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Market Efficiency and Investor Reactions to SEC Fraud Investigations

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I. INTRODUCTION

The Securities and Exchange Commission (SEC) plays a vital role in shaping and enforcing accounting standards. The SEC's enforcement role often leads the Commission to investigate instances of alleged fraud. The efficient markets hypothesis suggests that the market rapidly impounds relevant information into stock prices. We investigate the extent to which stock prices incorporate publicly available information about financial statement fraud in stock prices leading up to and during SEC fraud investigations in the years 2001 to 2003. This period is especially salient for investigating the market response to fraud investigations as investors were highly sensitive to corporate fraud following large-scale frauds at companies such as Enron and WorldCom. Moreover, we investigate factors associated with the likelihood that a company will be investigated by the SEC for financial statement fraud.

The SEC's formal investigation of an alleged fraud is publicly announced through an Accounting and Audit Enforcement Release (AAER). AAERs describe civil lawsuits brought by the Commission against alleged fraud firms in federal court. Most prior studies that have examined financial statement fraud have utilized AAERs to identify fraud firms (e.g., Feroz, Park, Pastena, 1991; Beasley, 1996; Dechow, Sloan, and Sweeny, 1996; Bonner, Palmrose, and Young, 1998; Beneish, 1999a and 1999b). Therefore, following prior research, we also identify

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[1] The SEC receives hundreds of thousands of annual and quarterly reports from corporations. Unless the SEC receives a tip, they are unable to investigate every filing for fraud. (McInnis, 2004)

our sample of fraud firms from AAERs during the 2001-2003 period. While the SEC's formal announcement of an investigation (via and AAER) is sometimes the first public revelation of the fraud, other sources often reveal the occurrence of the fraud weeks or months before the SEC decides to formally investigate the firm. Therefore, we investigate both the market discovery date (the first date investors discover the fraud) and the date the SEC announces its investigation.

Financial statement fraud usually leads to severe consequences for the accused firm when the fraud is discovered by the market and by the SEC. An article in *Fortune* illustrates the consequences of fraud discovery.

> "…and the fraud will go on until it is uncovered. The company's stock will drop then by a big percent. Class-action lawyers will leap. The Securities and Exchange Commission will file unpleasant enforcement actions, levy fines, and leave the bad guys looking for another line of work. Eventually someone may go to jail. And the fundamental reason, very often, will be that the company or one of its divisions was "managing earnings"—trying to meet Wall Street expectations or those of the boss, trying also to pretend that the course of business is smooth and predictable when in reality it is not." (Loomis, 1999)

We find that there is often a significant time lag between the market discovery of a firm's allegedly fraudulent conduct and the completion of the SEC's investigation. In addition, the market often uncovers news of a fraud prior to the SEC's formal announcement of an investigation. Specifically, we find an average lag in our sample of 26 months from the initial market discovery of a possible fraud until an AAER report is issued by the SEC. Moreover, the average lag from the beginning of an SEC investigation until the final AAER report is issued is 23 months. This suggests that investors discover the fraud, on average, 3.5 months before the SEC announces its formal investigation of a fraud.

Thus, we examine market reactions surrounding two significant events related to the public discovery of fraud: (1) the first date that a public news announcement becomes available regarding the alleged fraud and (2) the SEC's public announcement of its investigation. The

results indicate that investors penalize fraud firms surrounding both the fraud discovery date and the SEC's investigation announcement date. Specifically, we observe a 29 percent decline in cumulative abnormal returns during the three-day window surrounding the market's discovery of the fraud. We also find that cumulative abnormal returns drop by an additional eight percent during the three-day window surrounding the SEC's investigation announcement. These results suggest that investors do not fully realize the severity of a fraud until the SEC begins its formal investigation. Inconsistent with market efficiency, this result suggests that an SEC fraud investigation confirms the suspicions of investors regarding the gravity of previously released public information about fraud firms leading to a further market decline. We also examine different types of violations that lead to fraud investigations and find that the market responds more negatively to investigations related to revenue recognition, asset overstatement, and insider trading allegations than other types of violations. This suggests that investors exhibit more concern depending on the gravity of the charges against the firm being investigated.

Finally, we investigate factors associated with the likelihood that a firm will be investigated by the SEC for financial statement fraud. In order to do so, we collect a sample of control firms that are not investigated for fraud during our sample period matched on both firm size and industry. We employ logit regression analyses and find that both total and abnormal accruals, return on assets (ROA), and Altman Z-scores in the year prior to AAER are significant explanators of a firm's propensity to be investigated for financial statement fraud.

This study makes four important contributions to the fraud literature. First, our sample period provides a unique opportunity to explore the magnitude and efficiency with which stock prices incorporate new information about frauds because investors are highly sensitive to fraud given several important fraud scandals during this period. While prior research has investigated

fraud investigations in the 1980s and 1990s (Feroz et al. 1991), ours is the first to explore the impact of fraud investigations in the current environment when investors are more responsive to fraud allegations.

Second, while prior research has investigated market reactions to fraud announcements (Feroz et al. 1991), prior studies do not explore the efficiency with which stock prices impound information at the time of the initial public announcement of the fraud relative to the SEC's formal investigation announcement. Specifically, we explore the extent to which investors efficiently incorporate public information about financial fraud. While we do find evidence of a rapid decline in stock prices following the market discovery of the fraud, and inconsistent with the efficient markets hypothesis, we find that prices again decline significantly when the SEC subsequently announces its formal fraud investigation.

Third, our results also provide the first empirical evidence suggesting that the severity of the negative market response to fraud news depends on the type of fraud committed. Specifically, we find that the market penalizes fraud firms significantly more if the infraction is related to revenue recognition, the overstatement of assets, or insider trading. These results suggest that information about the type of alleged fraud can help investors anticipate the magnitude of the market decline associated with the fraud discovery and SEC investigation announcements.

Finally, although Jones et al. (2008) explore whether various abnormal accrual measures are associated with the likelihood of a fraud investigation, our logit regressions provide a more comprehensive view of various instrumental variables that can be used to predict the likelihood that a firm will be investigated for fraud violations. Our model includes measures of the likelihood of bankruptcy, operating performance, in addition to abnormal accruals. Thus, our

model provides a more complete picture of the factors that predict the likelihood of an SEC fraud investigation.

The remainder of the paper is organized as follows. Section 2 discusses prior research on fraud investigations and develops our hypotheses. Section 3 describes our sample selection procedures and provides descriptive statistics for our sample. Section 4 develops our research questions and discusses methodology. Section 5 presents the results, and section 6 provides concluding remarks.

