

Whistle-Blowing: Target Firm Characteristics and Economic Consequences

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Abstract:

We document what we believe is the first systematic evidence on the characteristics and economic consequences of firms subject to employee allegations of corporate financial misdeeds over the years 1989-2004. Compared to three control groups that were not exposed to public whistle-blowing allegations (the general population of firms, lawsuit firms, and restatement firms), firms subject to whistle-blowing events tend (i) to be relatively large, highly regarded and poorly governed, (ii) to have unclear communication channels and a recently downsized workforce, and (iii) to be concentrated in select industries, including healthcare and defense contracting where the whistleblower may share in a fraud settlement with the U.S. government. On average, a whistle-blowing announcement is associated with a negative 3% market-adjusted 3-day stock price reaction and this reaction is especially negative if the allegation involves earnings management (-7.7%). Whistle-blowing allegations are associated with further negative consequences including earnings restatements and shareholder lawsuits, suggesting that whistle-blowing allegations are a useful mechanism for uncovering agency issues. Relative to a control sample, whistle-blowing targets are more likely to make governance changes that reduce the size of the board, reduce insider representation on boards and replace the CEO.

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1.0 Introduction

The purpose of our study is to identify characteristics of firms subject to whistle-blowing allegations, examine the economic consequences of such allegations, and thus shed light on the role of whistle-blowers in uncovering agency issues at firms. We have notable anecdotal evidence that whistle blowers can make a difference. For example, two whistle-blowers, Cynthia Cooper and Sherron Watkins, played significant roles in exposing accounting frauds at WorldCom and Enron, respectively, and were named as the 2002 ‘persons of the year’ by TIME magazine.¹ In response to Enron, WorldCom and other scandals, Congress passed the Sarbanes-Oxley Act (SOX) in July 2002, which in part made it unlawful for companies to take negative action against employees who disclose “questionable accounting or auditing matters.” (See SOX section 806, codified as title 15 U.S.C., § 78f(m)(4).) Under the whistleblower provisions of SOX, employees who disclose improper financial practices receive greater protection from discrimination. (See title 18 U.S.C., § 1514A(a)(1).) SOX also ruled that every company quoted on a U.S. Stock Exchange must set up a hotline enabling whistle-blowers to report anonymously (*Economist* 2006). Further, experts have proposed giving whistle-blowers direct access to independent directors as a way of improving corporate governance (e.g., see *McKinsey Quarterly* 2002).

¹ Sherron Watkins voiced her concern about accounting irregularities in an anonymous memo to Enron’s Chairman, Ken Lay. The memo followed the abrupt departure of CEO Jeff Skilling, who left for “personal reasons” after only six months in the position. As rumors quickly spread among Enron employees and Wall Street analysts, Mr. Lay invited employees to submit their concerns in a comment box. It was in response to these events that Sherron Watkins—an Enron Vice-President who reported to CFO Andy Fastow—warned Ken Lay about “an elaborate accounting hoax.” By then, Watkins believed that Skilling knew the accounting problems could not be fixed and that he “would rather abandon ship now than resign in shame in two years.”

Like Ms. Watkins, Cynthia Cooper—WorldCom’s Vice President for Internal Auditing—also sought to expose and correct a massive accounting fraud. Her suspicion arose when a concerned manager in the wireless division told her the accounting department had taken \$400 million from his reserve account and used it to inflate WorldCom’s income. She first raised the issue with Arthur Andersen, WorldCom’s auditor. Although Andersen insisted that everything was fine, she continued to press on—notwithstanding that her boss, CFO Scott Sullivan, instructed her to back off. The largest accounting fraud in history might never have been uncovered had Cynthia Cooper and her team not pursued these financial misdeeds.

In contrast, skeptics argue that (i) whistle-blowers often misjudge the situation and indulge in trivial or frivolous complaints (Miceli and Near 1992), (ii) “Machiavellian” whistle-blowers, who have an axe to grind, lodge baseless allegations (Gobert and Punch 2000), or (iii) ineffective workers misuse their protected “whistle-blower” status to avoid discharges or disciplinary proceedings (Schmidt 2003).

Consistent with the notion that whistle-blowing allegations are generally frivolous, commentary in the *Wall Street Journal* (Delikat 2007) indicates that, of the approximately 1,000 whistle-blowing claims filed since the inception of SOX, only 17 have been deemed to have merit, and most of those have subsequently been overturned.

Despite the recent prominence of whistle-blowing, we know of no prior work in the accounting and finance literatures that examines either the characteristics of firms subject to publicly available whistle-blowing allegations or the economic consequences of whistle-blowing events for target firms. We analyze 81 whistle-blowing allegations related to financial misconduct between 1989 and 2004 reported in the financial press (Press sample) and 137 instances of whistle-blowing between 2002 and 2004 obtained from records of the U.S. government’s Occupational Safety and Health Administration office (OSHA), the agency responsible for handling complaints of discrimination from whistle-blowers’ who report SOX-related allegations (OSHA sample). We label these wide-ranging allegations as ‘financial’ whistle-blowing events. They include alleged earnings management, improper disclosure, insider trading, price-fixing in product markets, tax fraud and violations of securities regulation. We investigate four related research questions:

1. What operating, financial, governance, industry and regulatory characteristics differentiate firms subject to financial whistle-blowing from other firms that avoid publicly-disclosed whistle-blowing allegations?
2. What is the *immediate* stock market reaction to a financial whistle-blowing announcement? Do these stock price reactions vary with the nature of the announcement?
3. What are the *subsequent* economic consequences for firms subject to financial whistle-blowing events? Do these firms experience more earnings restatements, more shareholder lawsuits, and/or poor future operating and stock return performance?
4. Do firms respond to whistle-blowing allegations by improving their governance structure?

To investigate our first research question (Q1), we develop two sets of variables that potentially differentiate firms subject to a public whistle-blowing action.

First, we examine the ability of variables related to managers' opportunity and incentives to commit financial wrongdoing to discriminate whistle-blowing firms from a large sample of firms not exposed to whistle-blowing events. We find that firms targeted by whistle-blowing allegations are larger, have greater cash flow needs and are hence more likely to access the capital market, have lower blockholder and public pension fund ownership, larger boards and a greater incidence of CEO-chair duality.

Second, we examine incentives for the whistle-blower to make the allegation public. Compared to two control groups of firms tarnished by a) shareholder lawsuits and b) earnings restatements (firms with the potential for a whistle-blowing allegation but without any indication of a publicly known whistle-blowing event), we find some evidence that firms targeted by whistle-blowers (i) have better operating and/or stock price performance; (ii) are highly regarded; (iii) have downsized their workforce; (iv) have unclear communication channels (proxied by firm age, industrial and geographical diversification); and (v) are in industries where the whistleblower has an opportunity to share in the proceeds of any fraud-related settlement with the U.S. Government. The evidence is broadly consistent with whistle-blowers targeting good performers, perhaps because such firms are newsworthy to the media or because whistle-blowers have additional motivation to expose dubious practices that are perceived to enable the firm to report strong performance. Firms that have downsized or have unclear communication channels are more likely to be associated with a whistle-blowing event because, in such environments, workers are more likely to feel animosity toward the firm and internal complaints are more likely to go unheard or unaddressed. Overall, we interpret our evidence on the public revelation of whistle-blowing allegations as consistent (i) with managers having the opportunity and incentives to engage in questionable financial practices and (ii) with whistle-blowers having additional motivation to publicize their allegation of financial misconduct.

Our second research question (Q2) addresses the immediate stock market consequence of a publicly available whistle-blowing allegation. We find that the average market-adjusted three-day stock

return surrounding the announcement in the financial press is negative 3.03%. This reaction is especially negative if the allegation involves earnings management (-7.7%).

Our third research question (Q3) addresses ongoing economic consequences to whistle-blowing allegations. We find that whistle-blowing targets are more likely to restate their earnings and be sued by shareholders in the three years following the whistle-blowing allegation. Thus, whistle-blowers appear to expose firms that engage in financial misconduct and have previously unknown agency problems – both of which result in negative future consequences for the firm. Evidence of such negative ex post consequences is consistent with the implicit premise in SOX that whistle-blowers disclose valuable new information about agency problems at the firm.

Our fourth research question (Q4) examines firms' responses to whistle-blowing allegations. We find that, compared to a matched control sample, firms exposed to whistle-blowing allegations are more likely to reduce the size of the board, reduce the proportion of insiders on the board, and replace their CEO. While examining the consequences of whistle-blowing actions (such as restatements, lawsuits, performance and governance changes), our research design is careful to recognize that whistle-blowing is not an exogenous event and that negative consequences following whistle-blowing allegations could arise from many of the same underlying economic forces that contribute to the allegations themselves.

To our knowledge, our paper is the first to provide systematic evidence on firms subject to financial whistle-blowing by employees. We investigate an important, but hitherto unexplored, mechanism for discovering information about agency problems at firms. On average, our evidence is inconsistent with claims by critics that whistle-blowing complaints are frivolous, misleading or unreliable. From a broader perspective, we contribute to an emerging stream of literature on how information about financial wrongdoing reaches the stock market. In related work, Dyck, Morse and Zingales (2007) investigate who reveals information about corporate fraud. Using a sample of firms subject to shareholder class action litigation, they find that the most important sources of information are employees (19% of the cases), media (16%) and analysts (15%). While Dyck et al. (2007) list only 30 cases where employees directly reveal fraud to the public, our sample consists of 218 instances of employee-based whistle-blowing. Miller (2006)

investigates the role of the press in revealing fraud but he does not seem to indicate that employees are often named as the source of the articles. Unlike these papers, our focus is on (i) why employees reveal financial misdeeds either to the press or a regulator (OSHA), (ii) the economic consequences of such revelations and (iii) firms' responses via governance changes subsequent to employee whistle-blowing allegations.

The remainder of the paper is organized as follows. Section 2 discusses the background surrounding financial whistle-blowing and introduces predictions about the types of firm-specific factors likely to be associated with whistle-blowing events. Section 3 describes the sample and section 4 presents evidence on the predictions discussed in section 2. Section 5 presents evidence on three-day and five-day stock price reactions surrounding whistle-blowing allegations, and also provides evidence on longer-term consequences of whistle-blowing actions. Section 6 reports evidence on whether firms' improve governance after whistle-blowing allegations. Section 7 concludes with a summary of our findings and contributions.

2.0 Background and characteristics of firms subject to whistle-blowing allegations

2.1 Financial whistle-blowing – internal versus external

Miceli and Near (1985) define whistle-blowing as the disclosure by either former or current employees of alleged illegal, immoral or illegitimate practices which are under employer control. Whistle-blowing may be either internal or external. Internal whistle-blowing involves informing relevant members of the firm (e.g., management, internal audit) about potential wrongdoing. External whistle-blowing, on the other hand, involves either an internal allegation becoming public or the whistle-blower directly disclosing an allegation outside the organization (e.g., to the media or regulatory agencies such as OSHA). We focus on external whistle-blowing because instances of internal whistle-blowing generally are not reported in the media and public data on such cases are not generally available. Moreover, we concentrate only on whistle-blowing related to financial practices.

2.2 Congressional action to protect whistle-blowers

Largely in response to the Enron and WorldCom scandals, Congress passed the Sarbanes-Oxley Act (SOX) in July 2002. SOX, in part, sought to provide whistle-blowers greater legal protection. In addition to creating civil remedies for retaliation against employees in fraud cases, SOX made it a felony to take any action that is harmful to any person in retaliation for providing information about a federal crime to law enforcement officials. Thus, a retaliatory firing or demotion would constitute a crime.

2.3 Whistle-blowing is frivolous, misused, misleading, and/or unreliable

Some survey evidence (Brickey 2002, Zingales 2004) suggests that the personal cost to the whistle-blower can be high.² Given that whistle-blowers likely anticipate these costs, their allegations should be credible. However, some critics suggest that whistle-blowers often misjudge the situation and lodge frivolous complaints to garner attention and publicity (Near and Micelli 1996). Indeed, in June 2005, the French government's Data Protection Authority refused to allow the installation of anonymous whistle-blower hotlines, saying that such lines "were disproportionate to the objectives sought with the risks of slanderous denunciations" (The *Economist* 2006). Furthermore, trouble-makers could potentially misuse their whistle-blower status and avoid being suspended or dismissed from employment. For example, Anechiarico and Jacobs (1996, 67-68) argue that several municipal employees in New York City chose the option to blow the whistle in order to fall under state protection as a pre-emptive measure to getting fired. Hence, supervisors and managers might find it easier to tolerate an unproductive and ineffective employee rather than discipline the employee, given the enormous trouble that can result from disciplining a whistle-blower. Gobert and Punch (2000) argue that an employee might even be excluded from necessary salary

² Zingales (2004) summarizes evidence on the consequences of whistle-blowing for individual employees. In a 1992 survey of 1,500 federal workers, twenty-five percent of employees reported that they experienced verbal harassment and intimidation; 20 percent were shunned by co-workers and managers; 18 percent were assigned to less desirable duties; 11 percent were denied a promotion. A 1998 survey of 448 emergency physicians paints an even worse picture: twenty-three percent of those who complained about an issue reported having been fired or threatened with termination.

Brickey (2002) reports that in a random review of 200 whistleblower complaints filed with the National Whistleblower Center in 2002 found that about half of the complainants said they were fired after they reported misconduct. The remaining complainants had been subjected to other retaliatory action such as on-the-job harassment or discipline. A survey by another watchdog group, the Government Accountability Project, found that about ninety percent of whistleblowers are subjected to reprisals or threats.

cuts to avoid the perception that such a cut is retaliation against the whistle-blower. On average, if whistle-blower complaints are frivolous, misused, misleading, and/or unreliable, we should observe no significant economic consequences to a whistle-blowing action. Having said that, we acknowledge that even the taint of an allegation could potentially lead to some negative consequences for the firm. Section 5 provides evidence of immediate and ongoing consequences of whistle-blowing actions.

