

## **WHO BLOWS THE WHISTLE ON CORPORATE FRAUD?**

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### **ABSTRACT**

What external control mechanisms are most effective in detecting corporate fraud? To address this question we study in depth all reported cases of corporate fraud in companies with more than 750 million dollars in assets between 1996 and 2004. We find that no specific actor dominates the scene: fraud is detected by a web of, sometimes unlikely, monitors. As expected, we find auditors (14%), analysts (15%), and the SEC (6%). More surprising monitors are industry regulators (15%), employees (19%) and the media (15%). The data allow us to examine the relative merits of alternative approaches to fraud detection, showing that “regulatory” approaches to fraud detection (38% of cases) are dominated by institutions motivated by market-based incentives (62% of cases). Among market-based institutions, the predominance of actors with privileged access to information and not very strong incentives to reveal, suggests scope for improved detection.

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The large and numerous corporate frauds that emerged in the United States at the onset of the new millennium have provoked an immediate legislative response in the Sarbanes Oxley Act (SOX). This law was predicated upon the idea that the institutions designed to uncover fraud had failed, and their incentives as well as their monitoring should be increased. The political imperative to act quickly prevented any empirical analysis to substantiate the law's premises. Which actors play a role in preventing corporate fraud? How inactive were auditors in the corporate governance debacle of the late 1990s? Were reforms targeted on the right actors? Can detection be improved in a more cost effective way?

To answer these questions we gather data on a comprehensive sample of alleged corporate frauds in companies with more than 750 million dollars in assets that took place between 1996 and 2004. We restrict our attention to those frauds more likely to have merit, by eliminating dismissed cases, cases that have settled for less than \$3 million (which are likely to be frivolous), and unsettled cases that appear to be frivolous. This screening results in a sample of 230 cases of alleged corporate frauds, which include all of the high profile cases such as Enron, HealthSouth, and World Com.<sup>1</sup>

Through an extensive reading of each fraud's history, we identify who is involved in the revelation of the fraud, and what are the circumstances that lead to its detection. In particular, we study the source of the information and the incentives detectors face in bringing the fraud to light. We also study the timing of revelation to infer which mechanism is more efficient in revealing fraud in a timely manner.

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<sup>1</sup> In that follows we will drop the term alleged and simply refer to fraud. While a number of these cases have settled with findings of fact of fraud, the majority of them settled for financial payment without any admittance of wrongdoing and hence, from a legal point of view, remains allegations.

We find that no specific actor dominates the revelation of fraud. The SEC accounts for only 6 percent. Even use the most comprehensive and generous interpretation, the revelation can be attributed to shortsellers in only 9 percent of the cases. Financial analysts and auditors do a little better (respectively 15 and 14 percent of the cases), but they hardly dominate the scene. More surprising is the key role played by actors who lack a governance mandate, such as the employees (19 percent), the media (15 percent), and industry regulators (15 percent).

As interesting as who detects corporate fraud are who *did not*. Stock exchange regulators, commercial banks, and underwriters are notable for their complete absence. Also, private security litigation plays a minimal role (less than 2 percent) in the detection of fraud. This does not mean that it is useless to prevent fraud, since it could be the mechanism through which people committing fraud are forced to pay for their mistakes. But it does suggest that this mechanism cannot work alone. It needs another (vast) set of institutions to help bring fraud to light.

Another way to measure the relative efficiency of those actors, besides the frequency, is to look at the average speed with which these actors bring fraud to light. This approach suggests three lines of defense. The first line seems to be the analysts with a median duration of 8.4 months. Frauds that make it through this line are caught by those in the second line with an average duration of 13.6 months. This line includes auditors (14.7 months), industry regulators (13.3 months), professional investors (13.4 months), and ‘strategic players’ defined to include suppliers, buyers and competitors of the firm (13.3 months). Finally, for frauds that persist longer, another line of defense comes into focus, with an average median duration of 22.5 months. This third line of

defense includes the media (21.0 months), the SEC (21.2 months), employees (20.9 months) and professional service firms like plaintiff lawyers (31.3 months).

Having identified the whistle blowers, we then investigate the cost-benefits trade off they face. Overall, analysts, journalists, auditing firms, and employees who bring fraud to light do not seem to be rewarded in monetary or in career terms. In fact, conditional on a fraud being committed auditing firms are more likely to lose the job when they reveal it than when they do not. The only exception are employees who reveal a fraud against the government and so they can avail themselves of the *qui tam statute*, which guarantees them a percentage of the money recovered by the government.

The lack of significant rewards can also be inferred from the type of analysts and journalists who bring fraud to light. If detection were a high payoff activity, we would expect whistle blowers to be “young Turks” in secondary investment banks or newspapers. By contrast, we find that 59 percent of analysts’ detections are done by more seasoned analysts working at top 10 investment banks. Similarly, almost all the fraud scoops are published in top newspapers by established journalists, who do not seem to get a very high reward from it. The significant costs faced by employees blowing the whistle can also be inferred from the fact that in 45 % of the cases, the employee does not identify him or herself individually and in 82% of cases with named employees, the individual alleges that they were fired, quit under duress, or had significantly altered responsibilities as a result of bringing the fraud to light.

Generalizing from these results, we arrive at what might be called a paradox of whistle blowing: those with the best access to information have weak incentives to blow the whistle and are most active, while those with less access to information (because

further from the fraud) have better incentives and are least active. This paradox can be understood if we espouse Hayek's (1945) view that information is diffuse and that it is more cost effective to offer the reward where the information is, rather than to offer incentives to collect that information.

In fact, our data reveal the relative merits of two fundamental approaches to fraud detection. The first, which we label the "regulatory" approach, relies on entrusting some individuals with the task of collecting information that might lead to the detection of fraud. This category includes auditors, the SEC, and also possibly industry regulators. These actors are generally paid for the effort they exert, not for the outcome they achieve. The alternative approach, which we label the "market" approach, does not designate *ex ante* the people in charge of detecting fraud. By contrast, it provides a reward system for people who bring fraud to light. These incentives can be monetary, as in the case of short sellers, or reputational, as is the case for the financial analyst who exposes a problem in her report. In our sample, regulatory approaches to fraud detection account for only 38% of our sample, whereas market based institutions account for a much bigger portion, 62%, of our sample. This juxtaposition has important policy implications: rather than increase the layers of monitors (as done in SOX), it would be more cost effective to increase the reward for people to come forward, like in the *qui tam* statute.

This conclusion is strengthened by our analysis of the changes of behavior following the Enron scandal and the passage of SOX. The scandals and SOX seem to have sharpened auditors' incentive to speak up. They now account for 29.9% of detections of accounting frauds, up from 21% pre Enron, and have increased their scope of activity, now accounting for 13% of frauds that do not involve restatements versus 0%

before. Likewise, the SEC has become more active, now accounting for 8.5% of the cases versus a mere 2.7% of pre Enron. Regulatory incentives, thus, can be sharpened, but the relative unimportance of this category for fraud detection means less can be expected of such reforms.

The remainder of the paper proceeds as follows. Section 1 reviews regulatory and market-based approaches to fraud detection. Section 2 explains the data and sample selection process. Section 3 examines which approach to fraud detection accounts is more important for detecting frauds (frequency) and for identifying them early (efficiency). Section 4 explores the costs and benefits facing actors who rely on market-based incentives to detect fraud. Section 5 synthesizes these results and relates them to theoretical approaches to deterring fraud. Section 6 explores whether the change in environment post Enron has affected success of regulatory approaches. We conclude in section 7.

## **1. Approaches to Fraud Detection**

In designing a system to detect fraud there are two fundamental approaches. The first, which we might label the “regulatory” approach, consist in entrusting some individuals with the task of collecting information that might lead to the detection of fraud. These individuals are generally paid for the effort they exert, not for the outcome they achieve. These actors include external auditors, the board, financial market regulators, and to some extent, industry regulators.

The alternative approach, which we might label the “market” approach, does not designate *ex ante* the people in charge of detecting fraud. By contrast, it provides a

reward system for people who bring fraud to light. These incentives can be monetary, as in the case of short sellers, or reputational, as is the case for the financial analyst who exposes a problem in her report.

In comparing the functioning of these two systems, which coexist as in the U.S. market, it is useful to focus on two dimensions: the cost to collect the information necessary to identify the potential fraud and the incentives not only to collect this information, but also to reveal it. At one extreme, we have short sellers, who can benefit handsomely from the revelation of bad news, but have the most limited access to company-specific information and thus are likely to have the highest cost to collect it. On the other hand, we have employees. They have the lowest cost of collecting information: they stumble on it in the course of their jobs. But they generally derive no benefit from revealing bad information. In fact, they often pay a significant cost in doing so: loss of employment, ostracism, verbal and sometimes even physical harassment. Between these two extremes lay all the other actors.

The two approaches differ in the way they use incentives and in the way they tap into the diffuse information already present in the system. The market tries to provide the incentives where the information is, while the regulatory system tends to provide the information where the incentives are (or at least where there are no strong disincentives).

In our analysis we will try to map the real worked mechanisms into these categories and measure their effectiveness on the basis of two metrics: how often they detect fraud and, conditional in finding the fraud, how long does it take it to detect.

## **2. Data**

## 2.1 *Selecting the Sample*

Ideally, we would like a sample that includes all firms where the company and/or its officers engaged in fraud. A natural starting point is the Stanford Securities Class Action Clearinghouse (SSCAC), which contains all security class action lawsuits. This is a valid sample only if all the cases of frauds lead to a security class action. This assumption seems to hold for the following reasons.