II. BACKGROUND AND RESEARCH QUESTIONS

The SEC's Investigation Process

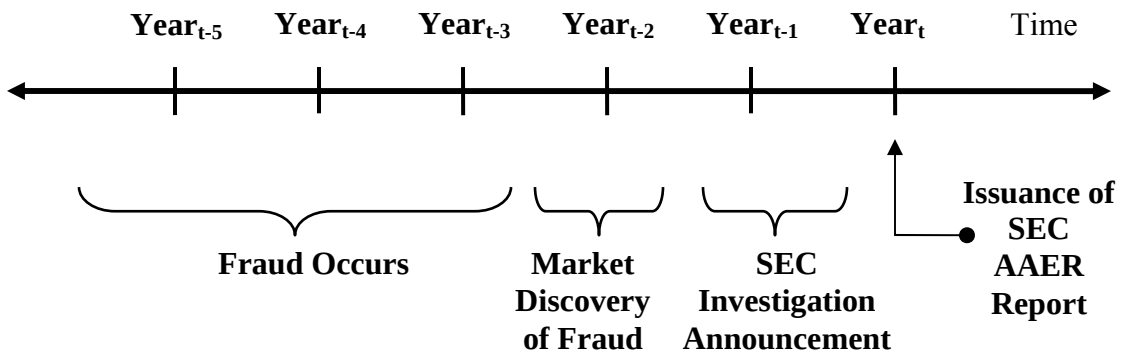
A significant period of time generally elapses between the market's discovery of a firm's allegedly fraudulent conduct until the SEC completes its investigation of the case. Figure 1 provides a timeline to illustrate the major events and their approximate timing relative to the SEC formal investigation and final AAER report. The base year, $Year_t$, is the year in which the SEC makes a public announcement in the form of an AAER stating the results of its completed investigation. The AAER states the results of the investigation and whether or not an enforcement action will be filed. The following example of an AAER (number 2004-134) illustrates the Commission's charges against a fraud firm:

> "The Securities and Exchange Commission today announced securities fraud charges against Computer Associates International, Inc. and three of the company's former top executives. Mark K. Schonfeld, Director of the SEC's Northeast Regional Office, said, 'Like a team that plays on after the final whistle has blown, Computer Associates kept scoring until it had all the points it needed to make every quarter look like a win. With these charges we have demonstrated our commitment to hold the highest levels of management responsible for fraud on the company's shareholders.'"

FIGURE 1

Time Line of the SEC's Investigation Process

This figure illustrates the normal sequence of major events leading up to the SEC's investigation and action related to fraud firms.



Due to limited funds and personnel, the SEC normally does not actively search for financial statement fraud. As a result, most SEC inquiries begin with a tip from an interested person, an auditor, or a news article (McInnis, 2004).[1] It usually takes a significant amount of time from when the SEC begins its investigation of a firm until it issues an AAER report for the completed inquiry. In our sample, the average lag time from an SEC investigation announcement about a possible fraud until an AAER report is issued is 23 months (715 days) with a standard deviation of 14 months. However, the average time between an SEC investigation announcement and the issuance of a final AAER report varies widely for each individual case from a minimum of one month to a maximum 59 months.

Investors frequently receive news of the alleged fraud prior to the SEC's investigation announcement. However, we find significant variability in the timing and the manner through which the public learns of an SEC fraud inquiry. The SEC does not usually announce publicly that it is beginning a fraud investigation. Moreover, many targeted companies elect not to disclose the investigation until the SEC gives formal notice of its decision to commence an enforcement action. On the other hand, knowing that investors will inevitably learn of the

investigation, many firms choose to control the flow of information by making a prompt public statement in the form of a denial or, where appropriate, an admission of the fraud. In our sample, we find a lag, on average, of 26 months from the time the market discovers a possible fraud until a final AAER report is issued. However, this lag time varies widely for each individual case from a minimum 1 month to a maximum 62 months. Anywhere from two to five years may elapse between the market's discovery of a fraud until the issuance of an AAER.

Prior Research on Fraud Investigations

Past research has investigated the financial characteristics of companies engaged in fraud. In 1997 the Committee of Sponsoring Organizations of the Treadway Commission (COSO) commissioned a research project which looked into fraudulent financial reporting in the U.S. industries between 1987 and 1997. This study finds that the majority of firms committing fraud are relatively small and experience net losses or are close to the break-even point at the time the fraud is committed. Hogan et al. (2008) presents a summary of relevant fraud academic research findings, and discusses the characteristics of firms committing financial statement fraud. They also discuss several "high risk" areas and other issues identified by the PCAOB.

Rosner (2003) finds that as bankrupt firms approach bankruptcy, their financial statements reflect significantly greater income-increasing accrual magnitudes than do control firms. His results also indicate that pre-bankruptcy firms display significantly more negative changes in cash flows from operations and net cash and a greater disparity between accrual-based net income and operating cash flows than do control firms. Lee et. al. (1999) also report that firms engaged in fraud show a disparity between net income and operating income for fraud years.

Several studies examine managerial incentives for earnings manipulation and fraud. For example, Beneish (1999a) presents a profile of sample earnings manipulators, their distinguishing features, and a suggested model for detecting earnings manipulation. His model is successful in identifying approximately half of the earnings manipulators prior to public discovery. Dechow, Sloan, and Sweeny (1996) examine 92 fraudulent firms identified by AAERs during the 1982-1992 period, and investigate (1) earnings manipulation, (2) internal governance structure, and (3) capital market consequences for firms that allegedly violate Generally Accepted Accounting Principles (GAAP). They find that these firms manage earnings mainly to attract external financing at a low cost, but experience a significant increase in the cost of capital when the manipulation is made public. Jones et al. (2008) examine ten measures of earnings management that are used in prior research, and find that the commonly used measures of discretionary accruals, as well as the accrual estimation errors and the Beneish measure (1999a), are associated with the existence of fraud, the magnitude of fraud, and non-fraud restatements.

Beneish (1999b) investigates 64 firms reported in the news media as well as in AAERs during 1987-1993 for fraudulent activities. He examines the incentives and the penalties related to earnings overstatements. He specifically explores the extent to which managers' trading behavior is associated with a company's propensity to commit fraud. He finds that (1) managers are more likely to sell their holdings and exercise stock appreciation rights in the period in which earnings are overstated and (2) the sales of their holdings occur at inflated prices. However, he does not find any evidence that the purpose of the earnings manipulation is to avoid debt covenant violations, which is inconsistent with Dechow, Sloan, and Sweeny (1996).

Beasley (1996) uses AAERs and a news search to identify 75 fraud firms during the 1980-1991 period and examines the relation between board of directors composition and the occurrence of financial statement fraud. He finds that non-fraud companies have a significantly higher percentage of outside directors than fraud firms. Bonner, Palmrose, and Young (1998) explore how different types of fraud are associated with auditor litigation. Their evidence suggests that auditors are more likely to be sued in cases involving frequently occurring fraud as well as fraud arising from fictitious transactions. Beasley, Carcello, and Hermanson (1999) investigate fraudulent financial reporting in the U.S. by examining 45 cases between 1987 and 1997. They find that the majority of firms committing fraud are relatively small and experience net losses or are close to the break-even point at the time the fraud is committed.

