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Restoring Trust after Fraud: Does Corporate Governance Matter?

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ABSTRACT: In this study, I examine the association between the credibility of the financial reporting system and the quality of governance mechanisms. I use a sample of 87 firms identified by the SEC as fraudulently manipulating their financial statements. Consistent with prior research, results indicate that fraud firms have poor governance relative to a control sample in the year prior to fraud detection. Specifically, fraud firms have fewer numbers and percentages of outside board members, fewer audit committee meetings, fewer financial experts on the audit committee, a smaller percentage of Big 4 auditing firms, and a higher percentage of CEOs who are also chairmen of the board of directors. However, the results indicate that fraud firms take actions to improve their governance, and three years after fraud detection these firms have governance characteristics similar to the control firms in terms of the numbers and percentages of outside members on the board, but exceed the control firms in the number of audit committee meetings. I also investigate whether the improved governance influences informed capital market participants. The results indicate that analyst following and institutional holdings do not increase in fraud firms, suggesting that credibility was still a problem for these firms. However, the results also indicate that firms that take actions to improve governance have superior stock price performance, even after controlling for earnings performance. This suggests that investors appear to value governance improvements.

Keywords: *fraud; corporate governance; credible financial reporting; investor trust; agency costs; independent directors; audit committee.*

Data Availability: *The data used in this study are available from public sources identified in the text.*

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I. INTRODUCTION

Empirical evidence indicates that weak corporate governance is associated with financial reporting fraud (e.g., Dechow et al. 1996 [hereafter DSS]; Beasley 1996), but little is known about the actions that fraud firms take to improve their weak governance after fraud detection and, perhaps more importantly, how effectively these actions restore investor trust. Given the importance of the relation between the quality of governance mechanisms and the credibility of the financial reporting system, it is surprising that we know so little about the nature and extent of this relation. In this study, I seek to fill this gap by investigating the association between the revelation of financial reporting fraud and subsequent improvements in the quality of corporate governance mechanisms and the corresponding economic consequences of such improvements. This evidence is important because the quality of corporate governance is at the forefront of concerns of regulators and corporate management.

Regulators, perhaps in response to the recent flurry of highly publicized financial reporting frauds (e.g., Enron), are considering or have enacted rules intended to strengthen the quality of corporate governance.[1] Much of the debate surrounding these proposals revolves around the idea that stronger governance is associated with more credible financial reporting. Some firms accused of fraud are using a recovery strategy that includes governance improvements. For example, in a recent financial press article (Sorkin 2002), Edward D. Breen, who was appointed CEO of Tyco following allegations of fraudulent financial reporting there, commented on the state of the quality of corporate governance at Tyco:

> The most important thing, in my opinion, when I came into the company, and I've stated this many times, was *fixing* corporate governance ... (emphasis added)

Breen appears to believe that there is a net benefit to improving his firm's governance mechanisms, perhaps in the form of a positive stock price reaction.

It seems obvious that firms caught committing fraud would take some actions with respect to their governance mechanisms, the most likely of which is to discharge the culprits associated with the fraud. However, it is not as obvious that these firms would necessarily *improve* their governance after fraud detection because they could merely replace inside directors with other insiders, rather than with outside directors, for example.

My first main research objective, therefore, is to examine whether there is an association between the detection of financial reporting fraud and subsequent improvements in the quality of governance mechanisms. I find that while fraud firms' governance structures are initially weak, by the end of a three-year period following the year of fraud detection these firms have a similar board of director profile and proportion of firms with the combined CEO/COB position to that of their matched control firms. I also find that fraud firms hold more audit committee meetings than their matched control firms by the end of this same period. Overall, these results suggest that improving the quality of governance is important to fraud firms.

Given that regulators are mandating new governance rules and that fraud firms are likely to be expending scarce resources on governance improvements after fraud detection, it is important to document whether these improvements provide *any* economic benefits. Evidence that governance improvements do indeed provide economic benefits would support the basis for these rules and firms' expenditures on enhanced governance. However, it could very well be the case that these improvements do not provide any economic benefits

[1] For example, NYSE (2004) and NASDAQ (2004) have both recently enacted rules requiring that their member firms have boards of directors with a majority of independent directors.

and are merely window dressing (i.e., non-value-enhancing) and thus an inefficient use of resources. Providing evidence on either case adds to our knowledge of the economics of improving the quality of the corporate governance mechanisms that monitor the financial reporting process.

My second main research objective, therefore, is to examine whether these improvements aid fraud firms in restoring their reputations with informed capital market participants and recovering share values. Specifically, I examine the relation between improvements that fraud firms make in their boards and audit committees following fraud detection and the corresponding responses of analysts, institutional investors, short sellers, and the stock market. Results indicate that analyst following and institutional ownership do not increase in fraud firms, suggesting that credibility is likely still a problem for these firms. These results are not surprising given that fraud firms experience negative returns following fraud detection. More interestingly, I find a positive and economically significant relation between increases in board independence and long-run buy-and-hold abnormal returns over the three-year period following fraud detection, even after controlling for earnings performance. Overall, my findings suggest that fraud firms and, perhaps more importantly, the market, view improving the quality of governance mechanisms as a way of restoring trust after fraud.

The remainder of this paper is organized as follows. In Section II, I provide a brief review of the relevant literature on governance mechanisms and fraud. Section III contains a description of the sample. Section IV contains the research design and empirical results. I summarize and conclude in Section V.

II. LITERATURE REVIEW

One stream of the accounting literature related to financial reporting fraud examines the association of governance mechanisms and the likelihood of fraud (e.g., DSS; Beasley 1996). DSS find that firms committing financial reporting fraud are more likely to have a board of directors dominated by insiders and are less likely to have an audit committee. However, they do not find that the use of a (then) Big 6 audit firm significantly influences the likelihood of fraud. Beasley (1996) finds that the inclusion of larger proportions of outside members on the board of directors significantly reduces the likelihood of financial reporting fraud, but does not find significant evidence that fraud firms' audit committees meet less frequently. In contrast to DSS and Beasley (1996), the current study investigates the magnitude and economic consequences of fraud firms' improvements in important monitoring mechanisms during the three-year period following fraud detection.

There are few extant studies that examine firm *responses* to fraud detection. In research closely related to the current study, Agrawal et al. (1999) investigate the association of fraud detection and subsequent turnover in senior managers and directors, but fail to find one. Agrawal et al. (1999) examine 103 firms that commit a broad range of frauds, but only four of those firms represent cases of financial reporting fraud. Thus, it is difficult to draw inferences from their study regarding the effect of GAAP violations on governance improvements. Moreover, past research (Karpoff and Lott 1993) finds that mean abnormal returns in a two- or three-day window around fraud detection are significantly more negative in cases of financial reporting fraud than in other cases of fraud. Therefore, incentives to overhaul governance mechanisms are likely to be greater for cases of financial reporting fraud firms than for other cases of fraud. However, this remains an empirical question—one that I examine in this study.

Livingston (1997) and Beneish (1999) investigate senior management turnover following the detection of financial reporting fraud. Srinivasan (2004) investigates outside director

turnover after an accounting restatement. Livingston (1997) finds significant turnover in top managers and financial officers, while Beneish (1999) finds no unusual turnover in senior management. Srinivasan (2004) finds significantly higher turnover in boards for firms that restate earnings downward and that the likelihood of director departure increases in restatement severity. Unlike the Livingston (1997) and Beneish (1999) studies, the current study focuses on the mechanisms intended to oversee managerial actions, rather than on management itself. This is important because agency costs will continue to exist as long there is separation of ownership and control in a firm. Replacing top management following fraud detection does not get to the root of the problem. As Jensen (1993) notes, "... bad systems or rules, not bad people, underlie the general failings of the board of directors." Therefore, enhancing the quality of governance mechanisms is more likely to ensure that managers do not deviate from their fiduciary duties. Unlike the Srinivasan (2004) study, the current study focuses on changes in a more comprehensive set of governance variables. The current study also examines these changes around a financial reporting fraud, a distinctly different event from an earnings restatement, which does not necessarily involve fraud. Moreover, the current study also investigates the economic consequences of these governance changes for the firms themselves.