First, class action law firms have automated the mechanism of filing class action suits so that they start searching for a cause to file a suit every time there is a negative shock to share prices. Since stock prices drop following revelation of most serious corporate frauds, it is highly unlikely that a corporate fraud would emerge without a subsequent class action suit being filed. And most fraud allegations have been pursued in federal rather than state courts (Thompson and Sale (2003)).

Second, in *Green vs. Santa Fe*, the Supreme Court ruled that for a class action suit to be brought under the 1933 Exchange Act there must be an element of misreporting. It is difficult to imagine that any significant fraud can occur without misreporting. One exception could be when a company engages in a merger at conditions that are detrimental to some of the shareholders. To check that this is the case we compare our data with the findings of Thompson and Thomas (2003), who study state class actions suits. As Appendix 2 shows there are very few cases where a state class action suit is not joined by a security class action suit, and almost all these cases involve alleged frauds in mergers and acquisitions.

A problem with this ‘fraud sample’ is that it may be over inclusive, containing also allegations that are frivolous. To address this concern we introduce six filters. First,



we restrict our attention to suits filed in the period of 1996 -2004, specifically excluding the period prior to passage of the Private Securities Litigation Reform Act of 1995 (PSLRA) that was designed to reduce frivolous suits. One of the changes introduced in the PSLRA was to raise the so-called pleading standard, whereby plaintiffs had to plead their case with particular examples of fraud rather than simply appealing to a drop in the share price. This criterion produces an initial sample of 2171 cases.

Second, we restrict our attention to the larger firms in this sample, because for these firms there are strong incentives for law firms to identify any fraudulent activity and to initiate lawsuits. Operationally, we restrict our attention to firms with at least \$750 million in assets in the year prior to the end of the class period (as firms may reduce dramatically in size surrounding the revelation of fraud). This reduces our sample to 501 cases.

Third, we exclude all cases where the judicial review process leads to their dismissal.<sup>2</sup> Specifically, we examine settled cases, cases that are still ongoing,<sup>3</sup> and cases that were voluntarily dismissed because of bankruptcy for in this instance the cases could still have had merit but as a result of the bankruptcy status, plaintiff lawyers no longer have a strong incentive to pursue them.

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<sup>2</sup> If the suit is not dismissed, negotiations commence among the parties, which can be prolonged by waiting for the outcome of other investigation testifying to the validity of fraud claims. Cases never reach the point of having a court verdict for the simple reason that Directors and Officers' Liability insurance contracts do not cover liabilities in which securities fraud are proven in court. Thus, if the suits are not dismissed in initial hearings, the executives of the defendant firm always force settlement of the case. The time in between the dismissal ruling and the settlement is spent bargaining for settlement on the strength of the claim.

<sup>3</sup> This produces xx cases, something understandable given the average of four years between filing of suits and settlement Cite[]

Fourth, for those class actions that have settled, we only include those firms where the settlement is at least \$3 million, a level of payment previous studies suggested helps divide frivolous suits from meritorious ones.<sup>4</sup>

Fifth, we exclude from our analysis those security frauds that Stanford classifies as non standard, including mutual funds, analyst, and IPO allocation.<sup>5</sup> The third through fifth screens reduce the number of cases by 257 producing a sample of 244 cases.

Sixth, we identify a handful of firms that settle for amounts of \$3 million or greater, but where the fraud, upon our reading, seems minor, and we fear have settled to avoid the publicity as these firms are often high profile firms. The rule we apply is to remove cases in which the firm's poor ex post realization could not have been known to the firm at the time when the firm or its executives issued a positive outlook statement for which they are later sued. This filter removes 14 cases producing our final sample of 230 cases. Appendix Table 1 illustrates these steps in our sample construction.

## 2.2 *Sample selection biases*

Our sample has two inevitable biases. First, we do not observe frauds that were committed but were never caught. The intense public scrutiny of these larger firms, the

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<sup>4</sup> Grundfest (1995), Choi (2004) and Choi, Nelson, and Pritchard (2005) suggest a dollar value for settlement as an indicator of whether a suit is frivolous or has merit. Grundfest establishes a regularity that suits which settle below a \$2.5-\$1.5 million threshold are on average frivolous. The range on average reflects the cost to the law firm for its effort in filing. A firm settling for less than \$1.5 million is most almost certainly just paying lawyers fees to avoid negative court exposure. To be sure, we employ \$3 million as our cutoff.

<sup>5</sup> Stanford Class Action Database distinguishes these suits for these reasons: "IPO Allocation" lawsuits...generally allege that underwriters engaged in undisclosed practices in connection with the distribution of certain IPO shares. These complaints do not allege that issuers have engaged in fraud when describing their own business or financial circumstances. "Mutual Fund" cases describe litigations in which plaintiffs allege that timing and late trading in funds has violated the federal securities laws. Plaintiffs have also been filing "Analyst" cases in which they allege that brokerage firm analysts falsely provided favorable coverage for certain issuers. These complaints generally do not allege that an issuer has engaged in any wrongdoing and are therefore distinguishable from the large majority of lawsuits otherwise represented in the database." <http://securities.stanford.edu/index.html> (accessed November 1, 2006)

ability to go back in time and sue based on past wrongdoing, and the strong incentives to sue by plaintiff lawyers, likely diminish this problem, but it still is a possibility.

Second, we do not observe those frauds that are caught so early that they never enter the public domain hence we cannot say anything about the importance of specific mechanisms in *preventing* fraud. This is a more serious problem for internal control mechanisms such as the board of directors that could, for example, be very effective in deterring fraud and in stopping frauds early on. What our data does allow us to evaluate are which are the most effective *external* mechanisms that help *detect* corporate fraud when there is a failure of internal mechanisms. This is a limited aspect of governance, but it is also an important aspect that has received little attention.

### 2.3 *Fraud Duration*

For each of the 230 cases, we manually collect information on the fraud and its detection from Factiva newswires, SSCAC database, and other public sources. The securities class action filing identifies a class period, giving a begin date and end date for the fraud. This period can and often is revised over time as the suit proceeds. We use the most recent (and accurate) definition of the class period as our measure for the duration of the fraud. We use this definition of the duration of the fraud rather than alternatives, such as the period for restatement, as in our sample there are many observations without restatements where we would have no information on duration.

Nonetheless, for the firms in our sample with both sources of data, Table 2 of the Appendix compares fraud duration using the class period and fraud duration using the financial restatement period. As the data show, class periods are conservative estimates of frauds, with restatement periods on average being 223 days longer than class periods.

This arises in part from a statute of limitations on class actions, whereby court decisions have led to the interpretation that under Section 10(b) of the Exchange Act, cases must be brought within one year after discovery of the alleged violation, and no more than three years after the violation occurred. This limit was loosened in 2002 as Sarbanes-Oxley legislation changed this to 2 years after discovery, and no more than 5 years after the violation occurred. Comparing these two estimates, the duration of the fraud estimated by the restatement information is higher by much fewer day when we look at frauds of low duration (e.g. just 69 days at the 25<sup>th</sup> percentile of duration) and greatest for frauds of higher duration (e.g. 361 days by the 75<sup>th</sup> percentile of duration), consistent with the class period measure of duration being truncated by the legal limitation. To address this issue we have reclassified the maximum duration through our whole sample period to be a maximum of three years (1095 days).

#### 2.4 *Identifying the Detector of Fraud*

We search the comprehensive database of news and wire reports in Factiva over the range beginning three months prior to the class period and going until the *settlement date* or until current if the case is yet pending. As a first pass, we limit searches to having the firm name in the first 30 words of the article, but we do not restrict the media source from which the article might be drawn. In a number of cases, local newspapers conduct more thorough investigative reporting of local firms, and thus we sacrifice having to read more articles rather than miss such important fact-finding. Where it is useful we extend the search window both earlier to see if prior indications of weakness, and post the suit date to identify subsequent court findings, SEC investigations and subsequent evaluations.

Our searches return an approximate average of 800 articles per case. The number of articles increases with length of the class period, the severity of the allegation, and the size or media exposure of the litigant firm. The number of articles per firm also generally increases during and following the Enron scandal.

In many cases the news reporting the fraud clearly indicates what actor brought this particular fraud to light, for example, a particular analyst, or employee, or government regulator. In other cases, the evidence is more indirect such as the reporting of an auditor being fired, including a discussion of difference of opinion regarding what come to be characterized as fraudulent reporting at the firm. We only attribute the media as the whistleblower, for example, if the media outlet is the first to report the concern, and the story does not give credit for the information to any specific source, named or unnamed (e.g. anonymous employee).

In a number of cases we find that the whistleblower is not the person labeled by the media as such. A chain of events initiated by another entity may already be forcing the scandal to light when an individual expedites the process by disclosing internal information. For instance, Enron's whistleblower by our classification is the Texas edition of the Wall Street Journal, not Sherron Watkins who is called the Enron whistleblower in the media. Of course, we do not want to discredit the importance of internal individuals identified as bringing fraudulent activity to the public. However, our aim is to identify the initial force that starts the snowball of a scandal coming to light. In the Enron example, investigative reporting by the Texas version of the Wall Street Journal raises concern about Enron's marking-to-market practices and the source of firm

revenues a full 8 months prior to employee whistle blowing. Appendix Table 3 provides a brief description of all of our cases, including the identity of the whistleblower.