Regarding the market reactions to fraud, Karpoff et al. (2008) examine the penalties imposed on the 585 firms targeted by SEC enforcement actions for financial misrepresentation from 1978-2002. The penalties imposed on firms through the legal system average only $23.5 million per firm. The penalties imposed by the market, in contrast, are huge due to the estimated reputational loss. For each dollar that a firm misleadingly inflates its market value, on average, it loses an additional $3.08 due to expected legal penalties and lost reputation.

The study most closely related to our research (by Feroz, Park, and Pastena, 1991) examines 224 AAERs issued between 1982 and 1989 and explores questions related to the SEC's accounting enforcement programs. They find that firms engaged in fraud, in general, underperform the market despite the benefits of the fraud schemes. They report that the market responds negatively to disclosures that report violations of GAAP or SEC investigations. They also find that cumulative abnormal returns decline 13 percent during the two-day event window surrounding the first disclosure of a violation. In addition to examining a more recent time period

and investigating differences in the market's response to contemporary SEC investigations, we extend their work by examining (1) the extent to which the market efficiently impounds information at the time of the first announcement of the fraud and (2) how different types of violations affect investors' response to the SEC investigation. Moreover, we explore factors associated with a firm's propensity to be investigated by the SEC. Not only can these firm characteristics be used by regulators in screening potential violators and allocating scarce resources for investigations, but they can be used by security analysts and investors in assessing the likelihood that a firm may have perpetuated an accounting irregularity or fraud.

Research Questions

This discussion leads to three specific research questions. We first investigate the extent to which stock prices impound the first public announcement of a potential fraud when it precedes the official SEC fraud investigation. The traditional semi-strong form of market efficiency implies that share prices fully adjust to new public information rapidly and in an unbiased fashion (Kothari 2001; Lee 2001). We specifically explore whether the market fully adjusts at the time of the first public announcement indicating that a fraud has taken place or whether the subsequent announcement of the SEC's fraud investigation further affects stock returns. This leads to our first research question:

> **RQ1: Does the market fully incorporate the information contained in the first public announcement that a fraud has taken place or do investors wait for a formal announcement of an SEC fraud investigation to fully adjust stock prices?**

Next we investigate whether the market's response differs depending on the type(s) of fraud committed. Prior research suggests that not all types of fraud are equal to investors. Therefore, we examine whether market reactions to public announcements of alleged fraudulent activities differ depending on the type of infraction announced. Descriptive statistics in the next

section provide information about the most common types of fraud investigated by the SEC. We expect that investors will react more negatively to the news of some types of fraud than others. Specifically, we query:

> **RQ2: Does the market reaction at the time of a fraud announcement differ depending on the type of fraud indicated in the press release?**

Finally, assuming we do find differences in the extent to which stock prices reflect public information about fraudulent activities and if there are differences in the magnitude of market reactions to fraud announcements, it would be useful if investors could identify factors that can help to identify fraud firms in advance. Specifically, the next question we explore is whether investors and analysts can identify firms most likely to be involved in fraudulent activities ex ante. Therefore, we investigate firm characteristics that may be predictive of the likelihood a firm will be investigated by the SEC for financial statement fraud.

> **RQ3: Are there firm characteristics that are useful in predicting which firms are most likely to be investigated by the SEC for financial statement fraud?**

III. SAMPLE SELECTION AND DESCRIPTIVE STATISTICS

Most prior studies that have examined financial statement fraud have utilized Accounting and Audit Enforcement Release (AAER) to identify fraud firms (Feroz, Park, Pastena, 1991; Beasley, 1996; Dechow, Sloan, and Sweeny, 1996; Bonner, Palmrose, and Young, 1998; Beneish, 1999a and 1999b). AAERs identify firms at the end of the errors-to-fraud continuum. The advantage of using these reports is that they provide an objective criterion for identifying companies with fraudulent financial statements. Another advantage of using AAER firms is that the SEC lists the fraud type committed in the AAER. However, the drawback to this data source is that it doesn't identify firms that the SEC chose not to investigate. It is likely that many fraud

firms are never investigated by the SEC because the SEC deems the fraud to be less material to investors or more difficult to prosecute. Nevertheless, since this population is unobservable, we focus on AAER to identify our sample. Due to this sample selection choice, our sample firms have all been investigated by the SEC and reported in AAERs. We note that prior to the SEC's public announcement, investors may or may not become aware of the investigation. We attempt to identify the first date on which the public discovers the fraud or the investigation by electronically searching news announcements of potential fraud using search terms that identify the fraud in publicly available news media.

Figure 2 illustrates the number of sample firms by year over our sample of AAERs released by the SEC during the three-year period from 2001 to 2003. In 2001, the SEC released 22 AAERs. In 2002, the number of AAERs increased sharply to 75. Finally, the SEC released 54 AAERs in 2003. The dramatic increase in SEC AAER releases in 2002 could be related to the fact that many managers were under pressure to meet market expectations despite the downturn in the economy following the terrorist attacks of September 11, 2001. Moreover, the environment was ripe for fraud detection and whistle blowing following the major accounting scandals of 2001 and 2002. Enron filed for bankruptcy in December 2001. Shortly thereafter WorldCom filed for bankruptcy in July 2002 after it announced that its prior earnings were overstated by 3.85 billion dollars. Therefore, the sharp increase in the number of AAERs from 2001 to 2002 is consistent with the SEC's response to the increased public attention to accounting fraud. Clearly, the public eye was focused on fraud detection and corporate reform as evidenced by the major political momentum of the Sarbanes-Oxley Act of 2002.

