

WHO BLOWS THE WHISTLE ON CORPORATE FRAUD?

Alexander Dyck
University of Toronto

Adair Morse
University of Chicago

*Luigi Zingales**
University of Chicago, NBER, & CEPR

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ABSTRACT

To identify the most effective mechanisms for detecting corporate fraud we study in depth all reported fraud cases in large U.S. companies between 1996 and 2004. We find that fraud detection does not rely on obvious actors (investors, SEC, and auditors), but takes a village of several non-traditional players (employees, media, and industry regulators). Having access to information or monetary rewards has a significant impact on the probability a stakeholder becomes a whistleblower. Reputational incentives do not work as well. Yet, after SOX auditors' reputation pays off in new client business, increasing their willingness to reveal fraud.

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The large and numerous corporate frauds that emerged in the United States at the onset of the new millennium provoked an immediate legislative response in the Sarbanes Oxley Act (SOX). This law was predicated upon the idea that the existing 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 bring corporate fraud to light? What motivates them? Did reforms target the right actors and change the situation? 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 that took place in U.S. companies with more than 750 million dollars in assets between 1996 and 2004. After screening for frivolous suits, we end up with a sample of 216 cases of alleged corporate frauds, which include all of the high profile cases such as Enron, HealthSouth, and World Com.¹

Through an extensive reading of each fraud's history, we identify who is involved in the revelation of the fraud. To understand better why these fraud detectors are active, we study the sources of information detectors use and the incentives they face in bringing the fraud to light. To identify the role played by short sellers, we look for unusual levels of short positions before a fraud emerges. This data allows us to test the two dominant views. On the one hand, stands the legal view, which claims fraud detection belongs to auditors and securities regulators. On the other hand, is the finance view (Fama (1990)), which predicts that monitoring will be done by those with residual claims (equity and debt holders) and their agents (analysts and auditors).

We find no support for the legal view, since the SEC accounts for only 7 percent of the cases and auditors for 10 percent. We also find very weak support for the finance view. Debt holders are absent. Equity holders play only a trivial role: they detect just 3 percent of the cases. Equity holders' agents (auditors and analysts) collectively account for 24 percent of the cases revealed. Even using the most comprehensive and generous interpretation of this view, which might include short sellers, the finance view accounts for only 38 percent.

More surprising, we find that actors, who do not own any residual claim in the firms involved and are often not considered as important players in the corporate governance arena,

¹ 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 settle for financial payment without any admittance of wrongdoing and hence, from a legal point of view, remain allegations.

play a key role in fraud detection: employees (17 percent of the cases), non-financial-market regulators (13 percent), and the media (13 percent). These results remain true if we value-weight the cases by the sum of fines and settlements associated with the impropriety. Value-weighting creates only one change in the distribution: the media become much more important (24 percent), suggesting they get involved only in the biggest cases.

What accounts for the differences between the law and finance views and our findings? In these frameworks two dimensions are missing. First, they ignore differences in the costs of identifying and gathering fraud-relevant information. Some actors (employees, industry regulators, and analysts) gather a lot of relevant information as a by-product of their normal work – as suggested by Hayek (1945). Hence, they are in a much better position to identify the fraud than short sellers, security regulators, or lawyers for whom detecting fraud is like looking for a needle in a haystack. Thus, while an employee might gain much less than a shortseller from revealing a fraud, he also faces a much lower cost (in fact often no cost) in finding out about it.

Second, there are incentives to uncover fraud for actors who neither have a legal obligation nor residual claims. One such incentive is reputation. A journalist uncovering a fraud gets national attention and increases his career opportunities. Another such incentive is a monetary reward directly linked to the size of the fraud uncovered. Thanks to the Federal Civil False Claims Act (also known as the *qui tam* statute), when a fraud involves fraud committed against the government (e.g., Medicare fraud), individuals who bring forward relevant information are entitled to between 15 and 30 percent of the money recovered by the government.

We find that all these aspects matter. When we distinguish actors on the basis of their information sources (inside information, regulatory discovery, and public information) we find that access to information is important. Having access to inside information rather than relying just on public information increases an actor's probability of detecting fraud by 5 percentage points. This effect, however, drops in half and becomes statistically indistinguishable from zero when we value-weight the cases. We regard this as evidence that the cost of gathering information is an important barrier only in smaller cases and becomes irrelevant when the stakes are higher.

We find the opposite effect for reputation. Reputational incentives do not appear to matter when we equally weight the cases. But if we weight the cases by the magnitude of their

settlement, we find that reputational considerations do matter. This is reasonable, since a journalist or an analyst will not become famous by uncovering a minor accounting irregularity in a small unknown company, but only for detecting a major fraud at a very large company.

By contrast, monetary incentives for fraud revelation seem to play a role regardless of the severity of the fraud. In particular, we find that in healthcare (an industry where the government accounts for a significant percentage of revenue and thus suits in which whistleblowers are rewarded financially are more likely) 41 percent of frauds are brought to light by employees. This contrasts with only 14 percent of cases detected by employees in all other industries. This difference is statistically significant at the 1 percent level, and the effect is robust to controls for differences in industry characteristics. Hence, a strong monetary incentive to blow the whistle does motivate people with information to come forward.

To shed some light on these incentives not coming from residual claims, we undertake an in-depth analysis of the cost-benefit trade-offs faced by actual whistleblowers. Any analysis of these whistleblowers' incentives will overstate the benefits and/or understate the costs, since these are people who, after assessing their costs-benefit, chose to come forward. In spite of this bias, we find a clear cost for auditors who blow the whistle. The auditor of a company involved with fraud is more likely to lose the client if he blows the whistle than if he does not. Nevertheless, after SOX auditors' complacency is also penalized: auditors that experience higher frequency of fraud in their account are less likely to capture new accounts.

Analysts who blow the whistle are no more likely to be promoted than similar analysts following the same company and not blowing the whistle. We do find, however, that star analysts who blow the whistle are less likely to lose their status.

The picture seems to be more encouraging for journalists. While the sample of identifiable journalists is small, we find that journalists breaking a story about a company's fraud are more likely to find a better job than a comparable journalist writing for the same newspaper/magazine at the same time.

The story for employee whistleblowers is more mixed. On the one hand, on occasion, employees can gain from whistle blowing. When employees can bring a *qui tam* suit that the company has defrauded the government, whistleblowers stand to win big time: on average our sample of successful *qui tam* whistleblowers collect \$46.7 million. The other important benefit to many employee whistleblowers is avoiding the potential legal liability which arises from being

involved in a fraud. On the other hand, employee whistleblowers face significant costs. In 45 percent of the cases, the employee blowing the whistle does not identify him or herself individually to avoid the penalties associated with bringing bad news to light. In 82 percent 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. Many of them are quoted saying, “If I had to do it over again, I wouldn’t”.

Overall, this web of monitors, so critical to fraud detection, seems to work with low monetary and reputational incentives. To gain a better understanding of what regulatory or market-based initiative can improve these incentives we split the sample period and exploit the changes in the regulatory environment that occurred after the Enron and WorldCom scandals. Consistent with the enhanced responsibility attributed to accountants by the Statement on Auditing Standards (SAS) No. 99 (approved in October 2002), we find that the percentage of fraud brought to light by auditors jumps from 6 percent to 24 percent. On a smaller scale, the SEC also becomes more active moving from 5 percent to the cases to 10 percent. By contrast, we do not find any evidence that the protection offered to whistleblowers by section 303 of SOX has any effect.

Our work is related to a large literature in accounting and finance that looks at the characteristics of firms involved in fraud (e.g. Richardson, Tuna and Wu (2002), Burns and Kedia (2006), Efendi, Srivastava and Swanson (2007)), the impact of fraudulent financial reporting on firm value (e.g. Palmrose and Schotz (2004)) and the role of specific whistleblower types including the press (Miller (2006)) and employee whistleblowers (Bowen, Call and Rajgopal (2007)). We differ in our focus of comparing the relative importance of different sources of detection. We also differ in the broadness of our sample that includes both accounting related and non-accounting related frauds.

Our work is also related to a significant literature in law and economics. As in Choi (2007), Griffin, Grundfest and Perino (2001), and Thompson and Sale (2003)), we use federal securities class actions to construct the sample of fraud. The focus of these papers, however, is on the frequency and the cost imposed by fraud, not on the alternative mechanisms of detection. In this respect, our work is closer to Black (2001) and Coffee (2001), who discuss the best mechanisms to protect investors from fraud and raise questions whether specific actors are reputation intermediaries or more simply attend to the concerns of their clients. Our paper

provides data that sheds light on these questions. Our work is complementary to two recent papers by Karpoff Lee and Martin (forthcoming). Whereas they focus on the costs borne by firms and managers when fraud is revealed, we analyze the mechanism that leads to the detection of fraud and the cost and benefits of whistle-blowing..

Finally, our work is related to the debate started by LaPorta et al. (2006) on what works in security regulation. They focus on the importance of private enforcement as opposed to public enforcement. As our analysis illustrates, both private and public enforcement function in the context of a broader web of actors. The involvement of these actors, their comparative advantage in terms of access to information, and their incentives need to be considered when considering reforms of governance in the US and abroad.

The remainder of the paper proceeds as follows. Section 1 presents a theoretical framework for considering who should be involved in fraud detection. Section 2 describes our data. Section 3 tests various hypotheses on who should be more likely to blow the whistle. Section 4 analyzes the costs and benefits of whistle-blowing. Section 5 explores the changes in environment occurred after 2002 and their effects on the relative frequency of different whistleblowers. Section 6 concludes.

1. Theory: Who Should Blow the Whistle?

The primary responsibility in uncovering and preventing fraud resides with management and the board of directors. Our interest, however, is with the external control mechanisms, which intervene when the board, management and internal control systems fail to identify/rectify governance shortfalls. To this end, the legal and economic literatures offer at least three views on which actors carry the role of revealing fraud when internal governance mechanisms fail.

(i) Legal view: Corporate fraud should be revealed by auditors and securities regulators.

The legal view of the firm highlights the role of external auditors. The Securities Act of 1933 required all firms subject to the act to have an annual audit of financial statements by an independent or certified public accountant. The Securities Exchange Act of 1934 has evolved to highlight the role of the audit committee and the role of independent auditors in their financial monitoring role. The second pillar in fraud detection is represented by the Securities and Exchange Commission. As its web page recites, the SEC's primary goals are "promoting the

disclosure of important market-related information, maintaining fair dealing, and protecting against fraud”.

(ii) Finance view: Fraud should be revealed by parties with the most payoff at risk.

According to Fama (1990), building on the previous work of Fama and Jensen (1983a, 1983b), it is efficient to insulate most of the firm stakeholders from risk by providing them a fixed payoff. As a result, the incentives and the role for monitoring are left to equity holders, debt holders, and their delegates (auditors, analysts and rating agencies).² In this efficient arrangement, no role for monitoring is expected from stakeholders with a fixed-payoff contract such as employees, suppliers and customers.

(iii) Private litigation view: Corporate fraud should be exposed by private litigation lawyers.

Coffee (1986) states that contingent fee payment in security class action cases creates a big incentive for lawyers to bring a case against companies committing value-relevant fraud. This view has been recently supported by La Porta et al (2006). In an international comparison they show that private enforcement (which they identify with the security class action suits) is more effective than public enforcement in deal with security law violations.

2. Data

In section 3 we will test these various views, but before doing so we need to describe our data collection approach and sample.

2.1 Sample of Frauds

Our sample of corporate frauds consists of U.S. firms against whom a securities class action lawsuit has been filed under the provisions of the Federal 1933/1934 Exchange Acts for the period 1996 - 2004. We use the Stanford Securities Class Action Clearinghouse (SSCAC) collection of all such suits. Because class action law firms have automated the mechanism of filing class action suits so to react to any negative shock to share prices, it is highly unlikely that a value-relevant fraud could emerge without a subsequent class action suit being filed (Coffee,

² This view emphasizes the incentives for shareholders to engage auditors even absent any legal requirement, consistent with the evidence in Watts and Zimmerman (1983).

1986; Choi, Nelson, and Pritchard, 2008). Furthermore, the suit will be filed in Federal court rather than a State court because very few state cases (outside of change of control lawsuits) lead to financial settlement, especially without also involving a federal class action suit (Thompson and Sale, 2003).