2.4 Characteristics of firms subject to whistle-blowing allegations: opportunities and incentives for committing financial misdeeds

In this section, we model whistle-blowing allegations as a function of management's opportunity and incentives to engage in financial wrongdoing. We expect whistle-blowing allegations to be more prevalent for firms where management has either the opportunity or incentive to commit financial wrongdoings. In section 2.5 (below), we model whistle-blowers' motivations to report financial misdeeds outside the company. We argue that managers of whistle-blowing targets face different motivations than do managers of firms not subject to external whistle-blowing allegations due to four factors: (i) capital market pressure, (ii) growth, (iii) corporate governance and (iv) firm size. At the outset, we acknowledge that some of these hypothesized factors are somewhat exploratory and descriptive. Given how much little published research exists in the area of whistle-blowing, we argue that our exploratory/descriptive approach is appropriate in this early stage of the literature's development.

2.4.1 Capital market pressure

Near and Miceli (1995) argue that organizational misdeeds occur when (i) the organization is highly dependent on the wrongdoing for its survival; or (ii) the company cannot afford change; or (iii) there are no alternatives to the wrongdoing. In recent years, firms have faced heightened capital market pressure to deliver sustained earnings growth (Graham, Harvey and Rajgopal 2005). Such pressures have likely created incentives for some managers to aggressively boost earnings, either via earnings management or via other questionable practices such as overbilling customers or improper disclosure of material financial events.

We use several empirical proxies to capture such capital market pressure. First, previous research has argued that an environment with scarce financial resources increases uncertainty facing the firm. In order to increase the probability of survival, managers may take actions to reduce such uncertainty, including engaging in questionable or illegal activities (e.g., Staw and Szwajkowski 1975, Baucus and Near 1991). Moreover, scarce financial resources also increase the pressure on the firm to prop up their stock price so they can seek external financing at relatively favorable terms. Hence, we expect a positive association between the scarcity of financial resources and whistle-blowing actions. Similar to Richardson, Tuna and Wu (2002), we proxy for scarcity of financial resources by setting a dummy equal to 1 when a firm's free cash flow in the year prior to the whistle-blowing allegation is less than -0.1, i.e., it is negative and at least 10% of average total assets (FIN_NEED).

Second, we argue that firms that grow via mergers and acquisitions (M&A) are more likely to engage in financial misdeeds to keep reporting favorable financial performance in an effort to prop up their short-run stock prices. Erickson and Wang (1999) and Louis (2004) show that acquiring firms tend to overstate their earnings to boost short-run stock prices.³ We measure M&A using a dummy variable = 1.0 when there is merger and acquisition activity in the three years prior to the whistle-blowing event.

Third, Callahan and Dworkin (1994) find that the seriousness of the misconduct is a key factor in the organization's dependence on it. One measure of the seriousness of the wrongdoing is the amount of money involved. We proxy for the amount of money involved in the wrongdoing by using the absolute value of discretionary accruals based on the modified Jones (1991) model (ABSDACC) for the fiscal year prior to the whistle-blowing event. We predict that firms with higher levels of ABSDACC will be more likely to be the target of a whistle-blowing allegation.

2.4.2 Growth

Firms rely on a number of mechanisms to manage rapidly growing or changing environments and potential financial misdeeds can occur as a result from such efforts (Finney and Lesieur 1982, Gross 1978).

³ Note that the inclusion of FIN_NEED, our proxy for resource scarcity, and EPS_GROWTH, one of our proxies for dynamic environment, can also be viewed as proxies for capital market pressure.

In rapidly growing environments, firms are more likely to outgrow their controls. Responsibility for overall decision-making is typically spread across many individuals, and each individual has less information and authority to stop wrongdoing (Baucus and Near 1991). We proxy for environments where control failures are more likely by using sales growth (SLS_GROWTH) and earnings growth (EPS_GROWTH) in the year before the whistle-blowing event.

2.4.3 External governance

Managers are more likely to engage in financial misconduct when they face weak internal controls and more generally, when the quality of external corporate governance is poor. We proxy for external governance quality in two, admittedly ad-hoc, ways: (i) the presence of block-holders (BLOCK); and (ii) public pension funds ownership (PP). Consistent with prior literature (e.g., Cremers, Martijn and Nair 2004), we argue that firms where BLOCK and PP are low are firms with poor governance quality, and we expect a positive association between whistle-blowing allegations and poor governance. Note that we rely on these and not other governance proxies because data on such proxies is available on a machine-readable basis for the time periods covered in our study. In particular, our sample spans several years before the Enron scandal broke and the availability of machine-readable governance data before the Enron scandal is limited.

2.4.4 Internal governance

Managers are more likely to indulge in corporate wrongdoing in the presence of weak internal governance and strong private incentives. We use seven admittedly ad-hoc proxies related to private incentives for managers and board structure. First, recent papers provide arguments (e.g., Jensen, Murphy and Wruck 2004) and empirical evidence (e.g., Burns and Kedia 2006) that link executive stock options to financial misconduct. The intuition is that managers hide unfavorable information from the stock market so that they can exercise their options at higher stock prices. Following Efendi, Srivastava and Swanson (2006) we argue that such motivation is stronger the greater the proportion of in-the-money exercisable stock options held by senior managers relative to their overall firm wealth. The intuition is that the exercise proceeds of the manager are directly increasing in higher stock price, and the manager has incentives to

hence prop up the stock price for a short time via earnings or disclosure management. We define EXECCOMP as the value of the CEO's in-the-money exercisable stock options, scaled by the CEO's wealth, and argue that the probability of financial misconduct, and hence whistle-blowing, increases with EXECCOMP. CEO wealth is proxied by the sum of the CEO's salary, bonus, the value of stock ownership, and the value of all in-the-money options.

Second, we consider the number of directors on the board (DIRECTORS). Jensen (1993) and Lipton and Lorsch (1992) argue that large boards can be less effective than small boards because director free riding increases with board size and larger boards may be more symbolic and less involved in the management process. Yermack (1996) tests this view and finds empirical support for it. Third, several studies show that boards composed mainly of outside (or independent) directors are more effective than boards made up of insiders (e.g., Brickley and James 1987; Weisbach 1988; Rosenstein and Wyatt 1990). Hence, we expect corporate wrong-doing to increase with the proportion of insiders on the board (INSIDER_PCT). Fourth, attendance at board meetings can also be viewed as a proxy for director involvement in governing the firm. Thus, a greater frequency of board meetings (ATTEND) may indicate active governance on the part of the board. Alternatively, it may signal the difficulty involved in monitoring the firm's operations and hence, a greater number of board meetings may suggest a mere reactionary response on the part of the board to poor performance or bad outcomes. Fifth, boards are known to be ineffectual monitors especially when the CEO or an insider is also Chairman of the Board (Jensen 1993) (CEO=COB). Sixth, directors who are on multiple boards are arguably less involved in monitoring management for any one company (Core, Holthausen and Larcker 1999). We obtain the proportion of the board composed of busy directors where busy is defined as three additional directorships (BUSY_PCT) and we hypothesize that boards with a greater proportion of busy directors are more likely to be associated with corporate wrong-doing. Finally, we also investigate whether the presence of a new CEO is more likely to be associated with greater corporate wrongdoing. We obtain board data from the IRRC database.

2.4.5 Firm Size

Large firms tend to have relatively severe communication and coordination problems. In addition, managers of large firms face greater pressure from external analysts to make earnings more predictable (Pincus and Rajgopal 2002), and are therefore more likely to engage in financial misdeeds in response. However, large firms tend to have more of everything, and it may not be surprising to find that they also have more whistle-blowing events. Our proxy for firm size is sales (SALES) of the firm before the whistle-blowing event is announced.

2.5 Motivations to blow the whistle

In this section, we model whistle-blowers' motivations to report financial misdeeds to parties outside the company. We argue that employees of whistle-blowing targets face different motivations than do employees of firms not subject to public whistle-blowing allegations due to six factors: (i) past performance; (ii) firm reputation; (iii) unclear communication channels; (iv) employee downsizing; (v) quitam; and (vi) firm size.

2.5.1 Past performance

We predict that firms who have reported strong operating performance in the past or whose stock price has performed well are more likely to be a target for whistle-blowing for two reasons. First, firms with strong operating or stock market performance are more newsworthy to the media. Reporters are more likely to publish whistle-blowing allegations targeted at high-profile companies. Second, an employee might be more likely to expose financial misdeeds that are perceived to enable the firm to report artificially strong performance. We measure performance, both operating (ROA) and stock returns (RET), over the year before the whistle-blowing event.

2.5.2 Firm reputation

We predict that a highly-regarded firm is more likely to attract the ire of a disgruntled employee and the resulting allegation is more likely to be newsworthy. The external whistle-blower or the media

outlet is likely to get more attention from exposing wrongdoing at a highly-regarded firm.⁴ We proxy for firm reputation based on whether the firm is listed either as a “Most Admired” firm or a “Best Place to Work For” by *Fortune* magazine (REPUTATION) in any of the five years prior to the whistle-blowing event. Note that the “Best Places” list is only available from 1998 while the “Most Admired” list is available throughout our sample period.

2.5.3 Unclear communication channels

We hypothesize that the employee’s motivation to resort to external whistle-blowing is higher when channels for raising concerns within the company are unclear. This situation likely occurs in two cases. First, bureaucratic work environments are more likely to be associated with external whistle-blowing. Keeping the level of organizational misconduct constant, Rothschild and Miethe (1999) suggest that bureaucratic and undemocratic work environments are likely to experience higher levels of *external* whistle-blowing because of significant barriers to effective *internal* whistle-blowing. Miceli & Near (1994) indicate that it is common for employees to first report problematic activities to management and, if the issue is ignored, then resort to reporting the problem to external audiences such as the media. In particular, missing or unclear channels for reporting problems can instigate external whistle-blowing (Winstanley & Woodall 2000). Moreover, employees in firms that have developed a “kill the messenger” culture regarding the reporting of a problem often do not report suspicion of wrongdoing or actual errors internally (Irvine & Millar 1996). We assume older firms (AGE) are likely to be more bureaucratic and hence more likely to be subject to a whistle-blowing action.

Second, a disperse organizational structure is likely to be positively associated with external whistle-blowing. King (1999) argues that geographical distance and multiple industrial segments in a firm make communication channels less clear. In such organizational structures, communication between people from another unit can be obstructed or limited because of rivalry between units, through speaking different jargon and having different sub-cultures. In particular, an employee who has to report a

⁴ Of course, it is possible that a highly-regarded firm is more likely to avoid organizational misconduct, or have processes in place that resolve employee allegations before they are disclosed publicly.

wrongdoing to a supervisor or boss they hardly know and who is geographically far away might feel uncomfortable raising sensitive issues (Miceli & Near 1994, Beresford et al. 2003). Such unclear internal communication channels increase the likelihood the employee will resort to external whistle-blowing. We measure industrial and geographical concentration as the Hirfindahl-Hirschman index based on revenues for each of the firm's industrial and geographic segments, respectively (IND_CONC and GEO_CONC). We expect the probability of external whistle-blowing to decrease with the industrial and geographic concentration of the firm's business segments. All of the variables proxying for the work environment are measured in the year prior to the whistle-blowing event.

2.5.4 Employee downsizing

Luthans and Sommer (1999) find that following employee downsizing, employees experience a decline in both loyalty and commitment to the firm. We predict that employees, especially former employees who have been let go, are more likely to blow the whistle. Further, layoffs can increase the level of animosity between the firm and existing employees, and if existing employees perceive their job as being less secure, the potential cost of blowing the whistle decreases. We proxy for downsizing (DOWNSIZE) with the average percentage change in employees over the three years prior to the whistle-blowing event. We predict that employees are more likely to blow the whistle when the firm has recently experienced a decline in the number of employees.

2.5.5 Quitam

In certain instances, whistle-blowers have the potential to benefit financially by uncovering corporate misdeeds. Under the Federal False Claims Act, citizens who help uncover fraud in government contracts or government programs may be awarded a portion of the recovered funds (<http://www.taf.org/>). Since these whistle-blower provisions went into effect in 1996, the government has recovered over \$11 billion in settlements and judgments from quitam-related cases. Of this amount, over 16% of the recovered funds have been distributed to those individuals who helped bring the fraud to light.

The majority of quitam cases fall into one of two industries: healthcare and defense contracting. Over 70% of the funds recovered as part of the quitam provisions relate to matters in which the Department

of Health and Human Services is the primary agency, while over 15% of the recovered funds pertain to matters in which the Department of Defense is the primary agency. We argue that the quitam provisions included in the Federal False Claims Act provide employees at these firms (healthcare firms and defense contractors) with increased incentives to blow the whistle. We proxy for these quitam incentives and set QUITAM equal to 1 if the firm is in a healthcare industry (two-digit SIC code equal to 80) or if the firm has been on the Department of Defense’s “100 Companies Receiving the Largest Dollar Volume of Prime Contract Awards” list in any of the 3 years prior to the whistle-blowing event.

2.5.6 Firm Size

Allegations of misconduct are more likely to be newsworthy when they involve large firms. Not only is the press more likely to report an allegation against a large firm, but other agencies are more likely to respond to an allegation if it involves a large firm. We expect that employees are more likely to blow the whistle when there is a greater likelihood that their allegations will be heard. As such, we expect a positive association between firm size, proxied as sales (SALES) of the firm before the event year, and the likelihood of an employee blowing the whistle. Note that we include SALES in both sets of variables (Section 2.4 and Section 2.5).