FIGURE 2
Frequency of SEC AAERs by Year

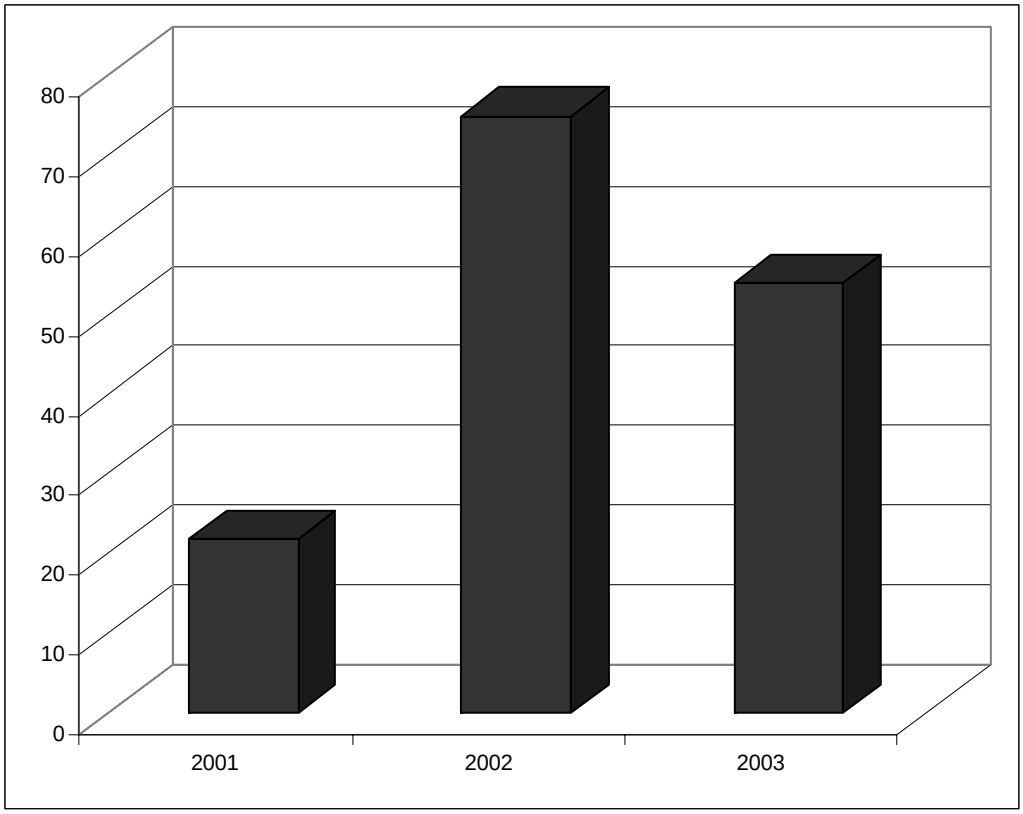
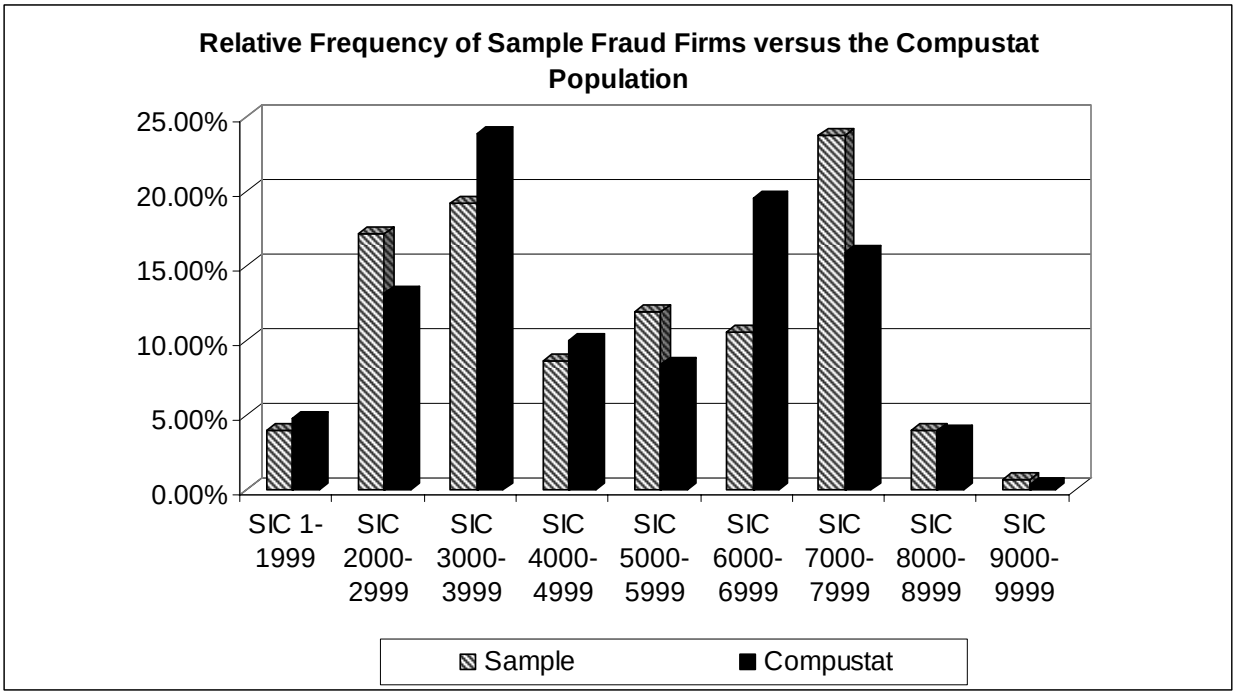


Figure 3 illustrates the industry distribution of sample fraud firms. We find that firms in service industries (SIC codes 7000 – 7999 which includes hotels, personal services, business services, automotive repair, motion pictures, amusement and recreation services) are highly represented in our sample. While the base rate of the firms in the service industries is about 16 percent for the entire Compustat population, this industry classification comprises about 24 percent of our sample. This difference is statistically significant in one percent level. On the contrary, we observe that firms in the financial service industries (SIC codes 6000 – 6999 which includes the financial services, insurance, and real estate industries) have a relatively smaller representation in our sample. The difference between the proportion of the firms in these industries in our sample and

the Compustat Population is about 9 percent, which is statistically significant at the one percent level.

FIGURE 3
Industry Distribution of Sample Firms



SIC Codes 1-1999	= Mineral and Construction Industries.
SIC Codes 2000-2999	= Manufacturing: Food, Tobacco, Textile, Lumber, Furniture, Paper, Printing, Chemicals, and Petroleum.
SIC Codes 3000-3999	= Manufacturing: Rubber, Leather, Stone, Metal, Machinery, Electronic Equipment, Transportation Equipment, etc.
SIC Codes 4000-4999	= Transportation, Communications, and Utilities.
SIC Codes 5000-5999	= Wholesale trade (durable and non-durable) and Retail trade (building materials, general merchandise, food, automotive, apparel, home furnishings, dining, etc.).
SIC Codes 6000-6999	= Financial services, insurance, and real estate industries.
SIC Codes 7000-7999	= Service industries: hotels, personal services, business services, automotive repair, motion pictures, amusement and recreation services.
SIC Codes 8000-8999	= Services industries: health, legal, educational, social, museums, engineering, accounting, management, etc.
SIC Codes 9000-9999	= Service industries: disposal, membership, etc.

