severity, the corporate governance environment, and firm

characteristics. Specification (1) has 14 explanatory variables and a pseudo- R^2 of 14.5%. Specification (2) adds the founder variable to the base model in an attempt to capture replacement costs and CEO power (following Leone and Liu 2010) and the pseudo- R^2 increases to 16.6%. Specification (3) adds the AAER variable intended to incrementally capture restatement severity and the pseudo- R^2 increases to 21.2%. Finally, specification (4) adds the four variables we use to test our hypotheses and the pseudo- R^2 increases to 23.8%. In sum, Specification (4) represents an improvement in explanatory power of 64.1%, 43.4%, and 12.3% over Specifications (1), (2), and (3) respectively, and we focus our discussion on the most complete model.¹⁴

The evidence on the costs of replacement provides support for H_{1A} : CEOs are 17.0% more likely to be fired when they have a poor track record relative to their peers prior to the misreporting (0.7382, p-value = 0.038). However, the evidence does not support H_{1B} : the coefficient on CEO out-performance is numerically negative, but is not significant at conventional levels (-0.7020, p-value = 0.149).¹⁵ We also find that CEOs are 14.6% more likely to be fired when there is a readily available replacement candidate serving on the board of directors (0.6224, p-value = 0.082). This is weakly consistent with H_2 . Further, consistent with Parrino (1997) and Leone and Liu (2010), we find that founder-CEOs are 21.4% less likely to be fired than non-founder-CEOs (-0.8858, p-value = 0.001).

The next variable evaluates whether the alignment of outside directors with the CEO influences their discretion exercised in making a CEO employment decision. We measure collusive abnormal selling as net selling by the CEO and outside directors in the test period that exceeds any net selling by the CEO and outside directors in the prior two-year period. We find

¹⁴ Our restatement sample consists of 427 firm observations, but, for two firms, we are missing data for a subset of independent variables. Our logistic regressions are thus based on 425 observations.

¹⁵ Our findings are similar to Jenter and Kanaan (2015) who find that underperforming relative to peers has a significant effect on forced CEO turnover, but outperforming does not.

that CEOs are 15.1% more likely to be retained when both the CEO and outside directors are abnormally selling shares of stock during the restatement period (-0.6120, p-value = 0.026).¹⁶

In terms of control variables, our findings include the following: (1) firms subject to regulatory intervention by the SEC are more likely to fire the CEO (1.2285, p-value = 0.0001), (2) firms with worse announcement returns are more likely to fire the CEO (-1.6686, p-value = 0.028), and (3) firms subject to 10b-5 litigation are more likely to fire the CEO (0.8304, p-value = 0.001). These results suggest that the costs of retaining the CEO increase with the severity of the misreporting and are consistent with evidence from Hennes et al. (2008) and Karpoff et al. (2008). Findings on the governance environment and firm controls include: (4) firms with greater stock ownership by the board are less likely to fire the CEO (-0.0187, p-value = 0.047), (5) firms with greater board independence are less likely to fire the CEO (-1.1647, p-value = 0.041) -- a counterintuitive result also found in prior research studying CEO turnover and compensation which reports either an insignificant or unexpected relationship with board independence (e.g., Faleye, Hoitash, and Hoitash 2011; Core, Holthausen, and Larcker 1999), and (6) firms with weaker prior stock performance are more likely to fire the CEO (-0.4863, p-value = 0.002).¹⁷

4.2. Board discretion and restatement severity

¹⁶ We obtain similar results using the alternative abnormal trading proxies described in the Appendix (untabulated, available upon request).

¹⁷ In untabulated tests, we control for whether the restatement relates to option backdating (available on request). We find that the coefficient estimate of the option backdating indicator is not distinguishable from zero and our other findings remain unchanged. As well, because option backdating is clustered around the latter part of our sample, we find that excluding these observations leaves our other results unchanged. The number of restatements related to option backdating in our sample (N=20) is small relative to the list of 141 firms identified by the *Wall Street Journal* (WSJ), and used in prior work (e.g., Efendi et al. 2013). However, the number of WSJ-identified firms in our sample is consistent with the number of irregularities/fraud observations related to option backdating in the Hennes, et al. (N=15) and Audit Analytics (N=26) databases. This is because most of the WSJ-identified option backdating cases are voluntary disclosures of an informal inquiry by the SEC, rather than cases where firms are the object of a formal SEC investigation or an enforcement action. Firms that make these voluntary disclosures often indicate a willingness to cooperate and self-police. We conjecture that this accounts for the lower rates of CEO turnover in such firms, because retention cost are lower as regulators have increasingly adopted policies of non-prosecution for such firms (Leone and Liu 2010; Arlen 2012).

The board of directors (as a whole or by special committee) is often responsible for investigating the misreporting and identifying the responsible parties. We argue that outside directors have more discretion and greater ability to retain the CEO when the misreporting is less severe (i.e., retention cost is lower). That is, in the most egregious cases, the cost of retention is prohibitively high and the board cannot begin the task of re-establishing organizational legitimacy and re-building the firm's reputation without first firing the CEO. Similarly, we argue that outside directors have more discretion to retain the CEO when the costs of replacement are not prohibitive. Thus, in less severe cases, directors could shield a CEO from blame if they find the CEO particularly costly to replace—for example, when the CEO has a comparable track record to industry peers or there is not an obvious replacement candidate. In sum, we conjecture that the CEO employment decision is more subjective in less severe cases or when it is especially difficult to find a suitable replacement. We investigate whether directors' alignment helps us explain potentially ambiguous employment decisions: if directors are aligned with the CEO, they have a personal incentive to shield that particular CEO from blame.¹⁸

We test this conjecture in Table 5 by analyzing CEO turnover in cross-tabulations of levels of retention cost or replacement cost with various proxies for outside director-CEO alignment. We classify a firm as having a high retention cost if they have at least three of the following five characteristics: they are subject to an accounting and auditing enforcement action by the SEC, the announcement return was in the bottom 20% of the sample, 10b-5 litigation was filed, an annual report (10-K) was restated rather than a 10-Q, and the firm's restatement did not occur at the subsidiary level, where at least two of the three are either AAER, announcement return in the

¹⁸ In a 2007 Businessweek article, Sulkowicz describes examples of CEO attachment issues experienced by board members: "Often, one of the hardest things for the board of directors is letting go of the emotional attachment the members have for the CEO ... Some directors have friendships with him. Others identify with him, as CEOs themselves. Still others can't admit they might have been mistaken when they supported (or even hired) him."

bottom 20%, or litigation. Similarly, we classify a firm as having high replacement costs if they have all three of the following characteristics: the CEO does not under-perform its industry peers, there is no certified inside director serving on the board, and the CEO is a founder.

The tenor of the results in Table 5 is consistent with our conjecture that outside director-CEO alignment generally plays a more important role in the CEO turnover decision in firms with low retention costs or low replacement costs. When neither the retention costs nor replacement costs are excessively high relative to the other, directors are able to exercise some level of discretion. In Panel A, the alignment measure appears to influence the CEO firing decision more strongly in cases where the accounting restatements are less severe or where the retention cost is low. Specifically, the measure of outside director-CEO alignment suggests that CEOs are less likely to lose their jobs when the CEO and outside directors profit through abnormal selling (19.1% v. 36.4%). The difference in CEO turnover across this dimension of alignment is only significant for less severe restatements. If the restatement occurred at a firm with high retention costs, alignment with outside directors would not shelter the CEO from removal. In Panel B, the alignment measure also influences the CEO firing decision only in cases where the replacement costs are lower or a replacement candidate is more readily available.

Table 6 presents multivariate tests of the partitions described in Table 5 using interactions to capture the cross-tabulations in Table 5. We interact our measure of outside director-CEO alignment with dummy variables for firms categorized as having high or low retention costs or replacement costs. Consistent with the univariate results, we find that collusive abnormal selling (-0.6411, p-value = 0.017) is only significantly related to CEO turnover for less severe restatements (lower costs of retention). The sign on the high retention cost indicator is positive and significant as would be expected from Figure 1. Thus, holding replacement costs constant, if a firm has lower

retention costs such that the minimized total cost point falls in the ambiguous region (e.g., point A of Figure 1), directors appear to exercise more discretion in making the employment decision by taking into account their own level of alignment with the CEO.

Similarly, when the outside director-CEO alignment proxies are interacted with the high and low replacement cost indicators, we find that collusive abnormal selling (-0.7157, p-value = 0.011) is only significantly related to CEO turnover for cases where the firm has low replacement costs. The sign on the high replacement cost indicator is negative and significant as would be expected from Figure 1. Thus, given restatement severity, if a firm has lower replacement costs such that the minimized total cost point falls in the ambiguous region (e.g., point A of Figure 1), directors appear to exercise more discretion in the turnover decision.

The evidence in Tables 5 and 6 is consistent with directors evaluating the costs of replacement and retention while taking into account their alignment with the CEO. In restatements that are more ambiguous because they are not severe enough to warrant an automatic dismissal or finding a replacement is not excessively costly, the board appears to exercise some discretion by considering their own personal incentives in this important monitoring decision.

5. Robustness

5.1. Alternative estimation methods

We present in Table 7 three alternative estimations of equation (1). Specifically, we use (1) a two-stage selection model by Heckman (1979), (2) a two-stage selection model by Heckman (1979) with year fixed-effects to control for time-variant effects (such as the passage of Sox) and industry fixed-effects to control for unobserved time-invariant industry-specific characteristics that might be correlated with CEO turnover, and (3) a logistic regression with year and industry fixed effects.

First, we recognize that in our sample, we only observe firms that are ‘caught’ manipulating earnings and who restate their financial results. A potential selection bias exists if firms that are caught intentionally misreporting are innately different from firms that either do not misreport or firms that misreport but do not get caught. To address this concern, we use the two-stage selection model by Heckman (1979) to test for the severity of the potential selection bias and make corrections as necessary. Since our outcome equation (CEO Turnover) has a dichotomous dependent variable, we estimate a bivariate probit model with selection using HECKPROB in STATA. In this procedure, a first stage probit regression is estimated on the entire COMPUSTAT population to control for determinants of selection. In the second stage, a probit regression is estimated on the model described by equation (1) using the Heckman procedure which provides consistent, asymptotically efficient estimates of all parameters in the probit outcome model and tests for the severity of the selection bias.