2.6 Model for assessing characteristics of firms subject to whistle-blowing allegations

Based on the discussion above, we estimate the following two logistic models (where firm subscripts are suppressed). The first model presents the relation between whistle-blowing allegations and managerial opportunity and incentives to commit financial wrongdoing. The second model examines the association between whistle-blowing and whistle-blowers’ incentives to come forward, after controlling for managerial opportunity and incentives to commit financial misconduct. Note that we compute a factor score of the independent variables in the first model to control for managerial opportunity and incentives in the second model.⁵ We introduce industry fixed effects (based on two-digit SIC codes) and year fixed effects in both models as controls. The models are:

⁵ We acknowledge that the distinction between the incentives to commit financial misdeeds (discussed in section 2.4) and the motivations to blow the whistle (in section 2.5) can overlap. Regardless, we make this distinction for

Model 1: Linking whistle-blowing events to managerial incentives to commit financial misdeeds

$$\begin{aligned} \text{Pr(Whistle-blowing)} = & \beta_0 + \beta_1 \text{FIN_NEED} + \beta_2 \text{M\&A} + \beta_3 \text{ABSDACC} + \beta_4 \text{SLS_GRWTH} + \\ & \beta_5 \text{EPS+GRWTH} + \beta_6 \text{D_BLOCK} + \beta_7 \text{D_BLOCK*BLOCK} + \beta_8 \text{D_PP} + \beta_9 \text{D_PP*PP} + \\ & \beta_{10} \text{D_EXECCOMP} + \beta_{11} \text{D_EXECCOMP*EXECCOMP} + \beta_{12} \text{D_IRRC} + \\ & \beta_{13} \text{D_IRRC*DIRECTORS} + \beta_{14} \text{D_IRRC*INSIDER_PCT} + \beta_{15} \text{D_IRRC*ATTEND} + \\ & \beta_{16} \text{D_IRRC*CEO=COB} + \beta_{17} \text{D_IRRC*BUSY+PCT} + \beta_{18} \text{D_NEW_CEO} + \\ & \beta_{19} \text{D_NEW_CEO*NEW_CEO} + \beta_{20} \text{SALES} + \text{IndustryDummies} + \text{YearDummies} + \\ & \text{error} \end{aligned} \quad (1)$$

Model 2: Linking whistle-blowing events to whistle-blowers' likelihood of coming forward

$$\begin{aligned} \text{Pr(Whistle-blowing)} = & \beta_0 + \beta_1 \text{Factor score of independent variables from (1)} + \beta_2 \text{ROA} + \\ & \beta_3 \text{RET} + \beta_4 \text{REPUTATION} + \beta_5 \text{AGE} + \beta_6 \text{D_IND_CONC} + \\ & \beta_7 \text{D_IND_CONC*IND_CONC} + \beta_8 \text{D_GEO_CONC} + \beta_9 \text{D_GEO_CONC*GEO_CONC} + \\ & \beta_{10} \text{DOWNSIZE} + \beta_{11} \text{QUITAM} + \beta_{12} \text{SALES} + \text{IndustryDummies} + \\ & \text{YearDummies} + \text{error} \end{aligned} \quad (2)$$

where Pr(Whistle-blowing) is the probability of a whistle-blowing event for this binary dependent variable, i.e., 1 = a whistle-blowing event and 0 = none. Data for certain variables (BLOCK, PP, EXECCOMP, IND_CONC, GEO_CONC and all IRRC variables) are not available for our entire sample. We code these variables as zero for firms without available data and interact these variables with a dummy variable that is equal to one for firms with data available and zero otherwise. This specification, called modified zero-order regression (Greene 1993), enables us to maintain a larger sample size and draw inferences on the remaining variables where data are more readily available.⁶ Detailed definitions for all the independent variables are in Appendix A.

3.0 Data

3.1 Sample

Our whistle-blower sample comes from two sources. The first source, labeled the Press sample, consists of 81 whistle-blowing events drawn from a Lexis-Nexis search of every combination of the following two groups of search terms (i) “whistle,” “whistleblowing,” “whistleblower,” “whistle-blower”

expository reasons because we believe that, overall, incentives to commit financial misdeeds and to blow the whistle relate to different people (managers and employees, respectively) who have different incentives.

⁶ Restricting the analysis to a sub-sample with complete data available limits the number of usable observations in model (1) to only 60 whistle-blowing and 478 control observations, and in model (2) to only 51 whistle-blowing and 432 control observations. In contrast, the zero-order regressions allow us run model (1) on 168 whistle-blowing and 4,648 control observations, and model (2) on 162 whistle-blowing and 4,553 control observations.

and (ii) “financial,” “accounting,” “reporting,” “fraud,” “accounting fraud” over the calendar years 1989 to 2004. Note that the Press sample does not imply that employee-whistle-blowers directly inform the press. These are merely instances of whistle-blowing reported in the media.

The second source, labeled the OSHA sample, consists of 137 whistle-blowing events gathered from written requests to the Occupational Health and Safety Administration (OSHA). While there are other varieties of whistle-blower allegations besides those who claim to have uncovered fraud and file for protection under SOX, we asked for and received data related only to financial whistle-blowing under the purview of SOX.⁷ These cases represent whistle-blowers’ complaints of discrimination in the workplace (e.g., demotion, termination) for having voiced allegations of financial impropriety. While we are unable to observe whistle-blowing allegations that do not result in employee discrimination (because these allegations are not reported to OSHA), each OSHA case represents an allegation of financial wrongdoing being made public.

Invoking the Freedom of Information Act, we contacted the 10 regional offices of OSHA in August 2004 seeking information about whistleblower complaints filed relevant to the Corporate and Criminal Fraud Accountability Act (CCFA) of 2002 (Sarbanes Oxley). In particular, we asked for the date on which each complaint was filed, the company identified in the complaint and the allegation made by the complainant. We received such data from nine regional offices. One office did not respond to our repeated requests for a list of whistle-blowing events despite several contacts. These reports trickled in from December 2004 to February 2005 and covered whistle-blowing events from September 2002 to December 2004.

The press sample differs from the OSHA sample in several ways. First, the press sample likely reflects the media’s bias in covering only the most visible, important or sensational whistle-blowing allegations. In contrast, the OSHA sample is likely to be less biased but is more likely to include relatively

⁷ The Sarbanes Oxley Act did not assign the job of protecting whistle-blowers to the Securities and Exchange Commission. Instead, the task went to the Labor Department’s OSHA because the law's drafters reasoned that OSHA had a record of helping workers penalized for voicing concerns. For example, OSHA has the responsibility of enforcing 13 additional whistle-blower statutes covering truckers, airline mechanics, nuclear-power-plant employees and others.

frivolous complaints. Moreover, Callahan and Dworkin (1994) find that misdeeds reported to the media are likely to involve larger sums of money than those reported to other outlets. Second, in several instances, the press sample would respect the confidentiality of the whistle-blower but in all cases, the complainant's identity is missing from the OSHA sample. This data limitation restricts our ability to investigate the consequences of whistle-blowing to the employee (e.g., fired, demoted, sued, etc.). Third, the press sample, by definition, is a clear public revelation of the whistle-blowing allegation whereas the OSHA whistle-blowing data are less likely to be widely disseminated in local and national media given the information has to be obtained via a special request from a government agency. Furthermore, we can ascertain the date on which the whistle-blowing allegation was made public based on the news story in the press; such event-dating is difficult with the OSHA sample. Hence, we conduct a study of the market reaction surrounding the whistle-blowing event only for the Press sample. However, to the extent possible, we examine the long-run performance consequences (both operating and stock market) of both types of whistle-blowing events. Data comparing the differences in characteristics of press and OSHA firms are discussed in section 4.

We start with an initial press (OSHA) sample of 81 (137) unique firms. Panel A of Table 1 presents an annual breakdown of the firms subject to whistle-blowing actions. The number of whistle-blowing actions in the press sample is relatively stable at a median value of four per year, except for a peak of 23 events in 1998 and 13 events in 2002. Because the OSHA sample begins in August 2002, 2002 has only 12 events, followed by 62 events in 2003 and 63 events in 2004 (which is truncated around mid November 2004 in most OSHA regions). Panel B of Table 1 lists the nature of whistle-blower allegations in both samples. Of the 81 events in the press sample, 40 relate to overbilling Medicare, the government, or customers while 24 relate to earnings management. In the OSHA sample, 26 relate to accounting irregularities, 16 relate to earnings management while 18 are associated with other allegations of financial misconduct. Panel C of Table 1 lists examples of allegations under each category.

Panel D of Table 1 presents the number of whistle-blowing complaints classified by industry. Industries with the most allegations in the press sample are Health services (9.9%), Chemicals and Allied

Products, and Oil and Gas Extraction (8.6% each). The mix is quite different for the OSHA sample with the most allegations in Business Services (14.6%), Depository Institutions (8.8%), and Security and Commodity Brokers and Industrial Machinery/Computers (7.3%). The difference in composition of industries across the Press and OSHA samples could reflect the media's differential incentives to cover stories from certain industries such as health services, and oil and gas. Table 2 shows how various sample filters affect the number of Press and OSHA firms that are usable in the tabled empirical tests to follow.

3.2 Control samples

We rely on three control samples. The purpose of the first control sample (labeled “control sample”) is to benchmark our whistle-blowing firms against a broad set of firms that have not been publicly targeted by a whistle-blower. This sample consists of all firms based on an intersection of the CRSP and COMPUSTAT tapes that have non-missing data for all of the independent variables listed in model (1). All observations that have non-missing data in the year before the whistle-blowing event for one of our sample firms are eligible for inclusion in the control sample at the first pass. We impose the following filters to these set of firms: (i) no observation relating to one of the sample firms can be included in the control sample, and (ii) no control firm can appear in the control sample more than once (i.e., no more than one firm-year for each control firm). Whenever we found multiple observations from the same firm in the control sample, we randomly selected just one firm-year.

One potential objection to benchmarking the whistle-blowing sample to a broad sample of firms is that firms subject to a whistle-blowing event are inherently different from the average firm because of the alleged financial impropriety. As a result, assessing differences in employees' willingness to blow the whistle (regression model 2) may be driven by these inherent differences. Thus, we also compare whistle-blowing firms to other firms tarnished by allegations of financial misdeeds that have not been exposed to a public whistle-blowing event. In particular, we identify firms that were subject to a lawsuit during the years 1989-2006 (labeled “lawsuit sample”) and firms that filed earnings restatements between 1997-2005 based on two GAO reports (labeled “restatement sample”). Comparisons between our whistle-blowing

samples and these samples allow us to more directly assess differences between firms that face whistle-blowing allegations and other tarnished firms that avoid such public allegations.

We compile the lawsuit sample of 1,119 usable firms (i) from the LEXIS/NEXIS Academic Universe Business News (searching on company name and “class action”) and (ii) by examining issues of Securities Class Action Alert (published from April 1988 through May 2006) to identify firms that were sued in connection with alleged financial misdeeds. Categories of financial misdeeds included earnings management, false/misleading statements such as failure to disclose material information, false revenue or earnings projections, falsifying records or inaccurate financial statements, inadequate internal controls, failure to disclose financing terms, inflating the stock price, management team problems, inadequate disclosure of debt terms and the failure to disclose acquisition problems.

The restatement sample is drawn from two lists of firms compiled by the General Accounting Office (GAO) through a Lexis-Nexis search with variations of the word ‘restate.’⁸ In the first report, titled “Financial Statement Restatements: Trends, Market Impacts, Regulatory Response, and Remaining Challenges,” the GAO identified 919 announcements of accounting restatements by 845 firms between January 1, 1997 and June 30, 2002. In a follow-up report titled “Financial Statement Restatements: Update of Public Company Trends, Market Impacts, and Regulatory Enforcement Activities,” the GAO identified 1,390 announcements of accounting restatements by 1,121 firms between July 1, 2002 and September 30, 2005. These two reports form the basis of the restatement sample. Data limitations on several of the independent variables constrain the restatement sample to 1,304 firm-year observations.

Note that we eliminate firms that overlap the whistle-blowing treatment sample and the two tarnished control samples (lawsuits and restatements) to avoid any mechanical correlation between these samples.

⁸ GAO restatements were due to accounting irregularities resulting in material misstatements of financial reports. The GAO list specifically excludes routine restatements due to mergers and acquisitions, discontinued operations, stock splits, issuance of stock dividends, currency-related issues, changes in business segment definitions, changes due to transfers of management, changes made for presentation purposes, general accounting changes under generally accepted accounting principles (GAAP), litigation settlements, arithmetic and general bookkeeping errors. The list also excludes restatements resulting from accounting policy changes because they did not necessarily reveal previously undisclosed, economically meaningful data to market participants. A limitation of the restatement sample is that it only spans 1997-2005 whereas the whistle-blowing sample covers a longer time period.

4.0 What are the characteristics of firms facing external whistle-blowing allegations? (Q1)

Tables 3, 4 and 5 present evidence on the characteristics of the whistle-blowing targets versus the three control samples discussed in section 3.2. Given the Press and OSHA samples differ from each other, we compare the level of each variable for each whistle-blowing sample in each test.

4.1 Whistle-blowing firms versus the full control sample

We begin by comparing the Press and OSHA whistle-blowing samples with the full control sample. We expect managerial opportunity and incentives for misdeeds for whistle-blowing firms to differ from firms in our full control sample (but perhaps not from samples of similarly tarnished firms discussed in section 4.2 below). The univariate mean-based evidence in panel A of Table 3 related to managerial opportunity and incentives to commit financial misdeeds is consistent with several of our predictions but inconsistent with others.⁹ As expected, we find that whistle-blowing targets in both samples have lower block-holder ownership, larger boards, CEO chair duality, and a greater number of busy directors. The OSHA sample also has greater acquisition activity and lower board attendance relative to the control sample. Inconsistent with expectations, whistle-blowing firms are unlikely to be characterized by (i) scarcity of financial resources (FIN_NEED), (ii) higher discretionary accruals (ABSDACC), or (iii) lower pension fund ownership (PP).

The univariate evidence in panel B of Table 3 for environmental variables related to whistle-blowers coming forward is more consistent with our predictions. In particular, we find that, relative to the control samples, whistle-blowing targets tend to be successful in past operating or stock performance, highly regarded, older, more disperse in their geographical and industry focus, more likely to have downsized their workforce, and over-represented in QUITAM environments where the whistleblower has an opportunity to share in the proceeds of any fraud-related settlement with the U.S. Government.

Table 4 presents the results of estimating multivariate model (1) separately for the Press and OSHA samples. Compared to our full control sample and consistent with univariate results reported earlier, whistle-blowing firms in both Press and OSHA samples have larger boards and higher sales. In addition,

⁹ Untabulated univariate comparisons based on medians are similar to the ones reported using means.

whistle-blowing targets in the Press sample have greater frequency of CEO-chair duality while firms in the OSHA sample are characterized by greater FIN_NEED, smaller BLOCK and PP ownership and less attendance at board meetings. These results are consistent with capital market pressures creating incentives for managers to push the envelope and engage in questionable financial practices in a lax internal and external governance environment. Untabulated industry-related variation also accounts for significant cross-sectional variation in whistle-blowing practices. Pseudo r-squareds for the Press sample and OSHA sample are 44.9% and 41.3%, respectively, suggesting reasonable empirical success at linking whistle-blowing to managers' opportunity and incentives to commit financial misdeeds.