The biggest potential problem with using class action data is not that we might miss important frauds, but that we include frivolous cases.³ To address this concern we apply six filters. First, we restrict our attention to alleged frauds that ended after the enactment of the Private Securities Litigation Reform Act of 1995 (PSLRA), which sought to reduce frivolous suits by making discovery right contingent on evidence (Nelson, Johnson and Pritchard, 2007).

Second, of the 2,171 suits from 1996-2004, we restrict our attention to large domestic firms, which have sufficient assets and insurance to motivate law firms to initiate suits and which do not have the complications of cross-border jurisdictional concerns. 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). The size and domestic filters reduce our sample to 501 cases.

Third, we exclude all cases where the judicial review process leads to their dismissal.⁴ 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 suggest as dividing frivolous suits from meritorious ones.⁵ Fifth, we exclude from our analysis security frauds that SSCAC distinguishes to involve wrong-doing of agents of the firm or investor, rather than of the underlying firm management. These cases include IPO underwriter allocation cases, mutual fund timing and late trading cases, and analyst cases involving false provision of favorable coverage. The third through fifth screens remove more than half the number of cases from 501 to 244 cases.

The final filter removes a handful of firms that settle for amounts of \$3 million or greater, but where the fraud, upon our reading, seems likely to have settled to avoid the negative publicity. The rule we apply is to eliminate cases in which the firm's poor ex post realization

³ Although we note that our procedure did not lead us to include the backdating cases brought into focus by the academic work of Eric Lie (2005) and Heron and Lie (2007), as suits launched on this basis were initiated after construction of our sample.

⁴ We do retain cases voluntarily dismissed when the reason for dropping the suit is bankruptcy. These 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.

⁵ Grundfest (1995), Choi (2007) and Choi, Nelson, and Pritchard (2008) 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.

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 216 cases.

For the rest of the paper, we refer to these 216 cases as *frauds*. Strictly speaking these are only alleged frauds. Directors and officers insurance does not cover firm management when courts find the firm guilty of security fraud. Thus, all of the cases settle before reaching a court verdict, and settlements almost always involve no admittance of wrongdoing. As a result, it is impossible for us to establish whether there was real fraud (which in legal terms implies the intent to deceive) or just gross negligence, or perhaps even just mistakes. For the purpose of this paper, however, this difference is not critical. We are interested in understanding the mechanisms that bring extreme bad execution of governance to light, not in establishing intent.

2.2 *Identifying the Detector of Fraud*

Our key variable is the identity of the actor who brings each fraud to light. To uncover the fraud detectors for each of our 216 cases, we search Factiva for news wires and articles over the time period beginning three months prior to the class period (the period over which the suit claims misbehavior) and going until the settlement date or until current if the case is yet pending. Our searches return approximately 800 articles per case. The point to reading so many articles for each case is to understand, as much as possible, the circumstances of the fraud being committed and the detector finding the information to collaborate our assessment of who blew the whistle. Table 1 provides definitions of the variables we collect from the case studies.

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 labeled the Enron whistleblower. Of course, we do not want to under-credit the importance of individuals who contribute details as the fraud emerges. However, our aim is to identify the initial force that starts the landslide of a scandal coming to light.

We are sensitive to potential concerns about subjectivity in identifying the first actor to bring each fraud to light and thus implement a meticulous procedure. The initial coding of each case was done by a research assistant (a law student) and, independently, at least one of the

authors. Where judgment was required, all three authors analyzed the case until a consensus was reached. A year after the initial coding, we divided the cases into thirds, and each of the authors re-coded cases without referencing the prior coding. Again, when the coding was at all unclear, all three authors read the case to ensure consistency in interpretation.

In the process of verifying our coding, we created a 70-page document of the news articles most revealing of the fraud detector as evidence of our coding. (This document resides on our websites.) We sent this document to colleagues across universities in the area of research and to the NBER corporate governance list soliciting comments if any researcher knew more details of particular cases. This document also includes an indicator of whether there was a “smoking gun” and identifies who the detector is.⁶ We show robustness of our results to using only the sample of smoking gun cases.⁷

Our coding is likely to be particularly problematic for shortsellers. Short sellers have a strong incentive to identify bad news and disseminate it (Diamond and Verrechia (1987)), but no incentive to reveal themselves as the source. A fraud-revealing short seller might be cutoff from future information from firms and might face suits or investigations for spreading false information (e.g. Lamont (2003)). We investigate the possibility that short sellers hide their revealing of corporate fraud by testing whether each firm’s average short interest position (from Bloomberg) during the three months prior to the fraud revelation date is more than three standard deviations higher than the year prior. We choose the three standard deviation rule because the volatility in the series is high. In the online appendix we present the graphs of the short interest positions for each of cases we re-classify. Our findings are similar using alternative approaches to identify hidden short sellers, as we show in a previous version of the paper where we include additional control variables such as those that capture aggregate movements in short interest. Karpoff and Lou (2008) also investigate this issue in their sample of SEC Enforcement Actions.

Not all fraud is equally important. Some, like Enron, destroy companies and billions of dollars of value, while others are less severe. We create a value weight for each fraud, where we

⁶ To illustrate the importance of this final step, consider cases which we pinpoint the fraud detector to be media. It is certainly true that the media “reports” the first revealing of the vast majority of cases, but for the media to be the fraud detector, it must be that the media “dug up” the story, not that the media reported the story from another source. We only attribute the media as the identifier of the fraud if the media story does not give credit for the information to any specific source, named or unnamed (e.g. anonymous employee). However, the media will only get a smoking gun designation if the article reveals that the media directly discovered the fraud.

⁷ Even with these procedures, we cannot be completely certain that the whistleblower we identify was not secretly tipped by an employee. This biases us against finding a role for employees, and makes it more likely to find a role for actors emphasized in the legal and financial views of fraud detection.

measure the severity of frauds by summing the settlement amount paid to shareholders in the class action lawsuit, any fines or settlements paid to the SEC, criminal or civil courts by the firm, its insurance, or its officer/directors, and any fines or settlements paid to the courts or regulators by the firm's agents (auditors and investment banks) regarding the impropriety.⁸

2.3 *Selection Bias of Data - Frauds Not in the Public Domain*

By focusing on discovered frauds, we introduce two selection biases: we do not observe frauds that are never caught, and we do not observe frauds caught so early that they never enter the public domain. In addition, we cannot say anything about the importance of specific mechanisms in preventing fraud that does not occur. Monitoring by the board of directors might be very effective in deterring fraud and in stopping frauds early on. In our sample, we attribute 34 percent of the fraud detections to internal governance, but this is undoubtedly a vast underestimate of how many frauds are prevented and corrected by internal corporate governance.⁹ Since we cannot draw any specific conclusion about the effectiveness of internal control systems, we exclude the internal governance revelation cases from the majority of our analysis and refer the interested reader to Bowen, Call and Rajgopal (2007). What our data do allow us to ask is: which are the most effective *external* mechanisms that help *detect* corporate fraud when there is a failure of internal mechanisms. This is an important aspect of governance that has received little attention.

2.4 *Distribution of whistleblowers*

Table 2 presents the distribution of whistleblowers. Column 1 reports the raw data while column 2 the recoded data after adjusting for hidden short activity. Since the latter is more credible, we focus on this.

The data do not provide much of a support for the legal view. Auditors catch a mere 10 percent of the cases, while the SEC 7 percent. One explanation for the relative paucity of

⁸ These estimates do not include the market value losses due to the reputational effects. As Karpoff et al. (forthcoming) show, these losses can be substantive. Nevertheless, to the extent they are proportional to the settlement and fines, they should not affect our conclusions.

⁹ The vast majority the internal governance cases are associated with either a managerial turnover or an economic or financial crisis that requires some major restructuring. These cases do not appear to be precipitated by an imminent whistle blower. There are, however, some cases where the firm's decision to come clean could have been triggered or even forced by the threat of an imminent revelation by a whistleblower. Our extensive reading of the cases allows us to identify these cases, where we credit the fraud detection to the whistleblower.

auditors is that auditors do not see this as their responsibility. As the CEO of one of the four large accounting firms stated in an interview: “investors seem to expect that an audit is an assurance of a company's financial health. In fact, an audit is an attestation of the accuracy of a company's financial statements, based on information that the company itself provides” (Taub, 2005). Concern over this gap between perception and reality induced the Auditing Standards Board to issue two rulings (SAS 53 in 1988; SAS 82 in 1997) to address shortcomings in the auditors’ role in detection of misstatements (Jakubowski, Broce, Stone, and Conner, 2002).

The results in Table 2 also provide no support for the private litigation view. Plaintiffs’ lawyers reveal only 3 percent of the cases. This does not mean that private litigation is useless in preventing 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.

The finance view does a little better. While equity holders catch only 3 percent of the cases, their delegates (analysts and auditors) catch a combined 24 percent.

Even before doing more sophisticated analysis, these data reveal two important facts. First, no actor dominates the scene. Six players seem to have a roughly equal role in discovering almost all fraud (82 percent of them): to catch fraud the United States relies upon a village of detectors.

Even more surprising is who belongs to this list. SEC, plaintiffs, and equity holders are not in this list. Instead, it is the employees (the most important external governance device with 17 percent of the cases), the media (13 percent), and the industry regulators (13 percent of the cases) who dominate the scene. These players do not appear in the traditional discussions of corporate governance, but they should.

Why are these implausible actors so important? What are the incentives that motivate them? And why are the more traditional ones, advocated by the economic and legal literature, not more numerous? In the rest of the paper we will try to answer these questions. But before doing so, we need to ascertain ourselves that our findings are robust.

To do so, we collect data on the size of the settlements and fines by fraud detector type (Table 2, panel B). The median cost is \$34 million, with a mean of \$198M. This difference is due to a couple of outlying cases (e.g., Enron (\$7.4 billion) and Cendant (\$9.7 billion)), whose damages completely swamp the distribution. For this reason, we choose to winsorize the

settlements and fines at the 10 percent upper level. The third column of Table 2B reports the winsorized average.

As we show in column 3 of Table 2, Panel A, this adjustment does not change our results much. If anything, it makes the traditional monitors look even less important, with the auditors dropping from 10 to 7 percent and the SEC from 7 to 6 percent. The only category of whistleblowers that dramatically increases its importance when we value-weight is the media, which uncover almost one fourth when we value weight the cases. This asymmetry likely reflects the particular incentives journalists face: the importance of a scoop is directly related to the size of the company involved and to the magnitude of the fraud. We are going to return on this point in section 4.3.

Another potential concern is that our identification strategy is subjective. To reduce this subjectivity we distinguish between cases where we find a “smoking gun” that makes attribution non controversial, and cases where this smoking gun does not exist.¹⁰ We find a smoking gun for 112 of the 152 cases. In the last column of Table 2A we report the equally-weighted distribution of fraud detectors for just the “smoking-gun” cases. The distribution is almost identical to that in column 2, relieving the concern that our results are driven by subjective calls.¹¹

3. Results: Tests for Incentives across Whistleblower Types

In this section we want to subject the impressions derived from Table 2 to more rigorous testing. Since we find little evidence supporting the legal and private litigation views, we structure our tests to compare the finance view with alternative explanations for the distribution. Our goal is to estimate to what extent incentives predict whistleblowing across the different players.

The dependent variable is a multi-group categorical variable identifying the fraud detector for each of the 152 cases. The ten categories of fraud detectors are the actors listed in the distribution table (Table 2). We implement a conditional logit estimation to control for the unobserved difficulty in discovering and revealing each case with the fixed effect. The simplest case asks whether a dummy variable that takes the value 1 for fraud detectors identified with the finance view predicts who reveals the fraud. The first column of Table 3A lists these actors:

¹⁰ In the online appendix with a description of all the cases, we also report the “smoking gun”.

¹¹ As we show in a previous version of the paper, these results are also robust to controlling for other features of the fraud. The results are available from the authors upon request.

analysts, auditors and equity holders. Table 4 presents the conditional logit estimates for the equal-weighted (column 1) and value-weighted (column 2) distributions. Our tests show no significant effects for the *finance view* variable for either distribution.