### **3. Which Approach Dominates Fraud Detection in the US?**

#### *3.1 Who Detects Corporate Fraud?*

Table 2 presents the distribution of fraud detectors for the cases in our sample. We begin by noting that 32.2% of the frauds are revealed by internal governance, including frauds noted by firms in press releases, in statements by management and by the board of directors. Because we cannot observe the cases where the internal governance mechanisms work quietly to curtail fraud and don't make it into our sample, we cannot pass judgment on the 32.2% magnitude. Hence, from here forward, we focus on the distribution of the other 68% of frauds that are detected by external control actors.

Among the external actors, the United States apparently is a village of detectors. No particular actor dominates the field. Standard approaches to governance (e.g. Healy and Palepu (2003)) suggest that actors demanding information (investors and analysts) and actors supplying information (auditors and financial regulators) should be lead detectors of fraud. Not surprisingly, each of these actors participates. Investors reveal 4.5% of the cases; analysts, 15%; auditors, 14%; and financial market regulators, 6%. More surprising is that more than 60 percent of the frauds in our sample are detected by actors that are not the focus of a standard approach and are not usually seen as having a governance purpose. These actors include employees (19%), the media (16%), industry regulators (16%), and strategic players (7%), with all except strategic players being more

important in terms of frequency than any of the traditional actors. We will have more to say about this below.

A potential concern with our use of the identity of the actor who brings the fraud to light based on the available public evidence is that some actors have an incentive to avoid being seen as the source of the information. While our data allow us to identify the type, even if a specific individual is not named in some cases (e.g. anonymous employee), this is a greater concern for shortsellers.

Shortsellers have a strong incentive to identify bad news and disseminate it (Diamond and Verrachia (1987)) but don't have an incentive to reveal themselves as the source. Were they to do so, they threat being cutoff from information or face other tactics from corporations such as being sued for spreading false information, being investigated, or face further requests for investigation by securities market regulators (e.g. Lamont (2003)). As a result, the two cases we identify of shortsellers may underestimate their importance.

### *3.2 Importance of Shortsellers in Fraud Detection?*

We investigate the possibility that shortsellers might be more active by identifying whether the level of short interest in a stock helps to predict the timing of the fraud coming to light, controlling for other factors. We collect information on short interest from Bloomberg, with short interest defined as the total number of shares investors have sold short but have not yet bought back which is available monthly from Bloomberg. To make the data comparable across companies we express this as a percentage of the shares outstanding, using data on monthly shares outstanding from CRSP. We do not use short interest in the month that the fraud was detected but rather

the short interest one month prior to being detected to see if short interest predicts fraud detection.

Table 3 provides evidence consistent with shortsellers predicting fraud and possibly having a role in its detection. The most straightforward test is to just include lagged short interest and aggregate short interest to account for possible changes in short activity driven by non-firm specific factors. This is what we do in column 1, with the positive and statistically significant coefficient on short interest indicating that short interest helps to predict frauds in our sample. In columns 2-4, we further our exploration to see if short-sellers are more likely to work in combination with a particular type of actor, by interacting short interest with actor type in columns 2 and 3 and including additional controls (column 2 includes controls for the type of fraud (restatement dummy, self-dealing dummy, other non-financial illegal activity dummy, misrepresentations on financial statements dummy, failure to disclose dummy), while column 3 replaces these controls with firm fixed effects), and then we run separate regressions for each fraud detector type in column 4, again with controls which in these regressions are allowed to vary by fraud type. The results indicate that fraud detection by shortsellers is consistently and significantly associated with detection by strategic players (col. 2-4), and is also associated with media (col. 2, 4), analysts (col. 4), and auditors (col. 2).

Our interpretation is that there is a symbiotic relationship between short sellers and these actors. These actors live in the same space and help each other. While short sellers have a large incentive to identify this information and communicate it, they can't do it by themselves. To close their positions, this information needs to be communicated broadly, and this communication has to be viewed as credible. We note that our results



could arise through two channels, with short sellers doing the fundamental research that identifies the fraud and going to these other actors to certify and disseminate this information, or alternatively with these other actors informing the short sellers before they come forward with the information. These results are consistent with other research that suggests short sellers are informed as they target firms with accounting restatements and high accruals (e.g. Efendi et. al (2004) and Desai et. al (2005)), anticipate downward analyst revisions and negative earnings surprises (Francis et. al (2005)).

While Table 3 indicates short seller activity is associated with detection, it doesn't provide any indications whether specific cases should be reclassified as short seller related. To explore this possibility we conducted a related test, whereby we look at individual time series of short positions and ask whether the lagged short position could predict fraud detection for each company. Since a test for significance off a single point event is fraught with noise, we ask whether the 6 month average pre-detection short interest is greater than the mean short interest position (excluding a year and a half around the fraud) plus 2 standard deviations. The criterion is fairly stringent, as two standard deviations increase the short position 60% on average.

Using this method we identified 16 cases with large short activity prior to the detection of fraud, eight of which we reclassify. The cases were previously the media (4 cases), analysts (2 cases), an auditor (1 case) and a client which we had classified as a strategic player (1 case). As a quality check, we re-analyzed each of these cases to search for explanations of the sources of the information in the fraud detection to see if there were reasons to eliminate a role for short sellers, and found no such cases. We do not reclassify the remaining eight cases as for two of these, the employee is the fraud detector

and there is little reason that communication went from shortseller to employee, and the timing of six cases indicated that the shortselling activity began after the fraud was detected by the fraud detector we have already identified.

### *3.3 Who Acts to Detect Frauds, Accounting for Indications of Shortseller Activity?*

In table 4, we reexamine who detects corporate fraud after having reclassified the additional 8 cases where there are indications of shortseller involvement. In all remaining tables in the paper we use this reclassified data. As column 1 shows, shortsellers now account for 6.4 percent of cases, and investors long and short now account for a combined 9.6 percent of cases. Nonetheless, our conclusions derived from the unadjusted data remain: fraud detection involves a village of detectors, many without any clear governance mandate.

Table 4 extends our description of the data to look at fraud duration by detector type. All the whistleblowers can be considered as competing sources of negative news. If we start from the safe assumption that the sooner news about fraud emerges, the better, then we can measure the relative efficiency of the various mechanisms by comparing the relative duration of the fraud uncovered.

The duration data provide some justification for the focus on shortsellers and analysts, for they are clearly the first line of defense in fraud detection, with a median duration to detection of just 9.1 months, with analysts in the forefront (8.4 months) and shortsellers close behind (10.5 months). Frauds that make it by this line are caught by those in the second line with an average duration of 14.0 months. This line includes industry regulators (13.3 months), ‘strategic players’ defined to include suppliers, buyers

and competitors of the firm (13.3 months), auditors (14.7 months), and large equity investors (15.9 months). Finally, for frauds that persist longer, another line of defense comes into focus, with an average median duration of 21.6 months. This third line of defense includes employees (20.9 months), the media (21.0 months), the SEC (21.2 months), and professional service firms like plaintiff lawyers (31.4 months). In column 3 we repeat this analysis, this time including controls for the type of fraud, producing very similar results.

We gain further understanding of the relative efficiency of these competing sources for detecting fraud by using a competing risk model, a variant of hazard rate analysis. Specifically we estimate a cox proportional hazard model assuming that the likelihood of detection depends upon the fraud detector, and upon the same characteristics of the fraud that we used in the adjustments to median duration described above. Figure 1 presents the most useful estimates arising from this analysis for our purposes, a plot that indicates for each date of duration of the fraud (x axis) what is the probability of detection (y axis) for a given fraud detector, given a fraud has not yet been detected and that controls for the characteristics of the fraud. Thus, for example at the median duration of fraud in our sample of 416 days, the analyst line is highest and the professional service line is lowest, indicating the highest and lowest probability of detection in our sample, and giving the same results as in the simpler median duration numbers in Table 2.

This figure reinforces the characterization of analysts as the first line of defense, as the steep slope of their line indicates their early aggressiveness in fraud detection, while the flatness of the slope of their line after 450 days or so indicates that they cease to

be an effective force for detection of frauds that persist longer than this. The relatively flat slope for the auditor line up to approximately 365 days, indicates that the contribution of auditors to detection takes approximately after one year to begin, then is active as indicated by the steep slope for approximately a year, then again becomes inactive after two years duration. The relatively constant slope to the line for media and industry regulators suggests that they are involved in detection of frauds of all durations, including those at low duration. The lower slope of the professional service and financial market regulator lines with a pickup later on indicates their almost exclusive relevance for frauds of longer duration. The employee line is particularly interesting, with involvement in detection at all durations, but increasing in importance the longer the duration as indicated by the increasing slope of the line and the height of the line at the end indicates their absolute importance for frauds of the longest duration.

Figure 1 provides an alternative characterization of these results, based on the cox proportional hazard model where we plot the cumulative probability of detection by type of fraud detector. For example, focusing on the far right side of the figure the results replicate those in the table, with the dark employee line at the top indicating this is the most important detector by frequency, and the clustering of lines near the top below this indicating the near equivalence in importance of auditors, industry regulators, the media, and analysts. What this plots reveals in addition is how important are fraud detectors for various durations of frauds. The analyst line, for example, by its presence high in the graph early on indicates the importance of this actor for detecting frauds quickly, at higher durations though the line flattens out indicating analysts are not very active in catching such frauds.