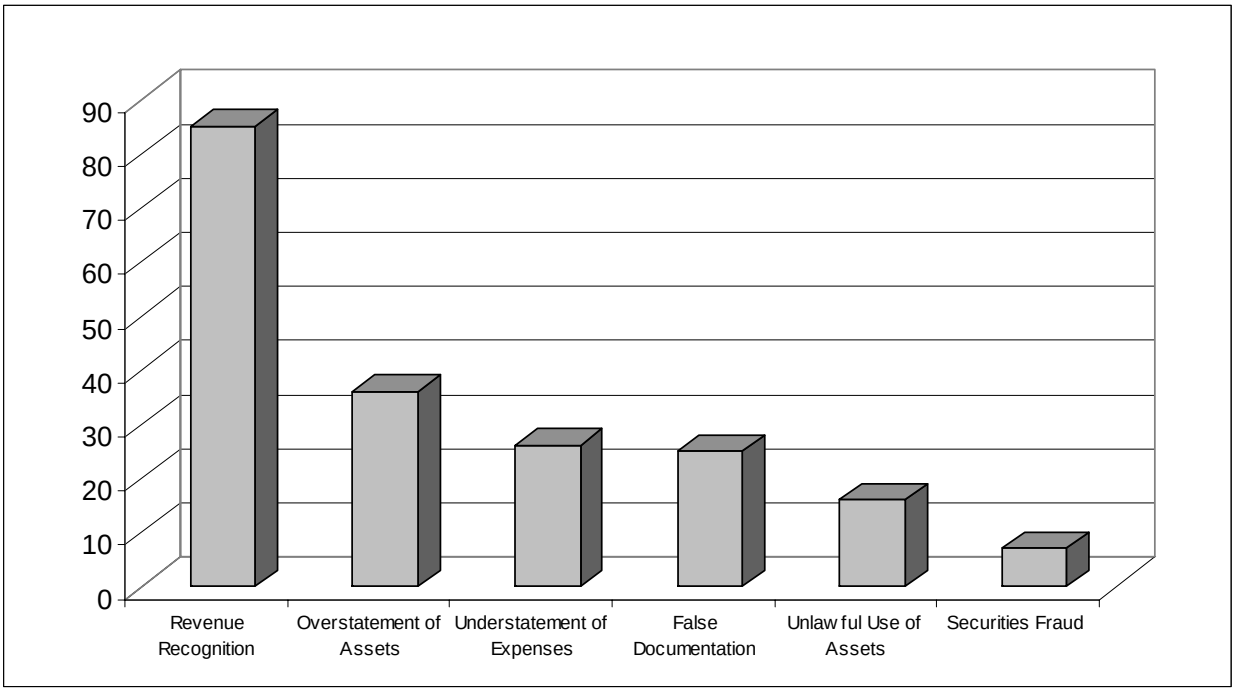
Figure 4 categorizes sample firms by the type of fraud committed as described in the AAERs. The most common fraud type identified by the SEC during this sample period by far is revenue recognition fraud. Revenue recognition fraud includes fictitious sales, the use of cookie jar reserves,[2] and accelerated sales at the end of a period[3]. It also includes the signing of return agreements, contractual agreements not yet fulfilled, bill and hold sales, and other sales that are not recognized according to GAAP. The second most common type of fraud is the overstatement of assets. Overstated assets usually occur in receivables, long term assets, or inventories. A large portion of this category also includes the fraudulent capitalization of expenses (as was the case with WorldCom.) In addition to the overstatement of assets, the understatement of expenses and liabilities is another common type of fraud. The most common way that expenses are understated is through the use of the cost of goods sold account. Other understated expenses include accounts related to debt, taxes, bad debt, and depreciation expense. Relatively smaller proportions of sample firms are involved with false documentation,[4] unlawful use of assets, and securities fraud, such as insider trading.

FIGURE 4
Types of Fraud Committed by Sample Firms Identified in SEC AAERs

[2] The establishment of cookie jar reserves is a practice in which a firm sets aside generous reserves from good years against losses that might be incurred in a bad year. For example, in 2002 the SEC alleged that Microsoft boosted its financial results by setting aside overly large reserves by reducing revenue in good quarters, with the intent of reversing the reserve to income in less profitable years during the 1994-1998 period. Obviously, the SEC does not permit the use of cookie jar reserves by public companies because it can mislead investors regarding a company's financial performance. (USA Today, June 3, 2002)

[3] We note that accelerated sales at the end of the period may not always indicate fraud. Nevertheless, it may be viewed as a "red flag" suggesting that fraud is likely.

[4] False documentation identified in the SEC's AAER is involved with creating false statements to cover up the fraud. For example, it includes fraud cases such as making materially false and misleading statements and other events in connection with the purchase or sale of securities.



Group Code	Category	Examples
1	Revenue recognition	Fictitious sales; accelerated sales; not in accordance with GAAP (signing return agreement, contractual agreement not yet fulfilled, bill and hold, etc.); cookie jar reserves
2	Overstated assets	Receivables; inventory; capitalize expenses; cash; long-term assets
3	Understated expenses	COGS; debt; taxes; bad debt; loss; depreciation
4	False documentation (citation)	Fraudulent dissemination of false and misleading press releases
5	Unlawful use of assets	Bribery; theft; assist other companies in committing fraud
6	Securities fraud	Insider trading

IV. METHODOLOGY

We first investigate the extent to which stock prices impound the first public announcement of a potential fraud when it precedes the official SEC fraud investigation. Specifically, we examine whether the market fully adjusts at the time of the first public announcement indicating that a fraud has taken place or whether the subsequent announcement of the SEC's fraud investigation further affects stock returns. We employ univariate comparisons of cumulative returns over different windows surrounding public fraud announcements to investigate this question.

Next we investigate whether the market's response differs depending on the type(s) of fraud committed. Prior research suggests that not all types of fraud are equal to investors. Therefore, we explore whether market reactions to public announcements of alleged fraudulent activities differ depending on the type of infraction announced. Our descriptive evidence in the previous section indicates that revenue recognition is the most frequent of type of fraud in our sample investigated by the SEC (See Figure 4). The report issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) also indicates that nearly 50 percent of all frauds involve revenue recognition problems. The next most frequent fraud investigated in our sample is asset overstatement, such as capitalizing expenses. Revenue recognition and asset overstatement possibly have the greatest impact on earnings among all types of fraud. Therefore, we examine whether specific types of alleged fraud result in more negative abnormal returns.

Finally, in order to explore factors associated with the likelihood that a firm will be investigated by the SEC for financial statement fraud, we employ a logit model. In order to perform these logit regression analyses, we collect a sample of control firms that are not

investigated for fraud during our sample period matched on both firm size and industry. Our prediction model includes factors from prior literature associated with earnings manipulation and financial distress. First, we include both total and abnormal accruals as discussed in prior earnings manipulation literature [e.g. Dechow et al. (1996) and Teoh et al. (1998)]. We also include the Altman Z-score to control for financial distress level, and other profitability variables, such as return on assets. We employ the following logit model (and define all variables in the appendix):

$$FRAUD_t = \beta_0 + \beta_1 ABNOR\_ACCR_{t-1} + \beta_2 TOT\_ACCR_{t-1} + \beta_3 ROA_{t-1} + \beta_4 ALTMANZ_{t-1} + \beta_5 LEVERAGE_{t-1} + u_t$$

V. RESULTS

Figure 5 presents two charts illustrating the average stock price reactions around the two key events relative to the SEC's investigation. The market discovery date is defined as the first news announcement date identified in the news media regarding the alleged fraud committed by a firm. We find these market discovery dates by searching news announcements of fraud in the media using the names of fraud firms and fraud years that are obtained in the SEC's AAER.