The only extant study of which I am aware that provides direct evidence on the market's response to *changes* in boards of directors is that by Rosenstein and Wyatt (1990), who, in a nonfraud setting, find a small positive mean abnormal return over a two-day window centered on the announcement dates of outside director appointments. It is possible, however, that the market will discount or ignore governance changes made by fraud firms because the revelation of fraud has so badly tarnished these firms' reputations. Therefore, our understanding of the economic consequences of governance changes after fraud detection is an open empirical issue that warrants investigation.

III. SAMPLE SELECTION

Fraud Sample

The fraud sample consists of publicly held companies cited in United States Securities and Exchange Commission (SEC) Accounting and Auditing Enforcement Releases (AAERs)[2] for violating SEC Rule 10b-5 during the period 1982–2000. An illustrative example of the SEC's justification for issuing AAERs under the fraud provisions of the Exchange Act of 1934 follows (per AAER No. 689, in the case of *Kurzweil Applied Intelligence, Inc.*):

> Section 10(b) of the antifraud provisions of the Exchange Act (of 1934) and Rule 10b-5 thereunder proscribes the making of materially false and misleading statements "in connection with the purchase or sale of any security." Violations of Section 10(b) and Rule 10b-5 occur when an issuer makes material misstatements in registration statements, prospectuses or periodic reports filed with the Commission and trading thereafter occurs in the issuer's securities. The filing of false and misleading reports is also a violation of Section 10(b) of the Exchange Act (of 1934) and Rule 10b-5 thereunder because reports of publicly traded companies affect the markets for offer, sale and purchase of their securities.

[2] The SEC issues AAERs against firms and others (e.g., audit firms, managers, and directors) for violations of SEC rules.

I use AAERs as a proxy for the occurrence of fraud. Consistent with Beasley (1996) and Bonner et al. (1998), this proxy is intended to capture extreme cases of fraud in the error-to-fraud continuum. A focus on AAERs is justified because while the SEC cannot possibly investigate every case of fraud, it does target the highest profile cases (Feroz et al. 1991). Consequently, the fraud sample used in this study is likely to include the most egregious cases of fraud and thus provides a powerful setting to examine the impact of fraud detection on governance improvements because if no effect is found in this setting, then it is not likely to be found in any other. However, the use of AAERs has limitations. For example, because the SEC selects cases for which it has the best chance of winning a judgment, they are likely to include instances of the most extreme misleading reporting. Therefore, the results of this study are not likely to be generalizable to the entire population of firms that report fraudulently.

I restrict my analyses to frauds that were *detected* through 1997 to allow for a three-year period after fraud detection in which to examine governance changes. The analysis period is restricted to five years to make data collection more tractable. Table 1, Panel A reconciles the number of AAERs issued over my analysis period to my final fraud sample. There were 1,357 AAERs issued from 1982 to 2000,[3] of which 1,067 did not involve financial statement fraud, were duplicates, or were outside the scope of the analysis period. I was unable to locate proxies or financial statement data for another 195 firms. I include in the final fraud sample each fraud firm that has either proxy statements or SEC Forms 10-K available for at least one year before and at least one year after fraud detection. This sample selection criteria initially leads to 95 firms in the fraud sample, but because I was unable to identify matches for 8 of the fraud firms, the final fraud sample size is 87. Once I identify a firm for inclusion in the fraud sample, I search the Dow Jones database for the period surrounding the fraud period identified in the AAER to determine the fraud detection date. Following Feroz et al. (1991), if no indication of the fraud detection date appears in Dow Jones, I use the AAER date as a proxy for the detection date. During my review of the AAERs, I carefully examined each one to ensure that the fraud firms identified were cited for false and misleading financial reports. Moreover, I noted no cases where a firm was cited for violating Rule 10b-5 only for reasons other than the issuance of false or misleading financial statements.

Panel B of Table 1 indicates that fraud firms are widely distributed among industries, with some clustering of firms in machinery and computer equipment, measurement instruments, and business services. Panel C of Table 1 indicates that 60 percent of the frauds involve fictitious transactions (i.e., those that are unambiguously fraudulent and include creating phony invoices for sales that do not exist and never will), that fraud firms overstate their net income by a mean (median) of 174 percent (53.70 percent) and that the mean (median) length of the fraud is 6.66 (6.00) quarters.

Control Sample

Prior research (e.g., DSS) and the current study show significant clustering by industry among fraud firms. Therefore, examination of governance changes surrounding fraud detection is likely to reveal characteristic governance behavior that is associated with changes in the industry rather than with fraud detection. To control for this possibility, I use a

[3] Because AAERs are typically issued two to three years subsequent to fraud detection (see, Feroz et al. 1991), I reviewed them through the year 2000 to ensure that I identified all frauds through the year 1997 (AAERs contain information regarding the fraud period).

matched-pairs design to test changes in corporate governance mechanisms following fraud detection.

For each fraud firm, I select a control firm with the same four-digit SIC code, with net sales within ±25 percent of the fraud firm's net sales for the year preceding fraud detection,

TABLE 1
Fraud Sample Selection, Fraud Firm Characteristics, and Fraud-Specific Statistics

Panel A: Sample Selection of 87 Firms Subject to Enforcement Actions under SEC Rule 10b-5 between 1982 and 2000

Number of AAERs issued between 1982 and 2000	1,357
Less:	
AAERs not involving financial statement fraud, duplicate AAERs, or AAERs outside scope of analysis period (e.g., unintentional misapplication of GAAP, AAERs against auditors, AAERs issued for frauds occurring after 1997)	1,067
Firms without proxy or financial statement data	195
Firms without an available matching non-fraud firm	8
Final Sample	87

Panel B: Distribution of Fraud Firms by SIC Code

Two-Digit SIC Code	Industry Description	Number of Firms
13	Oil and Gas Extraction	5
22	Textile Mill Products	1
23	Apparel	2
26	Paper and Allied Products	1
27	Printing and Publishing	2
28	Chemicals	5
32	Stone, Clay and Glass	1
34	Fabricating Metals	5
35	Machinery and Computer Equipment	10
36	Electrical	9
37	Transportation Equipment	1
38	Measurement Instruments	9
39	Miscellaneous Manufacturing	1
42	Motor Freight Trans, Warehousing	1
45	Air Transportation	1
49	Electric, Gas, Sanitary Services	4
50	Wholesale Durable Goods	5
52	Building Materials	1
56	Apparel and Accessory Stores	2
59	Miscellaneous Retail	4
61	Nondepository Credit Institution	1
73	Business Services	12
79	Amusements and Recreation	1
80	Health Services	2
99	Miscellaneous	1
	Total	87

(*continued on next page*)

TABLE 1 (continued)

Panel C: Fraud-Specific Statistics

Type of GAAP Violation[a]	Number of Firms	Percentage of Total
Fictitious Transactions	52	60
Timing Difference Transactions	31	36
Unidentified	4	4
Total	87	100

	Median	Mean	Std. Deviation	Max	Min
Overstatement as percentage of net income	53.70	174.20	361.86	2,169	0
Length of GAAP Violation (in quarters)	6.00	6.66	4.21	19	1

[a] Fictitious transactions are unambiguously fraudulent and include phony invoices for sales that do not exist and never will. Timing difference transactions represent premature recognition of legitimate transactions that eventually occur.

and within the same stock exchange. If I cannot find a match within the same four-digit SIC code, then I relax my matching criteria to include firms with the same three-digit SIC code, and if necessary, match firms on the basis of a two-digit SIC code. The potential control firm is included in the final matched control sample if there are no reports of fraud in the Dow Jones Database for that firm in the two years before and three years after the fraud detection year of its corresponding fraud firm. Additionally, I search AAERs issued during the analysis period to ensure that the SEC has not cited the potential control firm. The final non-fraud sample consists of 87 firms. Table 2 indicates that fraud and non-fraud firms do not differ significantly based on net sales, market value, or exchange listing.[4]

IV. RESEARCH DESIGN AND EMPIRICAL RESULTS

Changes in Governance Variables

Prior research (Beasley 1996; DSS) has established that, compared to matched control firms, fraud firms have weaknesses in several key governance mechanisms. These weaknesses include boards with lower percentages of outside directors, a higher proportion of firms with the combined CEO/COB position, a lower proportion of firms with audit committees, fewer audit committee meetings, and a smaller percentage blockholder ownership. Other governance mechanisms likely to be important to the financial reporting system include the composition of the audit committee, including its percentage of independent directors and financial experts, the quality of the external audit firm, and the percentage of ownership by managers and directors.