Turning to incentives for the whistle-blower to come forward, column (A) of Table 5 reports the results of estimating model (2), comparing whistle-blowing targets to the full control sample on dimensions we expect will make whistle-blowers more likely to make a public allegation of wrongdoing. After incorporating the significant factor score reflecting managerial opportunity and incentives from model (1), selected variables representing employees' *incremental* propensity to blow the whistle are significant. Consistent with expectations, whistle-blowing firms in both Press and OSHA samples (i) are well-regarded, (ii) come from QUITAM environments where the whistleblower has an opportunity to share in the proceeds of any fraud-related settlement with the U.S. Government, and (iii) have larger sales. For the Press sample, whistle-blowing events are also more likely to come from older, geographically dispersed and less focused firms. Combined, these results suggest that well-regarded firms with a bureaucratic, non-participatory culture are more likely than the average firm to be subject to whistle-blowing actions originated by employees.

4.2 Whistle-blowing firms versus lawsuit and restatement firms

In columns (B) and (C) of Table 5, we compare whistle-blowers' incentives to make their allegations public (from model 2) to lawsuit and restatement control samples where, although both are tarnished by alleged misdeeds, only the whistle-blowing targets experienced a public whistle-blowing event. If our variables in model (2) differentiate whistle-blowing targets from other firms *where a public whistle-blowing allegation could have been made* (i.e., lawsuit and restatement firms), we increase our

confidence that the results are correctly attributed to our underlying construct, ‘incentives for whistle-blowers to come forward,’ rather than to the existence of financial misdeeds per se.¹⁰

After incorporating the factor score reflecting managerial opportunities and incentives from model (1), we find that variables representing employees’ incremental propensity to blow the whistle tend to cluster by whistle-blowing sample – Press versus OSHA. For the Press sample, we find that whistle-blowing targets are (i) relatively successful in their past stock return performance, (ii) well-regarded, (iii) older, (iv) less concentrated, both in terms of industrial segment activity and geographical spread; and (v) have experienced employee downsizing. For the OSHA sample, whistle-blowing targets (i) tend to be well-regarded; (ii) have lower industrial concentration; (iii) have downsized their workforce; (iv) belong to QUITAM sensitive environments; and (v) tend to be relatively large.

In general, a comparison of whistle-blowing firms to lawsuit and restatement firms suggests that whistle-blowing firms are systematically different than other tarnished firms. These unique environmental factors encourage whistle-blowers to make their allegations public and help explain why some firms are subject to whistle-blowing allegations while other firms that presumably *could* be targeted by whistle-blowers are able to avoid such allegations. These results give us some reassurance that our hypothesized factors and the associated empirical proxies are reasonably effective at modeling employees’ incentives to resort to external whistle-blowing. Overall, we interpret our evidence in Tables 4 and 5 on the public revelation of whistle-blowing allegations as consistent (i) with managers at whistle-blowing firms having the opportunity and incentives to engage in questionable financial practices and (ii) with the whistle-blower having additional motivation to publicize their allegation of financial misconduct.

5.0 What are the immediate and on-going consequences of whistle-blowing allegations? (Q2 & Q3)

5.1 Immediate stock market reactions to whistle-blowing announcements

Recall that we can compute stock market reactions only for the Press sample, as the dates on which the OSHA whistle-blowing events become public are not generally available. Panel A of Table 6 presents

¹⁰ In untabulated results, we did not observe material differences in the opportunity and incentives variables from model (1) between whistle-blowing and lawsuit firms or between whistle-blowing and restatement firms. This is not surprising given all three sets of firms are tarnished ex post by alleged managerial misdeeds.

evidence on the stock market reaction to whistle-blowing events measured around two event-windows: (i) three days centered on the announcement date 0 (day -1 through day 1), and (ii) five days, from the day before the announcement to three days after (day -1 through day 3). RET represents raw returns while CAR signifies market-adjusted returns. The results indicate an average negative 3.03% (2.84%) market-adjusted three-day (five-day) abnormal stock market reaction. The median reactions, while smaller in magnitude, are also consistently negative. Given that the median market capitalization of a Press sample firm is \$7.3 billion (untabulated), market reactions following whistle-blowing allegations cause significant losses in shareholder value, on average. The frequency of negative reactions is also high, ranging from 61.5% (three-day) to 67.9% (five-day) of the sample.

A review of the event dates related to the Press sample reveals that 14 oil and gas sample firms were subject to the same whistle-blowing event related to underpayment of royalties for oil and gas leases to the U.S. government, and hence had a common event date (Amoco, British Petroleum, Burlington Resources, Chevron, Conoco, Exxon, Kerr-McGee, Occidental Petroleum, Pennzoil, Phillips Petroleum, Texaco, TRW, Union Pacific Resources and Unocal Corporation). Moreover, two other sets of firms share a common event date (i) American Maize Products, Archer-Daniels Midland, and CPC International; and (ii) Coca Cola and Lancer. These common event dates represent individual whistle-blower allegations implicating multiple firms. For each of these three sets of common whistle-blowing events, we computed the average return of all firms involved on the common date and treated each average as one observation. Hence, the number of observations drops from 78 to 62 ($78 - 13 - 2 - 1 = 62$). Untabulated results show that the mean three-day cumulative abnormal return (CAR) is negative 3.30% (p-value = 0.028) while the mean five-day CAR is negative 3.15% (p-value = 0.043). Thus, the event study results appear to be robust to the issue of overlapping event dates.

These significant negative reactions suggest that, on average, announcements of whistle-blowing allegations are economically important for the targeted firm and are not immediately seen as frivolous by the stock market. We consider ongoing economic consequences in section 5.3.

5.2 Cross-sectional determinants of the stock market reactions to whistle-blowing announcements

In panel B of Table 6, we include five factors in an attempt to explain the cross-sectional distribution of stock market reactions to a whistle-blowing event. First, we expect larger firms (proxied by SALES) to suffer larger negative stock price reactions. Larger firms have deeper pockets and are more likely to be the subject of a subsequent class action lawsuit. Second, highly regarded firms have more credibility to lose from an external whistle-blowing action reported in the financial press. We measure a firm's reputation based on whether the firm is ranked as most admired or best to work for per *Fortune* magazine (REPUTATION). Third, awareness of whistle-blowing actions likely heightened during and after the Enron and WorldCom scandals. Hence, we expect the stock market to react more negatively to a whistle-blowing action subsequent to these scandals. We define a dummy variable, POST-SCANDAL, set equal to one if the whistle-blowing action was reported in the press in the calendar year 2002 or later. Fourth, we include dummy variables for two common allegations, earnings management and overbilling, which suggest especially large agency issues. EM is set to 1 if the allegation pertains to earnings management (and zero otherwise) and OVERBILLING is set to 1 if the allegation involves overbilling (and zero otherwise).

Panel B of Table 6 presents evidence on the cross-sectional variation in stock price reactions around whistle-blowing allegations. Columns A and B report data related to the three-day and five-day reactions respectively. Only one of our predictions is consistently significant. We find that the stock market views whistle-blowing allegations relatively negatively for firms with alleged earnings management. In column A, the coefficient on EM is -0.097 (t-statistic = -2.09) indicating that allegations related to earnings management result in an incremental (overall) -9.7% (-7.7%) return over the three-day window. In column B, allegations of earnings management indicate an incremental (overall) -14.3% (-7.3%) 5-day return. Hence, it appears that, on average, whistle blowing events are far from trivial for targeted firms, particularly for firms accused of managing earnings.¹¹

¹¹ There is also some weak evidence that over-billing allegations are associated with relatively negative reactions in the 5-days surrounding the whistle-blowing announcement. Incremental (overall) CARs equal -7.1% (-1.1%).

5.3 Ongoing consequences of whistle-blowing events

Evidence of significant negative stock market reactions around the announcement of the whistle-blowing events indicates that, on average, such events have immediate negative consequences for the targeted firms. In this section, we explore four areas of potential ongoing negative consequences: (i) earnings restatements, (ii) shareholder lawsuits, (iii) future operating performance, and (iv) future stock market performance. If a whistle-blowing event uncovers financial reporting or agency problems in the firm, one would expect firms subject to such allegations to be more likely to file future earnings restatements and to be the target of shareholder lawsuits. For completeness, we also investigate whether such actions are associated with weak future operating and stock return performance.

It is important to recognize the importance of the endogeneity of whistle-blowing events to evaluating the consequences of whistle-blowing. In other words, when we assess future corporate consequences such as operating or stock return performance or governance changes, it is entirely possible that whistle-blowing allegations arise from many of the same economic forces that contribute to subsequent problems after a whistle-blowing allegation. Hence, it would be inappropriate to treat the whistle-blowing event as exogenous especially given that we attempt to model the factors associated with whistle-blowing in the first half of the paper. We control for the potential endogeneity of whistle-blowing allegations with future consequences by including the predicted probability of whistle-blowing (WB_HAT) estimated using (i) a combination of the factors discussed in models (1) and (2); and (ii) the full control sample. Note that WB_HAT is similar to propensity scores that researchers have used to create a control sample of firms screened along multiple dimensions allowing for a cleaner test of the effects of a treatment effect (in our case, whistle-blowing) on firm outcomes (e.g., Villalonga 2004, Hillion and Vermaelen 2004 and Cooper et al. 2005).

5.3.1 Do whistle-blowing announcements lead to subsequent earnings restatements?

To assess ongoing consequences (in this and the following lawsuit-based tests), we rely on the restatement and lawsuit samples discussed earlier in section 3.2 with one major exception. Unlike in section 3.2, we do not eliminate whistle-blowing firms that resulted in restatements and lawsuits, as the

purpose of this analysis is to document the existence of such a link – if it exists. Our dependent variable, $RESTATE_{t+3}$, is set to one if a firm experiences an earnings restatement announcement in whistle-blowing event year t or one of the following three years.¹² Note that the GAO report discloses the date of the restatement announcement, and not the years being restated.¹³ Our key independent variable is WB , a dummy set to one if the firm experienced a whistle-blowing event and zero otherwise. We include standard controls for firms' operating characteristics such as size ($SALES$), market-to-book ratio (MB), return volatility ($RISK$), prior stock return performance (RET), leverage (LEV), and untabulated dummies for two-digit SIC based industry membership and years. To address potential endogeneity of the outcomes of whistle-blowing actions, we rely on WB_HAT , the predicted probability of whistle-blowing modeled as a function of several characteristics discussed in sections 2.4 and 2.5. The idea is to assess whether the negative consequences arise from many of the same economic forces that contribute to these other problems.

The time-windows and data selection for the restatement tests need some elaboration. As mentioned above, we assume that whistle-blowing events increase the probability of a restatement announcement within the next three years (including the year of the allegation). Because the GAO restatement data are available only from 1997 to 2005, we are forced to delete observations that occur in and before 1993. Thus, the sample analyzed for these tests includes 67 Press firms, 107 OSHA firms, and 3,333 control firms. Of these, 12 Press firms, 15 OSHA firms, and 185 control firms were subject to restatements in one of the following three years. Results are reported with and without WB_HAT in the upcoming tables.

The evidence in Table 7 indicates that the probability of an earnings restatement is significantly higher in the three years following a whistle-blowing action for both Press and OSHA firms. The OSHA results suggest that negative consequences following a restatement are not merely a mechanistic response

¹² We verified that the whistle-blowing announcement preceded the earnings restatement before the announcement entered the empirical analyses.

¹³ Data on the year being restated is generally patchy and unreliable. Hence, we did not pursue an investigation into the year for which the financial statements were restated.

caused by the issue being raised in the media. Interestingly, the introduction of WB_HAT does not appear to affect inferences. In sum, whistle-blowing firms are more likely to restate earnings after controlling for the economic forces associated with the firm being a whistle-blowing target and discussed in sections 2.4 and 2.5.

5.3.2 Do whistle-blowing announcements lead to subsequent shareholder lawsuits?

Table 8 provides evidence on whether whistle-blowing allegations are a precursor to shareholder lawsuits. Because we have lawsuit data from 1988 to 2006, truncated data is not a concern in this analysis. The sample analyzed for this test includes 67 Press firms, 107 OSHA firms, and 3,335 control firms. Of these, 20 Press firms, 11 OSHA firms, and 171 control firms were subject to a lawsuit in one of the following three years. The results reported in Table 8 indicate that a whistle-blowing event significantly increases the probability of being sued for Press firms and for OSHA firms. Again, the introduction of WB-HAT does not affect inferences. In summary, the evidence in Tables 7 and 8 suggests that, on average, a whistle-blowing event can be an early warning indicator of future financial irregularities being revealed by firms (via earnings restatements) or alleged by shareholder lawsuits.

5.3.3 Are whistle-blowing events associated with relatively poor future operating performance?

In this and the following section, we evaluate whether whistle-blowing allegations serve as an early warning of negative future operating or stock price performance. The link between a whistle-blowing event and negative future performance can be motivated in at least three ways. First, given our earlier evidence that whistle-blowing is a significant indicator of subsequent earnings restatements and lawsuits, it is perhaps natural to expect negative future performance subsequent to a whistle-blowing event. Second, managers may engage in defensive actions to mitigate negative publicity and other consequences of a whistle-blowing event. Such defensive efforts can distract managers from normal everyday profit-seeking activities and siphon funds away from strategic investments. Third, a whistle-blowing event can hurt the firm's image with its stakeholders, result in a loss of confidence in management, increase the probability of management turnover and/or increase the perception that additional financial reporting or agency problems are lurking.

In analyzing the link between whistle-blowing events and future operating performance, we calculate cumulative return on assets (ROA) for three time windows following the whistle-blowing event ranging from one to three years (i.e., ROA for year +1; +1 and +2; and +1, +2 and +3). We treat ROA as the dependent variable in a regression, where the independent variables are WB, ROA for the whistle-blowing event year t , size (SALES), and industry and year dummies. We include the whistle-blowing event year ROA in the model to account for mean-reversion in firms' ROAs (Barber and Lyon 1996). Size, industry and time based dummies represent standard control variables in a future performance regression following Barber and Lyon (1996) and Holthausen and Larcker (1996). To account for potential endogeneity in whistle-blowing outcomes, we include WB_HAT in all ROA regressions.

Table 9 presents evidence on whether firms subject to whistle-blowing events report poorer operating performance in the years following such allegations. The data in Table 9 indicate a positive (negative) coefficient on WB in the first year after the allegation for the Press (OSHA) sample. Hence, there does not appear to be a consistent pattern to operating performance after the allegation. There is no association between the allegation and ROA two or three years out. Untabulated results using cash flow from operations (CFO) in place of net income in the numerator of the ROA metric are the same as those obtained for ROA. We perform this sensitivity test to abstract from any income-decreasing accruals taken as a consequence of the whistle-blowing allegation.