The two charts illustrate the average cumulative abnormal returns (CAR) for sample firms during the 15-day windows surrounding the market discovery date and the SEC investigation announcement date.[5] In the first chart, we observe a dramatic decrease in cumulative abnormal returns of more than 29 percent during the three-day window (day -1 to day +1) surrounding the market discovery date. This suggests that investors severely punish fraud

[5] We calculate the daily abnormal return as the firm's excess return above the contemporaneous market return. Specifically we calculate the daily abnormal return as the difference between the firm's daily return and the value-weighted market return on that day. We then cumulate these daily abnormal returns over the applicable event window. See the appendix for details.

firms for their alleged fraudulent activities. The question is whether this stock price reaction is complete. In the second chart, we observe that the market penalizes fraud firms once more when it receives the news of the SEC investigation, but relatively less severely than at the time of the fraud discovery date. Figure 5 indicates that cumulative abnormal returns decline about 8 percent during the three-day window (day -1 to day +1) surrounding the SEC investigation announcement date.

FIGURE 5
Cumulative Market-Adjusted Abnormal Stock Returns Surrounding Key Event Dates

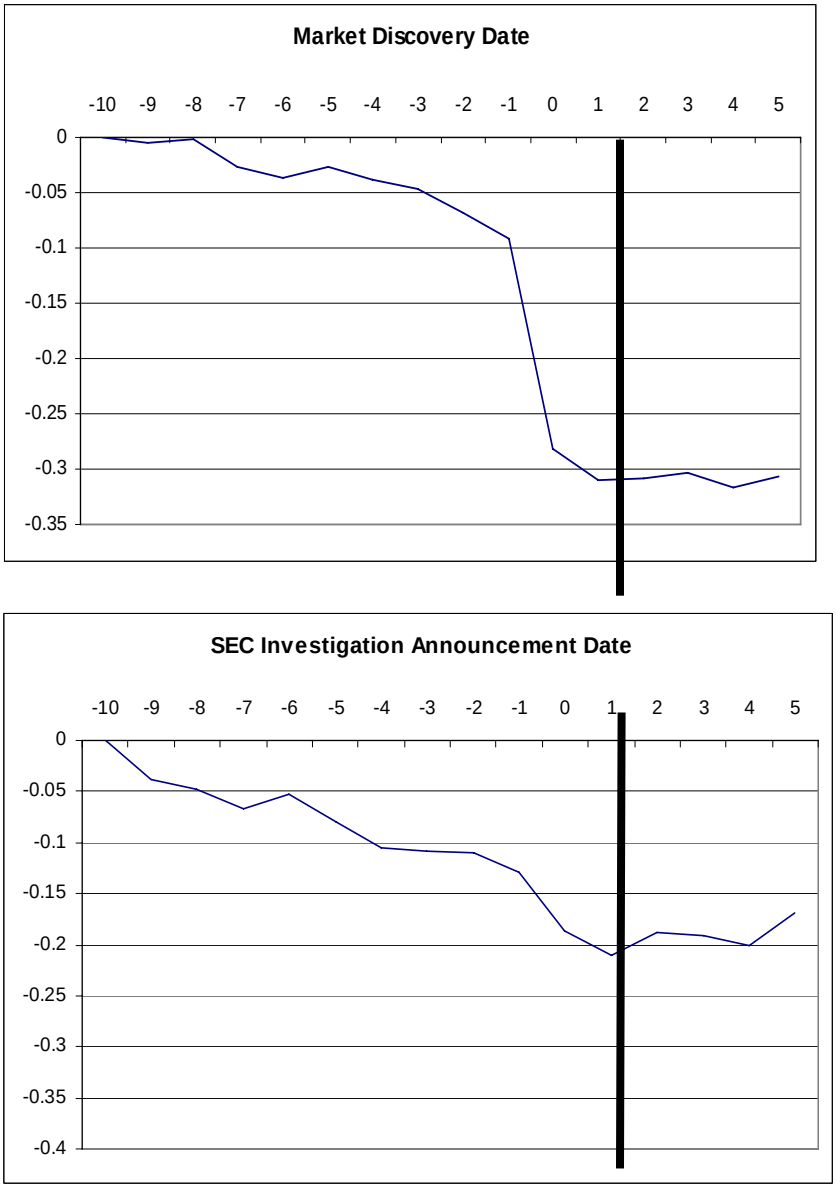
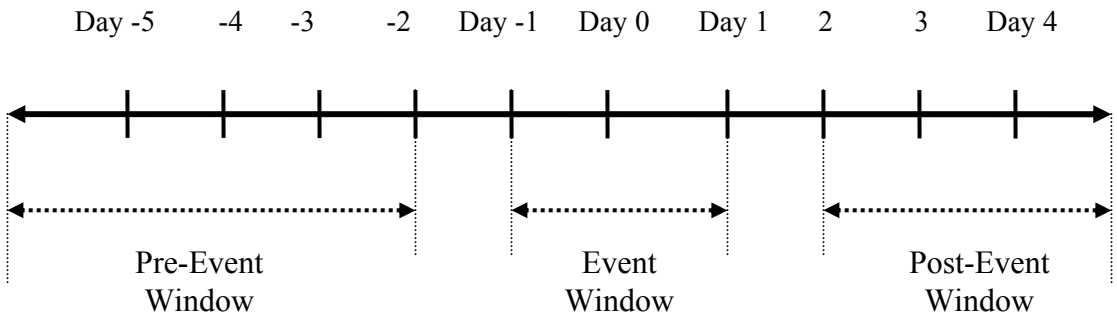


Table 1 reports statistical tests to investigate the significance of the visual evidence presented in Figure 5. Panel A reports that for the three-day window (day -1 to day +1) around the market discovery date, cumulative abnormal stock returns declined by 29.05 percent, on average, which is statistically different from zero at the one percent level. We also find that this 29% decline during the three-day event window is (1) statistically lower than the decline during the previous nine days (day -10 to day -2), pre-event window, and (2) the subsequent four days (day +2 to day +5), the post-event window. Both comparisons are statistically significant at the one percent level. Panel B indicates that the market penalizes fraud firms again when the SEC announces its investigation of the firm. The results reveal a decline of 7.55 percent during the three-day SEC investigation announcement window, which is statistically different from zero at one percent level. Moreover, the results reveal that this decline is also significantly lower than the investigation pre- and post-event periods.

Finally, Panel C reports comparisons of the magnitude of abnormal stock returns during the event windows between the two events. We find that the difference between the decline in abnormal stock returns during the two event windows is statistically significant at the one percent level. This indicates that the market penalty during the market discovery event window (29.05 percent) is significantly more severe than the decline in stock returns during the SEC investigation announcement window. In sum, the results suggest that the market penalizes fraud firms immediately when the news of the potential fraud is revealed. However, the market reaction is not complete until a further market penalty is imposed at the time of SEC's investigation announcement. This is consistent with the notion that the SEC's investigation alerts investors to the severity of the fraud, resulting in an additional stock price decline.