Several empirical studies show that boards composed mainly of outside directors are more effective than boards composed mainly of insiders (e.g., Brickley and James 1987; Weisbach 1988; Rosenstein and Wyatt 1990), and that boards are ineffectual monitors when the board's equity ownership is small and when the CEO is also Chairman of the Board (Jensen 1993). Agrawal et al. (1999) provide the only empirical study of which I am aware that investigates changes in both senior management and directors after fraud detection.

[4] I also test for the difference in age between fraud and control firms and find no statistical difference.

TABLE 2
Matching Statistics for Fraud and Control Firms

Variable	Fraud Firm Mean (in millions) (n = 87)	Control Firm Mean (in millions) (n = 87)	t-statistic	Fraud Firm Median (in millions) (n = 87)	Control Firm Median (in millions) (n = 87)	p-value
Net Sales	373.61	343.59	0.77	37.07	44.85	0.28
Market Value	336.59	315.94	0.40	55.48	31.39	0.14

Exchange Listing	Fraud Firm	Control Firm
NYSE	17	17
AMEX	5	5
NASDAQ/OTHER	65	65
Total	87	87

Fraud firms are matched with control firms on the basis of year, net sales, SIC code, and stock exchange listing. The t-statistic is for the difference between the means of the matched pairs. The p-value is for the Wilcoxon signed rank test.

They find no significant turnover in either senior management or directors in the three years after fraud detection. However, it is difficult to draw inferences from their study about the detection of GAAP violations as a catalyst for making improvements in governance because their sample included only four GAAP violators.

Sommer (1991) suggests that having an audit committee as part of the governance structure and having an effective audit committee are two different matters; further, the audit committee needs to meet on a regular basis without management in order for it to be effective. He also notes that the audit committee, because it has constant access to the internal audit staff, external audit firm, and other corporate personnel, is likely to be the first to identify a potential irregularity. His study supports the notion that there is a positive relation between the number of meetings an audit committee holds and its effectiveness. Beasley (1996), however, finds no significant difference between fraud and non-fraud firms in the number of audit committee meetings held in the year prior to fraud detection. The Blue Ribbon Committee on Improving the Effectiveness of Corporate Audit Committees (BRC) (1999) suggests that the composition of the audit committee is also likely to be critical to its performance. I therefore examine whether the composition of the audit committee differs for fraud and control firms along the dimensions of size, number of outside directors, and number of financial experts.

The extant literature finds no significant difference between fraud and non-fraud firms in audit-firm quality as measured by the use of Big 4 auditing firms versus non-Big 4 firms in the year prior to fraud detection (DSS; Beneish 1997). Several studies find an association between audit-firm quality and audit-firm size (e.g., DeAngelo 1981). One implication of this finding is that a larger audit firm is likely to be a stronger monitor than a smaller one. Palmrose (1988) suggests that (then) Big 8 audit firms are sued less frequently than other audit firms because they provide higher quality audits. DeFond (1992) finds a positive relation between audit-firm quality, as proxied by audit-firm size and name brand (i.e., Big 4), and its ability to mitigate agency problems. In sum, these findings suggest that Big 4 audit firms provide better monitoring than other categories of audit firms.

Firms choosing governance mechanisms likely also evaluate their costs. Empirical studies find that internal control improvements are costly to firms in terms of the time and effort required to improve governance (Yermack 1996; Klein 2002). Moreover, there is a prohibitive cost associated with establishing internal controls that would eliminate entirely the probability of (future) frauds (Jensen 1993). Notwithstanding these costs, because of the severity of the agency problems of the fraud firms used in this study, it is likely that their costs of not improving governance are greater than their costs of doing so. Economic theory suggests that efforts to repair the financial reporting system must necessarily include significant improvements in its monitoring components. More specifically, agency theory suggests that the demand for monitoring is positively related to the prevalence of agency costs (Fama 1980; Fama and Jensen 1983). Because fraud is a manifestation of acute agency costs, I expect that fraud firms will experience a greater increase in: (1) outside director percentage, (2) audit committee activity, (3) audit committee independence, (4) audit committee financial expertise, and (5) audit-firm quality; and a greater decrease in the proportion of firms with the combined CEO/COB position after fraud detection than will their corresponding control firms over the same period. Blockholders are also likely to play a key monitoring role (Jensen 1993), but because they are an external monitoring mechanism, it is difficult to predict changes in their post-fraud detection ownership. It is also difficult to predict the change in inside ownership by management and directors given that there is likely to be substantial turnover in both following the detection of fraud. I therefore do not make predictions for changes in the holdings of blockholders, managers, or directors.

I obtain data on these governance variables from the firm's proxy statement or SEC Form 10K. Figure 1 illustrates the direction of the changes in the governance variables for the sample of fraud firms from the year prior to fraud detection compared to the third year afterward. Figure 1, Panel A indicates that increases occur in the percentage of outside directors[5] (*OutsideDir%*), and the percentage of stock held by blockholders (*Block%*), while the percentage of firms with the combined CEO/COB position (*CEO=COB%*) and the percentage of stock held by management and directors (*InsideOwn%*) declines. Panel A also indicates that the percentage of firms with a Big 4 audit firm (*Big4%*) and the percentage of institutional ownership (*InstOwn%*) remain virtually the same.

Figure 1, Panel B provides evidence that fraud firms increase the number of outside directors on their boards (*#OutsideDir*), the number of audit committee meetings (*#AudComMeet*), the number of audit committee members (*#AudComMbrs*), and the number of outside directors on their audit committees (*#AudComOutsideDir*). This figure also indicates that the number of financial experts[6] (*#FinlExperts*) remains virtually unchanged.

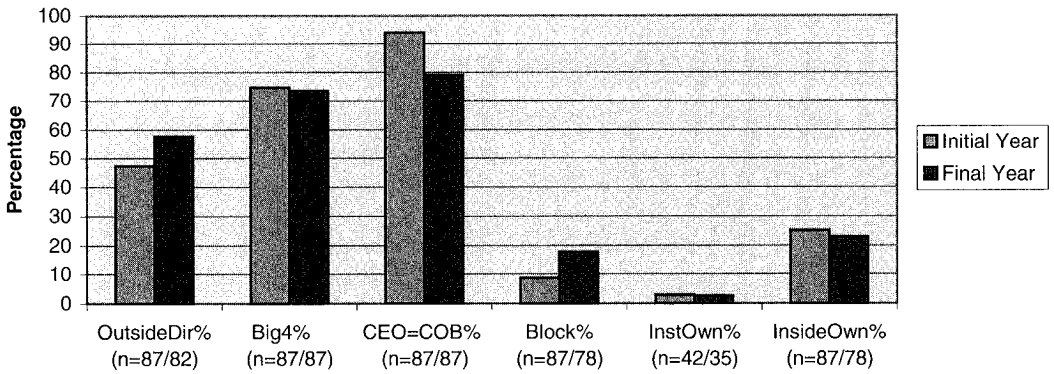
Table 3 provides tests of significance of these governance changes using a set of control firms. I first test whether the sample of fraud firms used in this study has a similar governance profile to that used in prior studies. I then test my predictions about changes in these governance variables. As reported in Table 3, Panel A, I find that the mean *OutsideDir%* in the year preceding fraud detection (Initial) is 47 percent for fraud firms compared to 56 percent for control firms, a statistically significant difference ($t = -2.54$), which is consistent with Beasley (1996) and DSS. Panel A also documents that *#OutsideDir* in Initial is 3.3 for fraud firms compared to 4.1 for control firms, a statistically significant

[5] Consistent with Rosenstein and Wyatt (1990), I define an outside director as a director who is not a present or former employee of the firm and whose only formal connection to the firm is his/her duty as a director.