We specify our first stage selection model as follows:

$$P(\text{Firm has accounting restatement}=1) = 1/(1+e^{-Y}),$$

where $Y = a_0$

$$+ a_1 \text{ Proxies for Potential SEC Enforcement Action} + a_2 \text{ Cash Flow to Price} + a_3 \text{ Bankruptcy Score} \\ + a_4 \text{ Book-to-Market} + a_5 \text{ Log of Sales} + a_6 \text{ Sales Growth} + a_7 \text{ Leverage} + a_8 \text{ Income Loss} \\ \text{Indicator} + a_9 \text{ Fiscal Year Return} + a_{10} \text{ ROA} + \text{error.} \quad (2)$$

Our first variable measures a firm’s information set regarding the potential for an SEC enforcement action based on the physical location of the firm’s headquarters. Kedia and Rajgopal (2011) provide evidence that the SEC is more likely to investigate firms that are geographically closer to its regional offices or the SEC headquarters in Washington D.C. and they interpret their evidence as consistent with a ‘constrained cop’ hypothesis. Given that the SEC’s resources are

constrained, firms anticipate that the SEC will find it more cost effective to initiate an investigation at firms located closer to their offices.¹⁹ The remaining variables are intended to distinguish restating firms from firms in the COMPUSTAT population over the same time period in terms of risk, profitability, growth, and pricing characteristics. The idea is that firms with higher risk of financial distress, declining profitability, higher growth opportunities, and glamour characteristics likely have both greater incentives to manipulate earnings and greater visibility in terms of regulatory or auditor actions.²⁰

As with the traditional Heckman model (continuous outcome variable) we need to include at least one variable in the selection model that does not appear in the outcome equation to ensure that our selection model is correctly identified (Sartori 2003). We have several such variables to satisfy exclusionary restrictions because only Log of Sales appears in both the selection and outcome equations. In addition, the proxies for the likelihood of SEC enforcement also satisfy exclusionary restrictions because they could influence a firm's estimate of the likelihood of being caught if they misreport and thus affect their decision to misreport in the first place, but do not influence the CEO retention decision directly.

In the first column of Table 7, we report the corrected coefficients and p-values from the second stage of the Heckman selection model using proxy (1), which is the number of past SEC enforcement actions at other firms located in the same county as the firm's headquarters at the beginning of the restatement period, to capture potential SEC enforcement action in the first stage. The likelihood ratio test of independence ($\rho = 0.1685$, $p\text{-value} = 0.567$) suggests that the models are independent and our selection bias is not severe.

¹⁹ We consider three proxies proposed by Kedia and Rajgopal: (1) the number of past SEC enforcement actions at other firms located in the same county as a firm's headquarters at the beginning of the restatement period, (2) an indicator for the minimum distance between a firm's headquarters and the nearest SEC office being less than 100 kilometers, and (3) the distance in kilometers between a firm's headquarters and the nearest regional SEC office or SEC headquarters.

²⁰ Univariate statistics of firm characteristics used in the first stage for our sample can be found in Table 2 (Panel D).

Second, we recognize that there could be time-variant effects (such as the passage of SOX) and time-invariant industry-specific characteristics that might be correlated with CEO turnover. The second column of Table 7 reports results from the second stage of the Heckman selection model using proxy (1) for potential SEC enforcement action, while also adding year and industry fixed effects in the second stage.²¹ The corrected coefficients and associated p-values from columns 1 and 2 show that the effects of under-performance, out-performance, founder status, and collusive abnormal selling on CEO turnover remain. In our third robustness check, we estimate the full model in equation (1) by adding year and industry fixed effects to the logistic regression, and the results are similar to our findings in Table 4.

5.2. Alternative explanatory variables

In Table 8, we present estimates of equation (1) with either additional or alternative explanatory variables. Specifically, we (1) consider two additional variables to control for the firm's information environment in the year preceding the restatement announcement and (2) replace collusive abnormal selling with a variable that captures either collusive abnormal trading (buying or selling), or simply concordant behavior—e.g., outside directors and the CEO are jointly abnormally buying, selling, or abstaining from trading.²²

Recent research suggests that information asymmetry between insiders and outsiders is an important determinant of monitoring effectiveness (Duchin, Matsusaka, and Ozbas 2010). We consider several information asymmetry proxies from prior work, including analyst following and stock return volatility. In column 1 of Table 8, we reproduce the estimation of equation (1) augmented by these two controls for the firm's information environment prior to the restatement

²¹ Results are similar if we use proxies (2) or (3) for potential SEC enforcement action in the first stage, both with and without year and industry fixed effects in the 2nd stage (untabulated, available upon request).

²² There are only four cases during the test period where outside directors and the CEO are jointly abstaining from trading and they are all in the subsample where the CEO is retained.

announcement. We find that one of the two variables (Analyst) attains significance (0.5268, p-value = 0.035). This would suggest that having at least one analyst follow the firm makes CEO turnover related to restatements more likely, and is consistent with the notion advanced by Duchin et al. (2010) that analyst coverage reduces the potential information asymmetry between insiders and outsiders, and increases the monitoring effectiveness of outside directors. More important, we show qualitatively similar results on the variables we use to test our hypotheses.

Also, we rule out the possibility that the results on collusive abnormal selling are simply driven by collusive trading amongst directors. This could arise if directors simply have access to similar information. We construct two measures in which the trading behavior of directors agrees with that of the CEO. In column 2, the coefficient on collusive abnormal trading (abnormal buying or selling) is not distinguishable from zero (-0.1292, p-value = 0.606). Similarly, in column 3, the coefficient on concordant trading behavior (abnormal buying, selling, or no trading) does not attain significance (-0.2198, p-value = 0.378). These results suggest that it is when directors profit by selling their shares to avoid losses that they are less likely to fire the CEO and not just when they are trading in the same direction or jointly abstaining from trading.

6. Conclusion

In this study, we provide two classes of explanations as to how CEOs are able to retain their positions following the public revelation of an instance of misreporting. First, we show that CEOs are more likely to be retained when the cost of replacing them is high. We propose alternative measures for the costs of replacing the CEO in misreporting firms: (1) a measure of CEO performance relative to their industry peers, and (2) whether the firm has a readily available replacement candidate serving on the board following evidence in Mobbs (2013) that the presence of certified inside directors reduces the cost of replacing CEOs. Consistent with economic

intuition, we find that a poor (strong) track record relative to industry peers in the period before the misreporting begins decreases (increases) the likelihood that the CEO is retained, and that the CEO is less likely to be retained when there is a readily available replacement candidate serving on the board (a certified inside director). Our findings on these measures of the costs of replacement obtain incrementally to whether the CEO is one of the founders (Leone and Liu 2010) and are robust to controlling for potential costs of retention, corporate governance measures, and firm characteristics.

Second, we examine whether boards exercise discretion in terms of CEO employment as part of their response to the revelation of an accounting irregularity. We find that boards not only weigh how the retention and replacement costs affect shareholders' wealth, but their decisions also encompass the extent to which outside directors and CEOs are aligned. This is particularly the case when restatements are not severe enough to warrant an automatic dismissal and when replacement costs are not high enough to justify automatic retention. Specifically, we find that collusive abnormal selling only influences the CEO turnover decision when the turnover decision is less clear based on the levels of retention and replacement costs.

Collectively, our proposed measures of costs of replacement and outside director-CEO alignment improve the explanatory power of the decision to retain by 43.4% relative to a benchmark model representative of models used in prior work. These results are robust to incorporating any potential effects from sample selection bias, controlling for year and industry fixed effects, and controlling for the information environment of the firm which can influence the level of private inside information or transparency.

Limited observability is a common hurdle faced by studies on the role of corporate boards. Without being able to observe the deliberations of boards, researchers have correlated observable

outcomes of decisions where potential agency conflicts are more acute (e.g., CEO turnover). This paper contributes to the literature on the board's response to accounting irregularities with regard to the CEO turnover decision. Our evidence suggests that we ought to consider directors' trading behavior, an additional and observable measure of outside directors' alignment with the CEO, as a relevant agency conflict. As this proxy operationalizes information sharing and trust and explains CEO turnover incrementally to social connections determined via biographical overlap, our evidence suggests a new construct for studies of economic decision-making in the presence of an embedded social relationship.

A.1. Proxies for information-motivated selling

Our test period begins at the later of one year prior to the start of the misreporting period and the start of the tenure of the CEO who is accountable for the misreporting; it ends at the earlier of the end of the restatement period and the end of the CEO's tenure.²³ We use insider trading data from Thomson Financial to assess whether the CEO and outside directors (presumably independent) are net sellers in the test period. By outside directors we mean directors who are not currently (nor have ever been) top officers of the company during our sample period. Top officers are identified by having at least one of the following titles: CEO, President, CFO, COO, CIO, and CTO.

We consider all transactions that are not options related. That is, in addition to open market purchases and sales (transaction codes "P" and "S"), we analyze bona fide gifts ("G") following the evidence in Yermack (2009), and also consider other acquisition or disposition ("J").²⁴ Our results are similar whether we use open market transactions only (67% of all insider transactions reported by Thompson) or all non-option related transactions (80.1% of all transactions).

If both the CEO and outside directors are net sellers (in shares or value) we designate this behavior as collusive insider selling. We need to study information-motivated selling in the test period to determine whether outside directors are connected or aligned with the CEO via their insider selling. To isolate information-motivated selling, we consider measures of abnormal selling. These measures compare trading in the test period by board members to their trading in a

²³ If a CEO is dismissed in the 18-month period around the restatement announcement date (-6, +12), we treat the CEO as accountable and dismissed (if the CEO "resigns" we require the resignation to be related to the restatement). Outside of that window, we require that 8-K filings, court documents, or media articles specify that the termination or resignation is related to the restatement. In the affirmative, we code those CEOs as accountable and dismissed. In cases where multiple CEOs' tenures overlap the restatement period, we designate as accountable the CEO who has the largest overlap and who has departed closest to the announcement date. We identify CFO turnover in a similar manner.