Almost as interesting as these results are in identifying who detects corporate fraud, are the results about who *did not* blow the whistle. Other prominent actors in traditional discussions of governance that are completely absent are banks, stock exchange regulators, commercial banks, and underwriters. Private litigation itself does not seem to play any role in the detection of fraud. This does not mean that it is useless to prevent fraud, since it could be the mechanism through which people committing fraud are forced to pay for their mistakes. But it does suggest that this mechanism cannot work alone. It needs another (vast) set of institutions to help bring fraud to light.

#### **4. What Drives Fraud Detection among Market-Based Actors?**

Having answered the question who brings frauds to light, we now explore our next questions: why do these actors bring fraud to light and in driving fraud detection is access to information about frauds more important than incentives to collect information? To organize our analysis of each of these actors we will focus on four factors that -- theory suggests -- should be crucial: the access to information at low cost, the incentives to collect additional information, the monetary or career benefit from whistle blowing and the costs whistle blowers can face.

Note that the fraud detectors we observe are those who had the highest incentives to do so and hence their cost-benefit ratio is downward biased. This makes our finding that their monetary and career incentives to blow the whistle are very low particularly remarkable.

##### *4.1 Financial Analysts*

We identify a fraud detector as a financial analyst if they work in a brokerage house or investment bank or if they for investors directly, issuing newsletters or public statements about companies.

From an information point of view, analysts are well located. While they do not have direct access to company information, especially after regulation FD (adopted by the SEC in August of 2000) curtailed their privileged access to companies' management, they are in the business of collecting information for valuation purposes. So while their goal is not to search for fraud, they might be particularly well positioned to identify it, by comparing results across companies in the same industry.

Viewed as agents of professional investors, analysts appear to have strong incentives to reveal fraud. Each analyst is paid to analyze companies and has potentially improved career prospects for establishing a reputation of insightful analysis that is valuable to investors. Identifying frauds is one part of establishing such a reputation (e.g. Fama (1980), Hong and Kubik (2000)).<sup>6</sup> Analysts' incentives to reveal fraud, however, may be reduced by the potential conflict of interest between the advising they do and the investment banking services their company generally offer (e.g. Michaely and Womak (1999)). Their incentives to reveal fraud may also be significantly reduced or eliminated by their tendency to herd.<sup>7</sup> Finally, before regulation FD analysts might have had incentives to develop a good reputation vis-à-vis the companies they followed to gain

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<sup>6</sup> Consistent with such career concerns in the analyst industry, Hong and Kubik (2000), for example, report that good forecast records are rewarded by upward mobility to higher-tiered brokerage houses, and the maintenance of jobs in top-tier brokerage houses.

<sup>7</sup> Sharfstein and Stein (1990) for example identify a "share the blame" effect whereby costs are greater in being different and incorrect, than in being incorrect like everyone else. This herding based bias is greater when analysts are young and there is uncertainty about their ability.

privileged access to soft information. If this were the case, they might not have the right incentives to bring a fraud to light.

Our findings lend support to both views. The fact that analysts are the first line of defense suggests their capabilities to detect frauds, but the fact that analysts only account for 15 percent of our observations suggest that this channel has not been fully exploited. To further our understanding of financial analyst incentives in our sample, we gathered information on the identify of the analyst that brought the information to light, including the investment bank they worked for, and to explore the potential impact on their career, we investigated the three year window surrounding the revelation of fraud. Since we do not have access to their bonus information, our only proxy for their career prospect is the *Institutional Investor* All American Analyst ranking. The magazine gives individuals this designation based upon a survey they conduct each year of buy-side money managers, with each area of research having usually three II All American analysts. As Hong and Kubik (2000) report, “All Stars” are actively sought by investment banks and receive the highest salaries.

Consistent with Hong, Kubik, and Solomon (2000), we find that analysts’ willingness to go against the herd (as signified by their identifying fraud) increases with age and with the status of their brokerage house: 59 percent of financial analyst detections are associated with analysts in top 10 investment banks, 14 percent in 11-40 ranked brokerage houses, and 27 percent in other institutions.

But we do not find any evidence associated with a significant reward for detecting fraud. No financial analyst changed their tier investment bank in the two years following their revelation of fraud. And there was only a small change in likelihood of being an All-

star. Prior to detection, 24 percent of the analysts detecting fraud belonged to the “All Stars” group. Following the revelation of fraud, their probability of entering the elite group is only 6 percent. Unfortunately, we do not have a good measure of the counterfactual (what this probability would have been had they not identified the fraud), but even if the alternative would have been zero, a 6 percentage point increase does not seem a very high reward.

#### 4.2 *Media*

Journalists are similar to analysts, in the sense that they collect and analyze information for their clients (the readers). As for analysts, they have an incentive to build a reputation of being nice vis-à-vis to companies in order to cultivate their sources (Dyck and Zingales (2003)). And as the analysts, journalists inherit conflicted incentives from their employers (newspapers or magazines), which are in the business to sell services to companies (i.e., advertising).

The main difference of journalist is that they are much less specialized than analysts and thus have access to less company and industry specific information. On the upside, however, journalists might benefit more from revelation of fraud, because a scoop may help establish their career and reputation.

Our data seem to suggest that the incentives to reveal fraud differ tremendously between major national outlets and minor ones. As Table 7 shows, 11 of the 13 cases reported by newspapers are published in the *Wall Street Journal* or the *New York Times*. Similarly, *Business Week* and *Fortune* account for 5 of the 6 cases identified by magazines. Why minor and local newspapers play no role?



One possibility is that minor newspapers cannot afford the most talented journalists able to do the investigation necessary to discover fraud or cannot afford to pay for the cost of these investigations. An alternative hypothesis is that only very established media with a very diversified advertising base can afford to alienate potential (or actual) advertisers. The pressure faced by Fortune when it was about to publish the first negative report on Enron gives credibility to the second hypothesis.

That most newspapers are not willing to pay and publish scoops on corporate fraud might also reflect the fact that these types of news are less entertaining (Dyck, Moss and Zingales, 2005). After all, the National Enquirer pays fortune to find out every possible detail about the personal lives of media stars.

Table 7 also tries to get at the personal career incentives of the journalists. While many of the journalists involved are national figures who also wrote books, it is not clear that they became national figures by exposing fraud and we do not find any evidence that they profited directly by writing books on the cases they expose.

Also in this case, thus, the upside from revealing information seems limited. On the positive side, however, also the downside seems limited. While there are many stories insinuating that analysts got fired for their negative report on companies, we are not aware of any claim that journalists get fired for this reason. Hence, journalists might be better protected than analysts on the downside associated with whistle blowing.

#### *4.3 Strategic Players*

We also find that strategic players of buyers, suppliers and competitors play a role in the detection of fraud. These actors have quite good access to information as they talk directly with firm employees and fraudulent firm statements sometimes might depend on

their own actions as suppliers or buyers (e.g. the ability to produce an input used in the companies product, the real demand that the client will account for). While they don't have very strong incentives to come forward with this information, there are circumstances that make this more likely, such as when a company's fraudulent information can impact their own profitability moving forward.

#### 4.4 *Employees*

In no case the tension between access to information and lack of incentives to reveal fraud is more intense than for employees. Employees clearly have access to information for few if any frauds can be committed without involving some of them. The biggest difference is that in the case of employees career incentives strongly play against them revealing information. As Table 8 shows, in 82% of cases where the identity of the whistleblower was revealed, s/he was fired, quit under duress, or had significantly altered responsibilities. In addition, many employee whistleblowers report having to move to another industry and to another town. Referring to James Bingham, a whistleblower in the Xerox case, his lawyer said: "Jim had a great career, but he'll never get a job in Corporate America again."

The surprising part, thus, is not that most employees do not talk, it is that some talk at all. Table 8 tries to give a sense of what motivates them. In 45 % of the cases, the costs of blowing the whistle are eliminated by keeping the identity of the whistleblower concealed.<sup>8</sup> This is often the case when the company is unionized, for the unions protect the employee from the potential retaliation.

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<sup>8</sup> This includes 9 cases where the individual is anonymous, 3 cases where there multiple individuals all associated with an employee organization blowing the whistle, and 2 cases where a change of authority

In 35 percent of the cases (6 out of 17) where the identity of the whistleblowers was revealed we observe a qui-tam lawsuit. This is short for “*qui tam pro domino rege quam pro sic ipso in hoc parte sequitur*” which means, “who as well for the king as for himself sues in this matter.”<sup>9</sup> Such suits arise from the Federal Civil False Claims Act, revised in 1986, whereby individuals, in the name of the U.S. Government, charges fraud by “government contractors and others who receive or use government funds.” The reward is between 15 and 30 percent of the amount of money recovered from the government. In our sample a whistleblower received \$70 million and in another case \$35 million. While the outcome of the suits is very uncertain and very delayed in time (one took 10 years, another at least 5 years), the expectation is this reward might have been an important factor in leading the employee to talk. To test this hypothesis we exploit the fact that *qui tam* suits are available only in certain industries like healthcare. Is it true that in this industry employees are more likely to blow the whistle?

In table 8 we test this hypothesis by comparing the proportion of employee whistleblowers in the healthcare industry (24% of cases identified by employees) and all the other industries (11 percent of cases). Since a t-test rejects the hypothesis that the proportion is the same, we can conclude that these types of incentives matter.

In another 30% of the cases (5 out of 17), the revelation of information seems to be associated to a wrongful dismissal claim. These are cases where the employee has already been fired and so s/he has less to lose. In the remaining 35% of the cases, however, it is difficult to find a rational reason for the employee to talk, especially in

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from one to another accounting group (e.g. arising from a merger) brought out the information and the group rather than any individual is associated with the information.