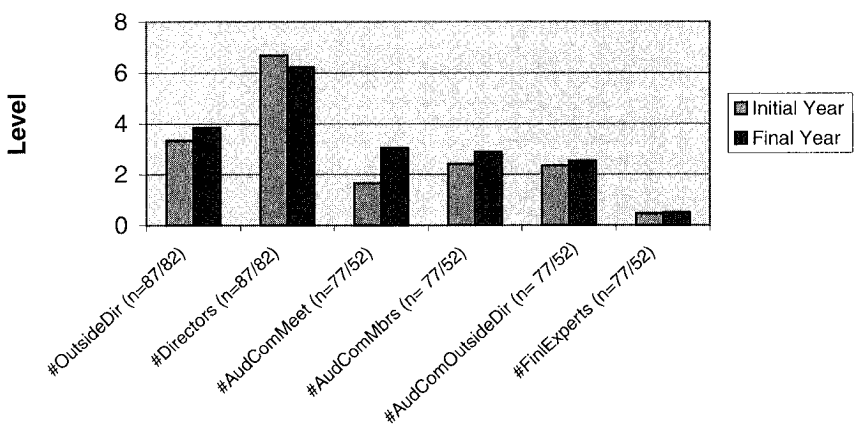
[6] I define a financial expert as one who has accounting or related financial management expertise (i.e., a person who is or has been chief financial officer, or other senior corporate officer with financial oversight responsibility). This definition is consistent with that in the report of the Blue Ribbon Committee (1999).

FIGURE 1
Governance Variables for Fraud Firms in the Year Prior to Fraud Detection (Initial) and the Third Year Afterward (Final) for Frauds Detected from 1982 to 2000

Panel A: Means of Governance Variables in Percentage (sample size = Initial/Final)



Panel B: Means of Governance Variables in Levels (sample size = Initial/Final)



OutsideDir% = outside director percentage;
Big4% = percentage with Big 4 audit firms;
CEO=COB% = percentage with the combined CEO/COB position;
Block% = percentage of shares held by > 5 percent blockholders;
InstOwn% = the percentage of shares held by institutions that file SEC Form 13F;
InsideOwn% = the percentage of shares held by management and directors;
#OutsideDir = number of outside directors;
#Directors = number of directors;
#AudComMeet = number of audit committee meetings;
#AudComMbrs = number of audit committee members;
#AudComOutsideDir = number of outside directors on audit committee;
#FinlExperts = number of financial experts on audit committee;
Initial Year = the year prior to fraud detection; and
Final Year = the third year after fraud detection.

difference (t = –2.08). The change in *OutsideDir%* is greater for fraud firms in years 1 through 4, thus providing support for the hypothesis that fraud firms will increase their

TABLE 3
Univariate Comparisons of Board of Director, Audit Committee, and Other Corporate Governance Variables

Panel A: Board of Director Characteristics

Variable	Firm	Year					
		Initial[a]	1[b]	2[b]	3[b]	4[b]	Final[a]
OutsideDir%	Fraud	47.03	3.25	3.50	7.21	9.95	55.77
	Control	55.68	−0.99	−1.26	−1.86	1.99	56.61
	(t-stat)	(−2.54)***	(2.11)**	(1.62)*	(2.87)***	(1.96)**	(−0.20)
	(#matched pairs)	(87)	(84)	(85)	(86)	(79)	(79)
#OutsideDir	Fraud	3.34	0.024	0.13	0.31	0.51	3.68
	Control	4.07	−0.04	−0.17	−0.20	−0.38	3.96
	(t-stat)	(−2.08)**	(0.36)	(1.14)	(1.89)**	(1.58)*	(−0.73)
	(#matched pairs)	(87)	(84)	(85)	(86)	(79)	(79)
#Directors	Fraud	6.69	−0.44	−0.45	−0.49	−0.52	6.05
	Control	7.00	0.05	−0.21	−0.27	−0.31	6.63
	(t-stat)	(−1.11)	(−2.41)**	(−0.84)	(−0.73)	(−0.66)	(−1.05)
	(#matched pairs)	(87)	(84)	(85)	(86)	(79)	(79)
Panel B: Audit Committee Characteristics							
#AudComMeet	Fraud	1.61	0.85	1.39	1.38	1.33	3.00
	Control	1.97	0.09	0.19	0.45	0.44	2.33
	(t-stat)	(−1.46)*	(2.73)**	(3.55)**	(1.77)**	(2.14)**	(1.54)*
	(#matched pairs)	(69)	(41)	(41)	(40)	(39)	(39)
#AudComMbrs	Fraud	2.41	0.08	−0.04	0.09	0.32	2.88
	Control	2.30	0.02	0.05	0.28	0.30	2.63
	(t-stat)	(0.40)	(−0.13)	(−0.35)	(−0.73)	(−0.62)	(0.96)
	(#matched pairs)	(63)	(36)	(40)	(40)	(39)	(39)
#AudComOutsideDir	Fraud	2.34	−0.21	−0.29	−0.13	−0.24	2.71
	Control	2.25	−0.15	−0.11	−0.02	0.00	2.55
	(t-stat)	(0.19)	(−1.44)	(−1.48)	(−0.31)	(−0.26)	(0.67)
	(#matched pairs)	(63)	(36)	(40)	(40)	(39)	(39)
#FinlExperts	Fraud	0.46	0.05	0.07	0.04	−0.01	0.49
	Control	0.80	−0.04	−0.06	−0.06	0.02	0.80
	(t-stat)	(−2.40)***	(0.00)	(0.47)	(1.64)	(−0.81)	(−1.90)**
	(#matched pairs)	(63)	(36)	(40)	(40)	(39)	(39)

(*continued on next page*)

TABLE 3 (continued)

Panel C: Other Governance Variables

Variable	Firm	Year					
		Initial[a]	1[b]	2[b]	3[b]	4[b]	Final[a]
Big4%	Fraud	0.75	0.05	0.00	−0.01	−0.01	0.74
	Control	0.85	−0.01	0.02	0.01	0.03	0.88
	(t-stat)	(−1.82)*	(1.68)*	(0.28)	(−0.77)	(−0.94)	(−2.48)**
	(#matched pairs)	(87)	(87)	(86)	(84)	(81)	(81)
CEO=COB%	Fraud	0.94	−0.05	−0.07	−0.15	−0.15	0.79
	Control	0.80	0.01	0.02	0.02	0.05	0.85
	(t-stat)	(2.79)***	(−1.92)**	(−2.40)***	(−3.51)***	(−3.86)***	(−1.04)
	(#matched pairs)	(87)	(84)	(85)	(86)	(79)	(79)
Block%	Fraud	8.73	2.74	4.40	5.72	11.06	18.67
	Control	13.38	−2.59	−0.53	1.16	2.90	15.24
	(t-stat)	(−2.05)**	(2.39)**	(2.20)**	(1.83)*	(2.39)**	(0.99)
	(#matched pairs)	(85)	(67)	(72)	(67)	(70)	(70)
InstOwn%	Fraud	0.03	−0.003	−0.005	−0.006	−0.007	0.03
	Control	0.03	0.001	0.002	0.002	0.005	0.03
	(t-stat)	(1.35)	(−1.99)*	(−2.19)**	(−2.53)**	(−1.84)*	(−0.30)
	(#matched pairs)	(22)	(18)	(18)	(17)	(13)	(13)
InsideOwn%	Fraud	25.20	−5.68	−2.81	−1.69	−1.20	22.80
	Control	26.46	−1.72	−3.89	−0.54	−2.80	22.83
	(t-stat)	(−0.42)	(−1.49)	(0.47)	(−0.49)	(0.52)	(−0.01)
	(#matched pairs)	(86)	(66)	(68)	(66)	(68)	(68)

*, **, *** Significant at the 10 percent, 5 percent, and 1 percent levels, respectively, based on one-tailed tests, except for *BLK%* and *INST%*, for which no directional predictions are made.