²⁴ Yermack (2009) provides evidence of opportunism in the timing of gifts of stock to a foundation or to charity. Because these gifts represent information-motivated disposals, we also consider gifts as part of selling by insiders.

prior period. To determine whether these net sellers during the test period are abnormal sellers, we assess whether they sell more in the test period than in two benchmark periods: (1) the two-year period preceding the beginning of the test period,²⁵ and (2) the period of equal length that immediately precedes the test period. This measure is motivated by reference legal decisions that have established that insider selling in suspicious amounts or at suspicious times is probative of bad faith and intent to deceive or defraud investors (scienter). However, the inference of scienter can be nullified by showing that such selling is “consistent in timing and amount with a past pattern of sales” (Freeman v. Decio 1978). This court-defined rule has been reaffirmed in insider trading litigation cases throughout our sample period (e.g., Apple Computer Securities Litigation 1989; Provenz v. Miller 1996; Wenger v. Lumisys, Inc., 1998; Blockbuster, Inc., Securities Litigation 2004). As a result, we view selling in the test period that exceeds any selling in a prior period as abnormal. In essence, net selling over a given period T can be computed as follows:

$$NS_{i,T} = \sum_{t=1}^T (\mathbf{Shares Sold}_{i,t} - \mathbf{Shares Purchased}_{i,t}),$$

where the sum is over each firm’s CEO and outside directors. To categorize any of these groups within firm i as an abnormal seller, we require each group to be a net seller in the test period, and that their net selling exceeds their net shares traded in the prior period:

$$\mathbf{Abnormal Selling} = \mathbf{1} \text{ if } NS_{\text{Test}} > \mathbf{0} \text{ and } NS_{\text{Test}} > NS_{\text{Prior}}, \text{ and } \mathbf{0} \text{ otherwise.}$$

A third alternative measure is the classification of trades as opportunistic or routine proposed by Cohen et al. (2012). If an insider trades in the same month of the year (e.g., in the month following bonus grant) for at least three years prior to our test period, we classify the insider’s trades in that month as routine trades. The insider’s trades in all other months are classified as opportunistic trades. We then aggregate the trades of all insiders in each of the three

²⁵ This is the abnormal insider trading measures used in Tables 4, 5, 6, 7, and 8.

categories: outside directors, the CEO, and inside directors including the CEO. Cohen et al. (2012) provide evidence that routine selling is likely driven by liquidity or diversification motives, whereas opportunistic trades are likely information-driven. They show that only opportunistic inside trades are profitable and that these opportunistic trades predict future news announcements such as analyst recommendations, analyst forecasts, management forecasts, and earnings announcements. They further show that opportunistic trades predict SEC investigations of insider trading and opportunistic selling drops following waves of SEC insider trading enforcement.²⁶

Our fourth measure is based on the insider trading intensity (*ITI*) measure proposed by John and Lang (1991). We construct three alternative ratio computations that divide the difference between sales and purchases by their sum (e.g., [sales - purchases]/[purchases + sales]). The three alternative computations are (1) $(NS - NP)/(NP + NS)$ where $NP(NS)$ is the number of purchase (sales) transactions by insiders, (2) $(NSS - NSP)/(NSP + NSS)$ where $NSP(NSS)$ is the number of shares purchased (sold) by insiders, and (3) $(VSS - VSP)/(VSP + VSS)$.²⁷

²⁶ Results using opportunistic abnormal insider trading are available upon request.

²⁷ Results using insider trading intensity are available upon request.

A.2. Variable definitions

Variable	Definition
Costs of Replacement	
<i>CEO Under-Performance (0,1)</i>	Indicator equal to 1 if, during the accountable CEO's tenure, the firm's stock performance is in the bottom quintile relative to its industry within the 24-month period before the misreporting begins
<i>CEO Out-Performance (0,1)</i>	Indicator equal to 1 if, during the accountable CEO's tenure, the firm's stock performance is in the top decile relative to its industry within the 24-month period before the misreporting begins
<i>Certified Inside Director (0,1)</i>	Indicator equal to 1 if at least one executive director is serving on the board of another public firm at the time of the CEO turnover decision
<i>Founder-CEO (0,1)</i>	Indicator equal to 1 if the CEO is the founder (or cofounder) of the firm
<i>Founder-CEO-Chairman (0,1)</i>	Indicator equal to 1 if the CEO is the founder (or cofounder) and serves as the chairman of the board of directors
<i>CEO Tenure (days)</i>	CEO's tenure at the firm with the accounting restatement in days
<i>High Replacement Cost (0,1)</i>	Indicator equal to 1 if the firm has all three of the following characteristics: the CEO does not under-perform, there is no certified inside director, and the CEO is a founder
Collusive Insider Trading	
<i>Net Selling [board]</i>	Indicator equal to 1 if the board of directors (cumulatively) has net shares sold during the test period ¹
<i>Collusive Selling [outside:CEO]</i>	Indicator equal to 1 if both outside directors and the CEO have net shares sold during the test period
<i>Collusive Abnormal Selling [outside:CEO]</i>	Indicator equal to 1 if both outside directors and the CEO have net shares sold during the test period and sold more equity over the test period than over the prior two year period
<i>Collusive Abnormal Trading [outside:CEO]</i>	Indicator equal to 1 if both outside directors and the CEO have net shares bought during the test period and bought more equity over the test period than over the prior two year period OR both outside directors and the CEO have net shares sold during the test period and sold more equity over the restatement period than over the prior two year period
<i>Concordant Abnormal Trading Behavior [outside:CEO]</i>	Indicator equal to 1 if the both outside directors and the CEO are engaged in Collusive Abnormal Trading or no trading.
Proxies for Asymmetric Information	
<i>Analyst (0,1)</i>	Indicator that the firm is followed by at least one analyst
<i>Stock Return Volatility</i>	Volatility of monthly market adjusted stock returns for a five year period ending 2 years before the restatement announcement

¹ The test period is the intersection of the restatement period minus 12 months, with the tenure period of the CEO who is accountable for the misreporting -- See Figure 2: [Restatement period begins - 12, Restatement period ends] \cap [CEO Tenure]

Restatement Characteristics	
<i>AAER (0,1)</i>	Indicator equal to 1 if the firm is subject to an accounting and auditing enforcement action by the SEC
<i>Restatement Anncmt. Return [-1,+1]</i>	Market-adjusted three day return from day -1 to day +1 of the restatement announcement date
<i>Litigation (0,1)</i>	Indicator equal to 1 if 10b-5 litigation (related to the accounting restatement) was filed
<i>Litigation Settlement (Millions of \$)</i>	Amount of cash settlement (in dollars) for the 10b-5 litigation filed against the firm that is related to the accounting restatement
<i>Annual (0,1)</i>	Indicator equal to 1 if the firm restated a 10-K, and 0 if the firm restated only 10-Qs
<i>Subsidiary (0,1)</i>	Indicator equal to 1 if the firm's restatement occurred at the subsidiary level
<i>Restatement Period (days)</i>	The number of days over which the financial statements are restated
<i>CFO Turnover (0,1)</i>	Indicator equal to 1 when the CFO is fired
<i>High Retention Cost (0,1)</i>	Indicator equal to 1 if the firm has at least three of the following characteristics: AAER=1, Restatement Announcement Return in the bottom 20%, Litigation=1, Annual=1, and Subsidiary Related = 0, where at least two of the three are either AAER, Restatement Announcement Return in the bottom 20%, or Litigation
Corporate Governance Measures	
<i>Board Ownership (%)</i>	Fraction of stock owned by the board of directors in the year prior to the restatement announcement
<i>Board Independence (%)</i>	Fraction of the board who are considered to be non-executives
<i>Board Size</i>	The number of directors on the board in the year prior to the restatement announcement
<i>Small Board (0,1)</i>	Indicator equal to 1 if the number of directors is less than that of the median firm
<i>Old Board (%)</i>	Fraction of directors known to be over 69 years old
<i>Post-Sox (0,1)</i>	Indicator equal to 1 if the fiscal year ends after 2002
<i>CEO Retirement Age (0,1)</i>	Indicator equal to 1 if the CEO is of retirement age (age 63 through 66) at the time the fraud is discovered
<i>CEO/Chairman Duality (0,1)</i>	Indicator equal to 1 if the CEO is also the Chairman of the board
<i>CEO/Director Social Ties (0,1)</i>	Indicator equal to 1 if the fraction of the board with at least one social connection to the CEO during the test period is greater than that of the average firm -- See Figure 2: [Beginning of social tie, Restatement period ends] \cap [CEO Tenure]
Other Firm Controls	
<i>Sales (Millions of \$)</i>	Sales (#12)
<i>Log of Sales</i>	Log of (Sales (#12) + 1)
<i>Prior Stock Performance [-24,0]</i>	Market-adjusted monthly return from month -24 to 0 of the restatement announcement date
<i>Cash from Operations</i>	Cash flow from operations (#308) divided by lagged total assets (#6)
<i>Cash Flow to Price</i>	Cash flow from operations (#308) divided by market value of equity (#24*#25)
<i>Bankruptcy Score</i>	"-4.803-(3.599*Return on Assets)+(5.406*Leverage)-(0.100*Current Ratio);" see Zmijewski (1984) (Higher scores indicate higher levels of financial distress)
<i>Book-to-Market</i>	Book value of common equity (#60) divided by market value of equity (#24*#25)
<i>Sales Growth</i>	Ratio of sales in two consecutive years minus 1
<i>Leverage</i>	Total debt to total assets [(#5+#9)/#6]
<i>Income Loss (0,1)</i>	Indicator equal to 1 when Income before Extraordinary Items (#18) is negative
<i>Fiscal Year Return</i>	One year stock return prior to the restatement announcement date
<i>Return on Assets</i>	Income before extraordinary items (#18) divided by lagged total assets (#6)
<i>SEC Enforcements Actions in County (#)</i>	The number of past SEC enforcement actions at other firms located in the same county as a firm's headquarters at the beginning of the restatement period
<i>Minimum SEC Distance (km)</i>	The distance in kilometers between a firm's headquarters and the nearest regional SEC office or SEC headquarters
<i>SEC Proximate 100km (0,1)</i>	Indicator equal to 1 if the minimum distance between a firm's headquarters and the nearest SEC office is less than 100 kilometers

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Figure 1: CEO Employment Decisions in Misreporting Firms - Trading off Replacement and Retention Costs