The parsimonious framework of the *finance view* may be too narrow. We hypothesize that two factors are missing. First, the framework focuses on differences in the incentives of various actors to acquire information about frauds, rather than on differences in the costs for them to identify and gather such information. Information is, in Hayek's (1945) view, diffuse such that certain actors (employees, industry regulators, and analysts) gather a lot of relevant information as a by-product of their normal work. An industry regulator, for example, may uncover securities fraud while using its regulatory discovery privilege unrelated to financial matters (e.g., Schein Pharmaceutical). An employee might be confronted with management misbehavior while trying to maintain operational safety standards (e.g., Northeast Utilities). By contrast, an analyst or a short seller has to delve through details of financial reports and industry trends to uncover misrepresentations (e.g., CVS and CHS Electronics).

To account for differences in access to information, we classify each actor by its degree of access to information. To reduce the subjectivity of this classification, we examine each of the cases in our database and record whether the information key to the revelation was inside information, regulatory discovery information, or publicly available information. The percentage of cases falling in these three categories is presented in columns 2-4. Then, we construct a categorical variable in column 5 called *Information Access Cost* in the following way. Starting from the left, we cumulate the percentage of cases, and when a particular fraud detector cumulates to more than 50 percent, we assign the detector type to that access rank: where rank 1 is inside private information; rank 2 is regulatory discovery private information; and rank 3 is public information.

For example, analysts almost always (95 percent of the times) identify a fraud on the basis of publicly available information, as do short sellers. In contrast, auditors always identify fraud on the basis of inside information. In the middle we find industry regulators, who uncover fraud mostly on the basis of information they obtain as a result of their regulatory activity. Since this is neither public information, nor inside information, we put them in an intermediate category. We put in this intermediate category also clients and competitors, since they seem to get their clues from a variety of sources.

Second, the *finance view* may miss benefits to uncovering fraud that do not arise from ownership of residual claims. One such incentive is reputation. Among the fraud detecting actors, four categories not included in the finance view may gain in reputation from whistle blowing. Journalists, for example, can gain reputation by blowing the whistle and writing a scoop. The same is true for a law firm. Even in the regulatory sector, uncovering fraud can have a reputational payoff in term of career, especially if an official want to move to the political sector.

Another missing benefit comes from a monetary reward directly linked to the size of the fraud uncovered. The first category of fraud detectors who have a monetary benefit not included in the finance view are short sellers, whose sell positions benefit from the emergence of negative news. The second category of fraud detectors who have potential monetary benefits are employees in industries deriving revenue from the government. Thanks to the Federal Civil False Claims Act (also known as the *qui tam* statute), when the fraud involves a false claim against the government, individuals who bring forward relevant information are entitled to between 15 and 30 percent of the money recovered by the government. This is particularly relevant in healthcare and defense industries.¹² The last column of Table 3 summarizes these additional monetary and reputation benefits by fraud detector.

Returning to the conditional logit specification in Table 4, we test for the importance of access, reputation and monetary incentives. In column 3, we find that access and other benefits matter. *Information Access Cost* is negative and very significant. A party with no inside information is 4.4 percent less likely to blow the whistle than a party with inside information. In column 4 we repeat this test, this time value weighting our observations. The only important difference is that the coefficient of the variable *Information Access Cost* halves and is not statistically significant any more. This change reflects the fact that informational barriers are important for smaller cases. Since the cost of learning the facts does not change much with the size of the company or the fraud, while reputational and monetary incentives to uncover a fraud do rise with the size of the company and the fraud, it is not surprising that the cost of accessing information becomes irrelevant for bigger fraud.

¹² Another possibility is to pursue a suit under the tax laws, but this provision only came into effect in December 2006 and was not in effect during our sample period.

Interestingly, in the equal-weighted model only cash benefits positively affects the revelation of fraud, while the information access costs affects it negatively. Having monetary incentives to reveal a fraud makes a detector type 13 percent more likely to blow the whistle, while having reputation incentives results in 7.4 percent higher probability of being the detector. By contrast, in the value-weighted model, access costs play no role, while the reputation benefits are significant.

A clearer picture seems to emerge. The finance view -- that the primary monitors are the stakeholders with a residual claim and their delegates -- seems at best incomplete. It overestimates the importance of some actors and misses others. Our results provide a rationale. On the one hand, there are other important benefits from blowing the whistle either monetary (short sellers and whistleblowers' bounties) and reputational (media). The latter benefits are important only for larger (more newsworthy) fraud. On the other hand, there are costs of accessing the information that enables to identify the fraud. These costs seem to represent an important barrier for ordinary fraud, but not for very large ones.¹³

4. Results: Tests for Incentive Payoffs within Whistleblower Types

In the prior section, our tests find that reputational and monetary benefits are both associated with the revealing of fraud, but that reputational benefits only matter for big impact cases. In this section, we want to build on the results and validate them by verifying the existence of these benefits. An advantage of our data is that we can delve into the details of cases and into the careers of individuals revealing fraud.

We consider in detail four of the five main villagers of fraud detection – financial analysts, auditors, the media, and employees. Since we do not see short seller actions, we cannot do investigative work concerning these individuals and their incentives. Likewise, understanding the mandates of industry regulators and observing the incentives of the people who discover financial improprieties while performing other duties in their regulator role is infeasible. However, with a reasonable amount of work, we can track the contracts of auditors and the careers of analysts, journalists, and employees who do the whistle blowing to look for ex post

¹³ Again, we found similar qualitative results and levels of significance when we repeated these tests where we restricted our attention only to the cases we classified as most reliable and had a “smoking gun” classification.

evidence of their incentives in revealing the fraud. We first focus on auditors and analyst and next look at media and employees.

Before undertaking this analysis a warning is necessary. Since we do not observe the ‘dog that did not bark’, we have data only for the whistleblowers who choose to speak up. Assuming they behave rationally, these are people for whom the expected benefits of blowing the whistle exceeded the expected cost. Hence, the benefits we observe will overestimate the average benefit and the costs we observe will underestimate the average cost. Nevertheless, this exercise is valuable in so much as it documents the existence of these benefits and costs and is able to point out incentives that are not generally discussed in the traditional corporate governance literature.

4.1 Auditors

The finance view suggests a significant role for auditors: not only are they agents of the board, but their access to internal and external information makes them efficient monitors. Incentives for auditors to monitor are present if an auditor is more likely to retain an account if he blows the whistle or if he is more likely to gain new accounts if he has a reputation of effective monitoring through fraud revelation. However, it is not clear how strong such incentives are. To the extent that auditors see themselves as the agents of management who are not interested in bringing fraud to light, they will be penalized for bringing such information forward, both in retaining the current contract and acquiring new contracts. Before SOX, the extensive non-audit work of many auditors reinforced such reputational concerns.¹⁴ An example of the weak (if not perverse) incentives in the demand for auditors is provided by Chen and Zhou (2007), who show that poorly governed firms choose lower quality auditors. Likewise, Brickey (2004) and Fuerman (2006) document that it was known that the quality of Arthur Andersen’s auditing had deteriorated prior to Enron, yet they did not experience a loss of market share.

In Table 5 A we test whether auditors that blew the whistle are more likely to retain the account. Contrary to the reputational story, auditors that blew the whistle are more likely to lose accounts: 78 percent of whistle blowing auditors are fired in the year of the fraud revelation (or

¹⁴ A case in point is the Arthur Andersen partner whom the SEC had suspended for improper professional conduct in the Waste Management case who was subsequently promoted by Arthur Andersen (Brickey, 2004).

three months subsequent to the revelation, if the fraud occurs in the last quarter).¹⁵ This is very statistically different (at the 1 percent level) from the 25 percent of auditors who are fired in the remaining fraud cases in our sample, and the 5 percent turnover, excluding Arthur Andersen forced turnovers, in all Compustat firms with more than \$750 million in assets during the same period of 1996-2004.

This result does not prove that whistle blowing is penalized since auditors can gain on the extensive margin. To test this hypothesis we use data on the identity of the auditors for all the Compustat firms with more than \$750 million in assets (see Table 5 B and C). Because the demise of Arthur Andersen, which audited 357 of the 2,391 firms in the sample, may have structurally changed the reputational incentives of auditors, we break the sample into two to study how whistle blowing impacts the auditors' ability to pick up clients.

In Panel 5A we look at accounts that turned over at least once between 1995 and 2000 (295 out of a universe of 2,399 large companies in existence in 2003). We then regress the probability that each of the existing auditors capture these new available accounts as a function of an auditor's market share, the cumulative number of frauds that took place in auditor client accounts from 1995-2000, and the cumulative number of times the auditor itself did the whistle blowing. Since this latter variable is always zero (see last column of Panel B.1), we have to drop it from the analysis. Since the Big Five auditors have more accounts, there is a mechanical link between the number of frauds that an auditor reveals and size. To eliminate this link, we also divide the number of frauds each auditors experience in its accounts by its market share. We then run, reported in Panel B.3, conditional logit of the choice of gaining a turned-over account on the auditor's market share, the standardized number of frauds, and an indicator variable for whether the accounting firm belongs to the top five. As Panel B.3 shows, auditors with a larger market share and auditors belonging to the elite group of the top 5 are more likely to acquire turned-over accounts. The number of fraud in audited firms does not have any negative impact on the probability to acquire a new account. Thus, there is no evidence that reputation pays off.

In Panel C.3 we repeat the analysis for the accounts that have become available as a result of the demise of Arthur Andersen, in particular for all Arthur Andersen accounts as of 2000. Here the standardized number of frauds an auditor missed has a negative and statistically

¹⁵ We manually code auditor turnover for our fraud cases by searching for turnover in Factiva three months subsequent to the revelation. Thus, auditor turnover is noted if either we uncover it in the manual search or Compustat documents an auditor change from the prior annual report.

significant effect on the probability of gaining an account, while the standardized cases of whistle blowing has a positive but not statistically significant effect. Hence, reputation (at least negative reputation) seems to work after 2002. The effect is also quantitatively sizeable. Deloitte and Touche's clients account for only 26 frauds, resulting in a standardized fraud measure equal to 110. As a result, Deloitte and Touche has a 6 percentage point higher probability of capturing an Arthur Andersen account than Peat, Marwick, who experience the same number of frauds in spite having 20 percent fewer accounts (and hence has a standardized fraud measure equal to 138).

The different role auditors' reputation plays after 2002 could be the result of an enhanced sensitivity to fraud after Enron or of a change in the location of the hiring decision. In 2002, SOX moved the responsibility of appointing the auditor from the management to the audit committee, formed only of independent directors. While management might have an interest in more friendly auditors, independent directors do not. Hence, this change may explain why reputation for integrity starts paying off.

4.2 *Financial Analysts*

The finance view suggests a significant role for analysts in fraud detection. As agents of investors holding residual claims (in both equity and debt), they specialize in interpreting company information into insightful analysis. Because analysis is tied to an individual, reputation matters for analysts' pay and career prospects. Identifying frauds can be one part of establishing such a reputation, which is rewarded over time with better jobs (e.g. Fama (1980), Hong and Kubik (2000)).¹⁶

At the same time, analysts' incentives to reveal fraud 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 Womack (1999)). Their incentives to reveal fraud may also be significantly reduced or eliminated by their tendency to herd.¹⁷ Finally, before

¹⁶ 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.

¹⁷ 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.

regulation FD analysts might have had incentives to develop a good reputation vis-à-vis the companies they followed to gain privileged access to soft information.

To test for reputational benefits, we follow Hong and Kubik (2000) and focus on two observable indicators of reputational benefit. The first measure is the *Institutional Investor* All American Analyst ranking (All Stars). Every year *Institutional Investor* gives this highly coveted prize to the analysts whom buy-side money managers see as best in their industry. All Stars are actively sought by investment banks and receive the highest salaries (Hong and Kubik (2000)). Our second measure of career advancement is the ranking of the investment bank where an analyst works. Hong and Kubik (2000) document a “well-defined hierarchy of prestige” among investment banks. If whistle blowing promotes career chances, we would expect to see whistle blowing activity rewarded by greater advancement to being an All Star and by more movement to higher-tier investment banks (gauged by Hong and Kubik’s hierarchy variable, updated to cover our extended sample period).