<sup>9</sup> [Add Source of much of this quitam.com]

light of the very high emotional costs paid by whistleblowers, as described in prominent websites providing information to potential qui tam whistleblowers.<sup>10</sup>

An aspect that our data on successful detections can not shed any light on is the difficulty whistleblowers face in establishing the credibility of their claim. The active scrutiny of the HealthSouth case provides a vivid example of this possibility. Former bookkeeper Michael Vines, who left the company in May 2002, sent his concerns to Ernst and Young, but was ignored except by the company itself that identified him as the source. In January and February 2003 he posted his concerns on Yahoo web site, where he wrote: "I know for a fact that HRC has assets on the books that are made up to trick the auditors." A naysayer replied: "If you really had information, you would have shorted the stock and given your info to the appropriate people. You wouldn't be babbling about it here. You'd be too busy picking out your new trailer."<sup>11</sup>

#### 4.5 *Plaintiff Law Firms*

In the corporate governance literature private enforcement plays a prominent role among the set of mechanisms to protect shareholders (e.g., La Porta et al., 2003). In our

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<sup>10</sup> "Whistleblowing is not an easy thing to do and a qui tam case can drag on for years. Think about your answers to the following questions:

Are my family and I financially and mentally ready for a protracted fight to prove the fraud and try to retain my job?

Am I mentally ready to have my fellow workers and perhaps my friends turn against me because of my lawsuit?

Am I ready for personal attacks against my character and to have my past indiscretions made public?

Do I have adequate documentation to prove my charges without having to return to my workplace?

Am I sure that my motivations are to expose the fraud to recover money for the government and not just sour grapes, revenge, or public attention. (All these things fade as the case drags out and will not sustain you in your fight.)

Am I financially and mentally ready to change my career to work outside my current field?

It is important for you and your family to come to an agreement on whether you should file a suit. All whistleblowing activity has proven to be very hard on a whistleblower's personal life."

<sup>11</sup> By Carrick Mollenkamp, WSJ, May 20, 2003, "Missed Signal: Accountant Tried In Vain to Expose HealthSouth Fraud --- Ex-Employee Took His Case To Auditors, Then Web -- But Convinced No One --- What About the Otters?"

sample we find only two cases (equal to 1.4 percent) where a security class action is the mechanism that triggers the revelation of fraud. In both cases, the class action suit leads to the discovery of information about managerial self dealing. For example, in the case of Sprint, the plaintiff sues the company for the failed merger with WorldCom and this leads to the discovery of a bylaw, introduced by management just before the attempted merger, ensuing them a payoff regardless of the outcome of the merger.

That class action plays almost no role in the revelation of fraud does not mean it is not an important mechanism to prevent fraud. First of all, it could play an important role in punishing who has committed fraud. Second, it could help publicize and make credible the claims made by other whistle blowers. At the very minimum, however, our finding suggests that private litigation alone is not sufficient to stop fraud. It can only work when a web of other mechanisms help bring fraud to light.

##### **5. *How Important are Changes to Regulatory Approaches?***

Following the explosion of the Enron scandal, many changes took place. The collapse of Arthur Andersen revealed the risk auditors faced in not addressing the possibility of fraud. SOX dramatically changed the incentives of the auditors by making it clearer that their primary responsibility was to the board, by introducing a ban on consulting work done by audit firms, and by introducing a requirement that management certify to the financial statements. Analysts incentives were also affected by the suit brought against them by the New York attorney Eliot Spitzer. Finally, the public opinion became much more sensitive on the issue, prompting the media to investigate more. Do any of these changes have an impact?

Since all them took place almost simultaneously, it is impossible to separate the various causes. It is possible, however, to see in relative terms whether the relative frequency of the different type of whistleblowers changed according to the changes in their relative incentives.

Table 12 compares the distribution of whistleblowers before and after SOX. The most remarkable change is in the role played by auditors. While before Sox they were responsible for only 7% of the cases of detection, after SOX they went to almost 30%. The increased role of the auditors come at the expense of analysts (who drop from 14 to 11% of the cases of detection), of shortellers (from 9 to 0%), and the media (from 15 to 9%). The other actors that seem to have a bigger role are the SEC (from 4 to 9%) and other regulators (from 15% to 18%).

Another issue we can explore is whether the changes to legislation regarding whistleblowers introduced by SOX had an impact. Section 301 of Sarbanes-Oxley Act requires audit committees of publicly traded companies to establish procedures for “the confidential anonymous submission by employees of the issuer of concerns regarding questionable accounting or auditing matters.” It also enhances protections for employees against being fired for coming forward with such information. That the percentage of employee whistleblowers drops from 21 to 16% is not consistent with these changes being very effective.

## **7. Conclusions**

The clearest result emerging from our data is that the “regulator” approach to fraud detection does not seem to work well. Only 6% of the fraud cases are identified by the authority in charge of discovering them (i.e., the SEC). Even if we enlarge the definition

and we include external auditors (who have a duty to disclose fraud when they find it, but not to search for it) and industry regulators (who are not in charge to look for financial frauds), only 36% of the cases are revealed by people appointed to search for it.

One interpretation of these results is that information about fraud is so diffuse that is extremely costly (and so ineffective) to appoint an official investigator: it is like looking for a needle in the haystack. Fraud tends to be revealed by people who find out about it in their normal course of business and who do not have any strong disincentive (or even better have some positive incentive) to reveal it. For example, in sectors like healthcare where *qui tam* suits are possible and thus whistleblowers are rewarded, employees play a much bigger role in revealing fraud.

Unfortunately, we have shown that in many real world situations (like auditors, analysts, and employees in other sectors) there are no monetary or career-related incentives to reveal fraud. That only the most established newspapers and the most senior analysts are willing to come forward suggests – to the contrary- that the risks involved in blowing the whistle are substantial.

The implication of these findings is that the regulator approach followed by SOX is not the most likely to address the problem emerged with the beginning of the millennium scandals. A lower cost (and potentially higher benefit) alternative would be to provide better incentives for market participants with knowledge of fraud to reveal it. To be fair, SOX has followed also this approach, at least in part, by protecting employee whistleblowers from being fired. Our data, however, suggest that this protection was insufficient for indemnifying an employee from all the costs associated with blowing the whistle.

The evidence suggest that a better alternative would be to provide an explicit reward for whistleblowers as a percentage of the money recovered, as in the *qui tam* legislation, even when the fraud it is not at the expense of the government. A benefit of this alternative is that, unlike many provisions in SOX, if it does not work, it will not cost a penny. And if it does work, it will have huge deterrence effects, reducing the number of the awards paid out.

An objection to this approach is that it might foster distrust among employees, undermining their ability to work together for the benefit of the company. We are not aware of any sign of this problem in sectors subject to *qui tam* suits. Nevertheless, further analysis of the *qui tam* experience is definitely necessary before considering an implementation of this alternative.

Our findings also suggest how difficult it is to export the U.S. system of corporate governance abroad. Copying the U.S. system of internal governance is not sufficient, since even this system is unable to prevent major frauds. The failures of internal governance cannot be easily solved by introducing U.S. institutions like derivative suits or the SEC (together they account for only 6% of the revelation of frauds). An effective corporate governance system relies on a complex web of market incentives that complement each other. Unfortunately, reproducing such a complex system abroad is much more difficult than copying a single legal institution.



## *Appendix 1*

A number of other studies have investigated fraud, using various samples. Various accounting studies focus on a sample of companies identified by the GAO that restated their financial statements between 1997 and June 2002. This ‘GAO sample’ includes all type of restatements (i.e. major and minor, revenue increasing and decreasing, and as a result of new GAAP, reclassification of accounts, merger/acquisition, restructuring charges or fraud). Our sample differs in two principle ways. First, many of these cases won’t make it into our sample as the underlying fraud is not sufficiently serious to trigger a lawsuit that withstands scrutiny and yields a settlement or is ongoing. Second, this approach does not allow for cases of fraud that do not require restatements, a category of frauds that, as we show later, accounts for more than 40 percent of our observations.

Other accounting studies have focused on a narrower sample of firms where the SEC has sanctioned the firm and released an Accounting, Auditing and Enforcement Release (the AAER sample - (e.g. Beneish (1999), Dechow, Sloan and Sweeney (1996), Miller (2006)). We will capture these cases if there is a simultaneous suit under federal securities laws that meets our tests for inclusion. The main concern with this sample is that, since the SEC has a limited budget, it is skewed to more high profile and egregious cases of fraud, and appears to be overly focused on smaller firms.<sup>12</sup> Our companion paper provides a more complete comparison of these samples.

Our sample does include lawsuits filed in state courts if there is also a filing under federal security laws, but does not include filings exclusively in state courts. Thompson and Thomas (2003, 2004) argue that through this omission we are unlikely to be missing many relevant cases, given the shift in cases from state to federal courts, accentuated by the passage of PSLRA and the Uniform Trading Act (????) They also conduct a comprehensive analysis of these filings in Delaware in 1999 and 2000, and find that almost all such cases that withstand scrutiny are cases surrounding merger and acquisitions.