5.3.4 Are whistle-blowing events associated with relatively poor future stock price performance?

Table 10 presents data on future stock return performance of firms subject to whistle-blowing allegations. In particular, we consider monthly returns over three years following the month in which the whistle-blowing allegation becomes public. Thus, this event window does not overlap with our immediate consequences tests in sections 5.1 and 5.2. Our benchmark model for returns includes the Fama-French market factor (MKT), the Fama-French size factor (SMB), the Fama-French market-to-book (HML) factor, and the Fama-French momentum factor (MOM), all drawn from Ken French's website. The regressions are conducted using a firm-month as the unit of analysis. For example, the number of firm-month

observations entering the regressions in the Press sample for year +1 is 902 because not all the 81 unique Press firms underlying this analysis have 12 complete months of returns data.

The variable of interest in these analyses is the intercept term. If whistle-blowing allegations are associated with poor future stock return performance, we ought to observe negative returns, on average, after controlling for other factors influencing stock returns. The results are not consistent with this prediction. We only observe negative but insignificant stock returns in the first year after the whistle-blowing event. In contrast, we observe positive and significant stock returns in year +3 for both the Press and OSHA samples. One potential explanation for this result is that a whistle-blowing event can reveal agency problems that are ultimately repaired by the firm and rewarded in the stock market. One such remedial event could be an improvement in the quality of corporate governance.

6.0 Do whistle blowing targets respond by changing corporate governance? (Q4)

In this section, we investigate our fourth research question (Q4): what actions (if any) do whistle-blowing targets take to improve corporate governance following the revelation of a whistle-blowing allegation and do such governance changes influence investors? It is not obvious that all firms will take actions to improve corporate governance following a whistle-blowing event. For example, a targeted firm can easily initiate cosmetic changes such as replacing one set of inside directors with another set of insiders. In extreme cases, a target firm might even fire the whistle-blower.

6.1 Changes in governance variables

We hand-collect governance data for the Press sample of whistle-blowing firms from their 10-Ks and proxy statements.¹⁴ To limit hand-collection of data to manageable levels, we focus on six aspects of governance, details of which have been discussed before in section 2.5: (i) the number of directors on the board (DIRECTORS); (ii) the proportion of insiders on the board (%INS_DIR); (iii) the proportion of the board composed of busy directors where busy is defined as three additional directorships (%BUSY); (iv) the percentage attendance at board meetings (%ATTEND); (v) the proportion of firms with a new CEO

¹⁴ Note that we hand-collect proxy data to assess subsequent governance changes, rather than use the IRRC data used in Section 2.4, in order to maximize the number of useable Press observations in this analysis.

(NEW_CEO%) and (vi) the proportion of firms where the CEO is also the chairman of the board (CEO=COB%).

Of the 81 possible Press firms, we are unable to find 10-Ks and/or proxy statements for 24 firms. We did not consider OSHA firms for this test because (i) a sufficient numbers of years have not elapsed subsequent to 2004, the last year for which we have OSHA data, and (ii) whistle-blowing events at OSHA firms appear to be less visible and the motivation for governance changes would presumably be lower, suggesting OSHA sample tests would have low power.

Panel A of Table 11 presents descriptive data on each of these six variables from the year before the whistle-blowing event (year -1) to two years after the event occurs (year +2), i.e., we report the average level of each variable for all available Press firms for each year. For example, in year -1, 22.9% of the board of the average Press firm consisted of inside directors. By year +2, that number declined to 18.6%, and the change of 4.3% is statistically significant (not tabulated). As reported in panel A, changes over the three-year period -1 to +2 are in the predicted direction for all six governance variables and five are significant at the 5% level or better (not tabulated).

While this evidence is consistent with whistle-blowing events being a precursor to significant changes in management and governance at targeted firms, it does not control for improvements in governance at control firms. Since the period following the accounting scandals and SOX encouraged governance improvements, we also collected governance data for a sample of matched firms that were not subject to a whistle-blowing allegation. We select matched firms with the same four-digit SIC code, within the same stock exchange, and with net sales as close as possible to the whistle-blowing firm's net sales for the year before the whistle-blowing event.¹⁵ The governance data over the corresponding years for these matched firms is also reported in panel A of Table 11.

Panel B of Table 11 reports the multivariate analyses that compare each governance change shown in Panel A between whistle-blowing firms and the matched firms. Control variables considered are size

¹⁵ If we cannot find a match firm within the same four-digit SIC code, then we relax the matching criteria to include firms with the same three-digit SIC code, and if necessary, the same two-digit SIC code.

(SALES), past stock market performance (RET), and WB_HAT, a control for the possibility that the same economic forces associated with whistle-blowing allegation also prompted governance improvements. We find that, compared to the matched control sample, firms exposed to whistle-blowing allegations are more likely to reduce the size of the board, reduce insider participation on the board, increase the number of board meetings and are more likely to replace their CEO. These results hold after the introduction of WB_HAT suggesting that the whistle-blowing allegation, per se, is associated with governance improvements. Thus, on average, whistle-blowing target firms appear to change governance on at least four dimensions that exceed the widespread governance improvements occurring in the post-SOX era.

6.2 Robustness tests

Our results are robust to two additional sensitivity checks detailed below:

- (i) *Prominent firms*: We eliminated Enron, Tyco and WorldCom from our analyses to ensure that our results are not driven by these prominent firms. Untabulated analyses confirm our results are qualitatively unaffected.
- (ii) *Rank regressions*: To ensure that outliers do not affect our regression results, we created ranks scaled to range from 0 to 1 on all continuous independent variables used in various tests and repeated our analyses. Inferences remain qualitatively similar to the ones reported above.

7.0 Conclusions

We investigate whistle-blowing – an important, but generally unexplored, mechanism for discovering information about agency problems at firms. We contribute to an emerging literature on how information about financial misdeeds reaches the stock market. While whistle-blowing has received considerable attention in recent years after (i) whistle-blowers were responsible, in part, for uncovering the accounting scandals at Enron and WorldCom, and (ii) provisions in SOX were enacted to protect potential whistle-blowers, little is known about the nature of firms that are subject to whistle-blowing and whether such allegations are economically significant events with meaningful consequences for the targeted firms. Unlike other research to date, our focus is on (i) why employees reveal financial misdeeds either to the

press or a regulator (OSHA), (ii) the economic consequences of such revelations and (iii) firms' responses via governance changes subsequent to employee whistle-blowing allegations.

Specifically, we report new empirical evidence on 218 whistle-blowing events between 1989 and 2004. Our paper adds to the literature on corporate governance in four ways. First, we conduct a cross-sectional analysis of the characteristics of firms subject to whistle-blowing. We find that, relative to control firms, whistle-blowing targets are associated with stronger incentives (i) for managers to commit financial wrongdoing and (ii) for employees to publicly expose their allegations to the press or to a regulator. While it may not be surprising that whistle-blowing targets are different from the broad cross-section of firms, it is important to emphasize that they are also different from other firms tarnished by financial misdeeds. Compared to firms with revelations of potential financial misdeeds (shareholder class action lawsuits and earnings restatements) but where no public whistle-blowing occurred, we find evidence that firms targeted by whistle-blowers (i) have better operating and/or stock price performance; (ii) are highly regarded; (iii) are more likely to have a bureaucratic work culture; (iv) have downsized their workforce; and (v) are in industries where the whistleblower shares in the proceeds of any fraud-related settlement with the U.S. Government. This evidence is broadly consistent with whistle-blowers targeting good performers and highly-regarded firms, perhaps because such firms are newsworthy or because whistle-blowers have additional motivation to expose dubious practices that are perceived to enable the firm to report strong performance. Firms that have a bureaucratic work environment or that have downsized are more likely to be associated with a whistle-blowing event, perhaps because in such environments, workers are more likely to feel animosity toward the firm and internal complaints are more likely to go unheard or unaddressed. Perhaps not surprisingly, the Federal False Claims Act, which awards whistle-blowers part of recovered proceeds from fraud settlements with government contractors, appears to be effective in stimulating allegations of wrongdoing.

Second, we present evidence that, on average, whistle-blowing allegations have an immediate negative economic consequence for the target firm. The average market-adjusted return in three days

around the day the allegation becomes public is -3%. Further, the stock market reaction is substantially more negative when the whistle-blower alleges earnings management (-7.7%).

Third, our evidence suggests a whistle-blower's allegations can serve as an early warning of future negative economic consequences, including earnings restatements and shareholder lawsuits. Surprisingly, stock return performance was relatively positive in the third year after the allegation, consistent with the firm responding to whistle-blowing allegations by improving governance and reducing agency costs.

Fourth, we find that, on average, whistle-blowing targets improve corporate governance after the allegation is made public. Whistle-blowing targets improved several dimensions of governance relative to the year before the whistle-blowing event, and relative to a matched sample of control firms, were more likely to decrease the size of the board, reduce insider representation on their boards, increase the number of board meetings and replace their CEO.

In sum, whistle-blowing is far from a trivial nuisance to target firms. On average, unique firm-specific factors appear to lead employees to expose alleged financial misdeeds. These allegations result in both short term and long term negative consequences, and firms appear to respond to these allegations by taking actions to improve corporate governance.

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Appendix A Variable Definitions

Managerial Incentives for Financial Misdeeds:

FIN_NEED = an indicator variable equal to one if the firm's free cash flow in the year prior to the whistle-blowing event is less than -0.1, and zero otherwise. Similar to Dechow, Sloan and Sweeney (1996), we calculate free cash flow as cash flows less the average capital expenditure (Compustat annual #128) over the last three years, deflated by average total assets.

M&A = an indicator variable coded as 1 if the firm was involved in a merger or acquisition (Compustat AFTN #1) in year t or in any one of the 3 years prior to the whistle-blowing event, and 0 otherwise.

ABSDACC = the absolute value of discretionary accruals for the fiscal year before the whistle-blowing event. Discretionary accruals are calculated as the fitted values from the following regression (2): $TOTACC = \beta_0 + \beta_1\Delta REV + \beta_2PPE + \beta_3CFO + \beta_4ROA + \text{error}$. This regression is estimated each year for every two-digit SIC code conditional on having at least 10 firms in an industry. Note that $TOTACC$ = total accruals, defined as income before extraordinary items minus cash flow from operations plus extraordinary items (CompUSA annual #18 – Compustat annual #308 + Compustat annual #124), ΔREV = the change in revenue (Compustat annual #12), PPE = plant, property, and equipment (Compustat annual #7), CFO = cash from operations (Compustat annual #308). ROA is defined below. Each variable in regression (2) is scaled by total assets (Compustat annual #6) at the beginning of the period.

SLS_GRWTH = sales growth, defined as the average growth in sales (Compustat annual #12) over the three years prior to the whistle-blowing event.

EPS_GROWTH = the percentage of the twelve quarters immediately preceding the whistle-blowing event with seasonally-adjusted EPS growth (Compustat quarterly #11).

D_{BLOCK} = an indicator variable coded as 1 if the firm has block-holder ownership data described next, and 0 otherwise.

BLOCK = percentage 5% block-holder ownership of the firm in the year prior to the whistle-blowing event obtained from Compact Disclosure.

D_{PP} = an indicator variable coded as 1 if the firm has pension fund ownership data described next, and 0 otherwise.

PP = percentage pension ownership of the firm in the year prior to the whistle-blowing event obtained from Cremers and Nair (2004).

D_{EXECCOMP} = an indicator variable coded as 1 if the firm has sufficient Execucomp data to calculate EXECCOMP described next, and 0 otherwise.

EXECCOMP = the value of the CEO's in-the-money exercisable stock options, scaled by the CEO's wealth. CEO wealth is defined as the sum of the CEO's salary, bonus, the value of stock ownership, and the value of all in-the-money options. This variable is measured for the year prior to the whistle-blowing event.

Appendix A (continued)
Variable Definitions

D_{IRRC} = an indicator variable coded as 1 if the firm has sufficient IRRC data to calculate DIRECTORS<INSIDER_PCT, CEO=COB, BUSY_PCT, AND ATTEND, and 0 otherwise.

DIRECTORS = the number of directors on the firm's board of directors in the year before the whistle-blowing event.

INSIDER_PCT = the percentage of directors who are insiders in the year before the whistle-blowing event.

ATTEND = the percentage of board members who attended at least 75% of the board committee meetings in the year before the whistle-blowing event.

CEO=COB = an indicator variable coded as 1 if the firm's CEO is also the chairman of the board (COB) in the year before the whistle-blowing event, and 0 otherwise.

BUSY_PCT = the percentage of directors who are "busy" in the year before the whistle-blowing event, where "busy" is defined as serving on at least 3 other corporate boards.

D_{NEW_CEO} = an indicator variable coded as 1 if the firm has sufficient IRRC data to calculate NEW_CEO, and 0 otherwise.

NEW_CEO = an indicator variable coded as 1 if the firm has a new CEO in the year before the whistle-blowing event, and 0 otherwise.

SALES = total sales revenue (Compustat annual #12) for the year before the whistle-blowing event.

Employee Motivations to Blow the Whistle

ROA = return-on-assets, defined as net income before extraordinary items divided by beginning-of-year total assets (Compustat annual #19 / Compustat annual #6), measured as of the end of the fiscal year before the whistle-blowing event.

RET = market-adjusted buy-and-hold returns for 12 months, beginning from month -12 and ending month -1, with month 0 is the month the whistle-blowing was reported in the press or to OSHA.

REPUTATION = an indicator variable coded as one if the firm has appeared on Fortune's "Best Companies to Work For" list or on Fortune's "Most Admired Companies" list in any of the five years prior to the whistle-blowing event, and coded as 0 otherwise.

AGE = the number of years the firm has been on CRSP as of the year of the whistle-blowing event.

D_{IND_CONC} = an indicator variable coded as 1 if the firm has sufficient Compustat segment data to calculate IND_CONC described next, and 0 otherwise.

Appendix A (continued)
Variable Definitions

IND_CONC = the Hirfindahl-Hirschman index based on the revenue for each of the firm's industry segments, calculated as the sum of squares of each industry segment's revenue as a percentage of total firm revenue. This variable is calculated for the year prior to the whistle-blowing event. See Bushman et al. (2004).