For each case brought to light by an analyst, we identify from I/B/E/S all analysts covering the firm at the time the fraud was revealed. We then trace where these analysts worked and who was an All Star prior to the fraud being revealed, as well as in the two years following the fraud revelation. We exclude from the analysis the analysts who leave the industry because this movement could indicate a promotion (e.g., to join a hedge fund or followed company) or a demotion from the profession (e.g. spending ‘more time with their families’, Hong and Kubik, 2003).

Table 6 presents our results. Panel A shows that whistleblowers are significantly more likely to start as All Star’s (50 percent versus 9.8 percent) and work in high-tier investment banks (60 percent versus 38 percent). The differences are strikingly large, suggesting perhaps that whistle blowing only has a payoff after careers have succeeded, that whistle blow is only credible when a person has first achieved credibility, or that only All Star analysts receive tips from company insiders.

The raw promotion and demotion probabilities reported in Panel B show that analysts who blow the whistle are more likely to be promoted and less likely to be demoted than non-whistleblowers, but that these differences are not significant. The lack of impact could be that the market does not factor whistle blowing into reputation; it could be that the test suffers from

sample selection that the prominent whistleblowers are already advanced in their careers; or it could be that univariate tests ignore other variables that affect promotion and demotion.

If we move to a multivariate setting, we can estimate a logit with company fixed effects and include experience in the regression. (We can only do this for the All Star measure, since no whistleblowers move in investment bank ranking.) Panel C reinforces the univariate result that whistle blowing analysts are no more likely to be promoted. However, over the two years following the fraud revelation, the probability that a whistle blowing analyst is demoted is 45 percent less likely than that for non-whistle blowing analysts following the same firms. Although this is a small sample result, we feel that the inference is fairly intuitive: whistle blowing is done by successful analysts who do not worry about recourse from companies for bringing bad news to light.

4.3 Media

Journalists are similar to analysts, in the sense that they collect and analyze information for their clients (the readers). They also have an incentive to build a reputation of being nice vis-à-vis companies in order to cultivate their sources (Dyck and Zingales (2003)). And as with analysts, there may also be a conflict arising from the fact that the companies in their stories often make direct payments to their employers (e.g. advertising).

The main difference between journalists and analysts is that journalists are much less specialized than analysts and thus potentially 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.

As Table 7A 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. Hence, whistle blowing seems to take place only at the most prestigious media outlets. This result can be interpreted in a number of ways. One possibility is that minor newspapers cannot afford to pay for specialized journalists able to do the investigation necessary to discover fraud or cannot afford to pay for the cost of these investigations. Another possibility, consistent with Miller (2006), is that local newspapers focus such activity on smaller

more local companies, not covered in our sample.¹⁸ A similar story could be that, to subscribers of local papers, these types of news are less entertaining (Miller (2006), Dyck, Moss, and Zingales (2008)). After all, the National Enquirer pays a fortune to find out every possible detail about the personal lives of media stars because there is high demand for it. An alternative hypothesis, much more troubling for studies like this of corporate governance, is that only very established media with a 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 this hypothesis.¹⁹ Finally, it could be that secret tipping of journalists by company insiders only takes place at the most prestigious media outlets.

A preliminary indication that whistle-blowing might be helpful for journalists is the fact that in the vast majority of cases (74 percent), the journalist presenting the information identifies him or herself by name. This contrasts with the situation for employees, as we describe below.

In Table 8 we go further and test whether whistle-blowing enhances a journalist's career. We follow a similar procedure as we used for analysts, first identifying a matching sample of journalists that were in a similar position as the whistle-blower at the time. We then track the career of the whistleblower and of the matching sample to test whether whistle blowing produced a significant change in promotion or demotion probabilities. To identify a comparison set of non-whistle blowing journalists for every journalist who writes a whistle blowing article we gather from *News Media Yellow Book* the names of peer journalists who write for the same newspaper producing a sample of 17 whistle blowers and 154 non-whistle blowers.²⁰ For this set of journalists we track their employer, the desk they work at and their job title in the next year and three years after the quarter the journalist wrote the article. We provide all of this

¹⁸ In Miller's (2006) study of firms with SEC Accounting, Auditing and Enforcement Releases which includes many smaller companies, he finds that local news outlets report frauds in 30.7 percent of cases flagged by the press prior to revelation by the firm.

¹⁹ As reported in the *New York Times*, "Her questions were so pointed that Enron's chief executive, Jeffrey K. Skilling, called her unethical for failing to do more research. Three Enron executives flew to New York in an unsuccessful effort to convince her editors that she was wrongheaded. Enron's chairman, Kenneth L. Lay, called Fortune's managing editor, Rik Kirkland, to complain that Fortune was relying on a source who stood to profit if the share price fell." Felicity Barringer, "10 Months Ago, Questions on Enron Came and Went With Little Notice," 28 January 2002, Page 11, Column 1.

²⁰ A journalist is a peer of the whistleblower journalist if she/he belongs in the same desk and holds (roughly) the same job title. For example, an Accounting Reporter in the Business Day Desk for the New York Times is considered a peer to a Wall Street Reporter in the Business Day Desk for the New York Times. In some cases, the reporter has a unique position in the desk she/he belongs in. A peer in this case is someone who holds the same title but belongs in a different desk. For example, the associate editor in the Business Day Desk is considered a peer to the associate editor for the National Desk.

information to a third party with expertise in journalism who classifies the career change using a three point scale to identify promotions (+1), equivalent jobs (0), or demotion (-1).²¹

Panel A indicates rewards for whistle blowing as this helps to maintain or enhance the status of a journalist. Whistle blowing journalists are never demoted within one year (6 percent probability within three years) of bringing the fraud to light in contrast with a demotion probability of 12 (26) percent for non-whistle blowers. Whistleblowers are promoted 18 (24) percent of the time in contrast to the 10 (22) percent promotion probability for non-whistleblowers. We test whether these differences are significant in Panel B, showing a positive mean movement for whistleblowers that is significantly different than that for non-whistleblowers using both 1 year and 3 year data. The three year results provide the strongest indication with a higher mean movement.

While we don't want to overstate these results, given the limited data and indications of career progression, the results are consistent with positive incentives for media bringing such frauds to light.

4.4 *Employees*

Employees clearly have the best access to information: few, if any, fraud can be committed without the knowledge and often the support of several of them. Some might be accomplices, enjoying some of the benefits of the fraud, but most are not. What are the incentives and disincentives they face in exposing the fraud? To answer this question we look in details to the 26 cases of employee whistle blowing in our sample.²²

Table 9 provides a summary. In 38 percent of the cases, the whistle blower conceals his identity. This is a clear sign that the expected reputational costs exceed the expected reputational benefits. This impression is confirmed by the data on the cases where the identity of the whistleblower was revealed. In spite of being selected cases (for which the benefit of revealing should exceed the cost), we find that in 82 percent of cases, the whistleblower was fired, quit

²¹ Discussions with journalists suggested that this procedure that incorporates three dimensions of status (outlet, desk, position) and allows an experienced journalist to weight these dimensions was superior to a simpler procedure focusing just on one dimension or a fixed weighting on dimensions.

²² Bowen, Call and Rajgopal (2007) provide further examination of employee incentives surrounding whistle blowing. They first collect whistleblower allegations arising from OSHA collection of such allegations following the passage of SOX. This part of the sample is likely to include more frivolous complaints as the sample is not subject to the same judicial scrutiny as class action law suits. The second part of their sample arises from any press allegations that connected a financial fraud with employee whistleblowing, a procedure different from our own.

under duress, or had significantly altered responsibilities. In addition, many employee whistleblowers report having to move to another industry and often to another town to escape personal harassment. The lawyer of James Bingham, a whistleblower in the Xerox case, sums up Jim's situation as: "Jim had a great career, but he'll never get a job in Corporate America again." Even according to a law firm seeking to sell its services to potential whistleblowers, the consequences to being the whistleblower include distancing and retaliation from fellow workers and friends, personal attacks on one's character during the course of a protracted dispute, and the need to change one's career.²³ This is an aspect rarely emphasized in the literature. Not only is the honest behavior not rewarded by the market, but it is penalized. Why employers prefer loyal employees to honest ones is an interesting question that deserves a separate study.

Given these costs, however, the surprising part is not that most employees do not talk; it is that some talk at all. Table 9 tries to give a sense of what motivates them. In 25 percent of the cases (4 out of 16) where the identity of the whistleblowers is known, we observe a *qui tam* lawsuit. Such suits arise from the Federal Civil False Claims Act, revised in 1986, whereby individuals revealing fraud committed against the U.S. government can collect 15 – 30 percent of the money recovered by the government. In our sample, three *qui tam* cases that have already settled rendered whistleblowers with rewards of \$35 million, \$35 million, and \$70 million. More generally, the outcome of *qui tam* suits is very uncertain and very delayed in time (5 and 10 years in these cases), but the expectation is that these rewards might have been an important factor in leading the employee to talk. Other potential monetary incentives are hard to find.²⁴

Another motivation for whistle blowing could be the desire to avoid a potential liability. This seems to be relevant in 31 percent of the cases. A similar, but distinct, case is the one of ICG, where the newly appointed CEO resigned a few months after beginning his job, while forcing the firm to reveal its mis-doings. This is a clear example of whistle blowing aimed at preserving reputation. Yet, we do not observe any evidence of this behavior among subordinates.

²³ See the statements on the website quitam.com which is organized by the Bauman and Rasor Group.

²⁴ This point is illustrated by the case of Ted Beatty, outlined in the *Wall Street Journal*, who tried but failed to profit by selling short the stock (only stopping when he realized he was violating insider-trading rules), by giving information to a short seller (failing to elicit a payment), by giving information to plaintiff attorney (receiving only a small consulting contract), by giving information to newspaper in exchange for payment (paper refused to pay), and giving information to government (would not hire as consultant). "Informer's Odyssey: The Complex Goals And Unseen Costs Of Whistle-Blowing --- Dynegy Ex-Trainee Encounters Short-Sellers and Lawyers, Fears Being Blackballed --- Seeking Justice and a Payday," by Jathon Sapsford and Paul Beckett, 25 November 2002, *The Wall Street Journal*.

As the case of Sharon Watkins at Enron suggests, the best way to avoid the reputational loss is to change job as soon as possible, without whistle blowing.

Finally, the revelation of information by employees is highly associated with wrongful dismissal suits (25 percent of the identified cases). It is unclear whether these are cases where the employee is fired for blowing the whistle internally or whether the whistle blowing is a form of revenge for a dismissal that is (or is perceived) as unjust.

4.4.1 Testing Money Incentives in Whistle Blowing

As a test of the effect of monetary incentives on whistle-blowing, we exploit the fact that *qui tam* lawsuits are not available in all industries, but only in very few industries where the government is a significant buyer of services. Table 10 compares the distribution of whistleblowers between the healthcare industry, which is a significant buyer of government services, and all other industries. Consistent with this incentive having a significant impact, we find that employees reveal the fraud in 41 percent of cases in the healthcare industry but only 14 percent in industries where the *qui tam* suits are not available. A proportion test confirms that these shares of the distribution are different at the 1 percent confidence level.

There are, however, at least three other possible explanations for our findings. First, heightened monetary incentives might create a free option for the employees, leading to an excessive amount of false claims.²⁵ If true, such an argument would completely change the policy implications of our results. To test this hypothesis we compare the frequencies of frivolous suits (suits dismissed or settled for less than 3 million) in the healthcare industry to that in other industries (where they are not clearly present). We find that the percentage of frivolous suits (panel B) is *lower* in the healthcare industry. Hence, there is no evidence that having stronger monetary incentives to blow the whistle leads to more frivolous suits.

A second explanation consistent with our finding more employee whistle blowing in healthcare comes from Bowen, Call and Rajgopal (2007). Bowen et al find that employee whistle blowing is more likely in firms in 'sensitive' industries, which they defined as including pharmaceuticals, healthcare, medicine, the environment, oil, utilities and banks. Not surprisingly, these are regulated industries. To ensure that our results come from monetary incentives and not from heightened moral sensitivity in these regulated industries, we set up a simple logit

²⁵ Bowen, Call and Rajgopal (2007) provide a more extended discussion of this issue and related literature.

framework in which we estimate that probability that the whistleblower is an employee as a function of the industry. The results are presented in Table 10C.