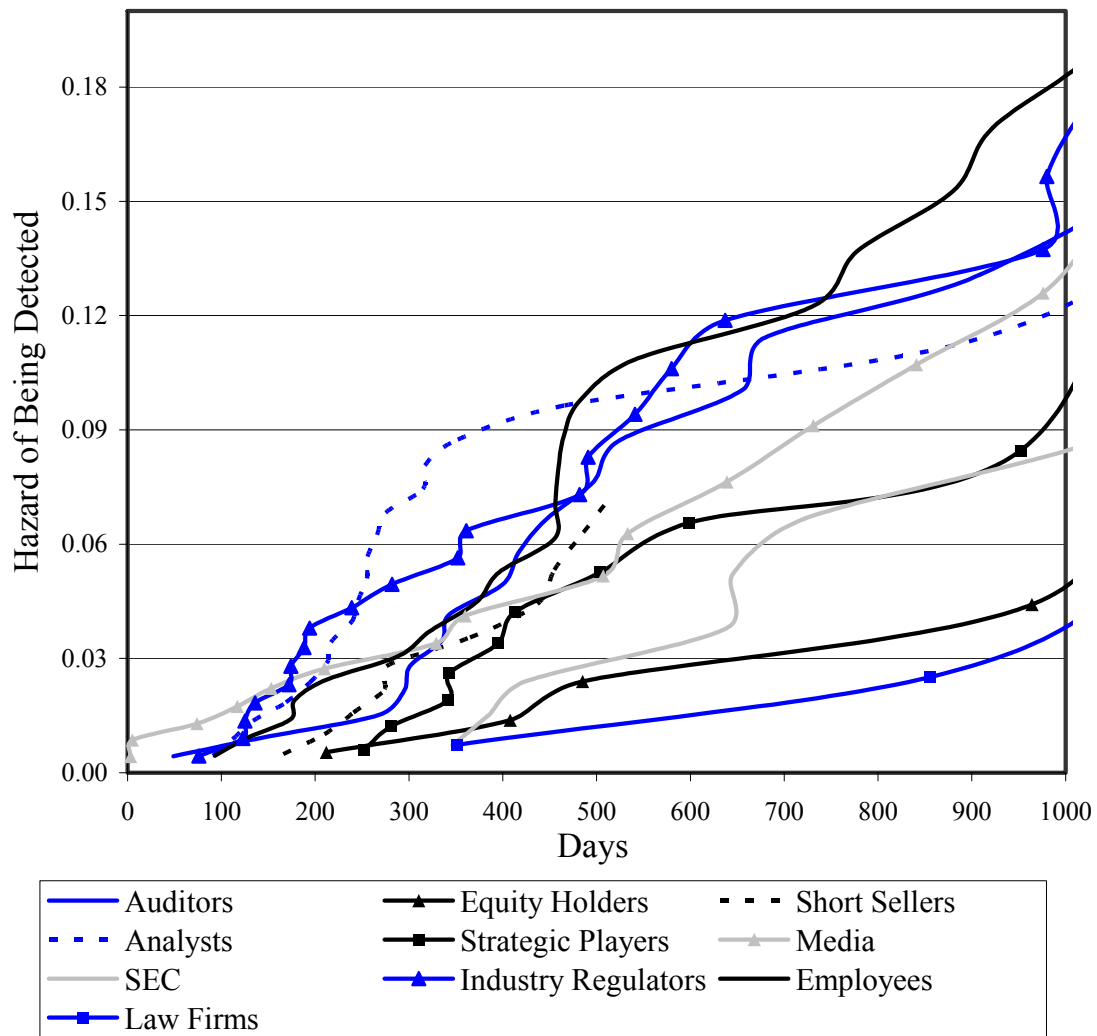
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<sup>12</sup> “Courts have recognized that the Commission’s limited resources may oblige it to prosecute only the most ‘flagrant abuses,’” p. 20, Report Pursuant to Section 308(c) of the Sarbanes Oxley Act of 2002, Dechow, Sloan and Sweeney (1996) write: “because our sample is subject to SEC enforcement actions, it is almost certainly biased toward the inclusion of the more obvious and spectacular cases of earnings manipulation.” Miller (2006) writes; “Defond and Smith (1991) believe that AAER are issued for high profile issues that will enhance the stature of the SEC.”

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**Figure 1 - Cumulative Hazard of Being Detected by Fraud Detector**

This figure is based on a cox proportional hazard model of the likelihood of detection. The figure plots, for each duration and after controlling for the type of fraud, the cumulative probability of detection by each fraud detector (i.e. 1- survival probability). A higher line at a specific duration indicates that that type of fraud detector is more likely to have detected the fraud up until that point.

**Table 1: Data Definition and Sources**

This table identifies the main variables used in our analysis, defines the variables, and provides the sources.

<i>Variable</i>	<i>Description</i>	<i>Sources</i>
Detector of Fraud	The actor who first identifies the fraud based on a combined reading of the legal case documents and an average of 800 articles from Factiva in a window from 3 months before the class action period to settlement. Ten detector categories include: external auditor, financial analyst, investor, shortseller, media, strategic players, financial market regulators, non-financial market regulators, employees and professional service organizations. The detection is attributed to the media only when the story does not indicate another actor as the principal source of information. Strategic players include suppliers, clients and competitors. Financial market regulators are the SEC and stock exchanges. Non-financial market regulators include industry regulators (e.g. FERC, FAA, FDA) and other government agencies. Professional service firms are law and insurance firms.	Security Class actions filings available from Stanford Securities Class Action Database, Articles in Factiva.
Fraud Duration	The class period defined in the security class action, reflecting all adjustments made before settlement. We restrict the maximum duration to 3 years, to avoid changes in duration possibly arising from changing rules with the passage of Sarbanes-Oxley in July of 2002.	Stanford Securities Class Action Database
Financial Restatement Dummy	Observation has value 1 if: the firm filed a 10-Q/A or 10-K/A filing or an 8-K which referred to restatement information [116 cases]; it announced an intention to restate its financials but did not as a result of bankruptcy (e.g. Enron) [7 cases]; it took a one-time accounting-related charge [6 cases]; and, it is an ongoing case where there are accounting-related investigations [3 cases].	SEC filings, General Accounting Office (GAO) report on Financial Statement Restatements.
Regulated Firm Dummy	Firm in following categories: financials (SIC 6000-6999), transportation equipment (SIC 3700-3799), transportation, communications, electric, gas and sanitary services (SIC 4000-4999), drug, drug proprietaries and druggists sundries (SIC 5122), petroleum and petroleum products wholesalers (SIC 5172), pharmaceuticals (SIC 2830-2836), and healthcare providers (8000-8099), and healthcare related firms in Business Services.	Industries identified in Winston (1998) and others.
Nature of Fraud Controls	Dummy variables identify primary nature of fraud as either self-dealing, non-accounting related illegal activity (e.g. price fixing and non-compliance), financial misrepresentations, and failure to disclose.	Dyck, Morse and Zingales (2006) based on Factiva and Security Class actions filings.
Short Interest	The total number of shares investors have sold short but have not yet bought back. This information is available monthly from Bloomberg. We normalize short interest by the total number of outstanding shares for each company.	Bloomberg
Aggregate Short Interest	The aggregate short position in the markets (NASDAQ, AMEX and NYSE) is the sum of all short interest positions for all firms. We normalize aggregate short interest by the total number of shares traded in the markets.	Bloomberg
Investment Bank Ranking	Ranking of investment banks and brokerage houses by Vault.	Vault Investment Bank Guide
All-Star Analyst	A dummy variable indicating whether or not the analyst appears as an All-American All-Star analyst according to the annual survey in <i>Institutional Investor</i> magazine.	<i>Institutional Investor</i> Magazine



## Table 2: Who Detects Corporate Fraud?

This table identifies the actor that first brings the fraud to light. Internal governance includes frauds where the detector is the firm (e.g. press release), company management, or the board of directors. Analysts include both sell-side analysts from brokerage houses and buy-side analysts. Non-financial-market regulators include industry regulators (e.g. FERC, FAA, FDA) and other government agencies (e.g., State attorney general's offices). Strategic players include buyers, suppliers and competitors to the firm. We identify the actor as the media if information is first revealed in a print media outlet identified through FACTIVA (newspaper and/or magazine) where the story does not indicate another actor as the principal source of information. Financial market regulators include the SEC, stock exchanges and self-regulatory organizations.

		<i>Count</i>	<i>% of Total</i>
Total Internal Governance		74	32.2%
External Governance	<i>Count of External Governance</i>	<i>% of External Governance</i>	
Employees	30	19.2%	
Non-Financial Market Regulators	25	16.0%	
Media	25	16.0%	
Analysts	23	14.7%	
Auditors	22	14.1%	
Strategic Players	11	7.1%	
SEC	9	5.8%	
Equity Holders	5	3.2%	
Insurance, Plaintiff Law Firms	4	2.6%	
Short Sellers	2	1.3%	
Total External Governance		156	67.8%
Total Cases		230	

**Table 3 – Are Shortsellers Involved in Fraud Detection?**

This table examines whether short interest helps to predict fraud detection. The data consists of an unbalanced panel of monthly observations for each company in our sample from 1994 until 2005. The dependent variable takes the value zero if no fraud is detected and 1 if fraud is detected. Column 1 independent variables are the short interest for the company one month earlier and aggregate short interest. Short interest and aggregate short interest are normalized to firm and market outstanding shares respectively. In column 2 we interact lag short interest with whistleblower type and include but do not report controls for the type of fraud (restatement dummy, self-dealing dummy, other non-financial illegal activity dummy, misrepresentations on financial statements dummy, failure to disclose dummy). In column 3, we include firm fixed effects, and do not include controls for the type of fraud. In column 4, each row is a separate logistic regression where the logistic is only fitted for that type of detector. (Column 4 allows the sensitivity of detection to the controls to vary by detector type.) All regressions include Newey-West Standard Errors to correct for serial correlation in the panel. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels respectively. We exclude two observations for where shortsellers are identified as the fraud detector.