TABLE 1
Market-Adjusted Abnormal Stock Return Comparisons around Event Dates

Event Day (Day 0) = Market Discovery Date or SEC Investigation Date



Panel A: Market Discovery of Fraud[1]

	Pre-Event (Days -10 to -2)	Event (Days -1 to +1)	Post-Event (Days +2 to +5)	
Cumulative Abnormal Returns (CAR)	-0.0769 (0.1961)	**-0.2905** (0.2987)	0.0184 (0.1672)	Mean Std. Dev.
Comparison to zero	-2.29**	**-5.15*** **	0.57	*t*-statistic
Comparison of Pre-Event period and Event Period	**3.22*** **			*t*-statistic
Comparison of Event period and Post-Event Period		**-4.97*** **		*t*-statistic

Panel B: SEC Investigation Announcement[2]

	Pre-Event (Days -10 to -2)	Event (Days -1 to +1)	Post-Event (Days +2 to +5)	
Cumulative Abnormal Returns (CAR)	-0.0161 (0.0991)	**-0.0755** (0.1421)	0.0099 (0.1111)	Mean Std. Dev.
Comparison to zero	-0.83	**-2.71** **	0.46	*t*-statistic
Comparison of Pre-Event period and Event Period	1.71*			*t*-statistic
Comparison of Event period and Post-Event Period		**-3.09*** **		*t*-statistic

Panel C: Comparisons of Market Discovery Event and SEC Investigation Event

Comparison of CAR between Market Discovery and SEC-Announcement		**-3.08*** **		*t*-statistic

***, **, * indicates significance at the 1%, 5%, and 10% level, respectively, using two-sided tests.
[1] Market discovery of fraud is defined as the first date of the market's finding potential fraud of a firm through news media
[2] SEC investigation announcement date is defined as the date the SEC announces the investigation of the fraud.

In contrasting these results with those of Feroz et al. (1991), we find a market decline over two times larger than they found in their sample. While it is possible that markets are more efficient and therefore, react more rapidly and completely to the discovery of a potential SEC investigation, the result is more likely attributable to the fact that we distinguish more clearly between the market discovery date and the date the SEC announces its investigation.

We extend the earlier work by Feroz et al. (1991) by investigating whether investors respond differently to news of an impending SEC investigation depending on the type of allegations against the company. In other words, we explore whether certain types of potential violations are more salient to investors. Table 2 presents descriptive statistics of cumulative abnormal returns (CARs) for each type of allegation. The results indicate that significant negative returns for alleged violations related to (1) revenue recognition, (2) overstated assets, and (3) insider trading. This suggests that investors exhibit more concern depending on the gravity of the charges against the firm being investigated.

TABLE 2
Cumulative Abnormal Returns (CAR) around the Market Discovery
(CAR between Day -10 and Day +5)

Fraud Type	N	Mean (t-value)	Std Dev	25%	Median	75%
Revenue Recognition	51	-0.2432 (-4.34)***	0.4003	-0.5081	-0.3241	-0.0402
Overstated Assets	21	-0.2455 (-1.87)**	0.6016	-0.5373	-0.4298	-0.1414
Understated Expenses	19	-0.0780 (-0.28)	1.2038	-0.5239	-0.4152	-0.1129
False	13	-0.1418	0.5961	-0.4162	-0.1638	-0.0893

Documentation		(-0.86)				
Unlawful Use of Assets	11	0.1787 (0.43)	1.3741	-0.4459	-0.1113	-0.0790
Insider Trading	4	-0.3669 (-2.11)**	0.3474	-0.5904	-0.4595	-0.1433

***, **, * indicates significance at the 1%, 5%, and 10% level, respectively, using two-sided tests.

The results suggest that the market responds more severely to revenue recognition or asset overstatement fraud than any other types of financial statement frauds. This significantly negative market reaction to revenue recognition is probably because it is the most frequent fraud type that is investigated by the SEC. Also, both revenue recognition and asset overstatement arguably have the greatest impact on overstating earnings numbers. In addition, we find that the investor response to fraud announcements is significant when insider trading is involved with fraud. This result is consistent with the Beneish's (1999b) results. He finds that insider trading motivates earnings overstatement because managers likely to sell their shares at inflated prices when earnings are overstated.

We next investigate firm characteristics that are predictive of a firm's propensity to be investigated by the SEC for fraud violations. We obtain the sample of control firms by identifying a similar in sized firm (based on total assets) in the same 4-digit SIC code for each observation in our fraud sample. We match firms in Year -5 (5 years prior to the AAERs) instead of Year 0 (AAER year) in order to examine the effect of the SEC investigation on firm performance during the years in question. Recall that the average time required for the SEC to complete an investigation after the market discovers the fraud is normally about 2 years.

Table 3 compares sample and control firms based on likely indicators of distress (and therefore pressure to manipulate earnings) based on prior literature. Variable definitions are explained in the appendix. In Year -1 and Year -2, sample firms are likely to have significantly deteriorating leverage ratios (total debt divided by total assets.) Similarly, Altman's bankruptcy prediction scores[6] (z-scores: See Altman 1968 and Shumway 2001) are significantly lower (worse) for sample firms for the previous three years prior to AAERs. Also, total accruals of sample firms for the three years prior to the AAER year are significantly more negative than those of control firms.

TABLE 3
Comparisons of Key Company Variables

Variable	Year 0	Year -1	Year -2	Year -3	Year -4
		Control Firms' Mean Value Sample Firms' Mean Value Difference in Means			
TOT_ ASSETS	27,172 42,887 -15,715	22,767 36,109 -13,342	19,034 30,074 -11,039	15,358 19,697 -4,339	13,815 15,730 -1,915
ROA	-0.072 -0.077 0.005	-0.106 -0.111 0.005	-0.170 -0.196 0.027	-0.104 -0.203 0.098	0.033 0.012 0.021
TOT_ACCR	0.038 -0.066 0.104	-0.003 -0.211 **0.208****	-0.072 -0.258 **0.186****	-0.053 -0.115 0.062	-0.066 -0.154 0.088
ALTMAN_Z	2.02 0.54 **1.49*****	1.74 0.45 **1.29****	2.18 0.53 **1.65*****	2.86 2.15 0.71	2.48 2.06 0.41
LEVERAGE	0.482 0.555 -0.073	0.481 0.656 **-0.175****	0.513 0.620 **-0.107***	0.529 0.521 0.008	0.506 0.561 -0.055
MKT_BOOK	2.545 2.647 -0.102	2.416 1.592 **0.824***	2.711 2.118 0.593	2.795 3.463 -0.667	3.655 3.558 0.097

***, **, * indicates significance at the 1%, 5%, and 10% level, respectively, using two-sided T-tests.
The variable definitions are explained in the Appendix.

[6] Altman's z-score combines five different financial ratios to determine the likelihood of bankruptcy among companies. Altman's z-score in the paper is calculated using the coefficients reported by Shumway (2001) as $z = 5.1X_1 + 1.0X_2 + 6.2X_3 + 0.1X_4 + 1.7X_5$ (See appendix for variable definition.)