[a] Initial and Final represent the first (pre-fraud detection) and last years of the analysis period, respectively; the variables for these years are measured in levels.

[b] Represent years relative to the pre-fraud detection year (Initial); the variables for these years are measured as changes from Initial.

OutsideDir% = outside director percentage;
#OutsideDir = number of outside directors;
#Directors = number of directors;
#AudComMeet = number of audit committee meetings;
#AudComMbrs = number of audit committee members;
#AudComOutsideDir = number of outside directors on audit committee;
#FinlExperts = number of financial experts on audit committee;
Big4% = proportion of firms with Big 4 audit firms;
CEO=COB = proportion of firms with the combined CEO/COB position;
Block% = percentage of shares held by > 5 percent blockholders;
InstOwn% = the percentage of shares held by institutions that file SEC Form 13F; and
InsideOwn% = the percentage of shares held by management and directors.

percentage of outside directors by more than control firms after fraud detection.[7] The change in *#OutsideDir* is also generally greater for fraud firms than for control firms over the analysis period, although this difference is statistically significant only after year 2. Over the analysis period, the change for *#Directors* is generally not different for fraud and control firms, except for year 1, where fraud firms have a larger decline than their corresponding control firms (t = –2.41). These results suggest that fraud firms improve their reputational capital through the addition of outside directors, both in number and proportion, although the decline in the total number of directors accounts for part of this result.[8]

As reported in Table 3, Panel B, I find that the mean *#AudComMeet* for fraud firms in Initial is 1.61, which is statistically smaller than the mean of 1.97 for control firms (t = –1.46). This result contrasts with that of Beasley (1996) and likely obtains due to more power in my tests—69 matched pairs in the current study versus 26 matched pairs in the Beasley (1996) study.

Table 3, Panel B also provides the cumulative numerical increase in *#AudComMeet* from its level in Initial to the fourth year afterward. The change in the mean *#AudComMeet* is greater for fraud firms than for control firms over the entire analysis period, thus providing support for the hypothesis that fraud firms increase the number of audit committee meetings by more than control firms. The mean *#AudComMeet* at Final for fraud firms is 3.00 versus 2.33 for control firms. This difference is statistically significant at the 10 percent level (one-tailed). Overall, fraud firms experience an increase of some 80 percent in *#AudComMeet* from the pre-fraud detection year to the fourth year afterward. It appears that in the wake of fraud detection the audit committee has at least visibly demonstrated that it is paying more attention to the financial reporting process.

Results provided in Table 3, Panel B also indicate that fraud firms have significantly fewer *#FinlExperts* in Initial, with 0.46 financial experts for fraud firms versus 0.80 financial experts for control firms (t = –2.40). This difference, however, persists at the end of the analysis period. I also find that while fraud firms have a majority of *#AudComOutsideDir* in the pre-fraud detection year, there is no difference between fraud and control firms in *#AudComOutside* in Initial or in any year through the fourth year afterward. One reasonable interpretation of these results is that although fraud firms' audit committees contained a majority of outsiders and some level of financial expertise, it appears that they did not pay enough attention to the financial reporting process, as evidenced by the fewer number of meetings held in Initial. Therefore, the number of audit committee meetings appears to be relatively more important than the composition of the audit committee for explaining the likelihood of committing fraud.

Results in Table 3, Panel C indicate that in the year prior to fraud detection 75 percent of fraud firms retain a Big 4 auditing firms compared to 85 percent for control firms, a statistically smaller percentage at the ten percent level (t = –1.82).[9] This result contrasts with those in DSS and Beneish (1997) and likely obtains because the severity of the frauds examined in this study likely exceeds the severity of the frauds examined in their studies in terms of the SEC rule violated. Untabulated results indicate that at the third year after fraud detection the difference between fraud and control firms relative to their use of Big 4

[7] Results are qualitatively similar for tests of all governance variables holding constant the sample size at Final.

[8] The possibility exists that the results obtained for changes in outside director percentage are due to mean reversion. However, changes in outside director percentage require some explicit action by management and therefore are not like other variables, such as returns, where changes can occur without actions directed by management. I thank a referee for pointing this out to me.

[9] This result suggests that there is relatively little room for monitoring improvement along this dimension for most fraud firms. Therefore, I exclude audit-firm changes from subsequent market-based analyses.

audit firms persists, with 75 percent of fraud firms retaining Big 4 firms versus 88 percent of the control firms, a statistically significant difference ($p = 0.03$). Overall, fraud firms are more likely than control firms to switch audit firms after fraud detection, but not audit-firm types. In the year of fraud detection, 25 percent of fraud firms switch audit firms, compared to 9 percent of control firms, a statistically significant result ($p = 0.00$). In the year after fraud detection, 24 percent of fraud firms switch audit firms, compared to 7 percent of control firms, again statistically significant ($p = 0.00$). For fraud firms, the majority of switches occurs within Big 4 firms, with 55 percent and 62 percent of the switches in the fraud detection year and year afterward, respectively. These results imply that in the post-fraud detection period fraud firms were at least able to maintain a high level of audit-firm quality, as measured by Big 4 audit firms.

Panel C of Table 3 also indicates that in Initial, 94 percent of fraud firms have *CEO=COB%* compared to 80 percent for control firms, a statistically greater proportion ($t = 2.79$). This result is consistent with that in DSS, who find that 86 percent of fraud firms have the combined position compared to 74 percent of control firms in the year prior to fraud detection. I find that by the end of the analysis period fraud and control firms have an indistinguishable difference in this variable. Panel C also reports that fraud firms have a significantly lower *Block%* in Initial ($t = -2.05$) compared to control firms, consistent with the finding in DSS. This difference disappears by the end of the analysis period, indicating that blockholders increase their holdings in fraud firms. I also find that while fraud firms and their matched control firms do not differ in *InstOwn%* in Initial, fraud firms experience a greater decrease in *InstOwn%* for each year of the analysis period, but do not differ in *InstOwn%* at the end of the analysis period. The sample size for this variable is very small and one therefore needs to carefully interpret these results. Finally, I find no difference in *InsideOwn%* between fraud and control firms in Initial or in any of the four years afterward.

In sum, I find that, in the year prior to fraud detection, fraud firms exhibit weakness along the governance dimensions of outside director percentage, the number of outside directors, the number of audit committee meetings, the number of financial experts on their audit committees, the quality of the external audit firm, the proportion of firms with the combined CEO/COB position, and the percentage of blockholder ownership. More interestingly, I find that by the end of the three years following fraud detection, fraud firms have indistinguishable differences from their matched control firms in outside director percentage and the proportion with the combined CEO/COB position; they also experience a *greater* number of audit committee meetings than their matched control firms. Overall, this evidence is consistent with my hypotheses and likely indicates that fraud firms wish to report their financial information more credibly. Whether this results in the restoration of fraud firms' reputations with informed capital market participants and the stock market are issues that I explore next.