<i>Logistic Regression</i>				
<i>Dependent Variable: Dummy for Fraud Detected in Period</i>				
	1	2	3	4
Lag Short Interest (All)	3.53*** (0.94)			4.92* (2.90)
Lag Short Interest (Auditors)		4.06** (1.60)	2.93 (4.37)	1.24 (6.77)
Lag Short Interest (Equity Holders)		-15.36 (14.95)	-20.84 (35.27)	-53.94 (36.26)
Lag Short Interest (Analysts)		7.29 (5.18)	10.87 (8.18)	11.68** (4.80)
Lag Short Interest (Strategic Actors)		6.63** (3.17)	12.17* (6.48)	13.32*** (4.83)
Lag Short Interest (Media)		7.18** (3.41)	7.41 (4.90)	7.87* (4.78)
Lag Short Interest (SEC)		7.39 (11.76)	10.41 (16.50)	7.93 (21.37)
Lag Short Interest (Industry Regulators)		-3.60 (5.92)	-4.83 (11.05)	-7.81 (9.08)
Lag Short Interest (Employees)		1.61 (1.95)	2.30 (3.10)	2.80 (2.85)
Lag Short Interest (Lawyers, Insurance)		4.82 (3.27)	7.77 (7.36)	5.31 (4.24)
Aggregate Market Short / Shares Market	138.4*** (21.65)	140.1*** (22.01)	165.1*** (26.71)	Varies
Pseudo R-Square	0.037	0.042	0.038	Varies
Observations	14546	14546	13594	from 418 to 14546
Included Whistleblower Type Effects	No	Yes	No	No
Included Dummies for Restated	No	Yes	No	Yes
Included Type of Fraud Dummies	No	Yes	No	Yes
Included Firm Fixed Effects	No	No	Yes	Yes



**Table 4: Revised Estimates of Who Detects Corporate Fraud after Reclassification Based on Shortselling Data**

This table revises the initial estimates of fraud detectors (Table 2) reclassifying the fraud detector for eight observations where we found significant shortselling surrounding fraud detection (previously identified fraud detectors were: newspaper (4), analyst (2), auditor (1) and strategic player (1)). Analysts include both sell-side analysts from brokerage houses and buy-side analysts. Non-financial-market regulators include industry regulators (e.g. FERC, FAA, FDA) and other government agencies (e.g., State attorney general's offices). Strategic players include buyers, suppliers and competitors to the firm. We identify the actor as the media if information is first revealed in a print media outlet identified through FACTIVA (newspaper and/or magazine) where the story does not indicate another actor as the principal source of information. Financial market regulators include the SEC, stock exchanges and self-regulatory organizations. The median durations of the frauds (columns 3 and 4) are in months, based on the class period, and capped at a maximum duration of 3 years. The median adjusted duration column is based on a regression (not presented) of duration on type of actor, including a dummy for financial restatements, and for the nature of the fraud (self-dealing, non-accounting related illegal activity, financial misrepresentations, and failure to disclose).

<i>Fraud Detector (External mechanisms only)</i>	<i>Count</i>	<i>Frequency %</i>	<i>Median Duration (months)</i>	<i>Median Adjusted Duration (months)</i>
Analysts	21	13.5%	8.4	10.8
Short Seller	10	6.4%	10.5	12.3
Non-Financial Market Regulators	25	16.0%	13.3	14.7
Clients, Competitors, Suppliers	10	6.4%	13.3	15.5
Auditors	21	13.5%	14.7	13.9
External Equity Holders	5	3.2%	15.9	15.2
Employees	30	19.2%	20.9	22.9
Media	21	13.5%	21.0	20.2
SEC	9	5.8%	21.2	20.4
Insurance, Plaintiff Law Firms	4	2.6%	31.4	30.8
Total	156		15.0	

**Table 5: Does the Distribution of Fraud Detectors Depend on Whether Fraud is Accounting Related or in Regulated Industries?**

Panel A breaks down the revised distribution of fraud detectors (including firms reclassified as shortsellers) by whether the fraud required the firm to file restated financial statements with the SEC or not. The median duration is the median for the category. Panel B breaks down the revised distribution of fraud detectors by whether the company is regulated or not. The median duration is the median for the category.

<i>Panel A</i>	<i>Not Restated Financials</i>		<i>Restated Financials</i>	
	Count	Frequency %	Count	Frequency %
Analysts	12	20.3%	9	9.3%
Short Seller	4	6.8%	6	6.2%
Non-Financial Market Regulators	13	22.0%	12	12.4%
Clients, Competitors, Suppliers	5	8.5%	5	5.2%
Auditors	3	5.1%	18	18.6%
External Equity Holders	2	3.4%	3	3.1%
Employees	10	16.9%	20	20.6%
Media	8	13.6%	13	13.4%
SEC	0	0.0%	9	9.3%
Insurance, Plaintiff Law Firms	2	3.4%	2	2.1%
Total (% of sample)	59	37.8%	97	62.2%
Median Duration	11.6		16.7	
Chi-Squared Test for Median Equivalence : $\chi(1) = 2.72$ pvalue = 0.099				
<i>Panel B</i>	<i>Not Regulated Industry</i>		<i>Regulated Industry</i>	
	Count	Frequency %	Count	Frequency %
Analysts	11	17.5%	10	11.2%
Short Seller	6	9.5%	4	4.5%
Non-Financial Market Regulators	4	6.3%	21	23.6%
Clients, Competitors, Suppliers	4	6.3%	6	6.7%
Auditors	10	15.9%	11	12.4%
External Equity Holders	3	4.8%	2	2.2%
Employees	14	22.2%	16	18.0%
Media	8	12.7%	13	14.6%
SEC	3	4.8%	6	6.7%
Insurance, Plaintiff Law Firms	1	1.6%	3	3.4%
Total	64		92	
Median Duration	14.1		16.0	
Chi-Squared Test for Median Equivalence : $\chi(1) = 0.66$ pvalue = 0.416				

**Table 6 – What is the Impact of Fraud Detection on an Analyst’s Career?**

***Panel A: Unconditional Probability of Being All American All-Star Analyst***

Panel A presents the unconditional probability that an analyst who reveals a fraud is an “All-Star” analyst in the year prior to fraud detection, as categorized by *Institutional Investor* magazine. We categorize analysts as Yes or No for the rating if we know the analyst name detecting the fraud and use the category Unknown if no specific name is provided for the analyst.

<i>Unconditional Probability of Being All-Star Analyst</i>	
Superstar Before	
No	0.717
Yes	0.239
Unknown	0.043

***Panel B: Transition Probability of Being All American All-Star Analyst***

Panel B presents the transition probability of an analyst remaining in their All-Star category or moving to other All-Star categories in the year after the fraud detection for each ex ante All-Star category. The blank fields indicate that no analysts who were in the Yes or Unknown All-Star categories moved to a different category.

<i>Transition Probability of Moving All-Star Categories - Year Prior to Fraud to Year After</i>			
Superstar Before	Superstars After		
	No	Yes	Unknown
No	0.818	0.061	0.121
Yes	--	1	--
Unknown	--	--	1

### Table 7 – Who in the Media Detects Fraud?

For each case in which the media is the fraud detector, the table records the newspaper or journal that reveals the fraud, the reporter(s) of the article, the page on which the article appears, and comments about the status and specialization of the reporter(s), where available.

<i>Company</i>	<i>News Outlet</i>	<i>Reporter</i>	<i>Article Location</i>	<i>Reporter Status</i>
Allegheny Energy	<i>New York Times</i>	David Barboza	page 1	
AOL Time Warner, Inc.	<i>New York Times</i>	Gretchen Morgenson	page 1, business	staff writer, specialist on governance
Computer Associates	<i>New York Times</i>	Alex Berenson	page 1, business	staff writer, author of book on governance
Halliburton Company	<i>New York Times</i>	Alex Berenson and Lowell Bergaman	page 1, business	staff writer, author of book on governance
Sprint Corporation	<i>New York Times</i>	David Cay Johnston	page 25, section 1	author of book on tax avoidance by corporations
Ascend Communications	<i>San Francisco Chronicle</i>	Herb Greenberg	page 1, business	staff writer, specialist on tech sector
3Com	<i>San Francisco Chronicle</i>	Herb Greenberg	page 1, business	staff writer, specialist on tech sector
Broadcom Corporation	<i>Wall Street Journal</i>	Molly Williams	C11, Heard on the Street	staff writer
Cardinal Health, Inc.	<i>Wall Street Journal</i>	Jonathan Weil	C1, Heard on the Street	writes accounting column for WSJ,
Enron Corporation	<i>Wall Street Journal</i>	Jonathan Weil	T1 - page 1 of Texas Journal (regional edition of WSJ)	writes accounting column for WSJ,
E.W. Blanch Holdings	<i>Wall Street Journal</i>	Deborah Lohse	A 10	staff writer
Qwest	<i>Wall Street Journal</i>	Deborah Solomon, Steve Liesman, Denis Berman	A1, B6	staff writer
Raytheon Company	<i>Wall Street Journal</i>	no author		
AT&T Corporation	<i>Business Week</i>	Robert Barker	Investor column (p. 264)	
Bausch & Lomb	<i>Business Week</i>	Rochelle Sharpe	p 87	
Mattel, Inc.	<i>Business Week</i>	Kathleen Morris	** cover story**	
Silicon Graphics	<i>Business Week</i>	Robert D. Hof, Ira Sager, Linda Himelstein	** cover story**	
Employee Solutions	<i>Financial World</i>	Debra Sparks	p 52	subsequently writer for business week
Apria Healthcare	<i>Fortune</i>	Erick Schonfeld	p 114	
Charter Communications	<i>Cable World</i>	Mavis Scanlon	Na	
Cambrex Corporation	<i>Chemical Reporter</i>	na	Na	
Long Island Lighting Co.	<i>Daily Electricity Reporter</i>	na	Na	
Bristol Myers Squibb	<i>Cancer Letter</i>	na	Na	
Tyco International	<i>SEC Insight</i>	no author	Na	

**Table 8 – What are the Costs and Benefits for Employee Whistle Blowing?**

The table indicates for each employee whistleblower the following information: company (column 1); the whistleblower and position, if the whistleblower identifies themselves (column 2); whether the individual claims they were terminated, quit or given a job with significantly reduced responsibility after whistleblowing (column 3); other costs claimed by the employee (column 4); whether a lawsuit filed with potential for damages including the type of lawsuit (column 5); whether an outcome to the lawsuit (column 6); and other possible benefits of whistleblowing (column 7).