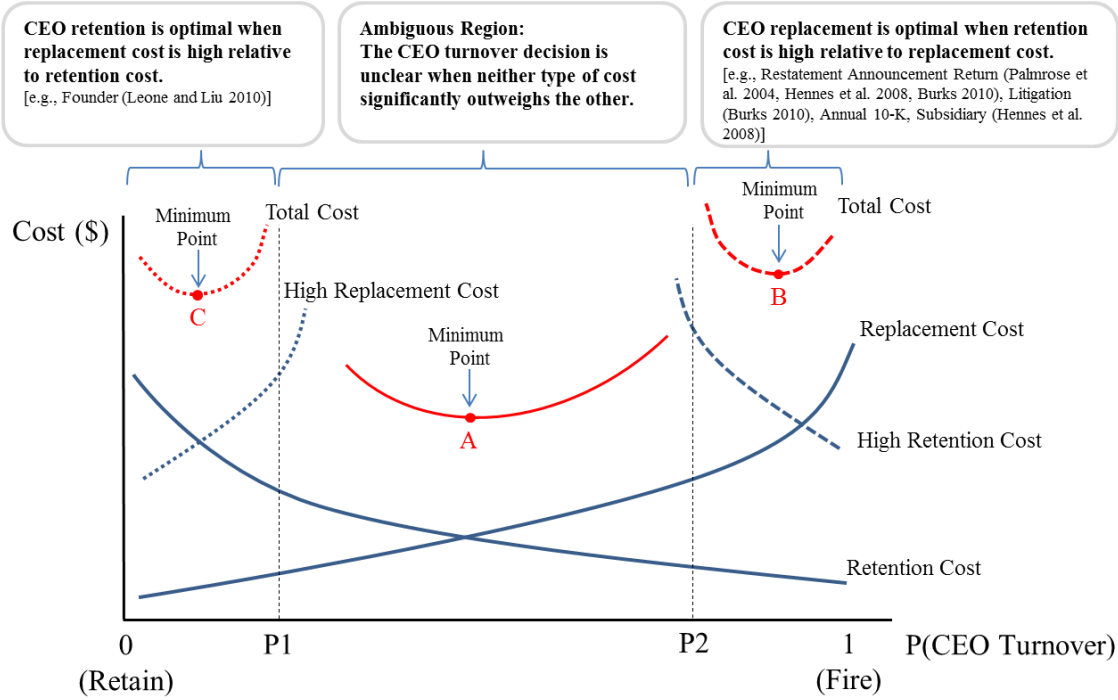


Figure 2: Timeline of Irregularities

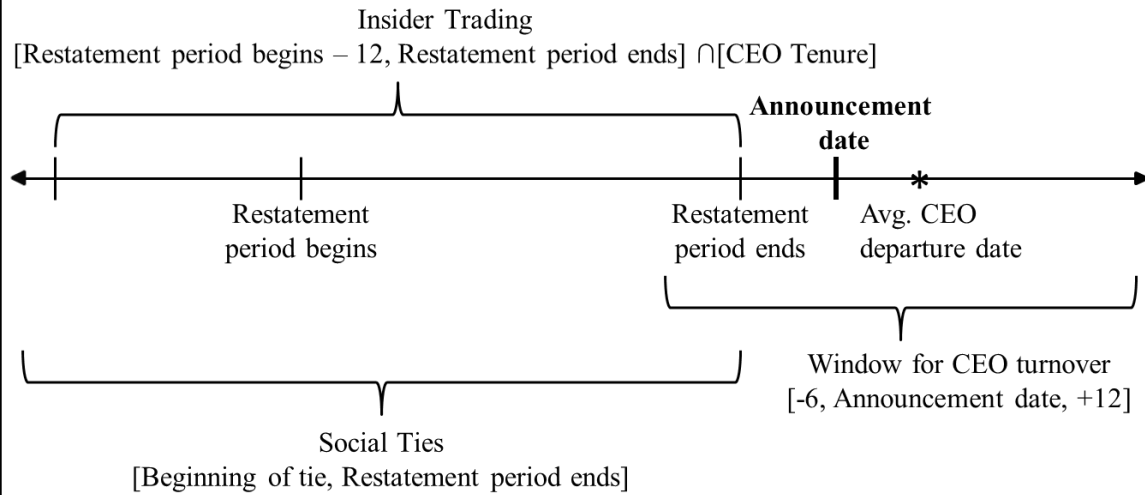


Table 1
Restatement Sample

The final sample consists of 427 firms that restated financial statements to correct intentional misreporting during the period 1993 to 2007. **Panel A** shows how the final sample was determined from the original sample of restatements gathered from AAER, GAO, and Audit Analytics. **Panel B** displays the number of restatements per year as well as the CEO Turnover, CEO Turnover -- Adjusted, and CFO Turnover for each year at the restating firms. CEO Turnover -- Adjusted takes the value of 1 (0 otherwise) if the CEO is fired as a result of the misreporting unless the fired CEO was a Chairman/Founder and remains on the board following the restatement. **Panel C** compares our sample of restatements to firms in COMPUSTAT from 1993 through 2007. All firm characteristics are measured as of the fiscal year end t-1, where year t is the year of the announcement of the restatement. The percentile rank is the rank of the sample firm in all firms in COMPUSTAT in that year. Subsequent tests will consider the possibility of a selection bias in our sample and COMPUSTAT data will be used in the first stage of the Heckman selection model. T-tests and median tests both test the null hypothesis that the percentile rank is equal to 50. Two-tailed p-values are reported. See the Appendix for descriptions of all variables.

Panel A: Sample Determination

Union of AAER, GAO, Audit Analytics	739
- Firms with missing COMPUSTAT data	173
- Firms with missing CRSP data	120
- Firms with missing Insider Trading data	19
Resulting Sample of Restatements	427

Panel B: Restatements, CEO Turnover, CEO Turnover -- Adjusted, and CFO Turnover by Year

Announcement Year	Restatements		CEO Turnover		
	Frequency	Percentage	CEO Turnover - Adjusted - Percentage	CFO Turnover Percentage	
1993	1	0.23	100.00	100.00	100.00
1994	8	1.87	75.00	75.00	87.50
1995	5	1.17	60.00	60.00	60.00
1996	6	1.41	50.00	33.33	66.67
1997	18	4.22	55.56	50.00	72.22
1998	30	7.03	60.00	53.33	70.00
1999	24	5.62	66.67	62.50	79.17
2000	36	8.43	75.00	75.00	75.00
2001	32	7.49	43.75	40.62	62.50
2002	52	12.18	51.92	51.92	55.77
2003	47	11.01	44.68	38.30	63.83
2004	51	11.94	33.33	33.33	60.78
2005	70	16.39	31.43	27.14	54.29
2006	35	8.20	25.71	22.86	57.14
2007	12	2.81	25.00	16.67	41.67
Total	427	100.00	46.14	42.86	62.76

Panel C: Percentile Rank of Our Restatement Firms Compared to COMPUSTAT

		Mean		Median	H0: Mean/Median = 50	
(N = 427/114,642)	Sample	Percentile	Sample Median	Percentile	Mean Diff.	Median Diff.
	Mean Value	Rank	Value	Rank	P-Value	P-Value
Cash Flow to Price	0.023	43.20	0.032	37.00	0.000	0.000
Bankruptcy Score	-2.196	51.03	-2.351	54.00	0.436	0.447
Book-to-Market	0.551	46.85	0.418	45.00	0.018	0.017
Sales (Millions of \$)	2,243.3	57.11	310.7	59.00	0.000	0.000
Sales Growth	0.238	53.37	0.115	55.00	0.016	0.015
Leverage	0.473	50.24	0.459	52.50	0.856	0.881
Income Loss (0,1)	0.429	52.07	0.000	34.00	0.084	0.000
Return on Assets	-0.078	46.00	0.013	45.00	0.002	0.003

Table 2

Univariate Statistics for the Restatement Sample

The final sample consists of 427 firms that restated financial statements to correct intentional misreporting during the period 1993 to 2007. Fired is measured as CEO Turnover -- Adjusted which takes the value of 1 (0 otherwise) if the CEO is fired as a result of the misreporting unless the fired CEO was a Chairman/Founder and remains on the board following the restatement. All firm characteristics are measured as of the fiscal year end t-1, where year t is the year of the announcement of the restatement. Two-tailed p-values are reported. See the Appendix for descriptions of all variables.

Panel A: Costs of Replacement and Outside Director-CEO Alignment	Fired (N = 183)		Retained (N = 244)		Mean Diff.	Median Diff.
	Mean	Median	Mean	Median	P-Value	P-Value
Costs of Replacement						
CEO Under-Performance - Bottom Quintile (0,1)	0.257	0.000	0.156	0.000	0.007	0.010
CEO Out-Performance - Top Decile (0,1)	0.060	0.000	0.131	0.000	0.011	0.016
Certified Inside Director (0,1)	0.213	0.000	0.082	0.000	0.000	0.000
Founder-CEO (0,1)	0.246	0.000	0.426	0.000	0.000	0.000
Founder-CEO-Chairman (0,1)	0.187	0.000	0.292	0.000	0.011	0.013
CEO Tenure (days)	2411.3	1689.0	4138.0	3455.5	0.000	0.000
High Replacement Cost (0,1)	0.098	0.000	0.258	0.000	0.000	0.000
Collusive Insider Trading						
Net Selling [board] (0,1)	0.596	1.000	0.738	1.000	0.002	0.002
Collusive Selling [outside:CEO] (0,1)	0.344	0.000	0.450	0.000	0.027	0.028
Collusive Abnormal Selling [outside:CEO] (0,1)	0.257	0.000	0.365	0.000	0.018	0.018
Collusive Abnormal Trading [outside:CEO] (0,1)	0.404	0.000	0.451	0.000	0.339	0.338
Concordant Abnormal Trading Behavior [outside:CEO] (0,1)	0.404	0.000	0.467	0.000	0.196	0.196
Panel B: Restatement Characteristics						
	Fired (N = 183)		Retained (N = 244)		Mean Diff.	Median Diff.
	Mean	Median	Mean	Median	P-Value	P-Value
AAER (0,1)	0.503	1.000	0.193	0.000	0.000	0.000
Restatement Anncmt. Return [-1,+1]	-0.156	-0.107	-0.072	-0.036	0.000	0.000
Litigation (0,1)	0.689	1.000	0.447	0.000	0.000	0.000
Litigation Settlement (Millions of \$)	34.204	0.595	11.892	0.000	0.137	0.000
Annual (0,1)	0.798	1.000	0.852	1.000	0.146	0.138
Subsidiary (0,1)	0.109	0.000	0.180	0.000	0.036	0.042
Restatement Period (days)	809.5	673.0	932.3	800.0	0.050	0.013
CFO Turnover (0,1)	0.836	1.000	0.471	0.000	0.000	0.000
High Retention Cost (0,1)	0.459	0.000	0.172	0.000	0.000	0.000