Column 1 just reproduces a test similar to the proportion test, including only the healthcare dummy as a predictor of employee whistle blowing. The marginal effects reported suggest that among our fraud-committing firms, those in the healthcare industry have 0.271 higher probability of having an employee as the whistleblower. The second column captures the ‘sensitivity’ of industry by including a dummy variable for regulated industries, defined by the SIC codes listed in Table 1. We do not find any statistical evidence that employees in regulated industries are more likely to be whistleblowers.

A third possibility is that the healthcare industry might have a flatter organizational structure, so that the employees are more likely to observe the executives’ action and so more likely to become informed that a fraud occurs.²⁶ To address this concern we obtain from Rajan and Wulf (2007) their measure of depth (verticality) of hierarchies by industry. When we insert this measure in the regression (column 3) we find that indeed more vertical hierarchies are less likely to have employees blowing the whistle. But this effect does not change the magnitude and significance of the healthcare dummy, increasing our confidence that it is the monetary incentives available in healthcare that drive this result. Finally, in column 4 we include both the regulated and the industry organization depth measures, again finding a significant effect for healthcare.²⁷

4.5 *Summary*

Overall, our analysis of whistleblowers’ incentives suggests that the reputational and career incentives tend to be weak, except for journalists. For this category, however, the incentives exist only for very large frauds in very famous companies. We cannot expect the media to act as effective monitor in smaller companies and for smaller and more technical violations. Monetary incentives seem to work well, without the negative side effects often attributed to them, but they are limited to a very specific set of cases. By contrast, we identify significant costs of whistle blowing for employees. Before drawing any conclusion on what could be done to improve fraud detection, it is interesting to see how the pattern of whistle

²⁶ We thank an anonymous referee for this suggestion.

²⁷ These findings are also robust to the use of various controls for characteristics of the fraud.

blowing has responded to the various regulatory changes in incentives that followed the Enron scandal.

5. The Impact of Regulatory Changes for Incentives

Thus far we have considered the whole period 1996 to 2004 as homogenous. But there have been a number of regulatory changes leading up to and following the Enron and WorldCom scandals. In 2000, Regulation Fair Disclosure was approved, making it impossible for analysts to have private conversations with top executives of the firms they follow. According to the proponents of this measure, this change should have increased analysts' independence, making them more likely to reveal fraud. According to the opponents, this change could reduce analysts' incentives to search for information, making them less likely to reveal fraud. In late 2001 and early 2002, the Enron Scandal and the collapse of Arthur Andersen increased the risk faced by auditors and thus their incentives to speak up.

In July 2002, the Sarbanes Oxley act was passed, introducing a vast array of changes. SOX made SEC involvement more politically appealing by providing that SEC civil penalties be used to compensate investors that were victims of securities fraud. It also made SEC involvement more feasible by significantly increasing its budget. SOX dramatically changed auditors' incentives by introducing a ban on consulting work done by audit firms, by conferring the right to appoint and revoke them to the audit committee formed only of independent directors, and by introducing section 404, which enhances the monitoring of the internal control systems.

SOX also altered the cost of whistle blowing for the employees. Section 301 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.

Finally, in April 2003 the New York Attorney General reached a settlement with ten of the nation's top investment firms aimed at promoting the independence of equity research. If this Global Research Settlement achieved its goal, the analysts should have become more independent and thus active in revealing fraud.

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

Table 11 reports the frequency of the different type of whistleblowers before and after SOX (which we take as the middle point of all these changes). The biggest change is for auditors. Prior to SOX, auditors accounted for just 6 percent of fraud detected by external actors, and focused exclusively on frauds requiring financial restatements. Post SOX, they account for 24 percent of cases, and their activity is spread across not only financial restatement cases, but also those cases not involving restatements. One possible explanation for this broader scope is auditors' increased exposure to liability for a firm's fraudulent activity. Another is that auditors become more aware of fraudulent activity as a result of their responsibility in evaluating internal controls per SOX section 404. A third one is that auditors become more sensitive to shareholders' need because they are not appointed by management any more. Our results in Section 4.1 are consistent with this latter interpretation.

We do not observe much change in the role of analysts, while there is a surge in the SEC interventions, which go from a mere 5 percent of the cases, to 10 percent. Interestingly, if we look at the equal weighted numbers, the media seem to play more of a role in the second part of the period. If we look at the value-weighted number we do not see this trend. A possible explanation is that following the major scandals, there was a period of heightened awareness of the readers about the scandals, which lead journalists to pursue even smaller cases. We expect this effect to be just temporary.

That the percentage of employee whistleblowers drops from 18 to 13 percent suggests that Sox's protection for whistleblowers has not increased employees' incentives to come forward for these significant cases of fraud.²⁸ One possible explanation is that protecting the whistleblower current job is a small reward given the extensive ostracism whistleblowers face. Another explanation could be that job protection in the pre-existing firm is of no use if the firm goes bankrupt after the revelation of fraud.

²⁸ This is not to say that the legislation has not influenced employee whistle blowing by other measures. Bowen, Call and Rajgopal (2007) report, for example, 137 cases of alleged financial frauds from employee whistle blowing arising from their inquiries to OSHA offices that are mandated to oversee SOX whistleblower provisions. This sample, unlike ours, does not limit cases to those where there has been judicial scrutiny and where there are significant financial settlements

Given the limited amount of time since the regulatory changes in our sample, we cannot tell whether these changes in the patterns of whistle blowing are permanent, or have temporarily crowded out the oversight of other actors.

6. Conclusions

The main result emerging from our analysis is that in the United States fraud detection relies on a wide range of, often improbable, actors. No single one of them accounts for more than 20 percent of the cases detected. These findings suggest that to improve corporate governance abroad it is insufficient to replicate U.S. institutions of private enforcement such as class action suits or of public enforcement such as the SEC (together they account for only 8.4 percent of the revelation of frauds by external actors). Rather, the US relies on a complex web of market actors that complement each other. Unfortunately, reproducing such a complex system abroad is much more difficult than copying a single legal institution.

The second main result is that the incentives for the existing network of whistleblowers are weak. Auditors, analysts, and employees do not seem to gain much and, in the cases of employees, seem to lose from whistle blowing. The two notable exceptions are journalists involved in large cases and employees who have access to a *qui tam* suit.

A natural implication of our findings on the significant role monetary incentives have in whistle blowing is the possibility of expanding the role for monetary incentives. As the evidence in the healthcare industry shows, such a system appears to be able to be fashioned in a way that does not lead to an excessive amount of frivolous suits. The idea of extending the *qui tam* statute to corporate frauds (i.e. providing a financial award to those who bring forward information about a corporate fraud) is very much in the Hayekian spirit of sharpening the incentives of those who are endowed with information. This proposal is consistent with a recent IRS move, which instituted a form of *qui tam* statute for whistleblowers in tax evasion cases.

Data Appendix

A.1 Comparing Our Sample with Other Fraud Samples

Many studies focus on a sample of companies identified by the GAO that restated their financial statements between 1997 and June 2002 (e.g. Palmrose and Scholz (2004)). 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 will not make it into our sample. This arises because the GAO sample includes: some non-US firms; the GAO sample includes many smaller firms that do not meet the selection criteria for our sample (the median market cap in the GAO sample (measured at date t-1) is \$ 214 million while the market cap of firms in our sample (also measured at t-1) is \$ 3525 million); and, because the underlying fraud is not sufficiently serious to trigger a lawsuit that withstands scrutiny and yields a settlement or is ongoing. The SEC recently declared that there were no intentional misstatements in 50 percent of this sample.²⁹ Second, this approach does not allow for cases of fraud where firms do not issue restatements, a category of frauds that accounts for 43 percent of our observations.

Other studies have focused on a sample of firms where the SEC has sanctioned the firm and released an administrative or litigation release and, in some cases, an Accounting, Auditing and Enforcement Release (AAER) (e.g. Dechow, Sloan and Sweeney (1996), Miller (2006), Karpoff, Lee and Martin (forthcoming)). We will capture these cases if there is a simultaneous suit under federal securities laws that meets our tests for inclusion. In contrast to our samples’ focus on larger firms, the SEC sample is focused on smaller firms (the median market cap (measured at t-1) for AAER firms is 262 million) and, given its limited budget, on a few high profile and egregious cases of fraud.³⁰

The larger size of firms in our sample likely corresponds with additional scrutiny both before the fraud was brought to light and evaluation of the fraud and how it got uncovered after the fact. This additional scrutiny aids us in identifying the likely source of the information about fraud and in identifying some of the interactions among fraud detectors, including identifying

²⁹ We thank Jonathan Karpoff for pointing this out to us.

³⁰ 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.”

actors who pushed the board to action. These factors help to account for the higher percentage of cases in our sample where indications of fraud arise from actors outside the firm. In our sample, we identify the firm as the source of information in 32 percent of cases whereas the firm is identified as the source in between 49 percent and 58 percent of cases in the GAO sample (1997-2002, and 2002-2005 respectively), and in 71 percent of cases in the AAER sample used by Miller (2006).³¹

Legal scholars have been the biggest user of the SSCAC database to construct samples of probable frauds (see citations above). A potential concern with this sample is that it is potentially missing additional cases of alleged fraud that are filed as a class action under state laws or as a derivative action. Thompson and Sale (2003) and Thompson and Thomas (2003, 2004) provide analysis and evidence that exploring such suits would not turn up many additional cases as there has been a profound shift in cases from state to federal courts, accentuated by the passage of PSLRA and the Uniform Standards Act (1998). Their comprehensive analysis of these filings in Delaware in 1999 and 2000 shows that almost all such cases that withstand scrutiny are breach of fiduciary duties in merger and acquisitions (and thus not fraud in the general use of this term in that they do not involve misrepresentations).

A.2 Identifying Frauds that Require Restatements

We distinguish between frauds that required financial restatements and frauds that do not. To identify whether the fraud involved restatements we used information from the United States General Accounting Office (GAO) report on Financial Statement Restatements that identifies 918 restatement announcements from 1997 to June 2002, which we matched to those in our sample. We also searched a firm's SEC filings after the revelation of fraud for either (a) a 10-Q/A or 10-K/A filing which indicate amended filings; or (b) an 8-K which referred to restatement information. We identified a fraud as involving misrepresentation if any of the following conditions applied: it restated its financials [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].

³¹ Correspondence with Shiva Rajgopal, January 2007.

The residual category of frauds that don't require financial misrepresentation, are primarily composed of "failure to disclose" material information, and a disclosure of misleading forward-looking information, with the case of CVS illustrating the first type and Ascend the second type. In the case of CVS, the alleged fraud was to issue positive statements concerning its business and operations and possibilities for expansion but not to disclose that a national shortage of pharmacists was negatively impacting CVS's business forcing a scale back in expansion plans. Or consider the case of Ascend Communications, where the company followed a competitor's announcement that it would ship a 56K modem, with a near immediate announcement that it too would ship a 56K modem and beat the competitor to market, even though there were strong indications, including the supplier that allegedly would produce the modem, that suggested this was not possible.