Responses to Governance Changes

Overall, the results presented thus far in this paper indicate that fraud firms experience an increase of less than one outside director and an increase of one audit committee meeting in the three years after fraud detection. It is not clear how to interpret the economic significance of these results. These increases likely have a second-order effect on the restoration of the firms' reputations, whereas improving the underlying economics of these firms likely has a first-order effect. In this section, I attempt to sort out these effects and examine whether there is a relation between governance improvements and the responses of informed capital market participants and the stock market.

Informed Capital Market Participants

In this subsection, I investigate whether improvements in (1) outside director percentage, (2) the number of outside directors, and (3) audit committee activity affect informed capital market participants, such as analysts, institutional investors, and short sellers. Specifically, I test for a relation between governance improvements and whether: (1) analyst following and institutional ownership increase and (2) short sales decrease.

I obtain data on analyst following from I/B/E/S and data on institutional holdings from the CDA Investment Technologies Spectrum database, which is derived from the SEC Form 13-F disclosure forms reported quarterly to the SEC. I hand-collect monthly short interest data from the Standard & Poor's Daily Stock Price Record, except as noted for NASDAQ firms for the period subsequent to 1987. For NASDAQ firms, I obtain short interest data for the years subsequent to 1987 directly from the NASDAQ.

It is possible that the level of governance improvements affects informed capital market participants. I therefore divide fraud firms into two groups, one for changes greater than 0 in outside director percentage, the number of outside directors, and the number of audit committee meetings from the pre-fraud detection year to the fourth year afterward; and one for those changes less than or equal to 0 over the same period. I then compare the means of the associated changes in the levels of analyst following, institutional ownership, and short sales for the two groups. Results in Table 4 indicate that changes in each of the governance variables do not affect analyst following, institutional ownership, or short sales.

One possible explanation for the result with respect to institutional investors is that the governance improvements are only a necessary condition for attracting large investors and, given the severity of the frauds and the related fall-out, these investors are likely to be precluded from investing in these firms because of their fiduciary responsibilities to only invest in sound firms. It is likely, therefore, that the lingering effects of the fraud have kept institutional investors from increasing their ownership in the fraud firms. It logically follows that the lack of institutional interest likely affects analysts' decisions regarding coverage of these firms. One plausible explanation for the lack of result with respect to short interests is that these positions are likely to close out when the stock hits bottom, which is likely be around the time of fraud detection. I next investigate whether governance improvements are related to changes in the market values of the fraud firms.

Stock Returns

Prior research finds negative abnormal returns in a three-day window surrounding the announcement date of fraud (e.g., Feroz et al. 1991; DSS). If governance improvements are viewed as credible signals, then they ought to positively affect firm value through a decrease in the cost of equity capital. Given the difficulties (e.g., missing forecasts) of *directly* estimating changes in cost of equity capital associated with governance improvements, I take an indirect approach, similar in spirit to that used in DSS, and proxy for it using buy-and-hold abnormal returns.[10] That is, increases in returns would be consistent with a decline in the cost of equity capital because returns directly affect the cost of equity capital.

The results in Table 3 indicate that, for fraud firms, the number of outside directors, outside director percentage, and the number of audit committee meetings are weak relative to their corresponding control firms in the pre-fraud detection year, but strengthen by the

[10] In subsequent analyses, I use ROA as a proxy for expected cash flows because ROA could be driving the returns. I also test for a relation between changes in governance and corresponding changes in bid-ask spread (arguably a proxy for cost of equity capital), but fail to find one.

TABLE 4
Association of Mean Changes for Fraud Firms in Outside Director Percentage, Number of Outside Directors, and Number of Audit Committee Meetings with Mean Changes in Institutional Ownership, Short Sales, and Analyst following from the Year Prior to Fraud Detection to the Third Year Afterward

Panel A: Analysis Based on Mean in Outside Director Percentage

	Change > 0 (n)	Change ≤ 0 (n)	t-stat for Difference (p-value)
Outside Director Percentage	22.20 (55)	−14.83 (27)	9.10 (< 0.001)
Institutional Ownership	−0.01 (20)	−0.01 (15)	0.47 (0.64)
Short Sales	−0.01 (22)	0.00 (9)	−0.97 (0.34)
Number of Analysts	−3.09 (55)	−1.81 (27)	−0.98 (0.33)

Panel B: Analysis Based on Mean Changes in the Number of Outside Directors

Number of Outside Directors	2.22 (37)	−0.93 (45)	8.97 (< 0.001)
Institutional Ownership	0.00 (16)	−0.01 (19)	0.21 (0.83)
Short Sales	−0.01 (11)	−0.01 (13)	−0.24 (0.81)
Number of Analysts	−2.68 (36)	−2.61 (46)	−0.05 (0.96)

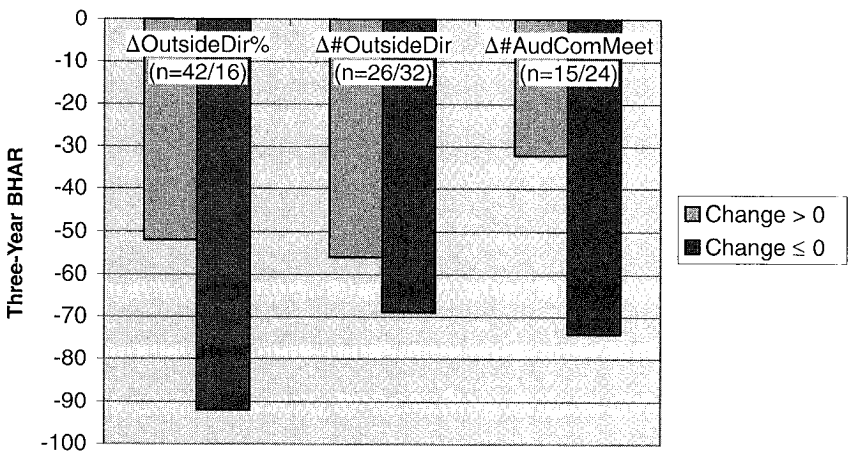
Panel C: Analysis Based on Mean Changes in the Number of Audit Committee Meetings

Number of Audit Committee Meetings	2.52 (34)	−0.47 (18)	5.37 (< 0.001)
Institutional Ownership	−0.01 (16)	0.00 (7)	−0.87 (0.39)
Short Sales	−0.01 (16)	0.00 (8)	−0.32 (0.75)
Number of Analysts	−2.00 (34)	−3.84 (18)	1.18 (0.24)

end of the fourth year afterward.[11] To investigate whether these improvements are associated with future returns, I first compare the magnitude of changes in these variables with subsequent changes in buy-and-hold returns (*BHAR*) using the CRSP equal-weighted index for the three-year period subsequent to fraud detection (see below for details on calculation of *BHAR*). I obtain returns data from CRSP. Figure 2 provides a histogram that indicates that fraud firms that make positive changes in outside director percentage, the number of outside directors, and the number of audit committee meetings have significantly ($p = 0.05$) less

[11] While the percentage of firms with the combined position of CEO/COB is also initially weak, only 11 out of 58 firms combined the positions of CEO and COB after the fraud detection year and 47 of the 58 firms experienced no change. Therefore, I exclude this variable from further analysis.