Panel C: Corporate Governance Measures	Fired (N = 183)		Retained (N = 244)		Mean Diff.	Median Diff.
	Mean	Median	Mean	Median	P-Value	P-Value
Board Ownership (%)	0.076	0.030	0.086	0.029	0.887	0.889
Board Independence (%)	0.640	0.667	0.705	0.750	0.003	0.002
Board Size	7.541	7.000	8.074	8.000	0.077	0.510
Small Board (0,1)	0.503	1.000	0.475	0.000	0.577	0.577
Old Board (%)	0.054	0.000	0.072	0.000	0.081	0.016
Post-Sox (0,1)	0.497	0.000	0.721	1.000	0.000	0.000
CEO Retirement Age (0,1)	0.038	0.000	0.041	0.000	0.887	0.447
CEO/Chairman Duality (0,1)	0.544	1.000	0.626	1.000	0.091	0.091
CEO/Director Social Ties (0,1)	0.153	0.000	0.270	0.000	0.003	0.004

Panel D: Other Firm Controls	Fired (N = 183)		Retained (N = 244)		Mean Diff.	Median Diff.
	Mean	Median	Mean	Median	P-Value	P-Value
Sales (Millions of \$)	2369.4	198.0	2148.7	388.4	0.689	0.005
Prior Stock Performance [-24,0]	-0.567	-0.691	-0.182	-0.429	0.000	0.001
Cash from Operations	-0.047	0.010	0.014	0.062	0.017	0.000
Cash Flow to Price	-0.033	0.005	0.064	0.057	0.000	0.000
Bankruptcy Score	-2.035	-2.167	-2.316	-2.568	0.128	0.019
Book-to-Market	0.616	0.455	0.503	0.399	0.047	0.190
Sales Growth	0.274	0.113	0.212	0.115	0.221	0.956
Leverage	0.480	0.475	0.467	0.452	0.587	0.328
Income Loss (0,1)	0.497	0.000	0.377	0.000	0.013	0.013
Return on Assets	-0.112	0.002	-0.052	0.021	0.035	0.045
Analyst (0,1)	0.555	1.000	0.434	0.000	0.014	0.014
Stock Return Volatility	0.049	0.034	0.040	0.025	0.069	0.001
SEC Enforcements Actions in County (#)	0.552	0.000	0.773	0.000	0.091	0.015
Minimum SEC Distance (km)	399.7	310.0	425.1	346.9	0.528	0.518
SEC Proximate 100km (0,1)	0.293	0.000	0.300	0.000	0.874	0.873

Table 3
Spearman Correlation Coefficients
Prob > |r| under H0: Rho=0

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)									
(1) CEO Turnover (0,1)	1																																						
(2) CFO Turnover (0,1)	0.373 0.000	1																																					
(3) CEO Under-Performance (0,1)	0.125 0.010	0.251 0.000	1																																				
(4) CEO Out-Performance (0,1)	-0.117 0.016	-0.096 0.047	-0.167 0.001	1																																			
(5) Certified Inside Director (0,1)	0.188 0.000	0.028 0.569	0.072 0.136	-0.021 0.662	1																																		
(6) Founder-CEO (0,1)	-0.187 0.000	0.035 0.466	0.140 0.004	0.033 0.502	-0.108 0.026	1																																	
(7) Founder-CEO-Chairman (0,1)	-0.121 0.013	0.014 0.766	0.123 0.011	-0.011 0.817	-0.120 0.014	0.780 0.000	1																																
(8) Log of CEO Tenure	-0.378 0.000	-0.197 0.000	-0.068 0.163	0.172 0.000	-0.180 0.000	0.448 0.000	0.355 0.000	1																															
(9) Collusive Selling [outside:CEO]	-0.107 0.027	-0.046 0.343	0.024 0.620	0.057 0.239	0.029 0.545	0.112 0.021	0.108 0.027	0.161 0.001	1																														
(10) Collusive Abnormal Selling [outside:CEO]	-0.115 0.018	0.007 0.891	0.075 0.124	0.089 0.067	0.003 0.950	0.111 0.022	0.081 0.096	0.085 0.080	0.823 0.001	1																													
(11) AAER (0,1)	0.328 0.000	0.173 0.000	0.117 0.016	-0.050 0.305	0.185 0.000	-0.005 0.913	0.011 0.828	-0.124 0.010	0.028 0.564	0.019 0.702	1																												
(12) Restatement Annmt. Return [-1,+1]	-0.235 0.000	-0.185 0.000	-0.081 0.096	0.004 0.942	-0.091 0.061	-0.001 0.981	-0.019 0.692	0.144 0.003	0.043 0.375	0.038 0.439	-0.194 0.000	1																											
(13) Litigation (0,1)	0.241 0.000	0.200 0.000	0.038 0.434	0.068 0.162	0.062 0.203	0.010 0.839	0.005 0.922	-0.093 0.055	0.119 0.015	0.113 0.020	0.196 0.000	-0.317 0.000	1																										
(14) Log of Cash Settlement	0.226 0.000	0.206 0.000	0.043 0.374	0.035 0.477	0.102 0.035	0.045 0.359	0.055 0.259	-0.083 0.088	0.087 0.075	0.061 0.210	0.183 0.000	-0.271 0.000	0.668 0.000	1																									
(15) Annual (0,1)	-0.072 0.138	-0.054 0.267	-0.085 0.079	0.049 0.316	0.038 0.438	-0.033 0.497	-0.032 0.508	0.037 0.440	0.109 0.025	0.150 0.002	0.063 0.192	0.084 0.083	0.090 0.064	0.040 0.413	1																								
(16) Subsidiary (0,1)	-0.098 0.042	-0.124 0.010	-0.045 0.353	0.034 0.485	0.003 0.951	0.009 0.850	0.018 0.710	0.086 0.076	-0.106 0.029	-0.104 0.032	-0.082 0.092	-0.040 0.414	-0.056 0.251	-0.160 0.001	-0.053 0.272	1																							
(17) Board Ownership (%)	-0.013 0.789	0.114 0.018	0.180 0.000	0.027 0.580	0.069 0.153	0.220 0.000	0.178 0.105	0.079 0.716	-0.018 0.580	0.027 0.002	0.152 0.002	-0.153 0.920	0.005 0.929	-0.004 0.450	0.037 0.776	-0.014 0.000	1																						
(18) Board Independence (%)	-0.167 0.001	-0.074 0.126	0.033 0.497	-0.022 0.656	-0.123 0.011	-0.017 0.722	0.053 0.280	0.061 0.210	0.025 0.610	0.017 0.719	-0.052 0.288	0.144 0.003	-0.053 0.271	-0.012 0.802	0.099 0.040	0.008 0.861	-0.090 0.063	1																					
(19) Small Board (0,1)	0.027 0.577	0.121 0.013	0.089 0.066	0.016 0.735	0.004 0.942	0.132 0.006	0.039 0.418	0.015 0.761	0.002 0.965	0.038 0.437	0.163 0.001	-0.120 0.013	-0.033 0.500	-0.017 0.726	-0.068 0.163	-0.134 0.006	0.232 0.000	-0.149 0.002	1																				
(20) Old Board (%)	-0.106 0.028	-0.123 0.011	-0.144 0.003	0.022 0.647	-0.109 0.024	-0.017 0.725	-0.008 0.875	0.139 0.004	-0.038 0.429	-0.049 0.313	-0.118 0.015	0.103 0.034	-0.069 0.157	-0.073 0.132	0.049 0.314	0.017 0.729	-0.058 0.233	0.077 0.111	-0.210 0.000	1																			
(21) Post-Sox (0,1)	-0.229 0.000	-0.146 0.003	-0.075 0.124	0.066 0.173	-0.195 0.000	-0.083 0.087	-0.087 0.073	0.056 0.251	-0.012 0.800	0.010 0.837	-0.474 0.000	0.259 0.000	-0.175 0.015	-0.118 0.078	0.085 0.092	-0.082 0.000	-0.252 0.003	0.146 0.000	-0.243 0.000	0.159 0.001	1																		
(22) CEO Retirement Age (0,1)	-0.007 0.887	-0.066 0.172	-0.012 0.812	0.011 0.813	0.023 0.642	0.102 0.035	0.078 0.109	0.129 0.573	0.027 0.826	-0.011 0.806	0.012 1.000	0.000 0.415	0.040 0.829	0.010 0.169	-0.067 0.002	0.149 0.798	-0.012 0.443	-0.037 0.034	-0.103 0.732	0.017 0.180	-0.065 0.000	1																	
(23) CEO/Chairman Duality (0,1)	-0.082 0.091	-0.060 0.215	0.129 0.008	-0.022 0.649	-0.178 0.000	0.171 0.477	0.203 0.000	0.027 0.578	-0.001 0.977	0.026 0.600	0.063 0.195	0.042 0.385	0.020 0.688	0.019 0.690	0.096 0.047	-0.034 0.480	0.204 0.000	-0.075 0.122	0.043 0.375	0.039 0.427	0.048 0.325	1																	
(24) CEO/Director Social Ties (0,1)	-0.140 0.004	-0.152 0.002	-0.053 0.279	0.085 0.079	-0.033 0.502	0.085 0.078	0.050 0.307	0.122 0.012	0.080 0.098	0.086 0.077	-0.176 0.000	0.115 0.018	-0.065 0.179	-0.011 0.827	0.001 0.983	0.030 0.533	-0.191 0.000	0.016 0.748	-0.122 0.012	0.045 0.357	0.259 0.000	0.036 0.454	0.052 0.288	1															
(25) Log of Sales	-0.099 0.041	-0.151 0.002	-0.100 0.038	0.035 0.469	0.009 0.850	-0.076 0.119	0.063 0.739	0.169 0.193	0.082 0.001	-0.100 0.092	0.175 0.038	0.088 0.000	0.077 0.069	0.034 0.114	0.158 0.486	-0.396 0.001	0.165 0.000	-0.476 0.000	0.113 0.020	0.229 0.000	0.079 0.105	0.141 0.004	0.259 0.000	1															
(26) Prior Stock Performance [-24,0]	-0.207 0.000	-0.216 0.000	-0.056 0.245	0.107 0.027	-0.081 0.095	0.014 0.772	-0.038 0.431	0.211 0.000	0.107 0.121	-0.064 0.027	0.124 0.189	-0.179 0.010	-0.134 0.000	0.088 0.006	-0.071 0.070	-0.007 0.145	0.079 0.892	-0.057 0.104	0.013 0.239	0.095 0.787	0.032 0.050	-0.034 0.504	0.079 0.481	0.060 0.213	1														
(27) Cash from Operations	-0.209 0.000	-0.205 0.000	-0.212 0.000	0.063 0.194	-0.130 0.007	-0.087 0.071	-0.107 0.027	0.188 0.000	0.149 0.002	0.058 0.228	-0.189 0.000	0.138 0.245	-0.056 0.717	-0.018 0.902	0.006 0.018	0.115 0.000	-0.226 0.000	0.158 0.484	-0.184 0.000	0.034 0.166	0.222 0.000	0.067 0.038	0.100 0.000	0.166 0.000	0.409 0.000	0.270 0.000	1												
(28) Return on Assets	-0.162 0.001	-0.156 0.001	-0.095 0.050	0.115 0.017	-0.089 0.069	-0.022 0.651	-0.018 0.707	0.220 0.001	0.181 0.001	0.093 0.001	-0.027 0.575	0.100 0.330	-0.047 0.829	-0.010 0.379	0.043 0.247	0.056 0.218	-0.060 0.060	0.091 0.001	-0.157 0.328	0.047 0.810	-0.012 0.046	0.096 0.112	0.111 0.001	0.077 0.001	0.331 0.001	0.347 0.001	0.549 0.001	1											
(29) Analyst (0,1)	0.119 0.014	0.138 0.004	0.161 0.001	0.064 0.187	0.032 0.216	0.060 0.014	-0.049 0.624	-0.116 0.315	-0.116 0.244	-0.057 0.751	-0.015 0.299	-0.050 0.090	-0.082 0.381	-0.043 0.517	-0.032 0.120	-0.120 0.153	0.153 0.093	-0.093 0.070	-0.001 0.017	0.017 -0.030	-0.030 -0.039	-0.030 0.533	-0.242 0.000	-0.090 0.064	-0.282 0.000	-0.238 0.000	1												
(30) Stock Return Volatility	0.172 0.000	0.215 0.000	0.083 0.088	-0.028 0.566	0.066 0.172	0.097 0.045	0.060 0.215	-0.149 0.002	-0.026 0.587	0.013 0.793	-0.165 0.104	0.123 0.001	-0.072 0.011	-0.190 0.004	0.234 0.139	-0.194 0.000	0.268 0.000	-0.194 0.000	0.268 0.000	-0.194 0.001	-0.129 0.063	-0.100 0.008	-0.146 0.039	-0.167 0.003	-0.401 0.000	-0.434 0.001	0.253 0.000	1											