D_{GEO_CONC} = an indicator variable coded as 1 if the firm has sufficient Compustat segment data to calculate GEO_CONC described next, and 0 otherwise.

GEO_CONC = the Hirfindahl-Hirschman index based on the revenue for each of the firm's geographic segments, calculated as the sum of squares of each geographic segment's revenue as a percentage of total firm revenue. This variable is calculated for the year prior to the whistle-blowing event. See Bushman et al. (2004).

DOWNSIZE = employee growth, defined as the average growth in the total employees, (Compustat annual #29) over the three years prior to the whistle-blowing event.

QUITAM = an indicator variable coded as 1 if the firm (a) is in the healthcare industry (2-digit SIC code = 80), or (b) has appeared on the "100 Companies Receiving the Largest Dollar Volume of Prime Contract Awards" list in any of the 3 years prior to the whistle-blowing event, and 0 otherwise.

Table 1
Sample Description

Panel A: Whistle-blowing Allegations by Year

	Press	OSHA		Press	OSHA
1989	1	n/a	1997	2	n/a
1990	0	n/a	1998	23	n/a
1991	1	n/a	1999	2	n/a
1992	3	n/a	2000	5	n/a
1993	4	n/a	2001	4	n/a
1994	5	n/a	2002	13	12
1995	5	n/a	2003	8	62
1996	5	n/a	2004	0	63
				81	137

Panel B: Whistle-blowing by Type of Allegation

	Press	%	OSHA	%
Earnings Management	24	29.6%	16	11.7%
Improper Disclosure	1	1.2%	4	2.9%
Overbilling	40	49.4%	3	2.2%
Insider Trading	3	3.7%	1	0.7%
Price Fixing	6	7.4%	0	0.0%
Tax Fraud	2	2.4%	0	0.0%
Securities Law Violations	0	0.0%	10	7.3%
Accounting Irregularities (in general)	1	1.2%	26	19.0%
Corporate Governance Issues	0	0.0%	3	2.2%
Fraud	0	0.0%	14	10.2%
Other	4	4.9%	18	13.1%
No Info	0	0.0%	42	30.7%
	81		137	

Table 1 (continued)
Sample Description

Panel C: Examples of Whistle-blowing Allegations

Allegation	Example and Target Firm
Earnings Management	“...allegations by a former internal auditor who says the soft-drink company engaged in massive fraud to inflate annual revenue by millions of dollars.” Coca-Cola
Improper Disclosure	“...concerns...in regards to inadequate SEC filings.” Ashland Inc.
Overbilling	“...alleges that TRW defrauded the government of more than \$ 50 million by improperly assigning the expense of developing a new space launch vehicle, so that the government would pay for it.” TRW Inc.
Insider Trading	“... alleges he was terminated for bringing possible insider trade issues to the attention of the Audit Committee.” ATA Holdings
Price Fixing	“...about alleged kickbacks, price fixing and unethical activities at some of the firm’s operations.” Johnson Controls
Tax Fraud	“...the required taxes on bonuses were not being paid by it (Wyeth) or by its executives.” Wyeth
Securities Law Violations	“...provided information...regarding violations of applicable federal and state laws protecting shareholders.” OfficeMax, Inc.
Accounting Irregularities (in general)	“...notable accounting irregularities (including revenue recognition issues) at the firm.” Framatome ANP
Corporate Governance Issues	“...concerns about the unsatisfactory level of internal controls at the firm...alleges the firm didn’t want these concerns to be addressed in future interviews with Deloitte & Touche, the external auditor.” E-TRADE Group, Inc.
Fraud	“...alleges financial improprieties and possible fraud.” Weyerhaeuser
Other	“concerns...about possible ethical misconduct by a financial advisor.” Raymond James Financial

Table 1 (continued)
Sample Description

Panel D: Sample Firms, By Industry

	Press	%	OSHA	%
Health Services	8	9.9%	1	0.7%
Chemicals and Allied Products	7	8.6%	7	5.1%
Oil and Gas Extraction	7	8.6%	0	0.0%
Transportation Equipment	6	7.4%	1	0.7%
Petroleum Refining	6	7.4%	0	0.0%
Food and Kindred Products	5	6.2%	1	0.7%
Electrical Equipment	4	4.9%	4	2.9%
Business Services	4	4.9%	20	14.6%
Communications	3	3.7%	5	3.6%
Nonclassifiable Establishment	3	3.7%	2	1.5%
Measuring Instruments	3	3.7%	7	5.1%
Depository Institutions	3	3.7%	12	8.8%
Apparel and Accessory Stores	2	2.5%	1	0.7%
Misc. Retail	2	2.5%	1	0.7%
Building Construction	2	2.5%	2	1.4%
Industrial Machinery / Computers	2	2.5%	10	7.3%
Durable Goods – Wholesale	2	2.5%	0	0.0%
Apparel and Other Finished Products	1	1.2%	1	0.7%
Furniture and Fixtures	1	1.2%	1	0.7%
Misc. Manufacturing Industries	1	1.2%	1	0.7%
Food Stores	1	1.2%	2	1.5%
Auto Dealers, Gas Stations	1	1.2%	2	1.5%
Real Estate	1	1.2%	2	1.5%
Holding, Other Investment Offices	1	1.2%	2	1.5%
Amusement, Recreations	1	1.2%	2	1.5%
Nondurable Goods – Wholesale	1	1.2%	4	2.9%
Electric, Gas, Sanitary Services	1	1.2%	8	5.8%
Insurance Carriers	1	1.2%	7	5.1%
Motion Pictures	1	1.2%	0	0.0%
Security and Commodity Brokers	0	0.0%	10	7.3%
Eating and Drinking Places	0	0.0%	4	2.9%
Engineering, Accounting, Mgmt. Services	0	0.0%	3	2.2%
Nondepository Credit Institutions	0	0.0%	5	3.6%
Transportation by Air	0	0.0%	2	1.5%
Insurance Agents, Brokers and Service	0	0.0%	1	0.7%
General Merchandise Stores	0	0.0%	1	0.7%
Building Materials, Hardware, Garden – Retail	0	0.0%	1	0.7%
Motor Freight Transportation	0	0.0%	1	0.7%
Lumber and Wood Products (except furniture)	0	0.0%	1	0.7%
Stone, Clay, Glass, and Concrete Production	0	0.0%	1	0.7%
Coal Mining	0	0.0%	1	0.7%
	81		137	

Table 2
Sample Selection for Whistle-Blowing Firms varies with the Tests Conducted

Sample Selection Criteria	Number of Remaining Observations					
	Press Sample			OSHA Sample		
	Test of Determinants	Test of Market Reaction	Tests of Consequences	Test of Determinants	Test of Market Reaction	Tests of Consequences
Initial Sample ^a	81 firms	81 firms	81 firms	137 firms	n/a	137 firms
Firms with requisite Compustat data for tests in table indicated ^b	69 firms (Table 4)		51 firms (Table 9)	99 firms (Table 4)		84 firms (Table 9)
Firms with requisite CRSP data for tests in table indicated ^{b,c}	67 firms (Table 5)		78 firms (Table 10)	95 firms (Table 5)		131 firms (Table 10)
Firms with requisite restatement and/or lawsuit data			67 firms (Tables 7 and 8)			107 firms (Tables 7 and 8)
Firms with requisite proxy data ^d			57 firms (Table 11)			n/a
Firms with return data for the 3-day (5-day) event window		78 firms (Table 6)			n/a	
Total # of firms used in test	67 – 69 firms	78 firms	51 – 78 firms	95 – 99 firms	n/a	84 – 131 firms

^a The initial sample consists of all firms that are used in one of the analyses in this study.

^b For the consequences tests that use 2 or 3 years of subsequent data, there may be fewer firms with sufficient data.

^c The test of determinants requires CRSP data for the year before the event date.

^d We examine proxy statements only for the Press sample.

Table 3
Univariate Determinants of a Whistle-Blowing Allegation

Panel A: Univariate Statistics for Press, OSHA, and Control Samples – Managerial Opportunity and Incentives

	Means			Tests of Significance ^a		
	Press (n=69)	OSHA (n=99)	Control (n=4,648)	Pred. Sign	Press vs. Control	OSHA vs. Control
FIN_NEED	0.106	0.165	0.185	+	0.990	0.731
M&A	0.558	0.643	0.518	+	0.236	0.004***
ABSDACC	0.056	0.065	0.072	+	0.985	0.892
SLS_GRWTH	0.115	-0.075	-0.578	+	0.112	0.195
EPS_GRWTH	0.615	0.579	0.595	+	0.175	0.811
D _{BLOCK}	0.333	0.414	0.119	?	<.001***	<.001***
BLOCK ^b	14.81	14.94	24.63	-	0.002***	<.001***
D _{PP}	0.768	0.566	0.395	?	<.001***	<.001***
PP ^c	2.885	2.517	2.301	-	0.999	0.977
D _{EXECCOMP}	0.768	0.657	0.305	?	<.001***	<.001***
EXECCOMP ^d	0.234	0.206	0.171	+	0.001***	0.109
D _{IRRC}	0.551	0.616	0.232	?	<.001***	<.001***
DIRECTORS ^c	12.184	10.590	8.986	+	<.001***	<.001***
INSIDER_PCT ^c	0.330	0.298	0.374	+	0.982	0.999
ATTEND ^c	0.976	0.965	0.986	-	0.245	0.063*
CEO=COB ^c	0.921	0.852	0.778	+	0.002***	0.086*
BUSY_PCT ^c	0.214	0.150	0.099	+	0.001***	0.004**
D _{NEW_CEO}	0.000	0.081	0.015	?	<.001***	0.019**
NEW_CEO ^f	n/a	0.250	0.029	+	n/a	0.110
SALES	13,076	12,422	1,323	+	<.001***	<.001***

Notes to Table 3, Panel A:

All variables are as defined in Appendix A.

*, **, ***: significant at 10%, 5%, 1% p-values. P-values are one-sided for variables with directional predictions. We report (1-p) values for coefficients that assume a sign opposite to the one predicted.

^a P-values are associated with t-statistics. When tests indicate inequality of variances at the 10% level, we report t-statistics that assume unequal variances. Otherwise, we report t-statistics that assume equal variances.

^b For the BLOCK variable we report the mean values only for observations with requisite data from Compact Disclosure. The sample sizes are 24 for the Press sample, 45 for the OSHA sample, 557 for the full Control sample, 190 for the Lawsuit sample, and 239 for the Restatement sample.

^c For the PP variable we report the mean values only for observations with requisite data from Cremers and Nair (2004). The sample sizes are 54 for the Press sample, 60 for the OSHA sample, 1,845 for the full Control sample, 541 for the Lawsuit sample, and 523 for the Restatement sample.

^d For the EXECCOMP variable we report the mean values only for observations with requisite data from Execucomp. The sample sizes are 54 for the Press sample, 68 for the OSHA sample, 1,424 for the full Control sample, 471 for the Lawsuit sample, and 526 for the Restatement sample.

Table 3 (continued)
Univariate Determinants of a Whistle-Blowing Allegation

Notes to Table 3, Panel (continued):

^e For the DIRECTORS, INSIDER_PCT, ATTEND, CEO=COB, and BUSY_PCT variables we report the mean values only for observations with requisite data from the IRRC database. The sample sizes are 39 for the Press sample, 64 for the OSHA sample, 1,081 for the full Control sample, 311 for the Lawsuit sample, and 472 for the Restatement sample.

^f For the NEW_CEO variable we report the mean values only for observations with requisite data from the IRRC database. The sample sizes are 0 for the Press sample, 8 for the OSHA sample, 72 for the full Control sample, 24 for the Lawsuit sample, and 38 for the Restatement sample.

Table 3 (continued)
Univariate Determinants of a Whistle-Blowing Allegation

Panel B: Univariate Statistics for Press, OSHA, Control, Lawsuit, and Restatement Samples – Environment Variables

	Means					Tests of Significance ^a						
	Press (n=67)	OSHA (n=95)	Control (n=4,553)	Lawsuit (n=1,119)	Restate (n=1,304)	Pred. Sign	Press vs. Control	Press vs. Lawsuit	Press vs. Restate	OSHA vs. Control	OSHA vs. Lawsuit	OSHA vs. Restate
ROA	0.042	-0.023	-0.026	-0.383	-0.084	+	<.001***	<.001***	<.001***	0.457	<.001***	0.018**
RET	0.088	0.167	0.167	-0.281	0.083	+	0.827	<.001***	0.436	0.492	<.001***	0.061**
REPUTATION	0.060	0.126	0.012	0.021	0.013	+	0.053*	0.110	0.405	0.001***	0.002***	0.001***
AGE	32.97	19.44	11.97	9.58	14.10	+	<.001***	<.001***	<.001***	<.001***	<.001***	0.007***
D _{IND_CONC}	0.985	0.947	0.979	0.979	0.962	?	0.674	<.001***	0.236	0.179	0.257	0.514
IND_CONC ^b	0.660	0.649	0.833	0.827	0.758	-	<.001***	<.001***	0.009***	<.001***	<.001***	0.006***
D _{GEO_CONC}	0.970	0.863	0.939	0.910	0.900	?	0.141	0.005***	0.006***	0.037**	0.185	0.357
GEO_CONC ^c	0.678	0.727	0.804	0.746	0.759	-	<.001***	0.054*	0.015**	0.003***	0.360	0.145
DOWNSIZE	0.126	0.077	0.142	0.321	0.166	-	0.302	<.001***	0.074*	0.006***	<.001***	0.002***
QUITAM	0.254	0.095	0.028	0.039	0.031	+	<.001***	0.001***	<.001***	0.015**	0.046**	0.020**

Notes to Table 3, Panel B:

All variables are as defined in Appendix A.

*, **, ***: significant at 10%, 5%, 1% p-values. P-values are one-sided for variables with directional predictions. We report (1-p) values for coefficients that assume a sign opposite to the one predicted.

^a P-values are associated with t-statistics. When tests indicate inequality of variances at the 10% level, we report t-statistics that assume unequal variances. Otherwise, we report t-statistics that assume equal variances.

^b For the IND_CONC variable we report the mean values only for observations with requisite data from the Compustat Segment files. The sample sizes are 66 for the Press sample, 90 for the OSHA sample, 4,456 for the full Control sample, 1,096 for the Lawsuit sample, and 1,255 for the Restatement sample.

^c For the GEO_CONC variable we report the mean values only for observations with requisite data from the Compustat Segment files. The sample sizes are 65 for the Press sample, 82 for the OSHA sample, 4,273 for the full Control sample, 1,018 for the Lawsuit sample, and 1,168 for the Restatement sample.

Table 4
What are Characteristics of Firms subject to Whistle-Blowing Allegations? (Q1a)

Logistic Regressions

Dependent variable = 1 if the firm experiences a whistle-blowing allegation, 0 otherwise, and the model is

$$\text{Pr(Whistle-blowing)} = \beta_0 + \beta_1 \text{FIN_NEED} + \beta_2 \text{M\&A} + \beta_3 \text{ABSDACC} + \beta_4 \text{SLS_GRWTH} + \beta_5 \text{EPS+GRWTH} + \beta_6 \text{D}_{\text{BLOCK}} + \beta_7 \text{D}_{\text{BLOCK}} * \text{BLOCK} + \beta_8 \text{D}_{\text{PP}} + \beta_9 \text{D}_{\text{PP}} * \text{PP} + \beta_{10} \text{D}_{\text{EXECCOMP}} + \beta_{11} \text{D}_{\text{EXECCOMP}} * \text{EXECCOMP} + \beta_{12} \text{D}_{\text{IRRC}} + \beta_{13} \text{D}_{\text{IRRC}} * \text{DIRECTORS} + \beta_{14} \text{D}_{\text{IRRC}} * \text{INSIDER_PCT} + \beta_{15} \text{D}_{\text{IRRC}} * \text{ATTEND} + \beta_{16} \text{D}_{\text{IRRC}} * \text{CEO=COB} + \beta_{17} \text{D}_{\text{IRRC}} * \text{BUSY+PCT} + \beta_{18} \text{D}_{\text{NEW_CEO}} + \beta_{19} \text{D}_{\text{NEW_CEO}} * \text{NEW_CEO} + \beta_{20} \text{SALES} + \text{IndustryDummies} + \text{YearDummies} + \text{error} \quad (1)$$

Independent Variables	Pred. sign	WB vs. Control			
		Press		OSHA	
		Coeff.	p-value	Coeff.	p-value
<i>Opportunity and Incentives</i>					
FIN_NEED	+	0.25	0.339	1.07	0.005***
M&A	+	0.17	0.318	0.30	0.154
ABSDACC	+	0.01	0.498	-0.27	0.755
SLS_GRWTH	+	0.49	0.280	0.00	0.475
EPS_GRWTH	+	-1.08	0.902	0.50	0.248
D_BLOCK	?	0.07	0.915	1.60	0.002***
D_BLOCK*BLOCK	-	-0.02	0.231	-0.04	0.019**
D_PP	?	0.16	0.740	-0.37	0.493
D_PP*PP	-	0.11	0.916	-0.33	0.049**
D_EXECCOMP	?	1.71	0.002***	0.61	0.239
D_EXECCOMP*EXECCOMP	+	0.07	0.472	0.23	0.389
D_IRRC	?	-11.20	0.076*	6.12	0.027**
D_IRRC*DIRECTORS	+	0.48	<.001***	0.15	0.015**
D_IRRC*INSIDER_PCT	+	0.19	0.449	-2.51	0.985
D_IRRC*ATTEND	-	5.69	0.831	-5.94	0.010***
D_IRRC*CEO=COB	+	1.35	0.058*	0.11	0.410
D_IRRC*BUSY_PCT	+	0.79	0.320	0.76	0.733
D_NEW_CEO	?	-12.02	0.969	0.46	0.396
D_NEW_CEO*NEW_CEO	+	1.21	0.500	1.66	0.142
SALES	+	0.00	<.001***	0.00	<.001***
Pseudo-R ²		44.9%		41.3%	
N		N _{Press} = 69		N _{Osha} = 99	
		N _{Control} = 4,648		N _{Control} = 4,648	

Notes to Table 4:

All variables are as defined in Appendix A.

*, **, ***: significant at 10%, 5%, 1% p-values. P-values are one-sided for variables with directional predictions. We report (1-p) values for coefficients that assume a sign opposite to the one predicted.

Table 5
What Firm Characteristics lead Employees to make Whistle-Blowing Allegations Public? (Q1b)

Logistic Regressions

Dependent variable = 1 if the firm experiences a whistle-blowing allegation, 0 otherwise, and the model is

$$\text{Pr(Whistle-blowing)} = \beta_0 + \beta_1 \text{Factor score of independent variables from (1)} + \beta_2 \text{ROA} + \beta_3 \text{PAST_RET} + \beta_4 \text{REPUTATION} + \beta_5 \text{AGE} + \beta_6 \text{D}_{\text{IND_CONC}} + \beta_7 \text{D}_{\text{IND_CONC}} * \text{IND_CONC} + \beta_8 \text{D}_{\text{GEO_CONC}} + \beta_9 \text{D}_{\text{GEO_CONC}} * \text{GEO_CONC} + \beta_{10} \text{DOWNSIZE} + \beta_{11} \text{QUITAM} + \beta_{12} \text{SALES} + \text{IndustryDummies} + \text{YearDummies} + \text{error} \quad (2)$$

Independent Variables	Pred. sign	(A) WB vs. Control				(B) WB vs. Lawsuit				(C) WB vs. Restate			
		Press		OSHA		Press		OSHA		Press		OSHA	
		Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value	Coeff	p-value
FACTOR	+	0.61	0.001***	0.40	0.001***	0.30	0.161	0.11	0.278	0.51	0.026**	0.45	0.002***
<i>Environmental Variables</i>													
ROA	+	-0.14	0.558	-0.50	0.866	1.20	0.266	0.31	0.308	0.65	0.334	0.27	0.256
RET	+	0.08	0.393	-0.20	0.769	0.38	0.033**	0.22	0.103	0.39	0.015**	-0.05	0.622
REPUTATION	+	1.74	0.005***	1.74	<0.001***	1.41	0.090*	0.71	0.145	0.71	0.302	2.01	0.001***
AGE	+	0.03	0.005***	0.01	0.181	0.05	0.001***	0.01	0.202	0.02	0.103	0.01	0.250
D _{IND_CONC}	?	1.58	0.182	0.71	0.307	5.22	0.651	0.81	0.382	-0.09	0.954	-0.47	0.520
D _{IND_CONC} * IND_CONC	-	-1.42	0.011**	-0.50	0.145	-2.63	0.016**	-1.21	<0.029**	-0.11	0.455	0.42	0.777
D _{GEO_CONC}	?	1.53	0.124	-0.81	0.199	1.58	0.354	-1.06	0.168	1.29	0.353	-1.00	0.159
D _{GEO_CONC} * GEO_CONC	-	-2.16	0.004***	1.11	0.962	-0.80	0.254	1.12	0.920	-1.57	0.091*	1.61	0.986
DOWNSIZE	-	0.68	0.154	-0.28	0.318	-2.24	0.023**	-1.94	0.009***	-0.32	0.315	-0.19	0.314
QUITAM	+	1.04	0.063*	1.41	0.015**	-2.13	0.949	0.88	0.193	-1.07	0.756	1.52	0.044**
SALES	+	0.00	0.007***	0.00	<.001***	-0.00	0.468	0.00	0.117	0.00	0.004***	0.00	0.042**
Pseudo-R ²		44.3%		40.1%		61.8%		58.4%		68.5%		44.8%	
N		N _{Press} = 67		N _{Osha} = 95		N _{Press} = 43		N _{Osha} = 84		N _{Press} = 60		N _{Osha} = 94	
		N _{Control} = 4,553		N _{Control} = 4,553		N _{Lawsuit} = 1,119		N _{Lawsuit} = 1,119		N _{Restate} = 1,304		N _{Restate} = 1,304	

Notes to Table 5:

All variables are as defined in Appendix A.

*, **, ***: significant at 10%, 5%, 1% p-values. P-values are one-sided for variables with directional predictions. We report (1-p) values for coefficients that assume a sign opposite to the one predicted.

Table 6
What is the Immediate Stock Market Reaction to Whistle-Blowing Announcements? (Q2)

Panel A: Three-day and Five-day Market Reaction (n = 78)

	% negative	MEAN	Q1	MEDIAN	Q3	p-value ^a	p-value ^b
<i>Three-day returns</i>							
RET _{-1,1}	61.5%	-0.0294	-0.0405	-0.0175	0.0125	0.023**	0.016**
CAR _{-1,1}	61.5%	-0.0303	-0.0440	-0.0129	0.0188	0.015**	0.013**
<i>Five-day returns</i>							
RET _{-1,3}	60.3%	-0.0246	-0.0478	-0.0125	0.0208	0.055*	0.033**
CAR _{-1,3}	67.9%	-0.0284	-0.0592	-0.0147	0.0284	0.024**	0.013**

Panel B: Cross-sectional Determinants of the Market Reaction (n=64)

Model: $CAR = \beta_0 + \beta_1 SALES + \beta_2 REPUTATION + \beta_3 POST-SCANDAL + \beta_4 EM + \beta_5 OVERBILLING + \varepsilon$

Independent Variables	Predicted Sign	(A) 3-Day Reaction		(B) 5-Day Reaction	
		Coefficient	t-statistic	Coefficient	t-statistic
INTERCEPT		0.020	0.52	0.060	1.47
SALES	-	-0.000	-0.52	-0.000	-0.72
REPUTATION	?	0.022	0.33	-0.033	-0.42
POST-SCANDAL	-	-0.015	-0.42	0.014	0.37
EM	-	-0.097	-2.09**	-0.143	-3.01***
OVERBILLING	-	-0.027	-0.63	-0.071	-1.55*
Adj. R ²		1.5%		8.0%	

Notes to Table 6:

*, **, ***: significant at 10%, 5%, and 1% level. P-values are one-sided for variables with directional predictions. We report (1-p) values for coefficients that assume a sign opposite to the one predicted.

^a P-values are one-sided associated with t-statistics.

^b P-values are one-sided associated with Wilcoxon z-statistics.

Definition of variables:

RET_{-1,1} = three-day cumulative raw returns centered on the date of the whistle-blowing allegation.

CAR_{-1,1} = three-day cumulative abnormal returns centered on the date of the whistle-blowing allegation.

SALES = total sales revenue for the year before the whistle-blowing event.

REPUTATION = an indicator variable coded as one if the firm has appeared on Fortune's "Best Companies to Work For" list or on Fortune's "Most Admired Companies" list in any of the five years prior to the whistle-blowing event, and coded as 0 otherwise.

POST-SCANDAL = an indicator variable equal to 1 if the allegation was made later than 1/1/2002, 0 otherwise.

EM = an indicator variable equal to 1 if the allegation is related to earnings management, 0 otherwise.

OVERBILLING = an indicator variable equal to 1 if the allegations related to overbilling, 0 otherwise.

Table 7
Long-term Consequences: Are Whistle-Blowing Allegations associated with Subsequent Restatements? (Q3a)

Logistic Regression

Dependent variable = 1 if the firm experienced a restatement (lawsuit) within the subsequent 3 years following the event date, 0 otherwise.

Model:

$$\text{RESTATE}_{t+3} = \beta_0 + \beta_1 \text{WB} + \beta_2 \text{SALES}_{t-1} + \beta_3 \text{MB}_{t-1} + \beta_4 \text{RISK}_{t-1} + \beta_5 \text{RET}_{t-1} + \beta_6 \text{LEV}_{t-1} + \beta_7 \text{WB_HAT} + \beta_8 \text{IndustryDummies} + \beta_9 \text{YearDummies} + \varepsilon_{t+n}$$

<i>Independent variables</i>	Pred Sign	PRESS				OSHA			
		Coeff.	p-value	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
WB	+	1.614	0.001***	1.590	0.001***	0.784	0.012**	0.586	0.059*
SALES		0.000	0.075*	0.000	0.277	0.000	0.328	-0.000	0.873
MB		-0.001	0.770	-0.001	0.807	-0.001	0.906	-0.011	0.584
RISK		0.723	0.354	1.186	0.143	0.798	0.303	1.295	0.107
RET		0.114	0.019**	0.109	0.027**	0.100	0.039**	0.103	0.039**
LEV		0.595	0.206	0.623	0.208	0.410	0.388	0.417	0.402
WB_HAT		n/a	n/a	1.136	0.483	n/a	n/a	2.136	0.272
Pseudo-R ²		11.1%		11.5%		8.8%		8.9%	
Likelihood Ratio Statistic		166.85	<.001***	162.16	<.001***	133.90	<.001***	125.96	<.001***
N		N _{Press} = 67 N _{Control} = 3,333		N _{Press} = 59 N _{Control} = 3,030		N _{OSHA} = 107 N _{Control} = 3,333		N _{OSHA} = 91 N _{Control} = 3,030	

Notes to Table 7:

*, **, ***: significant at 10%, 5%, 1% level. P-values are one-sided for variables with directional predictions. We report (1-p) values for coefficients that assume a sign opposite to the one predicted.

Definition of variables:

RESTATE_{t+3} = 1 if the firm experienced a restatement in the event year or in the 3 subsequent years after the event year, 0 otherwise.

WB = 1 if the firm experienced a whistle-blowing event, 0 otherwise.

SALES = total sales revenue (Compustat annual #12) for the year before the whistle-blowing event.

MB = the market-to-book ratio of the firm at the beginning of the event year ((Compustat annual #199 * Compustat annual #25) / Compustat annual #60).

RISK = the standard deviation of monthly stock returns for the 36 months preceding the event month. A minimum of 12 monthly stock returns is required.

RET = market-adjusted buy-and-hold returns for the 12 months before the event month.

LEV = leverage, defined as long-term debt divided by total assets (Compustat annual #9 / Compustat annual #6), measured as of the beginning of the event year.

WB_HAT = the likelihood that the firm has been subject to a whistle-blowing allegation, based on the determinants of whistle-blowing identified in Tables 4 and 5.

IndustryDummies = 1 if the firm belongs to the two-digit SIC code, and 0 otherwise.

YearDummies = 1 if the event date is in the year, and 0 otherwise.

Table 8
Long-term Consequences: Are Whistle-Blowing Allegations associated with Subsequent
Lawsuits? (Q3b)

Logistic Regression

Dependent variable = 1 if the firm experienced a restatement (lawsuit) within the subsequent 3 years following the event date, 0 otherwise.