References

- Black, Bernard, 2001, "The Legal and Institutional Preconditions for Strong Securities Markets," *UCLA Law Review*, 48 (1), 781-855.
- Bowen, Robert, Andrew Call and Shiva Rajgopal, 2007, "Whistle-Blowing: Target Firm Characteristics and Economic Consequences," *University of Washington Working Paper*
- Burns, Natasha and Simi Kedia, 2006, "The Impact of Performance-Based Compensation on Misreporting," *Journal of Financial Economics* 79: 35-67.
- Jakubowski, Stephen T., Patricia Broce, Joseph Stone, and Carolyn Conner, 2002, "SAS 82's Effects on Fraud Discovery," *CPA Journal*, February 2002 Issue
- Brickey, Kathleen F., 2004, "Anderson's Fall From Grace" *Washington University Law Quarterly*, 81 (4):917-960.
- Coffee, John, 1986, "Understanding the Plaintiff's Attorney: The Implications of Economic Theory for Private Enforcement of Law through Class and Derivative Actions," *Columbia Law Review*, 669-727.
- Coffee, John, 2001, "The Acquiescent Gatekeeper: Reputational Intermediaries, Auditor Independence and the Governance of Accounting," *Columbia Law and Economics Working Paper* No 191.
- Choi, Stephen J., 2007, "Do the Merits Matter Less after the Private Securities Litigation Reform Act?" *Journal of Law, Economics and Organization*, 598.
- Choi, Stephen J., Karen K. Nelson and A.C. Pritchard, 2008, "The Screening Effect of the Securities Litigation Reform Act," *Journal of Empirical Legal Studies*, forthcoming.
- Cox, James D., Randall S. Thomas and Diku Kiku, 2003, "SEC Enforcement Heuristics: An Empirical Inquiry," *Duke Law Journal*, 53(2): 737-79.
- Dechow, Patricia, M., Richard G. Sloan, and Amy Sweeney, 1996, "Causes and Consequences of Earnings Manipulation: An Analysis of Firms Subject to Enforcement Actions by the SEC." *Contemporary Accounting Research*, 13 (1): 1-36.
- Diamond, Douglas and Verrecchia, Robert, 1987, "Constraints on Short-Selling and Asset Price Adjustment to Private Information," *Journal of Financial Economics* 18(2): 277-311.
- Efendi, Jap, Anup Srivastava, and Edward Swanson, 2007, "Why Do Corporate Managers Misstate Financial Statements? The Role of in-the-Money Options and Other Incentives," *Journal of Financial Economics*, 85 (3): 667-708.
- Dyck, Alexander and Luigi Zingales, 2003, "Media and Asset Prices," Working paper

- Dyck, Alexander, David Moss, and Luigi Zingales, 2008, "Media vs. Special Interests", *NBER Working Paper* 14360.
- Fama, Eugene, 1980. "Agency Problems and the Theory of the Firm," *Journal of Political Economy*, 88 (2): 288-307.
- Fama, Eugene, 1990, "Contract Costs and Financing Decisions," *Journal of Business*, 63 (1 Part 2): S71-S91.
- Fama, Eugene, and Michael Jensen, 1983a "Separation of Ownership and Control," *Journal of Law and Economics*, 26 (2): 301-325.
- Fama, Eugene, and Michael Jensen, 1983b "Agency Problems and Residual Claims," *Journal of Law and Economics*, 26 (2): 327-349.
- Fuerman, Ross D., 2006, "Comparing the Auditor Quality of Arthur Andersen to that of the Big 4," *Accounting and the Public Interest*, 6 (1): 135-161.
- General Accounting Office, 2002, "Financial Statement Restatements: Trends, Market Impacts, Regulatory Responses, and Remaining Challenges," 03-018.
- Griffin, Paula, Joseph Grundfest and Micael Perino, "Stock Price Response to News of Securities Fraud Litigation: Market Efficiency and the Slow Diffusion of Costly Information," *Stanford Law and Economics Olin Working Paper* No. 208.
- Grundfest, Joseph A., 1995, "Why Disimply?" *Harvard Law Review*, 108: 740-741.
- Hayek, Friedrich, 1945, "The Use of Knowledge in Society," *American Economic Review*, 34 (4): 519-530.
- Heron, Randall A., and Erik Lie, 2007, Does Backdating Explain the Stock Price Pattern around Executive Stock Option Grants?, *Journal of Financial Economics* 83: 271-295.
- Hermalin, Benjamin E. and Michael S. Weisbach, 1998, "Endogenously Chosen Boards of Directors and Their Monitoring of the CEO," *American Economic Review*, 88: 98-116.
- Hong, Harrison, Jeffrey D. Kubik and Amit Solomon, 2000, "Security Analysts' Career Concerns and the Herding of Earnings Forecasts," *Rand Journal of Economics* 31: 121-144.
- Hong, Harrison, and Jeffrey D. Kubik (2000) "Analyzing the Analysts: Career Concerns and Biased Earnings Forecasts," *Journal of Finance*, vol. 58, no. 1, February 2003, pp. 313-51
- Johnson, Marilyn F., Ron Kasznik, and Karen K. Nelson, 2000, "Shareholder Wealth Effects of the Private Securities Litigation Reform Act of 1995," *Review of Accounting Studies*, 5(3): 217-233.

Johnson, Marilyn F., Karen K. Nelson and A.C. Pritchard, 2003, "Do the Merits Matter More? Class Actions under the Private Securities Litigation Reform Act." *Journal of Law, Economics, and Organization*, 23 (3).

Karpoff, Jonathan, D. Scott Lee and Gerald S. Martin, forthcoming, "The Consequences to Managers for Cooking the Books" *Journal of Financial Economics*.

Karpoff, Jonathan, D. Scott Lee and Gerald S. Martin, forthcoming, "The Costs to Firms of Cooking the Books," *Journal of Financial and Quantitative Analysis*.

Karpoff, Jonathan, and Xiaoxia Lou, 2008, "Do Short Sellers Detect Overpriced Firms? Evidence from SEC Enforcement Actions," *University of Washington Working Paper*.

Lamont, Owen, 2003, "Go Down Fighting: Short Sellers Versus Firms," *Working Paper*.

La Porta, Rafael, Florencio Lopez-de-Silanes, and Andrei Shleifer, 2006, "What Works in Securities Laws," *Journal of Finance*, 61, 1-33.

Lie, Erik, 2005, "On the Timing of CEO Stock Option Awards," *Management Science* 51, 802-810.

Marczewski, Donald C. and Michael D. Akers, 2005, "CPAs' Perceptions of the Impact of SAS 99," *CPA Journal*, June 2005 Issue.

Michaely, Roni and Kent L. Womack, 1999, "Conflict of Interest and the Credibility of Underwriter Analyst Recommendations," *Review of Financial Studies* 12, 653-686.

Miller, Gregory S. 2006, "The Press as a Watchdog for Accounting Fraud." *Journal of Accounting Research* 44, no. 5 (December): 1001-1033.

Palmrose, Zoe-Vonna, and Susan W. Scholz, 2004, "The Circumstances and Legal Consequences of Non-GAAP Reporting: Evidence from Restatements," *Contemporary Accounting Research*. 21(1) (Spring): 139-180.

Rajan, Raghu, and Julie Wulf, 2006, "The Flattening Firm: Evidence from Panel Data on the Changing Nature of Corporate Hierarchies," *Review of Economics and Statistics*, 88 (4): 759-773.

Richardson, Scott, Irem Tuna and Min Wu, 2002, "Predicting Earnings Management: The Case of Earnings Restatements," *Working Paper*.

Taub, Stephen, 2005, "The Auditor-Investor "Expectation Gap," *CFO.com*, October 17, 2005.

Thompson, Robert and Hillary Sale, 2003, "Securities Fraud as Corporate Governance: Reflections Upon Federalism," *Vanderbilt Law Review*, 56 (3): p859-910.

Thompson, Robert and Randall Thomas, 2004, "The Public and Private Faces of Derivative Lawsuits," *Vanderbilt Law Review*, 57: 1747-1793.

Watts, Ross and Jerold Zimmerman, 1983, "Agency Problems, Auditing, and the Theory of the Firm: Some Evidence" *Journal of Law and Economics*, 26 (3): 613-633.

Winston, Clifford, 1998, "U.S. Industry Adjustment to Economic Deregulation," *Journal of Economic Perspectives*," 12(3): 89-110.

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 first identifying the fraud based on reading the legal case and an average of 800 articles from Factiva in a window from 3 months before the class action period to settlement. Detector categories include: auditor, analyst, equity holder, short seller, media, clients & suppliers, financial market regulators, non-financial market regulators, employees and lawyers. Media is credited only when the story does not indicate another actor as the source. Financial market regulators are the SEC and stock exchanges. Non-financial regulators include industry regulators (e.g. FERC, FAA, FDA) and govt agencies.	Security Class actions filings available from Stanford Securities Class Action Database, Articles in Factiva.
Settlements and Fines	The sum of the settlement amount paid to shareholders in the class action lawsuit, any fines or settlements paid to the SEC, criminal or civil courts by the firm, its insurance, or its officer/directors, and any fines or settlements paid to the courts or regulators by the firm's agents (auditors and investment banks) regarding the impropriety.	Security Class actions filings in Stanford Securities Class Action Database, SEC, Factiva articles.
Assets	The dollar value of assets in the year prior to the revelation of the fraud.	Compustat
Fraud Duration	The class period defined in the final court-certified security class action suit. 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	Value of given for filing a 10-Q/A or 10-K/A filing or an 8-K which referred to restatement information [116 cases]; announcing an intention to restate its financials but did not as a result of bankruptcy (e.g. Enron) [7 cases]; taking a one-time accounting-related charge [6 cases]; or having accounting-related investigations for ongoing cases [3 cases].	SEC filings, GAO report on Financial Statement Restatements.
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
Investment Bank Tier of Equity Analysts	We identify equity analysts by combining information in the detailed file of analyst forecasts and recommendations from I/B/E/S. We collect information on both equity analyst whistleblowers and analysts in the same firms who did not blow the whistle. We follow Hong and Kubik (2003) and classify the tier of the investment bank where the analyst is employed for the period immediately prior to blowing the whistle and for the subsequent two years. Hong and Kubik (2003) report a well established hierarchy that they capture by identifying as top tier the 10 biggest brokerage houses by year, measured by the number of analysts employed. We use their ranking, where available, and update..	Analyst information from I/B/E/S. Investment Bank information from Hong and Kubik (2003) and <i>Vault</i> Investment Bank Guide
All- Star Analyst	We identify equity analysts by combining information in the detailed file of analyst forecasts and recommendations from I/B/E/S. We collect information on both equity analyst whistleblowers and analysts in the same firms who did not blow the whistle. We identify whether an analysis is an All-American All-Star analyst using the annual survey in <i>Institutional Investor</i> magazine. We identify the ranking immediately prior to blowing the whistle (taking into account the lag between surveys being collected and the rankings being published), and in the next two subsequent years.	Analyst information from I/B/E/S. <i>Institutional Investor</i> Magazine
Media Status Change Indicator	Takes the value 1 for a promotion, 0 for no change in status, and -1 for a demotion for the set of whistle blowing journalist and peers, identified as reporters at the same news outlet with a similar status at the time. Change in status is defined both 1 and 3 years after publishing of the article. The original classification of journalists with a similar status, and subsequent changes based on an independent classification by an established journalist.	<i>News Media Yellow Book</i>
Health Care Dummy	Include drug, drug proprietaries and druggists sundries (SIC 5122), and healthcare providers (8000-8099), and healthcare related firms in Business Services.	Industries identified in <i>Winston (1998)</i> and others.
Regulated Firms	Includes healthcare (above) plus financials (SIC 6000-6999), transportation equipment (SIC 3700-3799), transportation, communications, electric, gas and sanitary services (SIC 4000-4999)	Industries identified in <i>Winston (1998)</i> and others.
Organization Depth	This variable captures the organizational depth by industry.	<i>Rajan and Wulf (2006)</i> .

Table 2: Who Detects Corporate Fraud?

Panel A identifies the actor that first brings the fraud to light and Panel B provides descriptive statistics. We identify a case as one of *internal* governance when the revealer of fraud is firm management (e.g., via a press release or resignation) or the board of directors. Column 1 is the original coding. Column 2 includes a recoding of the fraud detector to being a short-seller when short selling activity prior to revelation is above 3 standard deviations over the prior three month average. Column 3 adjusts column 2 to reflect a value weighting of cases, where the weights are the adjusted value of the sum of settlements and fines. The adjustment is the winsorized settlement value reported in column 3 of panel B. For the few cases that have not settled or where the settlement amount was not made public, we use the median settlement amount. The final column presents, for robustness, the cases for which we identify a smoking gun identifying the fraud detector we credit with the revelation.

Panel B reports descriptive statistics of the fraud cases. Assets are the assets in the year prior to the announcement of the fraud; duration is based on the reported class period in the class action suit; and a case is recorded as an accounting restatement if the company filed a restatement or announced an intention to do so before falling into bankruptcy. Further information on these variables is provided in Table 1.

Panel A - Distribution of Fraud Detectors

<i>Fraud Detector</i>	<i>Raw Distribution (equal weight)</i> (1)	<i>Data adjusted for short activity (equal weight)</i> (2)	<i>Data adjusted for short activity (value weight)</i> (3)	<i>Robustness: Smoking Guns Only (equal weight)</i> (4)
Internal Governance	74 (34.3%)	64 (29.6%)	60 (27.9%)	n/a
External Governance	142 (65.7%)	152 (70.4%)	156 (72.1%)	112
Total Cases	216 (100%)	216 (100%)	216 (100%)	112 (100%)
<i>Fraud Detectors Within External Governance</i>				
Analyst	24 (16.9%)	21 (13.8%)	24.1 (15.9%)	18 (16.1%)
Auditor	16 (11.3%)	16 (10.5%)	11.3 (7.4%)	13 (11.6%)
Client or Competitor	9 (6.3%)	7 (4.6%)	2.7 (1.8%)	4 (3.6%)
Employee	26 (18.3%)	26 (17.1%)	25.6 (16.8%)	21 (18.8%)
Equity Holder	5 (3.5%)	5 (3.3%)	5.3 (3.5%)	5 (4.5%)
Industry Regulator, Gvt Agency or Self Regulatory Organization	20 (14.1%)	20 (13.2%)	14.1 (9.3%)	17 (15.2%)
Law Firm	5 (3.5%)	5 (3.3%)	3.5 (2.3%)	2 (1.8%)
Media (incl. academic publications)	22 (15.5%)	20 (13.2%)	35.7 (23.5%)	13 (11.6%)
SEC	10 (7.0%)	10 (6.6%)	8.6 (5.7%)	8 (7.1%)
Short-seller	5 (3.5%)	22 (14.5%)	21.2 (13.9%)	11 (9.8%)
External Governance Total Cases	142 (100%)	152 (100%)	152 (100%)	112 (100%)

Panel B – Descriptive Statistics of Crimes & Fines by Whistle Blower

	<i>Settlements & Fines \$M</i>			<i>Assets \$B</i>	<i>Duration</i>	<i>Accounting</i>
	<i>Median</i>	<i>Mean</i>	<i>Mean</i> <i>(winsorized)</i>	<i>(Prior)</i> <i>Median</i>	<i>(Years)</i> <i>Median</i>	<i>Restatement</i> <i>(% of Cases</i> <i>for Detector)</i>
Internal Governance	\$30.0	\$79.6	\$75.1	\$8.06	1.13 yrs	54.7%
Analyst	37.3	72.3	93.8	4.11	0.76	43%
Auditor	16.5	121.7	57.5	1.51	1.17	88%
Client or Competitor	7.0	25.0	31.4	2.76	1.12	71%
Employee	36.3	225.6	80.3	3.52	1.40	62%
Equity Holder	28.0	78.6	86.0	2.48	1.18	40%
Industry Regul., Gvt Agency	45.0	53.5	57.6	4.64	1.19	55%
Law firm	26.0	26.0	57.9	4.26	2.36	20%
Media	145.5	323.0	145.8	11.43	1.30	60%
SEC	21.8	800.1	70.1	3.48	1.89	100%
Short-seller	25.0	226.9	78.6	3.18	1.22	45%
All External	34.0	198.3	81.7	4.26	1.20	58%

Table 3: Theoretical Perspectives on Who Should Blow the Whistle

The table summarizes theoretical perspectives on fraud detection used in tests in Table 4. Column 1 identifies the primary actors from a finance view that emphasizes incentives arising from residual claims (e.g. Fama (1990)). Column 5 identifies the ease of access to information using a variable that takes the value 1-3 with 1 indicating the greatest access. This variable is constructed from columns 2-4 that report the percentage of cases in that category where fraud detection was based on information from that source. Starting from the left, we cumulate the percentage of cases, and when a particular fraud detector cumulates to more than 50 percent, we assign the detector type to that access rank, where rank 1 is inside private information; rank 2 is regulatory discovery private information; and rank 3 is public information. Column 6 identifies additional monetary and reputation benefits by fraud detector.

	<i>Finance View Benefits</i>	<i>Privately Available Information</i>		<i>Publicly Available Information: SEC Disclosure & Other Public Sources</i>	<i>Access to Information</i>	<i>Other Benefits</i>
		<i>Inside Info.</i>	<i>Regulatory Discovery</i>			
	(1)	(2)	(3)	(4)	(5)	(6)
Analyst	Yes	5%	--	95%	3	Already in <i>fin.view</i>
Auditor	Yes	100%	--	--	1	Already in <i>fin.view</i>
Client / Competitor	No	43%	14%	43%	2	None
Employee	No	81%	8%	12%	1	Money (for Healthcare & Defense only)
Equity Holder	Yes	40%	--	60%	3	Already in <i>fin.view</i>
Industry Reg. or Agcy	No	--	80%	20%	2	Reputation
Law firm	No	40%	--	60%	3	Reputation
Media	No	20%	5%	75%	3	Reputation
SEC	No	--	50%	50%	3	Reputation
Short-seller	No	--	--	100%	3	Money
		Key: 1: Access to Inside Information 2: Access to Selected Inside Information 3: Little-to-No Access to Inside Information				

Table 4: Tests of Theoretical Perspectives on Fraud Detection

This table reports tests of alternative views of fraud detection for *external* whistleblowers using a conditional logit specification, where the dependent variable is the fraud detector. This variable can take one of 10 values defined in table 2. In columns 1 and 2, we test the sufficiency of the finance view that emphasizes incentives arising from residual claims (e.g. Fama (1990)) to explain fraud detection. Columns 3-4 test for incremental explanatory power coming from access to information and additional monetary and reputational incentives. Independent variables defined in Table 3. Robust standard errors are in parentheses. ***, **, and * indicate significant differences at the 1% 5% and 10% levels respectively.

<i>Estimation Method: Conditional Logit</i>				
<i>(Fixed Effect: Fraud Case)</i>				
<i>Dependent Variable: Choice of Fraud Detector</i>				
	(1)	(2)	(3)	(4)
	<i>Equal Weighted</i>	<i>Value Weighted</i>	<i>Equal Weighted</i>	<i>Value Weighted</i>
Finance View	-0.116 (0.181)	-0.160 (0.288)	0.236 (0.259)	0.426 (0.393)
Money Benefits			1.014*** (0.311)	1.189** (0.480)
Reputation Benefits			0.399 (0.279)	0.646* (0.392)
Cost of Accessing Information			-0.335*** (0.115)	-0.180 (0.187)
Observations	1520	1520	1520	1520
Pseudo R-Squared	0.001	0.001	0.022	0.020

Table 5: Auditors' Turnover

The table summarizes the auditors' turnover as a result of whistle blowing. Panel A computes the turnover of auditors in all the sample of large (more than \$750 million in assets) during the sample period. We exclude the turnover due to the Arthur Andersen's demise. The second row reports the turnover of auditors in large firms that experience a case of fraud. The last row reports the turnover of auditors in large firms that experience a case of fraud and where the whistle blower was the auditing firm. Panel B looks at the turnover of auditors in large firms pre-Arthur Andersen demise, while Panel C looks at which firm captures the Arthur Andersen's accounts after its demise. Panels B.3 and C.3 report the results of a conditional logit regression where the dependent variable equals to one if an auditor captured the new account after the turnover.

Panel A

<i>Turnover:</i>	<i>mean</i>	<i>observations</i>	<i>p-value for t-test: different from all large firms</i>	
All Large Firms 1996-2004	0.052	20,171		
Fraud Firms 1996-2004	0.248	161	0.000	
Auditor Whistle Blowing Firms	0.778	9	0.000	

Panel B.1

	<i>Year 2000 # of Clients</i>		<i>Of the 2000 Clients, How Many Switched in Since 1995?</i>		<i>Frauds 1996-2000</i>	<i>Whistle Blowing Auditors 96-00</i>
	<i>Count</i>	<i>Market Share</i>	<i>Count</i>	<i>Distribution</i>		
Arthur Andersen	458	0.191	48	0.163	0	0
Ernst & Young	470	0.196	71	0.241	1	0
Deloitte & Touche	360	0.150	47	0.159	3	0
Peat, Marwick, Main	369	0.154	43	0.146	1	0
PriceWaterhouseCoopers	672	0.280	63	0.214	8	0
BDO Seidman	10	0.004	0	0.000	0	0
Grant Thornton	6	0.003	4	0.014	0	0
Other	54	0.023	19	0.064	0	0
Total Firms	2399	1.0	295	1.0	13	0

Panel B.2

<i>Summary Statistics as of Year 2000</i>	<i>mean</i>	<i>min</i>	<i>median</i>	<i>Max</i>	<i>st dev</i>
Market Share	0.185	0.002	0.190	0.279	0.066
Cumulative Frauds 1996-2000	2	0	1.5	5	1.916
Cumulative Frauds / Market Share	9.958	0	8.641	25.02	9.077
Cumulative Auditor Whistle Blowing	0	0	0	0	0

Panel B.3

<i>Dependent Variable: Choice of Auditor after Switching between 1995 and 2000</i>					
<i>Estimation: Conditional Logit</i>					
<i>Var:</i>	<i>Market Share</i>	<i>Cumulative Frauds/Share</i>	<i>Big 5</i>	<i>Observations</i>	<i>Pseudo R-squared</i>
coefficient	2.072**	0.001	0.657**	1,746	0.0287
standard error	(1.223)	(0.007)	(0.328)		
marginal effects	0.251	0.000	0.145		

Panel C.1

	Year 2003 # of Clients		Of the 2003 Clients, How Many Switched in after AA?		Frauds 1996-2002	Whistle Blowing Auditors 96-02
	Count	Market Share	Count	Distribution		
Ernst & Young	594	0.248	86	0.242	32	2
Deloitte & Touche	567	0.237	131	0.368	26	1
Peat, Marwick, Main	453	0.189	70	0.197	26	1
PriceWaterhouseCoopers	712	0.298	65	0.183	39	2
BDO Seidman	21	0.009	1	0.003	0	0
Grant Thornton	10	0.004	2	0.006	0	0
Other	34	0.014	1	0.003	0	0
Total Firms	2,391	1.0	356	1.0	123	6

Panel C.2

Summary Statistics as of Year 2003	mean	min	median	max	st dev
Market Share	0.239	0.004	0.237	0.298	0.042
Cumulative Frauds 1996-2002	17.57	0	26	39	15.75
Cumulative Frauds / Market Share	72.48	0	109.8	137.4	63.26
Cumulative Auditor Whistle Blowing	0.857	0	1	2	0.833
Cumulative Auditor Whistle Blowing / Market Share	3.471	0	4.223	8.061	3.200

Panel C.3

Dependent Variable: Choice of Auditor after Arthur Andersen Forced Switch
Estimation: Conditional Logit

Var:	Market Share	Cumulative Frauds/Share	Cumulative Auditor Whistleblowing/Share	Big 4	Observations	Pseudo R-squared
coefficient	-3.291*	-0.030***	0.052	8.450***	2,485	0.279
standard error	(1.991)	(0.007)	(0.056)	(1.061)		
marginal effects	-0.264	-0.002	0.004	0.921		

Table 6: Do Analysts Who Blow the Whistle Advance their Careers?

This table provides statistics and tests for differences in the promotion and demotion probabilities between sell-side equity analysts who blow the whistle and analysts in the firms where a whistle was blown that do not blow the whistle. All Star rankings are derived from Institutional Investor rankings. Ranking of I-banks follows classification in Hong and Kubik, applied to our sample period. See Table 1 for further information. Analyst information is from I/B/E/S. In panel C columns 1-2, the dependent variable takes the value 1 if the analyst became an all star following the whistle being blown, and was not before hand and zero otherwise. In panel C columns 3-4 the dependent variable takes the value 1 if the analyst loses an all star ranking following the whistle being blown. Regressions include company fixed effects. Robust standard errors are presented in parentheses. ***, **, and * indicate significant differences at the 1% 5% and 10% levels respectively.