Table 4
CEO Turnover

The final sample consists of 427 firms that restated financial statements to correct intentional misreporting during the period 1993 to 2007. *CEO Turnover* takes the value of 1 (0 otherwise) if the CEO is fired as a result of the misreporting unless the fired CEO was a Chairman/Founder and remains on the board following the restatement. **Column 1** reports results of a logistic regression of a base model with 14 explanatory variables commonly used in prior work capturing restatement severity, corporate governance environment, and firm characteristics. The model in **Column 2** adds the *Founder-CEO* variable based on Leone and Liu (2010). The model in **Column 3** adds the *AAER* variable to incrementally capture restatement severity. The final model in **Column 4** adds the four variables that we use to test our hypotheses on costs of replacement and outside director-CEO alignment and represents equation (1) in the paper as follows:

$$P(\text{CEO Fired}=1) = 1/(1+e^{-Y}), \text{ where } Y = a_0 + a_1 \text{ CEO Under-Performance} + a_2 \text{ CEO Out-Performance} + a_3 \text{ Certified Inside Director} + a_4 \text{ Founder-CEO} + a_5 \text{ Collusive Abnormal Selling} + a_6 \text{ AAER} + a_7 \text{ Restatement Anncmt. Return} + a_8 \text{ Litigation} + a_9 \text{ Annual} + a_{10} \text{ Subsidiary} + a_{11} \text{ Board Ownership} + a_{12} \text{ Board Independence} + a_{13} \text{ Small Board} + a_{14} \text{ Old Board} + a_{15} \text{ CEO Retirement Age} + a_{16} \text{ CEO/Chairman Duality} + a_{17} \text{ CEO/Director Social Ties} + a_{18} \text{ Log of Sales} + a_{19} \text{ Prior Stock Performance} + a_{20} \text{ Cash From Operations} + \text{error}$$

All firm characteristics are measured as of the fiscal year end t-1, where year t is the year of the announcement of the restatement. Coefficients are reported, marginal effects are in brackets, and two-tailed p-values are in parentheses. See below for descriptions of all variables.

Logistic Regressions: Dependent Variable Forced CEO Turnover = 1

	<i>Expectation</i>	(1)	(2)	(3)	(4)
Costs of Replacement:					
CEO Under-Performance (0,1)	(+)				0.7382** [.1701**] (0.038)
CEO Out-Performance (0,1)	(-)				-0.7020 [-.1724] (0.149)
Certified Inside Director (0,1)	(+)				0.6224* [.1458*] (0.082)
Founder-CEO (0,1)			-0.8663*** [-.2130***] (0.001)	-0.8975*** [-.2137***] (0.001)	-0.8858*** [-.2142***] (0.001)
Outside Director-CEO Alignment:					
Collusive Abnormal Selling [outside:CEO]	(-)				-0.6120** [-.1512**] (0.026)
Costs of Retention (Restatement Severity):					
AAER (0,1)				1.3053*** [.2798***] (0.000)	1.2285*** [.2592***] (0.000)
Restatement Anncmt. Return [-1,+1]		-2.2002*** (0.001)	-2.2839*** (0.001)	-1.7736** (0.016)	-1.6686** (0.028)
Litigation (0,1)		0.7518*** (0.001)	0.7984*** (0.001)	0.6990*** (0.005)	0.8304*** (0.001)
Annual (0,1)		-0.3588 (0.225)	-0.4241 (0.162)	-0.5654* (0.069)	-0.4563 (0.155)
Subsidiary (0,1)		-0.6438** (0.048)	-0.6220* (0.057)	-0.5337 (0.111)	-0.5201 (0.127)

Governance Environment:

Board Ownership (%)	-0.0174** (0.031)	-0.0124 (0.139)	-0.0142 (0.111)	-0.0187** (0.047)
Board Independence (%)	-1.1793** (0.023)	-1.1287** (0.034)	-1.1641** (0.037)	-1.1647** (0.041)
Small Board (0,1)	-0.2403 (0.352)	-0.1575 (0.552)	-0.3481 (0.210)	-0.2879 (0.307)
Old Board (%)	-1.4012 (0.183)	-1.3519 (0.211)	-1.2622 (0.261)	-0.9082 (0.431)
CEO Retirement Age (0,1)	-0.0275 (0.962)	0.1708 (0.769)	0.0124 (0.984)	0.0139 (0.982)
CEO/Chairman Duality (0,1)	-0.2426 (0.284)	-0.1019 (0.663)	-0.1709 (0.484)	-0.1910 (0.454)
CEO/Director Social Ties (0,1)	-0.5873** (0.037)	-0.5021* (0.080)	-0.3118 (0.295)	-0.2742 (0.374)

Firm Controls:

Log of Sales	-0.0390 (0.577)	-0.0496 (0.485)	-0.0790 (0.286)	-0.0790 (0.298)
Prior Stock Performance [-24,0]	-0.5495*** (0.000)	-0.5334*** (0.000)	-0.5429*** (0.001)	-0.4863*** (0.002)
Cash from Operations	-0.5541 (0.251)	-0.5917 (0.221)	-0.3331 (0.499)	-0.0435 (0.931)
Constant	0.8332 (0.210)	0.9798 (0.147)	1.0745 (0.125)	0.9838 (0.170)
Observations	425	425	425	425
Pseudo R-Square	0.145	0.166	0.212	0.238

Variable Descriptions: *CEO Under-Performance* equals 1 if, during the accountable CEO's tenure, the firm's stock performance is in the bottom quintile relative to its industry within the 24-month period before the misreporting begins. *CEO Out-Performance* equals 1 if, during the accountable CEO's tenure, the firm's stock performance is in the top decile relative to its industry within the 24-month period before the misreporting begins. *Certified Inside Director* equals 1 if at least one executive director is serving on the board of another public firm. *Founder-CEO* equals 1 if the CEO is the founder or cofounder. *Collusive Abnormal Selling* equals 1 if both outside directors and the CEO have net shares sold during the test period and sold more equity during the test period than over the prior two year period. *AAER* equals 1 if the firm is subject to an accounting and auditing enforcement action by the SEC. *Restatement Anncmt. Return* is the market adjusted 3-day return around the announcement date. *Litigation* is equal to 1 if 10b-5 litigation was filed. *Annual* is equal to 1 if the firm restated a 10-K. *Subsidiary* is equal to 1 if the firm's restatement occurred at the subsidiary level. *Board Ownership* is the fraction of stock owned by the board in the year prior to the restatement announcement. *Board Independence* is the fraction of the board who are considered to be non-executives. *Small Board* is equal to 1 if the number of directors is less than that of the median firm. *Old Board* is the fraction of directors over 69 years old. *CEO Retirement Age* is equal to 1 if the CEO is age 63-66 at the time the fraud is discovered. *CEO/Chairman Duality* is equal to 1 if the CEO is also the Chairman of the board. *CEO/Director Social Ties* equals 1 if the fraction of the board with at least one social connection during or prior to the restatement period is greater than that of the median firm. *Log of Sales* is Log of Sales (#12). *Prior Stock Performance* is the market adjusted monthly return from month -24 to the announcement date. *Cash from Operations* is the cash flow from operations (#308) divided by lagged total assets (#6).