Table 4 reports the results of our multi-variate logit regression analyses. The dependent variable, FRAUD, is a dichotomous variable that takes the value of one for sample fraud firms investigated by the SEC and zero for control firms.The logit regression results indicate that total and abnormal accruals, in addition to ROA (return on assets) of Year -1, are significant in explaining whether a firm is investigated by the SEC for financial statement fraud in year 0. The Altman Z-score in Year -1 is also marginally significant and positively associated with the probability that a firm will be investigated by the SEC for fraud. The overall percent concordant is 64.1%.[7]

TABLE 4
Logit Regression

$$FRAUD_t = \beta_0 + \beta_1 ABNOR\_ACCR_{t-1} + \beta_2 TOT\_ACCR_{t-1} + \beta_3 ROA_{t-1} + \beta_4 ALTMANZ_{t-1} + \beta_5 LEVERAGE_{t-1} + u_t$$

		Model 1 (All Sample Firms)	
Variable	**Parameter**	**Parameter Estimates**	**Pr > Chi Sq**
Intercept	β_0	-0.2889	0.64
$ABNOR\_ACCR_{t-1}$	β_1	-2.5367	**0.04****
TOT_ACCR_{t-1}	β_2	-3.1024	**0.004*****
ROA_{t-1}	β_3	4.7371	**0.01****
$ALTMANZ_{t-1}$	β_4	0.1866	**0.08***
$LEVERAGE_{t-1}$	β_5	0.3569	0.57

[7] In untabulated results, we repeat this regression after including indicator variables for the three types of fraud with significantly negative cumulative abnormal returns in Table 3. However, none of the indicator variables is statistically significant. Thus, we conclude that the prediction of fraud investigations does not differ across fraud types.

Likelihood Ratio Pr > Chi Sq	27.43	**0.004*** **
Percent Concordant	64.1%	

***, **, * indicates significance at the 1%, 5%, and 10% level, respectively, using two-sided tests.
The variable definitions are explained in the Appendix.

The results of our univariate and multivariate analyses presented in Tables 3 and 4 provide evidence consistent with the results of prior research [Dechow et. al. (1996), Rosner (2003), and Jones et al. (2008)]. Dechow et al. (1996) find evidence that fraud firms have incentives to manage earnings to attract external financing at a lower cost, but may experience significant increases in the cost of capital when such manipulations are made public. Rosner (2003) finds that as failing firms approach bankruptcy, they are more likely to overstate earnings, and their financial statements reflect significantly greater income-increasing accrual magnitudes than do control firms. Jones et al. (2008) find that commonly used measures of abnormal accruals are associated with the existence of fraud.

VI. CONCLUSION

This study examines fraud firms identified in the SEC's Accounting and Audit Enforcement Release (AAER) database for 2001-2003 period in order to investigate the market consequences fraud firms experience as investors become aware of the fraud and the SEC's subsequent investigation. Specifically, we examine market reactions surrounding two key events: (1) the market discovery of the fraud and (2) the SEC's investigation announcement. The results indicate that the market penalizes fraud firms with a 29 percent decline in abnormal stock returns during the three-day window (day -1 to day +1) surrounding the market discovery date. Subsequently investors penalize these firms again with an eight percent decline during the three-

day window (day -1 to day +1) surrounding the SEC's public investigation announcement. This result suggests that, on average, the market reaction at the time of the first public announcement of the fraud may be incomplete and that the SEC's investigation announcement confirms the gravity of the charges against the fraud firm, resulting in an additional decline in stock price.

Our analyses contribute to the existing fraud literature by examining the efficiency with which the market impounds information associated with the discovery of potential frauds that are later investigated by the SEC. Our evidence indicates that the market penalizes fraud firms significantly when the prospective fraud news is released to the public. However, the reaction may not be complete. Then, when the SEC subsequently announces its investigation, investors expectations considering the gravity of the alleged fraud are confirmed and stock prices again decline. We also find evidence that the magnitude of the negative market reaction to fraud news depends on the nature of the fraud. We find that fraud firms are penalized significantly more if the fraud is related to revenue recognition, overstatement of assets, or insider trading.

We also investigate firm characteristics that are predictive of the likelihood a firm is investigated by the SEC for financial statement fraud. Our logit regression analyses suggest that in addition to ROA and Altman Z-scores of the year prior to the AAER, total and abnormal accruals as our proxies for earnings manipulation during the year prior to the AAER are significant explanators of whether a firm is likely to be investigated by the SEC for financial statement fraud. These firm characteristics can be used by security analysts and investors in evaluating the probability that a firm may have engaged in fraudulent behavior. Also regulators may use them in screening potential violators and allocating their scarce resources for investigations.

APPENDIX

DESCRIPTION OF VARIABLES

CAR = Cumulative market-adjusted abnormal returns. We calculate daily abnormal returns as the firm-specific daily return minus the value-weighted market return for that day. We then, cumulate these returns over the applicable window.

TOT_ACCR = Total accruals is obtained by ΔCurrent assets$_t$ – ΔCash$_t$ – ΔCurrent liabilities$_t$ – ΔCurrent portion of long-term debt$_t$ – Depreciation and amortization expense$_t$

ABNOR_ACCR = Abnormal accruals are estimated cross-sectionally by using Modified Jones Model (see Dechow, Sloan, and Sweeney, 1995; and Teoh, Welch, and Wong 1998).

$$(1) \quad \frac{TOT\_ACCR_{j,t}}{TA_{j,t-1}} = \alpha_0 (\frac{1}{TA_{j,t-1}}) + \alpha_1 (\frac{\Delta Sales_{j,t-1}}{TA_{j,t-1}}) + \varepsilon_{j,t}$$

where TA is total assets; and j belongs to estimation sample of all two-digit SIC code peers.

$$(2) \quad NOR\_ACCR = \hat{\alpha}_0 (\frac{1}{TA_{j,t-1}}) + \hat{\alpha}_1 (\frac{\Delta Sales_{j,t-1}}{TA_{j,t-1}})$$

where NOR_ACCR is normal, nondiscretionary accruals; and α_0 is the estimated intercept and α_1 is the slope coefficient in equation (1).

$$(3) \quad ABNOR\_ACCR = \frac{TOT\_ACCR_{j,t}}{TA_{j,t-1}} - NOR\_ACCR$$

FRAUD = A dichotomous variable: 1 for sample firms and 0 for control firms.

ROA = (Net income before extraordinary items + extraordinary items & discontinued operations) / last year's ending assets

ALTMANZ = 5.1 * [(Current assets – current liabilities) / total assets]
+ (Retained earnings / total assets)
+ 6.2 * (Pretax income + interest expense) / total assets
+ 0.1 * [Market value / (total assets – book value equity)]
+ 1.7 * (Net sales / total assets)

LEVERAGE = (Current liabilities + long-term debt) / total assets

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