Model:

$$\text{LAWSUIT}_{t+3} = \beta_0 + \beta_1 \text{WB} + \beta_2 \text{SALES}_{t-1} + \beta_3 \text{MB}_{t-1} + \beta_4 \text{RISK}_{t-1} + \beta_5 \text{RET}_{t-1} + \beta_6 \text{LEV}_{t-1} + \beta_7 \text{WB_HAT} + \beta_8 \text{IndustryDummies} + \beta_9 \text{YearDummies} + \varepsilon_{t+n}$$

<i>Independent variables</i>	Pred Sign	PRESS				OSHA			
		Coeff.	p-value	Coeff.	p-value	Coeff.	p-value	Coeff.	p-value
WB	+	2.093	0.001***	2.133	<.001***	0.965	0.006***	0.691	0.059*
SALES		0.000	0.017**	0.000	0.360	0.000	0.011**	0.000	0.276
MB		-0.000	0.888	-0.000	0.859	-0.000	0.904	-0.000	0.870
RISK		1.093	0.151	0.837	0.320	1.202	0.114	1.005	0.228
RET		0.161	0.006***	0.161	0.001***	0.147	0.001***	0.150	0.002***
LEV		0.383	0.427	0.629	0.229	0.495	0.308	0.735	0.162
WB_HAT		n/a	n/a	1.792	0.281	n/a	n/a	1.517	0.463
Pseudo-R ²		11.3%		12.4%		9.3%		9.7%	
Likelihood Ratio Statistic		166.81	<.001***	161.97	<.001***	132.98	<.001***	121.79	0.001***
N		N _{PRESS} = 67 N _{Control} = 3,335		N _{PRESS} = 59 N _{Control} = 3,030		N _{OSHA} = 107 N _{Control} = 3,335		N _{OSHA} = 91 N _{Control} = 3,030	

Notes to Table 8:

*, **, ***: significant at 10%, 5%, 1% level. P-values are one-sided for variables with directional predictions. We report (1-p) values for coefficients that assume a sign opposite to the one predicted.

Definition of variables:

LAWSUIT_{t+3} = 1 if the firm experienced a lawsuit in the event year or in the 3 subsequent years after the event year, 0 otherwise.

WB = 1 if the firm experienced a whistle-blowing event, 0 otherwise.

SALES = total sales revenue (Compustat annual #12) for the year before the whistle-blowing event.

MB = the market-to-book ratio of the firm at the beginning of the event year ((Compustat annual #199 * Compustat annual #25) / Compustat annual #60).

RISK = the standard deviation of monthly stock returns for the 36 months preceding the event month. A minimum of 12 monthly stock returns is required.

RET = market-adjusted buy-and-hold returns for the 12 months before the event month.

LEV = leverage, defined as long-term debt divided by total assets (Compustat annual #9 / Compustat annual #6), measured as of the beginning of the event year.

WB_HAT = the likelihood that the firm has been subject to a whistle-blowing allegation, based on the determinants of whistle-blowing identified in Tables 4 and 5.

IndustryDummies = 1 if the firm belongs to the two-digit SIC code, and 0 otherwise.

YearDummies = 1 if the event date is in the year, and 0 otherwise.

Table 9

Long-term Consequences: Are Whistle-Blowing Allegations Associated with Poor Future Operating Performance? (Q3c)

Model:

$$ROA_{t+n} = \beta_0 + \beta_1 WB + \beta_2 ROA_t + \beta_3 SALES_t + \beta_4 WB_HAT + \beta_5 IndustryDummies_t + \beta_6 YearDummies_t + \epsilon_{t+n}$$

Independent Variables	Pred. Sign	Year +1		Year +2		Year +3	
		Press	OSHA	Press	OSHA	Press	OSHA
WB	-	0.028 (1.76)	-0.019 (-1.60)*	0.033 (0.89)	-0.022 (-0.81)	0.061 (1.10)	-0.014 (-0.11)
ROA		0.502 (13.65)***	0.510 (13.66)***	0.802 (14.16)***	0.818 (14.47)***	0.945 (13.49)***	0.911 (12.31)***
SALES		0.000 (0.96)	-0.000 (-0.96)***	-0.000 (-0.10)	-0.000 (-1.57)	-0.000 (-0.07)	-0.000 (-1.12)
WB_HAT		0.058 (2.12)**	0.149 (3.57)***	0.199 (3.29)***	0.317 (3.71)***	0.279 (2.32)**	0.521 (2.96)***
Adj. R ²		38.3%	38.9%	34.7%	35.5%	30.0%	28.4%
N		N _{Press} = 51 N _{Control} = 3,970	N _{OSHA} = 84 N _{Control} = 3,970	N _{Press} = 46 N _{Control} = 3,062	N _{OSHA} = 43 N _{Control} = 3,062	N _{Press} = 39 N _{Control} = 2,172	N _{OSHA} = 4 N _{Control} = 2,172

Notes to Table 9:

Coefficients (t-statistics) are reported. *, **, ***: significant at 10%, 5%, 1%. P-values are one-sided for variables with directional predictions. We report (1-p) values for coefficients that assume a sign opposite to the one predicted.

Definition of variables:

ROA_{t+n} = buy-and-hold return on assets, starting with ROA in the year after the event date, and ending n years after the whistle-blowing event.

WB = 1 if the firm experienced a whistle-blowing event, 0 otherwise.

ROA = return on assets for the event year. (Compustat annual #19 / Compustat annual #6).

SALES = total sales revenue (Compustat annual #12) for the year before the whistle-blowing event.

WB_HAT = the likelihood that the firm has been subject to a whistle-blowing allegation, based on the determinants of whistle-blowing identified in Tables 4 and 5.

IndustryDummies = 1 if the firm belongs to the two-digit SIC code, and 0 otherwise.

YearDummies = 1 if the event date is in the year, and 0 otherwise.

Table 10
Long-term Consequences: Are Whistle-Blowing Allegations Associated with Poor Future Stock Return Performance? (Q3d)

Model:

$$BH_RET_{t+n} = \beta_0 + \beta_1MKT_{t+n} + \beta_2SMB_{t+n} + \beta_3HML_{t+n} + \beta_4MOM_{t+n} + \varepsilon_{t+n}$$

Independent Variables	Pred. Sign	Year +1		Year +2		Year +3	
		Press	OSHA	Press	OSHA	Press	OSHA
Intercept	-	-0.287 (-0.60)	-0.093 (-0.24)	0.378 (1.19)	0.279 (1.15)	0.536 (2.04)**	0.318 (1.67)**
MKT		1.056 (8.56)***	1.378 (8.80)***	1.075 (12.92)***	1.236 (11.19)***	1.111 (16.08)***	1.213 (13.35)***
SMB		0.462 (3.18)***	0.196 (1.01)	0.291 (3.51)***	0.259 (1.94)**	0.074 (1.07)	0.204 (1.92)**
HML		0.433 (2.50)***	0.215 (0.99)	0.320 (2.83)***	0.084 (0.61)	0.441 (5.06)***	0.065 (0.60)
MOM		-0.434 (-4.55)***	-0.374 (-3.48)***	-0.514 (-8.20)***	-0.345 (-4.31)***	-0.400 (-8.59)***	-0.291 (-4.33)***
Adj. R ²		15.8%	11.5%	16.8%	10.7%	14.9%	10.6%
F-statistic		43.22***	50.24***	87.82***	88.44***	110.31***	117.86***
		N = 902	N = 1,525	N = 1,718	N = 2,907	N = 2,491	N = 3,943

Notes to Table 10:

Coefficients (t-statistics) are reported. *, **, ***: significant at 10%, 5%, 1% level. P-values are one-sided for variables with directional predictions. We report (1-p) values for coefficients that assume a sign opposite to the one predicted.

Definition of variables:

BH_RET_{t+n} = buy-and-hold raw returns for the subsequent n years, beginning with the monthly return immediately following the event date.

Mkt_{t+n} = the Fama-French market factor for the subsequent n years, beginning with the month immediately following the event date.

SMB_{t+n} = the Fama-French size factor for the subsequent n years, beginning with the month immediately following the event date.

HML_{t+n} = the Fama-French book-to-market factor for the subsequent n years, beginning with the month immediately following the event date.

MOM_{t+n} = the Fama-French momentum factor for the subsequent n years, beginning with the month immediately following the event date.

Table 11
Do Whistle-Blowing Allegations lead to Subsequent Changes in Corporate Governance? (Q4a)

Panel A: (Descriptive statistics) Are whistle-blowing allegations associated with changes in corporate governance?

Variables ^a		Pred. Direction	Year -1	Year 0	Year +1	Year +2
DIRECTORS	Press	-	11.474	11.226	11.315	11.093
	n		57	53	54	54
	Match	?	9.846	9.884	9.673	9.923
	n		52	52	52	52
%INS_DIR	Press	-	0.229	0.197	0.194	0.186
	n		57	53	54	54
	Match	?	0.313	0.287	0.265	0.259
	n		52	52	52	52
%BUSY	Press	-	0.346	0.350	0.342	0.343
	n		57	53	53	54
	Match	?	0.315	0.302	0.312	0.307
	n		52	52	52	52
%ATTEND	Press	+	0.790	0.789	0.796	0.798
	n		53	48	49	48
	Match	?	0.794	0.789	0.786	0.784
	n		52	52	52	52
CEO=COB%	Press	-	0.825	0.852	0.852	0.796
	n		52	54	54	54
	Match	?	0.788	0.731	0.788	0.769
	n		52	52	52	52
NEW_CEO%	Press	+	0.113	0.250	0.216	0.212
	n		53	52	51	52
	Match	?	0.077	0.115	0.115	0.077
	n		52	52	52	52

Notes to Table 11, Panel A:

^a We report raw values of the governance variables.

Definition of variables:

DIRECTORS = number of directors on the board.

%INS_DIR = percent of inside directors on the board.

%BUSY = percent of 'busy' directors.

%ATTEND = percent attendance at board meetings.

CEO=COB% = proportion of firms where the CEO is Chairman of the Board (COB).

NEW_CEO% = proportion of firms with a new CEO.

Table 11 (continued)

Do Whistle-Blowing Allegations lead to Subsequent Changes in Corporate Governance? (Q4a)

Panel B: (Multivariate analysis) Are whistle-blowing allegations associated with changes in corporate governance?

Model: $\Delta\text{GOV}_{i,t+2} = \beta_0 + \beta_1 \text{WB} + \beta_2 \text{REV}_{i,t-1} + \beta_3 \text{RET}_{i,t-1} + \beta_4 \text{WB_HAT}_{i,t-1} + \varepsilon_{i,t+2}$

Dependent Variables ^a	Pred. Sign of WB	Independent Variables					Adj. R ²	N
		Intercept	WB	REV	RET	WB_HAT		
$\Delta\text{DIRECTORS}$	-	-0.17 (0.674)	-1.12 (0.028)**	0.00 (0.634)	0.63 (0.172)	n/a n/a	5.2%	76
	-	-0.13 (0.769)	-1.13 (0.038)**	0.00 (0.519)	0.69 (0.196)	-0.83 (0.718)	3.3%	70
$\Delta\%\text{INS_DIR}$	-	0.05 (<.001)***	-0.10 (<.001)***	-0.00 (0.188)	0.02 (0.164)	n/a n/a	31.9%	76
	-	0.05 (0.001)***	-0.09 (<.001)***	-0.00 (0.521)	0.02 (0.174)	-0.04 (0.620)	29.2%	70
$\Delta\%\text{BUSY}$	-	0.02 (0.474)	-0.06 (0.104)	-0.00 (0.850)	-0.05 (0.255)	n/a n/a	-0.0%	76
	-	0.01 (0.806)	-0.04 (0.213)	-0.00 (0.562)	-0.06 (0.191)	0.14 (0.458)	-2.2%	70
$\Delta\%\text{ATTEND}$	+	0.01 (0.381)	0.01 (0.115)	0.00 (0.990)	0.01 (0.112)	n/a n/a	0.1%	70
	+	0.01 (0.484)	0.02 (0.089)*	0.00 (0.892)	0.01 (0.232)	-0.01 (0.809)	-1.9%	64
$\Delta\%\text{CEO}=\text{COB}\%^b$	-	n/a n/a	-0.00 (0.499)	0.00 (0.877)	0.17 (0.742)	n/a n/a	0.0%	76
	-	n/a n/a	-0.04 (0.472)	-0.00 (0.924)	0.56 (0.253)	0.46 (0.836)	1.5%	70
$\Delta\text{NEW_CEO}\%^c$	+	-0.81 (0.028)**	1.26 (0.008)***	-0.00 (0.954)	0.57 (0.180)	n/a n/a	7.0%	76
	+	-0.84 (0.042)**	1.50 (0.005)***	0.00 (0.561)	0.86 (0.118)	-2.13 (0.315)	10.2%	70

Table 11 (continued)

Do Whistle-Blowing Allegations lead to Subsequent Changes in Corporate Governance? (Q4a)

Notes to Table 11, Panel B:

*, **, *** indicate significant at 10%, 5%, 1% levels, respectively. P-values are reported in parentheses. P-values are one-sided for variables with directional predictions. We report (1-p) values for coefficients that assume a sign opposite to the one predicted.

^a We compare the value of each governance variable in year -1 (pre allegation) to its value year +2 (post allegation).

^b We report the results of an ordinal logistic regression, including the Pseudo-R².

^c We report the results of a logistic regression, including the Pseudo-R².

Definition of variables:

Δ DIRECTORS = number of directors on the board in year +2 minus the number of directors on the board in year -1.

Δ %INS_DIR = percent of inside directors on the board in year +2 minus the percent of inside directors on the board in year -1.

Δ %BUSY = percent of 'busy' directors on the board in year +2 minus the percent of busy directors on the board in year -1.

Δ %ATTEND = percent attendance at board meetings in year +2 minus the percent attendance at board meetings in year -1.

Δ CEO=COB% = an ordinal variable coded as 1 if the CEO was not the COB in year +2 but was in year -1, coded as -1 if the CEO was the COB in year +2 but was not in year -1, and coded as 0 otherwise.

Δ NEW_CEO% = a dummy variable coded as 1 if the firm replaced its CEO in year 0, year +1, or year +2, and 0 otherwise.