Table 5**The Effects of Outside Director-CEO Alignment on CEO Turnover Relative to Retention and Replacement Costs**

The final sample consists of 427 firms that restated financial statements to correct intentional misreporting during the period 1993 to 2007. **Panel A** reports mean *CEO Turnover* for firms partitioned on retention costs and outside director-CEO alignment. **Panel B** reports mean *CEO Turnover* for firms partitioned on replacement costs and outside director-CEO alignment. *High Retention Cost* firms are defined as those having at least three of the following characteristics: *AAER* = 1, *Restatement Announcement Return* in the bottom 20%, *Litigation* = 1, *Annual* = 1, and *Subsidiary Related* = 0, where at least two of the three are either *AAER*, *Restatement Announcement Return* in the bottom 20%, or *Litigation*. *High Replacement Cost* firms are defined as those having all three of the following characteristics: the CEO does not under-perform, there is no certified inside director, and the CEO is a founder. Two-tailed p-values are reported in parentheses. See the Appendix for descriptions of all variables.

Panel A: Differences in CEO Turnover by Outside Director-CEO Alignment and Retention Costs

Retention Costs:	Collusive Abnormal Selling = 1	Collusive Abnormal Selling = 0	Difference
High Retention Cost (n=143 out of 427)	63.83%	67.71%	-3.88%
	n=47	n=96	(0.647)
Low Retention Cost (n=284 out of 427)	19.10%	36.41%	-17.31%***
	n=89	n=195	(0.002)

Panel B: Differences in CEO Turnover by Outside Director-CEO Alignment and Replacement Costs

Replacement Costs:	Collusive Abnormal Selling = 1	Collusive Abnormal Selling = 0	Difference
High Replacement Cost (n=105 out of 427)	15.15%	26.39%	-11.24%
	n=33	n=72	(0.207)
Low Replacement Cost (n=322 out of 427)	40.78%	53.42%	-12.65%**
	n=103	n=219	(0.034)

Variable Descriptions: *Collusive Abnormal Selling* equals 1 if both outside directors and the CEO have net shares sold during the test period and sold more equity during the test period than over the prior two year period. *AAER* equals 1 if the firm is subject to an accounting and auditing enforcement action by the SEC. *Restatement Annncmt. Return* is the market adjusted 3-day return around the announcement date. *Litigation* is equal to 1 if 10b-5 litigation was filed. *Annual* is equal to 1 if the firm restated a 10-K. *Subsidiary* is equal to 1 if the firm's restatement occurred at the subsidiary level. *CEO Under-Performance* equals 1 if, during the accountable CEO's tenure, the firm's stock performance is in the bottom quintile relative to its industry within the 24-month period before the misreporting begins. *CEO Out-Performance* equals 1 if, during the accountable CEO's tenure, the firm's stock performance is in the top decile relative to its industry within the 24-month period before the misreporting begins. *Certified Inside Director* equals 1 if at least one executive director is serving on the board of another public firm. *Founder-CEO* equals 1 if the CEO is the founder or cofounder.

Table 6
CEO Turnover and Cost Index Interactions

The final sample consists of 427 firms that restated financial statements to correct intentional misreporting during the period 1993 to 2007. *CEO Turnover* takes the value of 1 (0 otherwise) if the CEO is fired as a result of the misreporting unless the fired CEO was a Chairman/Founder and remains on the board following the restatement. *High Retention Cost* firms are defined as those having at least three of the following characteristics: AAER = 1, Restatement Announcement Return in the bottom 20%, Litigation = 1, Annual = 1, and Subsidiary = 0, where at least two of the three are either AAER, Restatement Announcement Return in the bottom 20%, or Litigation. *High Replacement Cost* firms are defined as those having all three of the following characteristics: the CEO does not under-perform, there is no certified inside director, and the CEO is a founder. **Column 1** reports results of a logistic regression of the final model from Table 4 (Column 4) while adding the interaction of the High and Low Retention Cost indicators with the Collusive Abnormal Selling indicator. **Column 2** reports results of a logistic regression of the final model from Table 4 (Column 4) while adding the interaction of the High and Low Replacement Cost indicators with the Collusive Abnormal Selling indicator. All firm characteristics are measured as of the fiscal year end t-1, where year t is the year of the announcement of the accounting restatement. Two-tailed p-values are reported in parentheses. See below for descriptions of all variables.

Logistic Regressions: Dependent Variable Forced CEO Turnover = 1

Interaction of High/Low Cost Indicator with:	Expectation	Collusive Abnormal Selling (1)	Collusive Abnormal Selling (2)
High Retention Cost (0,1) *		1.4716	
Collusive Abnormal Selling [outside:CEO]		(0.228)	
Low Retention Cost (0,1) *	(-)	-0.6411**	
Collusive Abnormal Selling [outside:CEO]		(0.017)	
High Retention Cost (0,1)	(+)	1.3979***	
		(0.000)	
High Replacement Cost (0,1) *			-0.2262
Collusive Abnormal Selling [outside:CEO]			(0.740)
Low Replacement Cost (0,1) *	(-)		-0.7157**
Collusive Abnormal Selling [outside:CEO]			(0.011)
High Replacement Cost (0,1)	(-)		-1.0898***
			(0.004)
<i>Costs of Replacement:</i>			
CEO Under-Performance (0,1)		0.8701**	
		(0.012)	
CEO Out-Performance (0,1)		-0.7421	
		(0.124)	
Certified Inside Director (0,1)		0.6168*	
		(0.078)	
Founder-CEO (0,1)		-0.9234***	
		(0.001)	

Costs of Retention (Restatement Severity):

AAER (0,1)		1.2597*** (0.000)
Restatement Annmt. Return [-1,+1]		-1.5663** (0.034)
Litigation (0,1)		0.7875*** (0.002)
Annual (0,1)		-0.4244 (0.173)
Subsidiary (0,1)		-0.6151* (0.071)

Governance Environment:

Board Ownership (%)	-0.0158* (0.077)	-0.0190** (0.033)
Board Independence (%)	-1.4316** (0.010)	-1.2927** (0.022)
Small Board (0,1)	-0.1822 (0.505)	-0.3356 (0.228)
Old Board (%)	-1.3576 (0.217)	-1.1293 (0.318)
CEO Retirement Age (0,1)	0.0777 (0.897)	-0.0376 (0.951)
CEO/Chairman Duality (0,1)	-0.2117 (0.391)	-0.2217 (0.362)
CEO/Director Social Ties (0,1)	-0.3415 (0.254)	-0.3070 (0.310)

Firm Controls:

Log of Sales	-0.0609 (0.404)	-0.0862 (0.250)
Prior Stock Performance [-24,0]	-0.4934*** (0.002)	-0.5136*** (0.001)
Cash from Operations	-0.0156 (0.974)	-0.2179 (0.654)
Constant	1.1396* (0.087)	1.2380* (0.083)
Observations	425	425
Pseudo R-Square	0.209	0.217

Variable Descriptions: *CEO Under-Performance* equals 1 if, during the accountable CEO's tenure, the firm's stock performance is in the bottom quintile relative to its industry within the 24-month period before the misreporting begins. *CEO Out-Performance* equals 1 if, during the accountable CEO's tenure, the firm's stock performance is in the top decile relative to its industry within the 24-month period before the misreporting begins. *Certified Inside Director* equals 1 if at least one executive director is serving on the board of another public firm. *Founder-CEO* equals 1 if the CEO is the founder or cofounder. *Collusive Abnormal Selling* equals 1 if both outside directors and the CEO have net shares sold during the test period and sold more equity during the test period than over the prior two year period. *AAER* equals 1 if the firm is subject to an accounting and auditing enforcement action by the SEC. *Restatement Annmt. Return* is the market adjusted 3-day return around the announcement date. *Litigation* is equal to 1 if 10b-5 litigation was filed. *Annual* is equal to 1 if the firm restated a 10-K. *Subsidiary* is equal to 1 if the firm's restatement occurred at the subsidiary level. *Board Ownership* is the fraction of stock owned by the board in the year prior to the restatement announcement. *Board Independence* is the fraction of the board who are considered to be non-executives. *Small Board* is equal to 1 if the number of directors is less than that of the median firm. *Old Board* is the fraction of directors over 69 years old. *CEO Retirement Age* is equal to 1 if the CEO is age 63-66 at the time the fraud is discovered. *CEO/Chairman Duality* is equal to 1 if the CEO is also the Chairman of the board. *CEO/Director Social Ties* equals 1 if the fraction of the board with at least one social connection during or prior to the restatement period is greater than that of the median firm. *Log of Sales* is Log of Sales (#12). *Prior Stock Performance* is the market adjusted monthly return from month -24 to the announcement date. *Cash from Operations* is the cash flow from operations (#308) divided by lagged total assets (#6).

Table 7
Alternative Estimation Methods

The final sample consists of 427 firms that restated financial statements to correct intentional misreporting during the period 1993 to 2007. *CEO Turnover* takes the value of 1 (0 otherwise) if the CEO is fired as a result of the misreporting unless the fired CEO was a Chairman/Founder and remains on the board following the restatement. **Column 1** reports corrected coefficients and p-values from the second stage of a probit Heckman Selection Model, where restating firms are distinguished from the Compustat population using a model that captures risk, profitability, growth, pricing characteristics, and a proxy for the firm's information set regarding the potential for an SEC enforcement action. The first stage selection model (equation (2) in the paper) is:

$$P(\text{Firm has accounting restatement}=1) = 1/(1+e^{-Y}), \text{ where } Y = a_0 + a_1 \text{ Proxy for Potential SEC Enforcement Action} + a_2 \text{ Cash Flow to Price} + a_3 \text{ Bankruptcy Score} + a_4 \text{ Book-to-Market} + a_5 \text{ Log of Sales} + a_6 \text{ Sales Growth} + a_7 \text{ Leverage} + a_8 \text{ Income Loss Indicator} + a_9 \text{ Fiscal Year Return} + a_{10} \text{ ROA} + \text{error}$$

The proxy for potential SEC enforcement actions is the number of past SEC enforcement actions at other firms located in the same county as a firm's headquarters. **Column 2** reports results of the model in Column 1 while including year and industry fixed effects. **Column 3** reports the results of a logistic regression of the final model in Table 4 (Column 4) with year and industry fixed effects. All firm characteristics are measured as of the fiscal year end t-1, where year t is the year of the announcement of the accounting restatement. Two-tailed p-values are reported in parentheses. See below for descriptions of all variables.