<i>Company</i>	<i>Whistleblower, Position</i>	<i>Costs</i>		<i>Benefits</i>		
		<i>Terminated, Quit, or Reduced Responsibility</i>	<i>Other Costs</i>	<i>Filed Lawsuit with Potential for Damages</i>	<i>Positive Outcome of Lawsuit</i>	<i>Other Possible Benefits</i>
Apria Healthcare, Inc.	Mark Parker, branch manager	yes		yes - qui tam, wrongful dismissal	no - government doesn't join	vengeance
Columbia HCA Healthcare / Olsten [2 cases]	Donald McLendon, executive of acquired firm	yes	Couldn't find other job, financial stress	yes - qui tam	yes - \$35 million	avoid potential legal liability
Dynegy, Inc.	Ted Beatty, management trainee	yes	Couldn't find other job, forced to leave hometown, home broken into, threats and intimidation	No		vengeance
Endocare	Joseph Hafemann, corporate controller	yes		No		avoid potential legal liability
GTECH Holdings Corporation	David Armitage, engineer	no		No		vengeance
Healthsouth	Weston Smith, vice president	yes	Sentenced to 27 months, forced to pay \$6.9 million	No		avoid potential legal liability
JDN Realty	William Kerley, CFO	no	Alleged loss of \$19 million including legal and job loss costs	yes –wrongful dismissal suit	yes - \$2.3 million	
Johnson & Johnson	Hector Arce	yes		yes - qui tam	no - government doesn't join	
Marsh & McLennan Companies, Inc.	Peter Scannell, call taker	yes	Lost job, threats and intimidation	yes - qui tam	no - government doesn't join	Readers Digest 'everyday hero'
Northeast Utilities	George Galatis, engineer	yes	"If I had it to do over again," says Galatis, "I wouldn't." Alienated by co-workers.	yes - payment to leave likely	yes - settlement amount not revealed	on cover of Time magazine
Quorum	Jim Alderson	yes	Lost job. Moved to 5 towns in next 10 years.	yes - qui tam	yes - \$70 million	
Rite Aid	Joseph Speaker, senior finance executive	no	Left firm a year later.	No		

Service Corporation International	Charles Albert and Thomas Chaney	yes		yes –wrongful dismissal suit	no information	
Solectron Corporation	Ronald Sorisho, division CFO	yes		yes –wrongful dismissal suit	no information	avoid potential legal liability
Xerox Corporation	James Bingham, assistant treasurer	yes	"... never get a job in Corporate America again," Bingham's lawyer.	yes –wrongful dismissal suit	no information	avoid potential legal liability
Ann Taylor	internal unknown	Unknown				
America West Holding	Unionized maintenance workers	Unknown				improve employment conditions
Cendant Corporation	Accounting staff integrating newly acquired firm	Unknown				avoid potential legal liability
Ceridian	unnamed employee	Unknown				
Consol Energy	internal unknown letter to auditor and SEC	Unknown				
Enterasys Networks, Inc.	unnamed finance executive	Unknown				
Footstar, Inc.	Corporate Accounting group	Unknown				avoid potential legal liability
Laidlaw	internal unknown	Unknown				
Nicor, Inc.	anonymous letter	Unknown				
PhyCor, Inc.	Doctors who are employees	Unknown				improve employment conditions
SUPERVALU, Inc.	an unnamed female auditor fired	Unknown				avoid potential legal liability
Symbol Technologies	unknown letter to SEC	Unknown				
Tenet Healthcare Corporation	unnamed employee	Unknown				
Union Pacific Corporation	Union action	Unknown				improve employment conditions

**Table 9 – Do Incentives Impact Employee Whistleblowing? Evidence from Qui-Tam Availability**

This table provides a breakdown of the distribution of fraud detector for the healthcare and non-healthcare industries, where healthcare includes medical treatments and supporting industries including pharmaceuticals and manufacturers of medical supplies and equipment. In many healthcare companies, the government is a significant buyer of company services, and consequently employees can possibly benefit from qui-tam lawsuits. This table is based on the full set of 230 observations.

	<i>Non-Healthcare</i>		<i>Healthcare</i>	
	<b>Count</b>	<b>Freq %</b>	<b>Count</b>	<b>Freq %</b>
Internal Governance	67	34.7%	7	18.9%
Analysts	19	9.8%	2	5.4%
Short Seller	9	4.7%	1	2.7%
Non-Financial Market Regulators	17	8.8%	8	21.6%
Strategic Players	9	4.7%	1	2.7%
Auditors	18	9.3%	3	8.1%
External Equity Holders	4	2.1%	1	2.7%
<b><i>Employees</i></b>	<b>21</b>	<b>10.9%</b>	<b>9</b>	<b>24.3%</b>
Media	17	8.8%	4	10.8%
SEC	8	4.1%	1	2.7%
Insurance, Plaintiff Law Firms	4	2.1%	0	0.0%
Total	193		37	
Chi-Square Goodness of Fit Test for Distributional Equality: $\chi(9) = 17.17$ pvalue = 0.046				

**Table 10 – Fraud Detector Distribution by Information Source**

This table indicates the source of information used by the fraud detector to detect the fraud. This is based upon a reading of the case.

	SEC	Non-SEC		
		Private	Regulator	Other
Analysts	66.7% (14)	14.3% (3)	--	19.0% (4)
Short Seller	70.0 (7)	20.0 (2)	--	10.0 (1)
Strategic Players	40.0 (4)	20.0 (2)	30.0 (3)	10.0 (1)
External Equity Holders	80.0 (4)	20.0 (1)	--	--
Employees	3.3 (1)	86.7 (26)	10.0 (3)	--
Media	71.4 (15)	19.0 (4)	4.8 (1)	4.8 (1)
Professional Service	50.0 (2)	--	--	50.0 (2)
Total	39.1% (61)	37.2% (58)	15.4% (24)	8.3% (13)



**Table 11 – Does Auditor Involvement in Detection Change post Enron?**

The table breaks down the frauds along two dimensions. The rows indicate whether the fraud in question required restatements filed with the SEC for the period in question (row 1) or did not require restatements (row 2). The columns provide details about the identity of the fraud detector, and how the relevance of this category of detector changes over time. Column 1 presents the percentage and count (in parentheses) of the 156 external frauds that required restatements, while column 2 repeats the exercise for the 21 cases where auditors were the fraud detectors ( We do not include the two accounting cases we reclassified as shortsellers). In Columns 3 and 4, we breakdown the auditor cases over time, column 3 indicating the cases raised by auditors prior to Enron, and column 4 indicating those cases post Enron.

<i>Accounting Status of Fraud</i>	<i>All Fraud Detectors</i>	<i>Auditor</i>	<i>Auditor PreEnron</i>	<i>Auditor PostEnron</i>
Required Restatements	62.2% (97)	85.7% (18)	100% (7)	78.6% (11)
Not Required Restatements	37.8% (59)	14.3% (3)	--	21.4% (3)
Totals	156 External Cases	21 Cases of 156 External = 13.55	7 Cases of 73 Pre Enron = 9.6%	14 Cases of 83 Post Enron = 16.9%

**Table 12 – Impact of SOX on Fraud Detector Distribution**

This table provides the distribution of external fraud detectors before and after the passage of Sarbanes-Oxley in July 2002.

	<i>Pre-SOX</i>		<i>Post-Sox</i>	
	<b>Count</b>	<b>Freq %</b>	<b>Count</b>	<b>Freq %</b>
Analysts	16	14.4%	5	11.1%
Short Seller	10	9.0%	--	--
Non-Financial Market Regulators	17	15.3%	8	17.8%
Strategic Players	8	7.2%	2	4.4%
Auditors	8	7.2%	13	28.9%
External Equity Holders	4	3.6%	1	2.2%
Employees	23	20.7%	7	15.6%
Media	17	15.3%	4	8.9%
SEC	5	4.5%	4	8.9%
Insurance, Plaintiff Law Firms	3	2.7%	1	2.2%
Total	111		45	
Chi-Square Goodness of Fit Test for Distributional Equality: $\chi (8) = 28.71$ pvalue = 0.004				