FIGURE 2
Buy-and-Hold Abnormal Returns for the Three Years after Fraud Detection and the Associated Governance Changes for Fraud Firms from the Year Prior to Fraud Detection to the Third Year Afterward for Frauds Detected from 1982 to 2000



Three-Year BHAR = the mean three-year buy-and-hold abnormal return for the sample of fraud firms for the three years after fraud detection using the CRSP equal-weighted index;
ΔOutsideDir% = change in outside director percentage from the year prior to fraud detection to the third year afterward;
Δ#OutsideDir = change in number of outside directors from the year prior to fraud detection to the third year afterward;
Δ#AudComMeet = change in number of audit committee meetings from the year prior to fraud detection to the third year afterward;
Change > 0 = positive governance changes from the year prior to fraud detection to the third year afterward; and
Change ≤ 0 = nonpositive governance changes from the year prior to fraud detection to the third year afterward.

negative *BHAR* than do firms that make non-positive changes.[12] Because the percentage of outside directors and the number of outside directors are likely to be highly correlated and because the effect of increasing the percentage of outside directors has a larger impact on future returns than does increasing the number of outside directors, I exclude the change in the number of outside directors from the regression analysis below.

I analyze more rigorously the relation of improvements in the quality of the board of directors and audit committee activity with abnormal returns over the three-year period following fraud detection by estimating the following regression:

$$BHAR_{i,t} = \alpha + \beta_1 \Delta OutsideDir\%_{i,t} + \beta_2 \Delta\#AudComMeet_{i,t} + \beta_3 \Delta ROA_{i,t} + \beta_4 BMV_{i,t} + \beta_5 MVE_{i,t} + e_{i,t}, \quad (1)$$

where:

[12] I also use ROA as a measure of future performance, but fail to find a significant relation between changes in the governance variables mentioned above and ROA (results not presented).

$BHAR_{i,t}$ ≡ buy-and-hold abnormal return for firm i at time t, where t is as defined below;

$\Delta OutsideDir\%_{i,t}$ ≡ lagged change in outside director percentage from the pre-fraud detection year to the fourth year afterward for firm i at time t, where t is as defined below;

$\Delta\#AudComMeet_{i,t}$ ≡ lagged change in the number of audit committee meetings from the pre-fraud detection year to the fourth year afterward for firm i at time t, where t is as defined below;

$\Delta ROA_{i,t}$ ≡ change in net income scaled by total assets over the three years following fraud detection;

$BMV_{i,t}$ ≡ book value per share divided by the market value per share for firm i at time t, where t is as defined below. Book and market value are measured as of the end of the year prior to the analysis year (Source: Compustat-book value, and CRSP-market value);

$MVE_{i,t}$ ≡ log of the market value of equity for firm i at time t, where t is as defined below. Market value is measured as of the end of the year prior to the analysis year (Source: CRSP); and

$e_{i,t}$ ≡ the residual for firm i at time t, where t is as defined below.

I compute long-run buy-and-hold abnormal returns (BHAR) for fraud firm i and control firm/portfolio m as follows:

$$R_{i,t} = \prod_{t=2}^{4} (1 + r_{i,t}) - 1 \tag{2}$$

$$R_{m,t} = \prod_{t=2}^{4} (1 + r_{m,t}) - 1 \tag{3}$$

where $r_{i,t}$ and $r_{m,t}$ are the annual returns of fraud firm i and control firm/index m, respectively, on date t. The *BHAR* for each fraud firm is computed as the difference between the buy-and-hold returns of the fraud firm and its respective control firm/index:

$$BHAR_{i,t} = R_{i,t} - R_{m,t} \tag{4}$$

The *BHAR*s are computed with respect to (a) control firms, (b) CRSP equal-weighted index, (c) CRSP value-weighted index, and (d) CRSP S&P 500 Index. Additionally, in order to compute *BHAR* for the three years after fraud detection, only those firms with CRSP data for this three-year period are included in the following analyses.

Panel A of Table 5 reports descriptive statistics for these variables and for raw returns for fraud and control firms and the CRSP equal-weighted index for the three years following fraud detection. This panel indicates that fraud firms experience a mean (median) raw return of −22 percent (−32 percent), compared to mean (median) raw returns for control firms and the CRSP equal-weighted index of 39 percent (0.00 percent) and 31 percent (26 percent), respectively. These findings illustrate that while fraud firms experience negative abnormal returns over the analysis period, they also experience negative raw returns. This result is consistent with that provided in Figure 2.

TABLE 5
Descriptive Statistics and Pearson Pairwise Correlations for Returns, Change in Net Income, Governance Changes, and Control Variables for Fraud Firms for the Three-Year Period following Fraud Detection

Panel A: Descriptive Statistics of Returns, Governance Variables, and Control Variables (n = 34)

Variable	Mean	Std. Dev.	Median	First Quartile	Third Quartile
BHAR	−0.53	0.70	−0.83	−1.10	0.02
Fraud_Return	−0.22	0.69	−0.32	−0.71	0.52
Control_Return	0.39	1.35	0.00	−0.43	0.56
EW_CRSP	0.31	0.27	0.26	0.12	0.53
ΔROA	−0.14	0.60	0.02	−0.08	0.12
ΔOutsideDir%	6.86	12.74	5.35	0.00	12.94
BMV	8.63	50.63	0.02	0.01	0.08
MVE	4.40	1.76	4.12	3.40	5.34

Panel B: Pearson Pairwise Correlations for Returns, Change in Net Income, Governance Changes, and Control Variables (n = 34)

	BHAR	*ΔROA*	*ΔOutsideDir%*	*Δ#AudComMeet*	*BMV*	*MVE*	*Fraud_Return*
BHAR	100%	14.6%	22.6%***	7.8%	21.9%***	7.9%	92.5***
ΔROA		100%	22.5%	6.1%	13.8%	7.3%	8.4%
ΔOutsideDir%			100%	7.7%	−0.9%	−6.8%	31.8%*
Δ#AudComMeet				100%	28.2%***	9.5%	−12.7%
BMV					100%	−44.9%***	15.8%
MVE						100%	13.5%
Fraud_Return							100%

*,*** Significant at the 10 percent and 1 percent levels, respectively, based on two-tailed tests.
BHAR ≡ the buy-and-hold abnormal return for fraud firms for the three years following fraud detection using the CRSP equal-weighted index;
Fraud_Return ≡ the raw buy-and-hold return for fraud firms for the three years following fraud detection;
Control_Return ≡ the raw buy-and-hold return for control firms for the three years following fraud detection;
EW_CRSP ≡ the CRSP equal-weighted index return for the three years following fraud detection;
ΔROA ≡ the change in net income scaled by total assets over the three years following fraud detection;
ΔOutsideDir% ≡ the lagged change in outside director percentage from the pre-fraud detection year to the fourth year afterward;
Δ#AudComMeet ≡ the lagged change in the number of audit committee meetings from the pre-fraud detection year to the fourth year afterward;
BMV ≡ the book value per share divided by the market value per share; and
MVE ≡ the log of the market value of equity.

Panel B of Table 5 provides the Pearson pairwise correlations for the regression variables and the raw returns for fraud firms (*Fraud_Return*) over the three-year period following fraud detection. For my sample of fraud firms, *BHAR* is positively correlated at the one percent level with *ΔOutsideDir%* (22.6 percent), *BMV* (21.9 percent), and *Fraud_Return* (92.5 percent). *ΔOutsideDir%* is also positively correlated with *Fraud_Return* (31.8 percent) at the 10 percent level. Also, *Δ#AudComMeet* is positively correlated with *BMV* (28.2 percent) at the 1 percent level. However, *ΔROA*, *Δ#AudComMeet*, and *MVE* are not

significantly correlated with *BHAR* over the analysis period. In short, these pairwise correlations appear reasonable and do not seem large enough to create multicollinearity problems in the regressions presented in Table 6.[13]

Table 6 presents the results of the regressions of buy-and-hold abnormal returns on the explanatory variables in Equation (1).[14] The dependent variable is the buy-and-hold abnormal return for fraud firms for the three-year period following fraud detection based on the CRSP equal-weighted index. I obtain qualitatively similar results estimating these regressions using *BHAR* based on the CRSP value-weighted and CRSP S&P 500 indices, and control firm approach (results not tabulated). I use lagged governance variables because most of the changes in the governance variables take place by the end of the second year after fraud detection (see Table 3). Results in Table 6 confirm the relative importance of improvements in outside director percentage in explaining abnormal returns. In Model 1, the coefficient on Δ*OutsideDir%* is positive and statistically significant at the 5 percent level (t = 2.32), whereas the coefficient on Δ*#AudComMeet* is negative, but not statistically significant. This finding provides evidence that the market values increases in board independence, and is consistent in spirit with the results in Rosenstein and Wyatt (1990), but is ten times the economic significance of that found in their study. The coefficient on Δ*OutsideDir%* is 0.022, which implies that a 1 percent increase in outside director percentage is associated with a 2.2 percent increase in *BHAR*, an economically significant result. The coefficients on *BMV* and *MVE* are not statistically significant. Another interesting finding from Model 1 is that the adjusted R^2 is 18.50 percent. This very high R^2 is possibly due to Δ*OutsideDir%* being a substitute for changes in earnings.

