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Whistleblowing Allegations, Audit Fees, and Internal Control Deficiencies*

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ABSTRACT

We investigate whether audit fees and auditors' opinions on internal controls are associated with whistleblowing allegations externally filed to regulatory agencies. We find that firms subject to whistleblowing allegations have significantly higher audit fees, regardless of the substance of these allegations, whereas an auditor is more likely to issue an adverse opinion on internal controls when the allegation is substantiated, rather than frivolous. Further, our findings suggest that auditors are involved in the auditing of whistleblowing when the allegation is still in an internal stage. We also show that firms subject to external whistleblowing allegations have a lower likelihood of restating financial statements prepared in the allegation year when greater audit effort is made in that year. Our study is among the first to demonstrate the role of auditors in the context of whistleblowing.

Keywords: *Whistleblowing; audit risk; audit fees; internal control*

JEL descriptors: M41; M42; M48

Data availability: Data used in this study are available from the sources identified in the text.

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1. Introduction

Whistleblowing is an action undertaken by a person who exposes any kind of information or activity that is deemed illegal or unethical concerning an organization. Given that whistleblowing can expose financial misdeeds, auditors may consider such allegations against client firms to be a signal of heightened risk of material misstatement, and act accordingly (Taylor and Thomas 2013). However, the substance of whistleblowing allegations can be a subject of great uncertainty, as whistleblowers often incorrectly assess the situation (Bowen et al. 2010; Near and Miceli 1996) or possess mixed incentives and file frivolous whistleblowing claims (Anechiarico and Jacobs 1996; Gobert and Punch 2000).¹ In this study, we are interested in understanding how auditors respond to whistleblowing allegations filed to an external regulatory agency, such as the United States (US) Government's Occupational Safety and Health Administration Office (OSHA)—an agency of the Department of Labor (DOL)—or the Department of Justice (DOJ). Specifically, we focus on external whistleblowing allegations relating to financial matters and empirically examine the relationship between a whistleblowing allegation and audit outcomes, including audit fees and auditors' opinion on internal controls.

Auditing standards require auditors to compile information from all relevant sources—including whistleblowing tips—in their risk assessment (AS 2110). Evidence shows that firms subject to external whistleblowing allegations may subsequently face a higher litigation risk and a

¹ Government statistics on financial whistleblowing indicate that frivolous claims are often filed. Statistics from the United States Government's Occupational Safety and Health Administration (OSHA) website report that, among all whistleblowing claims filed under the Sarbanes-Oxley Act (SOX) of 2002, between 2006 and 2016, only 20 percent saw positive outcomes for the whistleblower, while the majority (66 percent) of all cases were dismissed by the OSHA.

greater likelihood of accounting restatements (Bowen et al. 2010; Call et al. 2018), thereby suggesting that a whistleblowing allegation is informative for a financial statement audit. Auditing standards also require auditors to consider possible illegal acts that could affect financial statements by applying audit procedures to ascertain whether that act has occurred (AS 2405). Hence, auditors have good reasons to react to external whistleblowing allegations, and their responses should be reflected in audit-related outcomes, such as audit fees and internal control opinions. However, some anecdotes indicate that auditors have chosen not to act upon whistleblowing tips. For example, Ernst and Young did not follow through on whistleblowers' claims over unethical accounting in Lehman Brothers (Clark 2010) and KPMG played down whistleblowing tips over HBOS (Bambrough 2015). Similar cases involving Deloitte and PwC have also been reported (Garside 2014). Thus, the association between external whistleblowing allegations and audit-related outcomes warrants an empirical investigation.

To analyze the effects of external whistleblowing allegations on auditor actions, we employ the audit risk model—a framework that explains the relationship among overall audit risk, inherent risk, control risk, and detection risk (Bell et al. 2001; Dusenbury et al. 2000; Hogan and Wilkins 2008). We argue that auditors will respond to external whistleblowing allegations because such claims increase a client's inherent and control risks. Further, the increased public scrutiny and attention directed toward a client firm involved in an external whistleblowing allegation is likely to raise reputation concerns and litigation risk in audits (Pae and Yoo 2001). Auditors should carefully consider the allegations and design their audit strategies accordingly—such as increasing

the amount of fieldwork—to ensure an acceptable level of audit risk. Both increased auditor effort and litigation risk suggest higher audit fees. Thus, we expect audit fees to increase when a firm is involved in an external whistleblowing allegation.

An external whistleblowing allegation can also help the auditor identify deficiencies in a firm's internal controls. Whistleblowing tips provide auditors specific information on potential misstatements and produce a more thorough audit. For example, upon becoming aware of external whistleblowing allegations, auditors can work backward to identify whether related internal controls have, indeed, failed. In doing so, auditors will gain deeper insight into the substance of the whistleblowing allegation and be in a better position to evaluate the validity or materiality of the possible misstatement and the effectiveness of a firm's internal controls. If there is no substance to the allegation, there is unlikely to be a misstatement, or a corresponding control failure, which will also be discovered by auditors following up on the information in the whistleblowing allegation. To summarize, we predict that auditors will judge that internal controls are ineffective only when the external whistleblowing allegation has substance.

To investigate this issue, we first interview audit practitioners on their views about the importance of external whistleblowing allegations in audits. The insights gained from these interviews suggest that auditors apply professional judgment and assess the relevance and significance of whistleblowing events to reporting quality on a case-by-case basis. We next perform empirical analysis to examine our expectations. We collect information on external whistleblowing allegations filed with the OSHA and *qui tam* actions filed under the False Claims

Act (FCA) with the DOJ.² Given the non-random occurrence of whistleblowing allegations (Bowen et al. 2010), we employ entropy balancing in the analysis, balancing on all three moments, as a multivariate reweighting method to address the covariate imbalance (Hainmueller 2012; McMullin and Schonberger 2018).

Using a sample of firm–years, from 2004 to 2014, we find results consistent with our expectations. First, occurrences of external whistleblowing allegations, irrespective of their substance, are associated with higher audit fees. In addition, audit fees are significantly greater for substantiated (compared with frivolous) allegations (i.e., cases found to be favorable to whistleblowers based on administrative enforcement or court outcomes). