WHO BLOWS THE WHISTLE ON CORPORATE FRAUD?

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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 in general seem to be weak, except for journalists in large cases.

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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 dominant views. While, the legal view claims fraud detection belongs to auditors and securities regulators, the private litigation view (Coffee, 1986) attributes it to law firms. Finally, the finance view (Fama (1990)) 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 nor for the private litigation view: only 3% of the cases . 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.

[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.

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, 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 mainly involved in the biggest cases.

What accounts for the differences between the traditional views and our findings? In the traditional views two dimensions are missing. First, 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 that do not arise from a residual claim or a legal obligation. 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 is 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 15 percentage points. This effect, however, 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.

Reputational incentives also appear important, especially if we weight the cases by the magnitude of their settlement. This is reasonable, since a journalist or an analyst will not become famous by uncovering a minor accounting irregularity in a small unknown company.

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, while there is no significance evidence that bringing the fraud to light pays him off in terms of a greater number of accounts.

Career incentives work a bit better for analysts. While 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 that they are less likely to be demoted. The picture is even more encouraging for journalists. 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. For many employee whistleblowers the more important benefit to 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 brining 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 relatively 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 WolrdCom 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.

The remainder of the paper proceeds as follows. Part I of the paper describes the data and presents the distribution of fraud detectors. In Part II we lay out competing theories of fraud detection and test them. Part III concludes.

I. Data and Distribution of Whistleblowers

I.1 *Data: 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 of reacting 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, 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.[2] 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 2,171 suits provided by the SSCAC 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.[3] 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.[4] Fifth, we exclude from our analysis security frauds that SSCAC distinguishes to involve wrong-doing of agents of the firm or investor, rather that 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 230 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 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.

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[2] 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.

[3] 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.

[4] 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.

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 guilt 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.

I.2 *Data: 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 (defined as 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 and in the *Journal of Finance* web appendix.) 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.[5] We show robustness of our results to using only the sample of smoking gun cases. [6] Finally, to verify that our identification of the whistle blower is plausible, we conduct an event study to see whether it corresponds to a major movement in the stock price.

For each company, we consider the time interval from the beginning of the class action period (the date at which the fraud allegedly began) until one year after the end of the class action period. For each firm we regress stock returns on the S&P500 returns and an indicator variable marking the date of the news article that we associate with a whistleblower bringing a fraud to light. We then repeat the regression thirty times, changing the event date in each of the regression such that we have run the single day event study for all dates from the news article date minus fifteen days to the news article date plus fifteen days. The average of the estimated coefficients of these dummy variables is plotted in Figure 1A. Since it is possible that a few large stock price declines could be driving our results, we redo the event study using median regression rather than OLS (Figure 1B). While there are few negative abnormal returns in dates before the "whistle blowing" event, on average there is a 20% negative return in the two days around the time the whistle was blown, providing support for our classification.

Yet, our coding might still be problematic when the whistle-blowers are shortsellers. Short sellers have a strong incentive to identify bad news and disseminate it (Diamond and Verrecchia (1987)), but no incentive to reveal themselves as the source. A fraud-revealing short

[5] 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.

[6] 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.

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. If we find this to be the case we reclassify the whistleblower as a short seller. We choose the three standard deviation rule because the volatility in the series is high for firms after accusations. 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 frauds are equally important. Some, like Enron, destroy companies and billions of dollars of value, while others are less severe. To capture these differences we weight each fraud, where the weight captures the severity of frauds. We compute these weights by summing any class action lawsuit settlement, any fines or settlement paid by the firm, its insurance, or its officer and directors, and any fines or settlements paid to the courts or regulators by the firm's agents (auditors and investment banks).[7]

I.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 under-estimate of how many frauds are prevented and corrected by internal corporate governance.[8] Since we cannot draw any specific conclusion

[7] 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.

[8] 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

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.

I.4 Distribution of Whistleblowers

Table 2 presents the distribution of whistleblowers. Column 1 reports the raw data while column 2 reports the distribution after adjusting for hidden short seller activity. Since the latter distribution is more credible, we focus on this. Before proceeding to our investigation of the distribution of external whistleblowers, we note that thirty percent of detections are due to internal mechanisms. The vast majority of these cases are associated with either a managerial turnover or an economic or financial crisis that requires some major restructuring. These cases, thus, do not appear to be precipitated by an imminent whistle blower.[9]

The distribution reveals a clear picture of fraud detection: no single detector type dominates. The United States apparently relies upon a village of whistle blowers. Six players account for at least 10 percent of detections, while none is responsible for more than 17 percent. Together, these six players account for 82 percent of all cases.

What is more surprising are some of the key players: employees (the most important external governance device with 17 percent of the cases), media (13 percent), industry regulators (13 percent). These players do not appear in the traditional discussions of corporate governance, but they should. By contrast, auditors account for only 10.5 percent of detections and short sellers, who should have the strongest incentive to see fraud come to light, for 14.5 percent, even under the more generous attribution mechanism.

A third fact emerging from Table 2 is the relative unimportance of many mechanisms emphasized in the literature. Completely missing are investment banks, commercial banks and

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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.

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stock exchanges. The absence of banks or investment banks among fraud detection is consistent with Coffee's (2001) hypothesis that these actors had "neither the obligation nor the right to make disclosure when any reasonable doubt exists concerning the client's obligation of disclosure", Coffee (2003). This result does not preclude the possibility that these actors played a more indirect role; e.g., not accepting jobs from companies whenever a concern of fraud emerged. The SEC, plaintiff lawyers, and equity holders do a little better than the banks, but together only account for 13 percent of all cases.

In column 3 of Panel A we test whether these results are an artifact of treating all frauds equally. The median fraud punishment 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 and then to use the winsorized punishments as the fraud size weights.

As we show in the third column of panel A, value weighting 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 account for almost one quarter of the detections. 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 return to this point in section II.3.3.

Differences in our ability to identify the fraud detector also do not change the distribution. In column 4 we restrict our attention to those cases we have the most confidence in, having classified the case as having a smoking gun (112 of the 152 cases of external whistleblowing). The distribution is almost identical to that in column 2, relieving the concern that our results are driven by subjective calls.

II. Making Sense of the Distribution: Theory and Results

While these descriptive statistics are interesting, they cannot be evaluated outside of a theoretical framework, which we provide below.

II.1 Theory: Who Should Blow the Whistle?

Which external control mechanisms should intervene when the board, management and internal control systems fail to identify and rectify governance shortfalls? The legal and economic literatures offer three main views.

(i) Legal view: Corporate fraud should be revealed by those mandated to do so; namely, auditors and securities regulators.

The legal view of the firm emphasizes the roles of external auditors and the Securities and Exchange Commission (SEC). The Securities Act of 1933 requires all firms subject to the Act to have an annual audit of financial statements. The Securities Exchange Act of 1934 underscores the roles of the audit committee and independent auditors in their financial monitoring role. The second pillar of the legal view is the SEC. According to its web page, the SEC's primary goals are "promoting the disclosure of important market-related information, maintaining fair dealing, and protecting against fraud".

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

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

(iii) Financial risk view: Fraud should be revealed by parties with the most payoff at risk; namely investors and their delegates.

According to Fama (1990), building on the previous work of Fama and Jensen (1983a, 1983b), it is efficient to insulate most firm stakeholders from risk by providing them with a fixed payoff. As a result, the incentives to monitor and the role for monitoring are left to equity holders, debt holders, and their delegates (auditors, analysts, rating agencies and bankers).[10] In this view, no role for monitoring is expected from stakeholders with fixed-payoff contracts such as employees, suppliers and customers. If employees have significant stock option stakes

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

(Bergman and Jenter, 2007), however, their incentives may be aligned with equity holders and thus they might have incentives to monitor.

While these three theories dominate the current corporate governance discussion, we think they lack some additional factors. First, *monetary incentives to reveal the fraud that do not arise from stock ownership*. The most obvious actor fitting this depiction are short sellers, whose positions benefit from the emergence of negative news. A more subtle but equally important case are employees in industries dealing with 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, where a large portion of revenues are derived from governmental billings.[11]

A second important factor is *career concerns*. Several potential fraud detectors may derive reputational benefit from blowing the whistle, mostly in the form of better career opportunities. Journalists, analysts, auditors, regulators, and law firms are in this category. Only for law firms, however, the career benefit of blowing the whistle is unequivocal. For all the others besides some career benefits, there might be some costs too. For example, a journalist can be denied access to information if he develops a reputation to expose corporate scandals.

The third missing factor is the *cost of accessing information*, for clearly there are differences in the cost different actors bear to access information about frauds. As Hayek (1945) says, information is diffuse. As a result, 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 mis-behavior 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).

[11] 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.

II.2 Results of Testing Competing Theories of Whistle Blowing

Which of these views best explains fraud detection? A concern in testing the theories is the question of how we can credit one theory or another with the motivation of whistle blowing. Our identification of the effectiveness of the competing motivations comes from our ability to bundle predicted whistleblowers together and then see which bundles have explanatory power in explaining the distribution.

In Table 3, the dependent variable is a categorical variable identifying the fraud detector for each of the 152 cases. Each case has ten observations, one for each potential type of whistle blower, and the dependent variable identifies the actor responsible for the case in question. We use a conditional logit estimation to control for the unobserved difficulty in discovering and revealing each case via a fraud-case fixed effect. The independent variables are indicators bundling potential whistle blowers together as predicted by theory.

The *Legal View* variable equals unity if the potential whistle blower left-hand side variable is either auditor or the SEC. *Private litigation* equals unity for law firms. *Financial risk* equals unity for analysts, auditors and equity holders. *Monetary rewards* equals unity for short sellers or employees in the health care industry. *Career concerns* equals unity for analysts, auditors, industry regulators, law firms, media, and the SEC. Finally, to create a "*cost of access*" variable we went back to all the cases and identified from where the whistle blower obtained the information – either from private information inside the firm, from regulatory privilege information, or from public information. For only two categories, auditors and employees, did the majority of information come from private internal access. For this reason we set the cost of access of these two categories at zero, and all the others at one.

Table 3 presents the conditional logit estimates for the equal-weighted (Panel A) and value-weighted (Panel B) distributions. The results in column 1 provide little support for the legal and private litigation views, as the associated dummies are not positive as predicted but rather negative (and significant). This is not very surprising since in Table 2 we saw that auditors catch a mere 10.5 percent of the cases, while the litigation lawyers catch 3 percent.

One explanation for the relative paucity of 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).

Turning to the weak performance of plaintiffs' lawyers, the fact that they only reveal 3 percent of the cases does not mean that private litigation is useless in preventing fraud. First of all, it could play an important role in punishing who has committed fraud. Second, it could help publicize and make credible the claims made by other whistle blowers. At the very minimum, however, our finding suggests that private litigation alone is not sufficient to stop fraud. It can only work when a web of other mechanisms help bring fraud to light.

Similarly, in column 1 we find no significant effects for the financial risk view variable for either the equally-weighted or the value-weighted distributions. This result is robust to excluding the legal and private litigation variables, as we do in column 2 of Panels A and B. To account for the possibility that employees might be motivated in blowing the whistle by their stock ownership, we include in the finance view also the employees in companies where the average stock option holdings per employee is above \$6,699 (75^{th} percentile). The results do not change.

By contrast, we find strong support for the importance of the other three factors. As expected, detectors with monetary or career incentives are more likely to blow the whistle, as are detectors with better access to information. To conservatively assess the economic magnitude of these effects in column 2 we drop the legal and private litigation dummies, which had significant coefficients in the wrong direction, and focus on the marginal effects, reported in column 3. A potential detector with a monetary incentive is 23 percentage points more likely to blow the whistle. Similarly, career incentives increase the probability of blowing the whistle by 11.5 percentage points. Potential whistle blowers who do not have direct access to information are 15 percentage points less likely to blow the whistle. These effects are robust to value-weighting the observations, except the effect of access cost (Panel B).

Not all analysts, however, have the same incentives and access to information. An all-star analyst could have better access to information than other analysts while a new analyst has more to gain (and less to lose) than an all-star analyst.[12] To explore this hypothesis in column 4 we

[12] We thank an anonymous referee for this suggestion.

insert a variable equal to the percentage of analysts following a firm who belong to the *Institutional Investor* All American Analyst ranking (All Star). The variable has a positive effect, suggesting that an analyst is more likely to blow the whistle when the percentage of All Star analysts is higher, but this effect is not statistically significant. The same can be said for the average tenure of the analysts (column 5). If we insert both variables in the regression at the same time (column 6) the results do not change.

This multinomial analysis confirms the descriptive results. The traditional views of fraud detection seem unable to explain the results. To understand who blows the whistle we need to look at the incentives, either monetary (short sellers and whistleblowers' bounties) or reputational (media), and at the cost of gathering the information. These costs seem to represent an important barrier to uncover ordinary fraud, but not very large ones. [13]

II.3 Results of Tests for Incentive Payoffs within Whistleblower Types

Our distributional 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 build on these 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.

Of the six main fraud detectors we were able to trace the career effects for auditors, analysts, journalists, and employees. We could not do the same, however, for short sellers, since we do not know their identity, and for industry regulators, for whom it proved impossible to trace the career.

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 overestimate the average benefit and the costs we observe 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.

[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.

II.3.1 Auditors

Almost all of the theories suggest a significant role for auditors: not only are they agents of the board with an oversight mandate, but also have direct access to internal and external information. An auditor has an incentive to report a fraud if he is more likely to retain an account and to gain new account after blowing the whistle.

While these incentives are very powerful in theory, might not be as powerful in practice. Until Sarbanes Oxley auditors were appointed by management and thus were more likely to care about being friendly to management than being loyal to shareholders. For example, the Arthur Andersen partner suspended by the SEC for improper professional conduct in the Waste Management case was subsequently promoted by Arthur Andersen (Brickey, 2004). Academic evidence also supports the weak (if not perverse) incentives for auditors to reveal fraud. Chen and Zhou (2007) 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.

To test the role played by incentives in auditor's whistleblowing Table 4 reports evidence on auditor turnovers and new account acquisitions around whistle blowing. We identify auditor turnover from annual report data compiled by Compustat. We also manually code auditor turnover for our fraud cases by doing Factiva searches for auditor turnovers three months subsequent to the revelation.

As Panel A of table 4 reports, auditors that blow the whistle are more likely to lose accounts: 50 percent of whistle blowing auditors lose the firm account in the year of the fraud revelation (or three months subsequent to the revelation, if the fraud occurs in the last quarter). This is very statistically different (at the 1 percent level) from auditors in the overall sample of 1996-2004 Compustat firms with assets greater than $750 million, who -- excluding Arthur Andersen forced turnovers -- experience on average a 5 percent turnover. This is also very statistically different from the 14 to 15 percent turnover of auditors presiding over a fraud-committing firm but not uncovering or revealing the fraud. Therefore, an auditor of fraud-committing firm is more likely to be replaced after the fraud comes to light, but this likelihood is much higher if the auditor himself blew the whistle.

Unlike in the labor literature, where we cannot separate firings from voluntary resignations, for auditors we can because the SEC requires all filing firms to disclose the cause of the turnover within 5 business days in an 8 K.[14] The firm initiates the replacement in the vast majority of our cases: 91 percent of the cases when an auditor is the whistleblower, 83 percent of the cases when another outside whistleblower, and 91 percent of the cases when the firm is the whistleblower.

This result does not necessarily prove that auditors lose out by whistle blowing since they could gain on the extensive margin by attracting new clients thanks to their enhanced reputation. To test this hypothesis we examine in Table 4C whether a company's historical association with firms with frauds affects their ability to attract new accounts. Because the demise of Arthur Andersen may have structurally changed the reputational incentives of auditors, we break the sample into two periods (1999-2000[15] and 2001-2003).

We estimate a conditional logit choice model, where the dependent variable is the choice of a new auditing firm among a set of eight[16] and the independent variables are the proportion of prior accounts with frauds (the cumulative number of frauds that took place in auditor client accounts for the three years prior to the turnover divided by the firms market share), the proportion of prior accounts that required restatements (not all frauds resulted in financial restatements) , the proportion of prior accounts in which the auditor itself did the whistle blowing, as well as a dummy if an auditor is a Big Five/Big Four firm. Unfortunately, in the pre-Arthur Andersen period we have too few observations of whistleblowing auditors for this to be a meaningful variable.

Both before (columns 1 and 2) and after (columns 3 and 4) the demise of Arthur Andersen we find that auditors overseeing firms where a fraud comes to light suffer in terms of reputation. Specifically, we find that a one standard deviation increase in the normalized number of large firm frauds (equivalent to 3.6 more frauds over three years) results in a 4.8% less likelihood of attracting a new turnover client (0.048=20.3*0.0024). Firms where the frauds

[14] We thank an anonymous referee for suggesting this test.
[15] By focusing on these years, we take advantage of having a rolling three year prior window to measure fraud detection reputation for our data starting in 1996. Of the roughly 2,400 large companies in each of 1999 and 2000, we observe a total of 290 auditor turnovers.
[16] Arthur Andersen; Deloitte & Touche; Ernst & Young; Grant Thornton; McGladrey & Pullen; Peat, Marwick, Main; PriceWaterhouseCoopers; and other

require restatements fare even worse, with one standard deviation more accounting frauds producing an additional 3.5 percentage point decline in likelihood of attracting a new client.[17]

Columns (3) and (4) repeat the analysis for the 368 accounts that have become available as a result of the demise of Arthur Andersen, finding that a one standard deviation higher count of prior frauds have an 8.5% less likelihood of attracting an Arthur Andersen client. In this sample period, we can add the proportion of companies in which an auditor blew the whistle. Consistent with positive reputation effects, whistle blowing has a positive effect on the probability of gaining new account, but this effect is not statistically significant.

To summarize, we find very weak evidence of auditor's incentives to blow the whistle. Auditing a fraudulent company is bad for reputation, but conditional on doing so, bringing this information to light cost has no benefit for an auditor: it is likely to cost him the account and it does not make him gain new ones.

II.3.2 Financial Analysts

The finance and career concern views suggest a significant role for analysts in fraud detection. As agents of investors holding residual claims (for both equity and debt), they specialize in interpreting company information into insightful analysis. While analysts do not receive direct monetary compensation for revealing fraud, they can benefit indirectly: through enhanced reputation and career prospects (e.g. Fama (1980), Hong and Kubik (2000)).[18]

At the same time, analysts' incentives to reveal fraud may be reduced by the potential conflict of interest between the analysis they do and the investment banking services their companies offer (e.g. Michaely and Womack (1999)). Their incentives to reveal fraud may also be significantly reduced or eliminated by their tendency to herd.[19] Finally, before 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.

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[17] We also investigated whether our finding of a negative reputation effect from frauds could be driven by a change in the composition of clients by interacting the cumulative number of frauds variable with proxies for the quality of clients. The interactions are not significant and we continue to find negative and significant coefficient on frauds suggesting our results are not driven by a change in the type of clients.

[18] 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.

[19] 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.

To test the analysts' career benefits of whistleblowing we focus on two observable indicators of their career prospects used by Hong and Kubik (2000). The first measure is the *Institutional Investor* All American Analyst ranking. Every year the magazine *Institutional Investor* ranks analysts whom buy-side money managers see as best in their industry. The top ranked in each category (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 careers, we would expect that analysts who blew the whistle should be more likely to become "All Star" analysts and more likely to move to a higher-tier investment bank (gauged by Hong and Kubik's hierarchy variable, updated to cover our extended sample period).

To properly compare the whistle blowing analysts we benchmark with all the other analysts from I/B/E/S covering the same firm at the time the fraud was revealed. We then trace where these analysts worked and the All Star status both before and two years after a fraud was revealed. We exclude from the analysis the analysts who leave the industry because this movement could indicate either a promotion (e.g., to join a hedge fund) or a demotion from the profession (e.g. spending 'more time with their families', Hong and Kubik, 2003).

Table 5 presents our results. Panel A shows that whistleblowers are significantly more likely to be an All Star's (50 percent versus 9.8 percent) and work in high-tier investment banks (60 percent versus 38 percent) at the time they blow the whistle. The differences are strikingly large, suggesting perhaps that whistle blow is only credible when a person has first achieved credibility.

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 neither of these differences is statistically significant. The lack of impact could be that univariate tests ignore other variables that affect promotion and demotion.

For this reason, in Panel C we move to a multivariate setting, where we can estimate a logit with company fixed effects and control for analysts' experience in the regression. We can perform this analysis only for the All Star measure, since no whistleblowers move in investment bank ranking, which by itself is an indication of lack of positive career effects. 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. (This is the economic effect of the logit coefficient -2.562.) 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.

II.3.3 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 6A shows, 10 of the 11 cases reported by daily news outlets 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. As for analysts, whistle blowing by journalists takes place primarily at the most prestigious media outlets. As for analysts, this result can be due to the fact that only the most reputable publications have the credibility to blow the whistle. An alternative hypothesis 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.[20] Finally, it could be that secret tipping of journalists by company insiders only takes place at the most prestigious media outlets.

[20] 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.

A preliminary indication that whistle-blowing might contribute positively to journalists' reputation is the fact that in the vast majority of cases (75 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 7 we go further and test whether whistle-blowing enhances a journalist's career. We first identify 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* all the names of journalists in the same position (for example business reporter) who write for the same newspaper at the same time. This matching procedure creates a sample 154 comparisons for the 17 whistle blowers. For all these journalists we track their employer, the desk they work at, and their job title one year and three years after the quarter the journalist wrote the article. We then provided all of this information to a third party with expertise in journalism who classified the career changes using a three point scale to identify promotions (+1), no change or change to an equivalent job (0), or demotion (-1).[21]

Panel A reports the distribution of career advancement for journalists who blew the whistle and for the comparison set. Whistle blowing journalists are never demoted within one year (6 percent are demoted 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. To summarize these different career paths in Panel B we average the -1 (demotion), 0 (no change), +1 (promotion) scoring. We find a positive mean movement for whistleblowers that is significantly different than the negative mean movement for non-whistleblowers, both at the 1 year and at the 3 year horizon.[22]

[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] The result gives the same result as an ordered logit test or a distribution transition matrix test.

While we do not want to overstate these results, given the limited data and rough career advancement coding, the results are consistent with positive incentives for media bringing frauds to light.

II.3.4 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 27 cases of employee whistle blowing in our sample.[23]

Table 8 provides a summary. In 37 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 expected benefit of revealing should exceed the expected cost), we find that in 82 percent of cases, the whistleblower was fired, quit 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.[24] 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 separate study.

[23] 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.

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

Given these costs, however, the surprising part is not that most employees do not talk; it is that some talk at all. Table 8 tries to give a sense of what motivates them. In 29 percent of the cases 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 to 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 can be 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.[25]

Another motivation for whistle blowing could be the desire to avoid a potential liability. This seems to be relevant in 35 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. 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 (29 percent of the identified cases). It is unclear whether these are cases where the employee is fired for blowing the whistle internally or whether whistle blowing is a form of revenge for a dismissal that is (or is perceived to be) unjust.

II.3.5 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 the very few industries where the government is a significant customer. Table 9 compares the distribution of whistleblowers

[25] 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.*

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.[26] 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 at 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 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 9C.

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

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

likely to become informed that a fraud occurs.[27] 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.[28]

II.3.6 Summary

Overall, our analysis of whistleblowers' incentives suggests that positive 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 blowing has responded to the various regulatory changes in incentives that followed the Enron scandal.

II.4 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

[27] We thank an anonymous referee for this suggestion.
[28] These findings are also robust to the use of various controls for characteristics of the fraud.

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 requiring auditors hiring and firing to be a decision of the audit committee that is now required to be composed 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 10 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 explanation is that auditors become more sensitive to shareholders' needs because independent directors on the audit committee appointed them. Our data do not allow us to distinguish among these interpretations.

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.

The final point from Table 10 is that the percentage of employee whistleblowers drops from 18 to 13 percent, suggesting that SOX's protection for whistleblowers has not increased employees' incentives to come forward with cases of fraud.[29] One possible explanation is that rules which strengthen the protection of the whistleblowers' current jobs offer only a small reward relative to the extensive ostracism whistleblowers face. Additionally, just because jobs are protected does not mean that career advancements in the firm are not impacted by whistle blowing. Another explanation could be that job protection is of no use if the firm goes bankrupt after the revelation of fraud.

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.

II.5 Related Literature

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

[29] 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

Rajgopal (2007)). We differ in our focus of comparing the relative importance of difference 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.

III. 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 one needs to adopt a broader view than implied by the legal or private litigation approaches to corporate governance. 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 10 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 outright from whistle blowing. The two notable exceptions who benefit from whistle blowing are journalists involved in large cases and employees who have access to a *qui tam* suit.

A natural implication of our findings is that the use of monetary rewards providing positive incentives for 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* statue 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* statue 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 Acting Chief Accountant in a review of restatements from 2003-2005 argued that " well over half of the errors that resulted in restatements were caused by ordinary books and records deficiencies or by simple misapplications of the accounting standards." Two recent teams of researchers have similarly found the restatement sample to be dominated by cases that are benign rather than examples of intentional manipulation .[30] 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.[31]

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[30] SEC Acting Chief Accountant made his comments on November 17, 2006, "Remarks Regarding Restatements Before the Financial Executives International Meeting," November 17, 2006. Researchers coming to similar conclusions include Hennes, Leone, and Miller (2008) and Plumlee and Yohn (2009). We thank Jonathan Karpoff for this information.

[31] 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."

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 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).[32]

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

[32] Correspondence with Shiva Rajgopal, January 2007.

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].

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.

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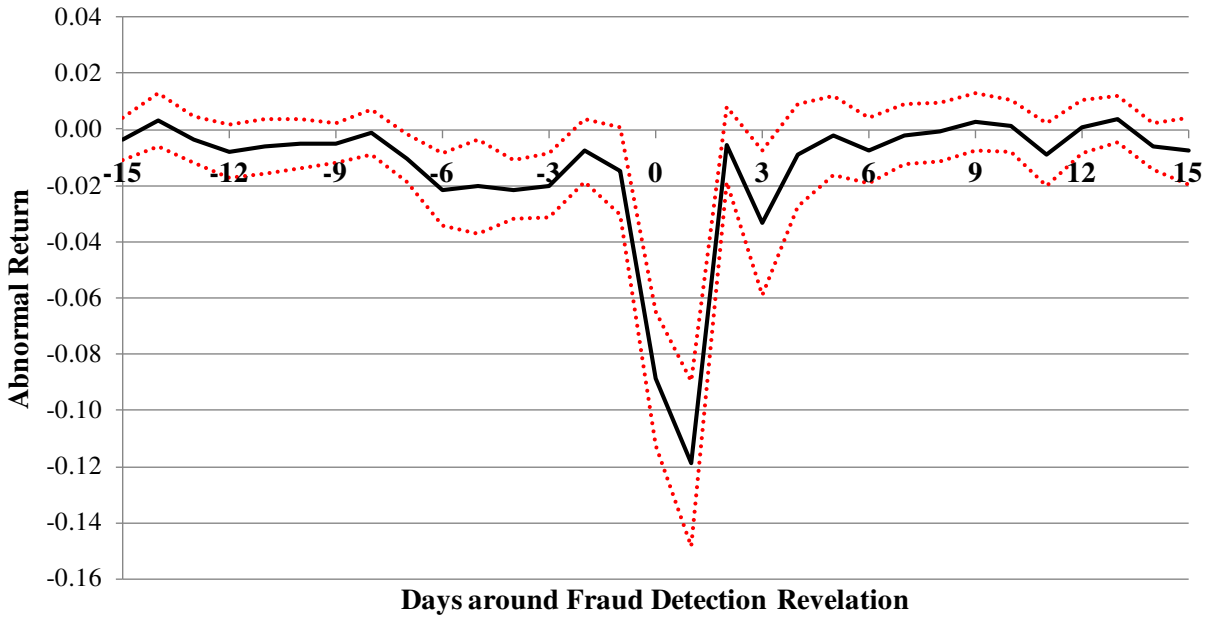
Figure 1: Event Study around the Whistle Blowing Date

For each company, we consider the time interval from the beginning of the class action period (the date at which the fraud allegedly began) until one year after the end of the class action period We regress stock returns on the S&P500 returns and an indicator variable marking the date of the news article which reported on the fraud detection for each firm. We then repeat the regression thirty times, changing the event date in each of the regression such that we have run the single day event study for all dates from the news article date minus fifteen days to the news article date plus fifteen days. Figure 1 A reports the estimates of the event dummy using an OLS regression, while Figure 1B reports the estimates using a median regression.

Panel A: OLS regression estimates



Panel B: Median regression estimates

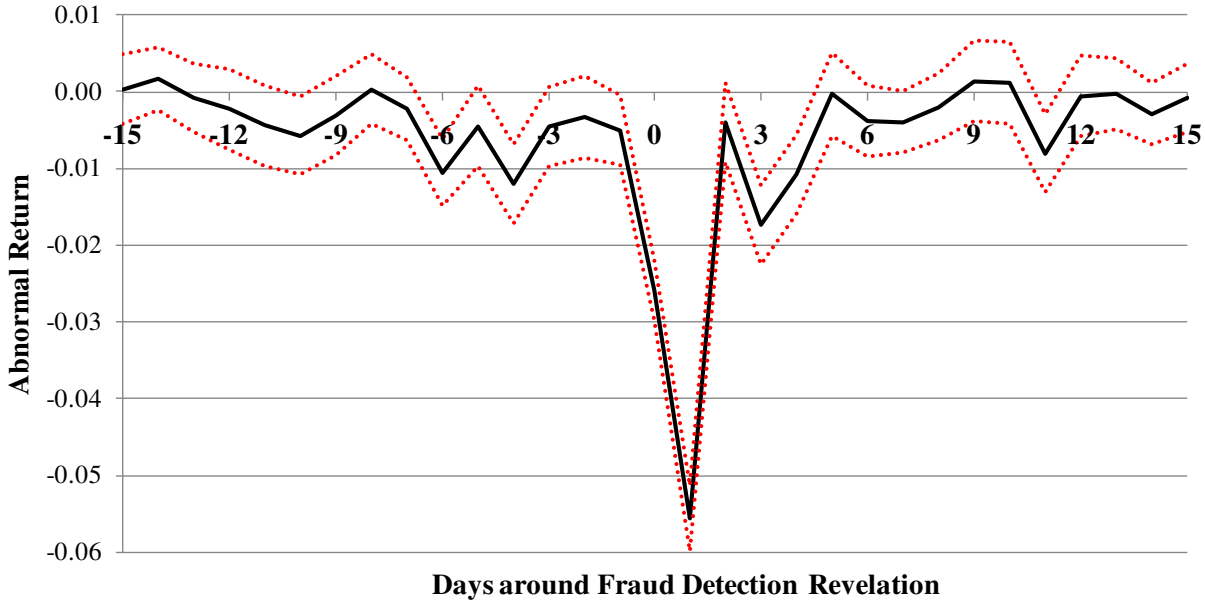


Table 1: Data Definition and Sources

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

Variable	*Description*	*Sources*
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 government agencies.	Security Class Action 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 Action 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 1 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 *Vault* Investment Bank Guide.
All- Star 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 identify whether an analysis is an All-American All-Star analyst using the annual survey in *Institutional Investor* 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. *Institutional Investor* 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. For example, an Accounting Reporter in the Business Day Desk 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. 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 is based on an independent classification by an established journalist..	*News Media Yellow Book*
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 *Winston (1998)* 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 *Winston (1998)* and others.
Organization Depth	This variable captures the organizational depth by industry.	*Rajan and Wulf (2006).*

Table 2: Who Detects Corporate Fraud?

Panel A identifies the actor that first brings the fraud to light and Panel B provides descriptive statistics`, with variables defined in Table 1. 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. In Column 2 we recode the fraud detector to 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 A - Distribution of Fraud Detectors

	Raw Distribution (equal weight)	*Data adjusted for short activity (equal weight)*	*Data adjusted for short activity (value weight)*	*Robustness: Smoking Guns Only (equal weight)*
Fraud Detector	*(1)*	*(2)*	*(3)*	*(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%)
Fraud Detectors Within External Governance				
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

	Settlements & Fines $M			*Assets $B (Prior) Median*	*Duration (Years) Median*	*Fraud With Accounting Restatement (% of Cases for Detector)*
	Median	*Mean*	*Mean (winsorized)*			
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: Results among Competing Theories of Who Blows the Whistle

The table reports conditional logit tests of fraud detection theories, where the dependent variable is an indicator for being the fraud detector for that case with case fixed effects. Panel A reports equal-weighted tests, and Panel B, value-weighted. Robust standard errors are in parentheses. ***, **, and * indicate significance at the 1% 5% and 10% levels respectively. The *mfx* columns report marginal effects for significant variables in the previous column.

Panel A: Equal Weighted

Theories:	*Dependent Variable: Choice of Fraud Detector Among 10 Types*					
	(1)	*(2)*	*(3) mfx*	*(4)*	*(5)*	*(6)*
Legal View	-0.962***					
	(0.308)					
Private Litigation	-1.460***					
	(0.470)					
Financial Risk	-0.183	-0.167		-0.268	-0.290	-0.315
	(0.213)	(0.216)		(0.232)	(0.241)	(0.244)
Monetary Rewards	1.065***	0.949***	0.230	0.934***	0.937***	0.933***
	(0.290)	(0.273)		(0.280)	(0.280)	(0.281)
Career Concerns	1.047***	0.464**	0.115	0.453**	0.453**	0.451**
	(0.249)	(0.201)		(0.211)	(0.213)	(0.214)
External Access	-0.953***	-0.596***	-0.148	-0.671***	-0.685***	-0.700***
	(0.239)	(0.205)		(0.214)	(0.221)	(0.221)
All Star Analyst %				1.374**		1.165
				(0.681)		(0.871)
Analyst Tenure					0.062*	0.026
					(0.037)	(0.049)
Observations	1,520	1,520		1,480	1,480	1,480
Pseudo R-Squared	0.059	0.027		0.031	0.029	0.031

Panel B: Value Weighted

Theories:	*Dependent Variable: Choice of Fraud Detector Among 10 Types*					
	(1)	*(2)*	*(3) mfx*	*(4)*	*(5)*	*(6)*
Legal View	-1.529***					
	(0.539)					
Private Litigation	-1.993***					
	(0.676)					
Financial Risk	-0.172	-0.169		-0.282	-0.503	-0.503
	(0.346)	(0.369)		(0.426)	(0.456)	(0.459)
Monetary Rewards	1.412***	1.203***	0.266	1.211***	1.210***	1.210***
	(0.445)	(0.413)		(0.418)	(0.424)	(0.424)
Career Concerns	1.573***	0.741**	0.183	0.748**	0.751**	0.751**
	(0.403)	(0.324)		(0.337)	(0.358)	(0.358)
External Access	-1.097***	-0.456		-0.521	-0.659*	-0.659*
	(0.403)	(0.354)		(0.381)	(0.393)	(0.394)
All Star Analyst %				1.033		-0.043
				(1.032)		(1.444)
Analyst Tenure					0.102	0.104
					(0.066)	(0.083)
Observations	1,520	1,520		1,480	1,480	1,480
Pseudo R-Squared	0.097	0.033		0.035	0.040	0.040

Table 4: Auditors' Turnover

The 1st row of Panel A reports the turnover of auditors in the sample of all large firms (more than $750 million in assets) during the sample period, excluding Arthur Andersen clients during 2001-2002. The next two rows report the turnover of auditors for the fraud firms, separately for the fraud being revealed by internal (2nd row) and external (3rd row) mechanisms. The 4th row reports the turnover of auditors in the subset of our fraud firms where the whistle blower was the auditing firm. The third column of panel A reports the p-value from a simple binomial test that the probability of turnover is different from the all firms row 1. Panel B reports the summary statistics for the independent variables. Panel C presents the results of a conditional logit of the choice of new auditor following auditor turnover. The first two columns limit the analysis to turnovers in 1999 and 2000. Columns labeled 3 and 4 limit the sample to the selection of auditor in 2002 for clients of Arthur Andersen as of 2000. The columns labeled *mfx* report the marginal effects from the prior column for the significant coefficients. Standard errors are in parentheses. ***, **, and * indicate significant differences at the 1% 5% and 10% levels respectively.

Panel A

Turnover in:	*frequency*	*Observations*	*p-value for difference from row 1*
All Large Firms 1996-2004	0.052	20,171	
Fraud Firms, Internal 1996-2004	0.141	64	0.006
Fraud Firms, External 1996-2004	0.147	136	0.000
Auditor Whistle Blowing Firms	0.500	16	0.000

Panel B

	1999 & 2000 Turnovers Sample of 290 Auditor Changes		*2002 Arthur Anderson Turnovers Sample f 356 Auditor Changes*	
3 Prior Year Cumulates of:	*Mean*	*Std. Dev.*	*Mean*	*Std. Dev.*
Frauds in Auditing Firm Clients	7.00	3.58	26.3	5.66
Accounting Frauds in Clients	4.52	2.25	15.7	3.73
Whistle Blowing by Auditor	--	--	0.913	0.250
Frauds / Market Share	39.4	20.4	110.9	56.7
Accounting Frauds / Market Share	25.7	13.7	66.0	34.8
Whistle Blowing / Market Share	--	--	3.99	3.92

Panel C

Conditional Logit Estimation	*Choice of New Auditor Turnovers 1999 & 2000*				*Arthur Andersen Clients' Auditor Choice in 2002*			
	(1)	*mfx*	(2)	*mfx*	(3)	*mfx*	(4)	*mfx*
Proportion Frauds	-0.016**	-0.0033	-0.011*	-0.0024	-0.005***	-0.0004	-0.022**	-0.002
	(0.006)		(0.006)		(0.001)		(0.011)	
Proportion Accounting Frauds			-0.012*	-0.0026			0.024	
			(0.007)				(0.020)	
Proportion Frauds Where Whistle Blower							0.033	
							(0.041)	
Big 5/4	2.10***		2.28***		4.47***		4.61***	
	(0.331)		(0.338)		(0.515)		(0.523)	
Observations	2,320		2,320		2,208		2,208	
Pseudo R^2	0.073		0.076		0.221		0.227	

Table 5: 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	0.871	0.618	-2.562**
	(1.540)	(1.522)	(1.653)	(1.286)
Experience	0.528	0.920**	-0.630	0.030
	(0.395)	(0.411)	(0.681)	(0.525)
Pseudo R-Squared	195	155	20	34
Observations	0.104	0.173	0.149	0.155

Table 6: 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.

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

Table 7: 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

	1 year post-fraud		3 years post-fraud	
	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)

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

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

The table indicates for each employee whistleblower the following information: company (column 1); the whistleblower 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.

		Costs		*Benefits*		
Company	*Whistleblower, Position*	*Terminated, Quit, or Reduced Responsibility*	*Other Costs*	*Filed Lawsuit with Potential for Damages*	*Positive Outcome of Lawsuit*	*Other Possible Benefits*
(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*
Named Whistleblowers						
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
Unnamed Whistleblowers						
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 9: 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.

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

	Non-Healthcare		*Healthcare*	
	Count	*Freq %*	*Count*	*Freq %*
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

	Original Sample	*Fraud Cases*	*Dismissed as Frivolous*	*Percentage Frivolous*
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

	Logit Estimates: Dependent Variable: Probability of Fraud Detector Being Employee			
	(1)	(2)	(3)	(4)
Healthcare				
coefficient	1.452***	1.577***	1.646***	1.950***
robust standard error	(0.55)	(0.60)	(0.57)	(0.66)
marginal effects	*0.271*	*0.299*	*0.307*	*0.374*
Regulated				
coefficient		-0.269		-0.591
robust standard error		(0.482)		(0.53)
marginal effects		*n/sig*		*n/sig*
Industry Organizational Depth				
coefficient			-1.210**	-1.467***
robust standard error			(0.52)	(0.56)
marginal effects			*-0.157*	*-0.187*
Constant				
coefficient	-1.809***	-1.680***	-0.672	-0.147
robust standard error	(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 10: 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.

	Ended Pre-Sox		*Ended Post-Sox*	
	(equal weight)	*(value weight)*	*(equal weight)*	*(value weight)*
	(1)	(2)	(3)	(4)
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%)