Dependent Variable: Forced CEO Turnover = 1

	<i>Expectation</i>	2nd Stage of Probit Heckman Selection Model without Fixed Effects (1)	2nd Stage of Probit Heckman Selection Model with Fixed Effects (2)	Logistic Regression of Final Model with Fixed Effects (3)
<i>Costs of Replacement:</i>				
CEO Under-Performance (0,1)	(+)	0.4324* (0.054)	0.5295** (0.031)	0.7119* (0.062)
CEO Out-Performance (0,1)	(-)	-0.3668 (0.179)	-0.5279* (0.086)	-0.9314* (0.077)
Certified Inside Director (0,1)	(+)	0.2907 (0.186)	0.2302 (0.330)	0.4711 (0.215)
Founder-CEO (0,1)		-0.5084*** (0.002)	-0.6919*** (0.000)	-1.1699*** (0.000)
<i>Outside Director-CEO Alignment:</i>				
Collusive Abnormal Selling [outside:CEO]	(-)	-0.4089** (0.015)	-0.4009** (0.029)	-0.5551* (0.063)
<i>Costs of Retention (Restatement Severity):</i>				
AAER (0,1)		0.6529*** (0.000)	0.6031*** (0.002)	1.1121*** (0.001)
Restatement Annmt. Return [-1,+1]		-0.9985** (0.031)	-0.6548 (0.212)	-1.1116 (0.184)
Litigation (0,1)		0.4799*** (0.002)	0.5596*** (0.002)	0.9908*** (0.001)
Annual (0,1)		-0.1931 (0.324)	-0.1971 (0.353)	-0.5038 (0.142)
Subsidiary (0,1)		-0.3261 (0.108)	-0.2491 (0.259)	-0.4145 (0.265)

Governance Environment:

Board Ownership (%)	-0.0077 (0.196)	-0.0043 (0.505)	-0.0179* (0.070)
Board Independence (%)	-0.5728* (0.098)	-0.4678 (0.216)	-1.0541* (0.086)
Small Board (0,1)	-0.1723 (0.296)	-0.2586 (0.157)	-0.4535 (0.142)
Old Board (%)	-0.5568 (0.413)	-0.2393 (0.751)	-0.7586 (0.551)
CEO Retirement Age (0,1)	0.0496 (0.892)	0.2057 (0.624)	0.1737 (0.799)
CEO/Chairman Duality (0,1)	-0.1580 (0.300)	-0.0903 (0.594)	-0.0869 (0.758)
CEO/Director Social Ties (0,1)	-0.1511 (0.414)	-0.0845 (0.678)	-0.1639 (0.632)

Firm Controls:

Log of Sales	-0.0240 (0.619)	-0.0441 (0.449)	-0.1122 (0.216)
Prior Stock Performance [-24,0]	-0.2629*** (0.005)	-0.3449*** (0.001)	-0.5972*** (0.001)
Cash from Operations	-0.2094 (0.529)	-0.2101 (0.561)	-0.3093 (0.550)
Constant	-0.1125 (0.906)	0.0933 (0.940)	1.0472 (0.406)
Observations	78,170	78,170	425
Pseudo R-Square			0.287
Year Fixed Effects	NO	YES	YES
Industry Fixed Effects	NO	YES	YES
LR Test of Independence rho=0	0.1685	0.0494	
chi2(1)	0.33	0.02	
prob>chi1	(0.567)	(0.879)	

Variable Descriptions: *CEO Under-Performance* equals 1 if, during the accountable CEO's tenure, the firm's stock performance is in the bottom quintile relative to its industry within the 24-month period before the misreporting begins. *CEO Out-Performance* equals 1 if, during the accountable CEO's tenure, the firm's stock performance is in the top decile relative to its industry within the 24-month period before the misreporting begins. *Certified Inside Director* equals 1 if at least one executive director is serving on the board of another public firm. *Founder-CEO* equals 1 if the CEO is the founder or cofounder. *Collusive Abnormal Selling* equals 1 if both outside directors and the CEO have net shares sold during the test period and sold more equity during the test period than over the prior two year period. *AAER* equals 1 if the firm is subject to an accounting and auditing enforcement action by the SEC. *Restatement Annmt. Return* is the market adjusted 3-day return around the announcement date. *Litigation* is equal to 1 if 10b-5 litigation was filed. *Annual* is equal to 1 if the firm restated a 10-K. *Subsidiary* is equal to 1 if the firm's restatement occurred at the subsidiary level. *Board Ownership* is the fraction of stock owned by the board in the year prior to the restatement announcement. *Board Independence* is the fraction of the board who are considered to be non-executives. *Small Board* is equal to 1 if the number of directors is less than that of the median firm. *Old Board* is the fraction of directors over 69 years old. *CEO Retirement Age* is equal to 1 if the CEO is age 63-66 at the time the fraud is discovered. *CEO/Chairman Duality* is equal to 1 if the CEO is also the Chairman of the board. *CEO/Director Social Ties* equals 1 if the fraction of the board with at least one social connection during or prior to the restatement period is greater than that of the median firm. *Log of Sales* is Log of Sales (#12). *Prior Stock Performance* is the market adjusted monthly return from month -24 to the announcement date. *Cash from Operations* is the cash flow from operations (#308) divided by lagged total assets (#6). *Proxy for Potential SEC Enforcement Action* is equal to the number of past SEC enforcement actions at other firms located in the same county as a firm's headquarters at the beginning of the restatement period. *Cash Flow to Price* is cash flow from operations (#308) divided by market value of equity (#24*#25). *Bankruptcy Score* is "-4.803-(3.599*Return on Assets)+(5.406*Leverage)-(0.100*Current Ratio);" see Zmijewski (1984). *Book to Market* is book value of common equity (#60) divided by market value of equity (#24*#25). *Sales Growth* is the ratio of sales in two consecutive years minus 1. *Leverage* is total debt to total assets [(#5+#9)/#6]. *Income Loss Indicator* is equal to 1 when Income before extraordinary items (#18) is negative. *Fiscal Year Return* is the one year stock return prior to the restatement announcement date. *ROA* is income before extraordinary items (#18) divided by lagged total assets (#6).

Table 8
Alternative or Additional Explanatory Variables

The final sample consists of 427 firms that restated financial statements to correct intentional misreporting during the period 1993 to 2007. *CEO Turnover* takes the value of 1 (0 otherwise) if the CEO is fired as a result of the misreporting unless the fired CEO was a Chairman/Founder and remains on the board following the restatement. **Column 1** reports results of a logistic regression of the final model in Table 4 (Column 4) with two controls for the information environment of the firm. **Column 2** reports results of a logistic regression of the final model in Table 4 (Column 4) while using *Collusive Abnormal Trading* instead of *Collusive Abnormal Selling*. **Column 3** reports results of a logistic regression of the final model in Table 4 (Column 4) while using *Concordant Abnormal Trading Behavior* instead of *Collusive Abnormal Selling*. All firm characteristics are measured as of the fiscal year end t-1, where year t is the year of the announcement of the accounting restatement. Two-tailed p-values are reported in parentheses. See below for descriptions of all variables.

Logistic Regressions: Dependent Variable Forced CEO Turnover = 1

	<i>Expectation</i>	Information Asymmetry Environment (1)	Collusive Abnormal Trading (2)	Concordant Trading Behavior (3)
Costs of Replacement:				
CEO Under-Performance - Bottom Quintile(0,1)	(+)	0.6917* (0.055)	0.6191* (0.078)	0.6420* (0.067)
CEO Out-Performance - Top Decile (0,1)	(-)	-0.7912 (0.113)	-0.7773 (0.114)	-0.7575 (0.122)
Certified Inside Director (0,1)	(+)	0.6351* (0.079)	0.6093* (0.087)	0.6087* (0.087)
Founder-CEO (0,1)		-0.9375*** (0.001)	-0.9241*** (0.001)	-0.9102*** (0.001)
Outside Director-CEO Alignment:				
Collusive Abnormal Selling [outside:CEO]	(-)	-0.6078** (0.031)		
Collusive Abnormal Trading [outside:CEO]			-0.1292 (0.606)	
Concordant Abnormal Trading Behavior [outside: CEO]				-0.2198 (0.378)
Proxies for Asymmetric Information:				
Analyst (0,1)		0.5268** (0.035)		
Stock Return Volatility		0.5553 (0.830)		
Constant		0.4228 (0.596)	0.9824 (0.168)	0.9943 (0.163)
Costs of Retention (Restatement Severity) Controls		YES	YES	YES
Governance Environment Controls		YES	YES	YES
Firm Controls		YES	YES	YES
Observations		425	425	425
Pseudo R-Square		0.248	0.229	0.230

Variable Descriptions: *CEO Under-Performance* equals 1 if, during the accountable CEO's tenure, the firm's stock performance is in the bottom quintile relative to its industry within the 24-month period before the misreporting begins. *CEO Out-Performance* equals 1 if, during the accountable CEO's tenure, the firm's stock performance is in the top decile relative to its industry within the 24-month period before the misreporting begins. *Certified Inside Director* equals 1 if at least one executive director is serving on the board of another public firm. *Founder-CEO* equals 1 if the CEO is the founder or cofounder. *Collusive Abnormal Selling* equals 1 if both outside directors and the CEO have net shares sold during the test period and sold more equity during the test period than over the prior two year period. *Collusive Abnormal Trading* equals 1 if both outside directors and the CEO have net shares bought during the test period and bought more equity over the test period than over the prior two year period OR both outside directors and the CEO have net shares sold during the test period and sold more equity over the test period than over the prior two year period. *Concordant Abnormal Trading Behavior* equals 1 if the both outside directors and the CEO are engaged in *Collusive Abnormal Trading* or no trading. *Analyst* equals 1 if the firm is followed by at least one analyst. *Stock Return Volatility* is the volatility of monthly market adjusted stock returns for a five year period ending 2 years before the announcement.