Panel A – % of Highly Ranked Analyst among all I/B/E/S Analysis Covering Fraud-Committing Firms

	Whistleblower	Non-Whistleblower	p-value (diff)
Pre-Period All Star Analyst	50%	9.8%	0.000***
Pre-Period Employed at High Tier I-Bank	60%	38%	0.053**
Observations	20	397	

Panel B – Career Advancement of I/B/E/S Analysts Covering Fraud Firms

		Whistleblower	Non-Whistleblower	p-value (diff)
All Star Analyst				
Promoted to All Star in:	1 year	10.0%	4.5%	0.419
	2 years	12.5%	5.4%	0.398
Demoted from All Star in:	1 year	20.0%	18.4%	0.912
	2 years	22.2%	50.0%	0.138
I-Bank Ranking				
Promoted to High Tier I-Bank:	1 year	0	1.0%	0.783
	2 years	0	3.8%	0.604
Demoted from High Tier I-Bank:	1 year	0	4.3%	0.466
	2 years	0	8.5%	0.339

Panel C – Logit Test of Advancement Difference for All Star Analysts

Dependent Variable:	Promoted		Demoted	
	1 Year	2 Years	1 Year	2 Years
Whistleblower	0.921 (1.540)	0.871 (1.522)	0.618 (1.653)	-2.562** (1.286)
Experience	0.528 (0.395)	0.920** (0.411)	-0.630 (0.681)	0.030 (0.525)
Pseudo R-Squared	195	155	20	34
Observations	0.104	0.173	0.149	0.155

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, and the page on which the article appears.

<i>Company</i>	<i>News Outlet</i>	<i>Reporter</i>	<i>Article Location</i>
AOL TimeWarner	<i>New York Times</i>	Gretchen Morgenson	Page 1, Business
Computer Associates	<i>New York Times</i>	Alex Berenson	Page 1, Business
Halliburton	<i>New York Times</i>	Alex Berenson and Lowell Bergaman	Page 1, Business
Sprint	<i>New York Times</i>	David Cay Johnston	Page 25, Section 1
Ascend Communications	<i>San Francisco Chronicle</i>	Herb Greenberg	Page 1, Business
Broadcom	<i>Wall Street Journal</i>	Molly Williams	Page C11, Heard on the Street
Cardinal Health	<i>Wall Street Journal</i>	Jonathan Weil	Page C1, Heard on the Street
Enron	<i>Wall Street Journal</i>	Jonathan Weil	Page T1 - regional front page of WSJ
E.W. Blanch	<i>Wall Street Journal</i>	Deborah Lohse	Page A10
Qwest	<i>Wall Street Journal</i>	Deborah Solomon, Steve Liesman, Denis Berman	Pages A1, B6
Raytheon	<i>Wall Street Journal</i>	N/A	
AT&T	<i>Business Week</i>	Robert Barker	Investor column (p. 264)
Bausch & Lomb	<i>Business Week</i>	Rochelle Sharpe	Page 87
Silicon Graphics	<i>Business Week</i>	Robert Hof, Ira Sager, Linda Himmelstein	Cover Story
Apria Healthcare	<i>Fortune</i>	Erick Schonfeld	Page 114
Sunbeam	<i>Barrons</i>	Jonathan Laing	Page 17
Cambrex	<i>Chemical Reporter</i>	N/A	N/A
Long Island Lighting	<i>Daily Electricity Reporter</i>	N/A	N/A
Bristol Myers Squibb	<i>Cancer Letter</i>	N/A	N/A
Cumulus Media	<i>Inside Radio</i>	N/A	N/A

Table 8: Do Journalists Who Blow the Whistle Advance their Careers?

This table provides statistics and tests for differences in the promotion and demotion probabilities between reporters who blow the whistle identified in Table 7 and reporters with a similar status at the same time in the same media outlet who did not blow the whistle. See Table 1 for further details about peer construction. Panel A reports the movement distribution, where movement is categorized as being movement to a lower job, staying in the same job or equivalent job, or moving to a higher job. Panel B tests whether the mean movement is different for the whistleblower and non-whistleblower samples. An F-test is used to allow for weighting the peers such that there is one peer and one whistleblower for each case. **, and * indicate significant differences at the 5% and 10% levels respectively.

Panel A: Distribution of Career Promotions & Demotions

	<u>1 year post-fraud</u>		<u>3 years post-fraud</u>	
	Whistleblower	Non-Whistleblower	Whistleblower	Non-Whistleblower
Lower Job	0 (0%)	18 (12%)	1 (6%)	39 (26%)
Equivalent Job	14 (82%)	120 (78%)	12 (71%)	80 (53%)
Higher Job	3 (18%)	16 (10%)	4 (24%)	33 (22%)

Panel B: Test for Difference in Mean Movement

(Mean Movement is coded +1=promoted, 0=no change, -1=demoted)

	<u>1 year post-fraud</u>		<u>3 years post-fraud</u>	
	Whistleblower	Non-Whistleblower	Whistleblower	Non-Whistleblower
Mean Movement	0.153	-0.086	0.289	-0.083
	Ho: Whistle - NonWhistle = 0		Ho: Whistle - NonWhistle = 0	
	F(1, 167) = 2.75*		F(1, 167) = 3.99**	
	Prob > F = 0.0990		Prob > F = 0.0475	

Table 9: 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 name and position (column 2); whether the whistleblower was terminated, quit, or was given a job with significantly reduced responsibility (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 whistle blowing (column 7). The table first reports results for whistleblowers where the name of the whistleblower was revealed and below this results for whistleblowers that remain unnamed.

Company (1)	Whistleblower, Position (2)	Costs		Benefits		
		Terminated, Quit, or Reduced Responsibility (3)	Other Costs (4)	Filed Lawsuit with Potential for Damages (5)	Positive Outcome of Lawsuit (6)	Other Possible Benefits (7)
<i>Named Whistleblowers</i>						
Apria Healthcare	Mark Parker, branch manager	Yes		Yes - qui tam, wrongful dismissal	No - government doesn't join	Vengeance
Citizens Utilities	Robert Arnold, project manager	Yes		Not clear. State filed lawsuit, gets lower rates.		
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	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	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
ICG	Carl Vogel, CEO	Yes	Left within month after forcing firm to reveal concerns about fraud and accounting.	No		Maintained reputation – within year hired CEO elsewhere.
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	

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
Olsten	Donald McLendon, executive	Yes	Lost job, couldn't find other job, alienated from employees.	Yes - qui tam	Yes - \$35 million, significant time delay	
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	Ronald Sorisho, division CFO	Yes		Yes - wrongful dismissal suit	No information	Avoid potential legal liability
Xerox	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
<i>Unnamed Whistleblowers</i>						
Allegheny Energy	Unnamed executives	Unknown				
America West	Unionized maintenance workers	Unknown				Improve employment conditions
Cendant	Accounting staff integrating newly acquired firm	Unknown				Avoid potential legal liability
Enterasys Networks	Unnamed finance executive	Unknown				
Footstar	Corporate Accounting group	Unknown				Avoid potential legal liability
Nicor	Anonymous letter	Unknown				
PhyCor	Doctors who are employees	Unknown				Improve employment conditions
Symbol Technologies	Unknown letter to SEC	Unknown				
Tenet Healthcare	Unnamed employee	Unknown				
Union Pacific	Union action	Unknown				Improve employment conditions

Table 10: Do Monetary Incentives Impact Employee Whistle Blowing?

This table reports differences in fraud detection between healthcare industries and non-healthcare industries. In healthcare government purchasing creates the potential for employees to use the *qui tam* statute and derive a monetary benefit from whistle blowing. Panel A reports differences in the distribution of fraud detectors based on our sample of all external whistleblowers. Panel B reports the dismissal rates of suits over our sample period across healthcare and non-healthcare industries based on data from Stanford Securities Class Action Clearinghouse. Panel C tests whether employee whistle blowing is more likely in industries where monetary incentives exist as a result of *qui tam* suits, where the dependent variable takes the value 1 if the fraud detector is an employee and 0 otherwise. Table 1 provides definitions for the industries included in healthcare and regulated dummies. The measure of organizational depth is the Rajan-Wulf measure (2006). ***, **, and * indicate significant differences at the 1% 5% and 10% levels respectively.

Panel A – Distribution of Fraud Detectors by Healthcare or Other Industries

	<i>Non-Healthcare</i>		<i>Healthcare</i>	
	<i>Count</i>	<i>Freq %</i>	<i>Count</i>	<i>Freq %</i>
Analyst	20	14.8%	1	5.9%
Auditor	14	10.4%	2	11.8%
Client or Competitor	7	5.2%	--	--
Employee	19	14.1%	7	41.2%
Equity Holder	4	3.0%	1	5.9%
Industry Regulator	17	12.6%	3	17.7%
Law firm	5	3.7%	--	--
Newspaper	17	12.6%	3	17.7%
SEC	10	7.4%	--	--
Short-seller	22	16.3%	--	--
Total	135		17	
Proportions Test Null: Proportion (employee, non-healthcare) - Proportion (employee, healthcare) = 0				
		difference	-27.1%	
		z- statistic	-2.79	
		P-value	0.005	

Panel B – Frivolous Suits By Healthcare or Other Industries

	<i>Original Sample</i>	<i>Fraud Cases</i>	<i>Dismissed as Frivolous</i>	<i>Percentage Frivolous</i>
Healthcare	30	17	13	36.7%
Non-Healthcare	471	199	272	57.8%
Total Sample	501	216	285	56.9%

Panel C – Logit Estimates whether Employee Whistle Blowing more Common in Healthcare

		<i>Logit Estimates:</i>			
		<i>Dependent Variable: Probability of Fraud Detector Being Employee</i>			
		(1)	(2)	(3)	(4)
Healthcare	<i>coefficient</i>	1.452***	1.577***	1.646***	1.950***
	<i>robust standard error</i>	(0.55)	(0.60)	(0.57)	(0.66)
	<i>marginal effects</i>	0.271	0.299	0.307	0.374
Regulated	<i>coefficient</i>		-0.269		-0.591
	<i>robust standard error</i>		(0.482)		(0.53)
	<i>marginal effects</i>		<i>n/sig</i>		<i>n/sig</i>
Industry Organizational Depth	<i>coefficient</i>			-1.210**	-1.467***
	<i>robust standard error</i>			(0.52)	(0.56)
	<i>marginal effects</i>			-0.157	-0.187
Constant	<i>coefficient</i>	-1.809***	-1.680***	-0.672	-0.147
	<i>robust standard error</i>	(0.25)	(0.338)	(0.54)	(0.69)
Observations		152	152	152	152
Pseudo R-squared		0.046	0.048	0.071	0.080

Table 11: Do Regulatory Changes around the Passage of SOX Affect Whistle Blowing?

This table reports differences in the pattern of whistleblowers before and after the passage of Sarbanes Oxley (SOX) in July of 2002. Column 2 and 4 report results where observations are weighted by value using the sum total of all settlements and fines associated with the class action. ***, **, and * indicate significant difference in distribution pre- and post-Sox for each category compared to all other categories using a Chi-Square distribution test.

	<i>Ended Pre-Sox</i>		<i>Ended Post-Sox</i>	
	<i>(equal weight)</i>	<i>(value weight)</i>	<i>(equal weight)</i>	<i>(value weight)</i>
Analyst	16 (14.0%)	21.3 (17.4%)	5 (13.2%)	2.8 (9.6%)
Auditor	7 (6.1%)	5.9 (4.8%)	9** (23.7%)	5.3*** (18.1%)
Client or Competitor	7 (6.1%)	2.7 (2.2%)	--	--
Employee	21 (18.4%)	18.7 (15.2%)	5 (13.2%)	6.9 (23.5%)
Equity Holder	4 (3.5%)	4.5 (3.7%)	1* (2.6%)	0.7 (2.4%)
Industry Regulator, Gvt Agency	13 (11.4%)	10.4 (8.5%)	7 (18.4%)	3.7 (12.6%)
Law firm	5 (4.4%)	3.5 (2.9%)	--	--
Media	17 (14.9%)	31.2 (25.4%)	3 (7.9%)	4.5 (15.4%)
SEC	6 (5.3%)	6.8 (5.5%)	4 (10.5%)	1.8 (6.1%)
Short-seller	18 (15.8%)	17.5 (14.3%)	4 (10.5%)	3.7 (12.6%)
Total External Governance	114 (100%)	122.7 (100%)	38 (100%)	29.3 (100%)