Therefore, in Model 2, I test for the significance of Δ*ROA* in explaining returns. Results for Model 2 indicate that the coefficient on Δ*ROA* is not statistically significant, with an adjusted R^2 of 0.00 percent. In Model 3, I test for the incremental explanatory value of Δ*OutsideDir%* over Δ*ROA*. The coefficient on Δ*OutsideDir%* is again statistically significant, but at a slightly lower level of significance (t = 2.2, 5 percent level). Results also indicate that while the coefficient on Δ*ROA* is positive, it is again statistically insignificant. The overall explanatory power of Model 3 is slightly lower than that of Model 1, with an adjusted R^2 of 15.25 percent. In sum, the results from this section are consistent with the notion that improvements in outside director percentage following fraud detection are strongly linked to returns over the same period. Moreover, changes in net income over the same period provide only marginal explanatory value with respect to returns.

It is possible that the results obtained for Models 1 and 3 are driven by the correlated omitted variable of survivorship bias. That is, the results are likely to be overstated if poorly performing firms are more likely to drop out of the analysis than are those firms that are performing well (or less poorly), and if those poor performers are in the group with the smallest governance change. To test this possibility, I perform a binomial proportions test to determine whether there is a differential survivorship rate for firms in the group with the largest increase in the percentage of outside director representation and for those firms in the group with the smallest such increase. I partition the fraud sample into three equal groups based on the frequency distribution of changes in outside director percentage from

[13] I also conduct more formal tests of collinearity on the regressions presented in Table 6. The highest condition index for any variable is 7.8 (index values above 30 would indicate a collinearity problem).

[14] I also estimate regressions that include other controls for firm performance—lagged Δ*ROA*, Δ*EPS*, and lagged Δ*EPS*—with no qualitative difference in the results. I also include variables that interact a yearly dummy with Δ*OutsideDir%* to assess whether the speed with which governance changes were made had a differential impact on returns. The coefficients on the interaction terms are zero, with no difference among any of the years (results not tabulated).

TABLE 6
Regressions of Fraud Firms' Long-Run Buy-and-Hold Abnormal Returns for the Three Years after Fraud Detection on Governance Changes from the Year Prior to Fraud Detection to the Third Year Afterward

	Dependent Variable: *BHAR* (t-statistic)		
Variable	**(1)**	**(2)**	**(3)**
Intercept	−1.03 (−2.57)**	−1.02 (−2.26)**	−1.01 (−2.38)**
Δ*OutsideDir%*	0.022 (2.32)**		0.022 (2.19)**
Δ*#AudComMeet*	−0.05 (−1.47)		−0.05 (−1.46)
Δ*ROA*		0.11 (0.47)	0.04 (0.20)
BMV	0.86 (0.68)	1.83 (1.35)	0.83 (0.64)
MVE	0.10 (1.33)	0.09 (1.08)	0.10 (1.26)
n	34	34	34
Adj. R^2	18.50%	0.00%	15.25%

** Significant at the 5 percent level, based on two-tailed tests.

BHAR ≡ the buy-and-hold abnormal return for the three years following fraud detection using the CRSP equal-weighted index;
Δ*OutsideDir%* ≡ the lagged change in outside director percentage from the pre fraud detection year to the fourth year afterward;
Δ*#AudComMeet* ≡ the lagged change in the number of audit committee meetings from the pre-fraud detection year to the fourth year afterward;
Δ*ROA* ≡ the change in net income scaled by total assets over the three years following fraud detection;
BMV ≡ the book value per share divided by the market value per share; and
MVE ≡ the log of the market value of equity.

the pre-fraud detection year to the fourth year afterward. Results (untabulated) indicate that 32.14 percent of fraud firms with the largest increase in outside director representation drop out of the analysis versus 26.92 percent of those firms with the smallest such increase. This difference is not statistically significant (Z = 0.42, p = 0.67). Additionally, I test whether the change in outside director percentage and abnormal returns are statistically different for surviving firms and those that dropped out of the analysis. Results (untabulated) of a standard t-test indicate that there is no difference in either the increase in outside director percentage or abnormal returns for these firms (t = –0.50 p = 0.62 and t = 0.30 p = 0.76, respectively).

The results from the regressions need to be interpreted with caution. Analyses based on long-run buy-and-hold abnormal returns are fraught with well-established econometric and interpretation issues.[15] However, this paper does provide some evidence consistent with

[15] I considered conducting a short-window event study to examine the market's response to outside director appointments, but because only a scant number of director appointments for my sample firms are disclosed prior to the issuance of proxy statements, I am unable to identify a sufficiently large enough sample to execute such a study.

the notion that increasing outside director percentage subsequent to fraud detection yields economic benefits in the form of higher abnormal returns.

V. SUMMARY AND CONCLUSIONS

This is the first study of its kind that provides evidence on the link between the credibility of the financial reporting system and the quality of governance mechanisms by investigating changes in these mechanisms subsequent to fraud detection and the corresponding economic consequences of such changes. It uses a sample of 87 firms identified by the SEC as fraudulently manipulating their financial statements. Consistent with prior research, results indicate that fraud firms have poor governance relative to a control sample in the year prior to fraud detection. Specifically, fraud firms have fewer numbers and percentages of outside board members, fewer audit committee meetings, fewer financial experts on the audit committee, a smaller percentage of Big 4 auditing firms, and a higher percentage of CEOs who are also chairmen of the board of directors. However, the results indicate that fraud firms take actions to improve their governance and that three years after fraud detection these firms have governance characteristics similar to the control firms in terms of the numbers and percentages of outside members on the board, but exceed the control firms in the number of audit committee meetings. This study also investigates whether improved governance influences informed capital market participants. The results indicate that analyst following and institutional holdings do not increase in fraud firms, suggesting that credibility was still a problem for these firms. However, the results also indicate that firms that take actions to improve governance have superior stock price performance, even after controlling for earnings performance.

This study makes several contributions to the accounting literature. It adds to our knowledge of the link between the credibility of the financial reporting system and quality of governance mechanisms by extending research on the causes and consequences of financial reporting failures (Beasley 1996; DSS; Agrawal et al 1999; Beneish 1999). This study also sheds light on the efficacy of a post-fraud detection recovery strategy that involves governance improvements by providing evidence that there are positive economic benefits that accrue to fraud firms that improve the independence of their boards. Finally, this study provides insights into the agency problem by utilizing a unique setting that provides a rare opportunity to observe agency costs directly and to study the governance measures that firms implement in an attempt to reduce these costs.

My research design, which is intended to include firms most likely to exhibit an increase in governance quality following the detection of financial reporting fraud, necessarily focuses on the most egregious GAAP violators. An issue to be resolved with future research is whether the inferences of this study are generalizable to samples of firms with a broader class of financial reporting credibility problems (e.g., earnings restatements).

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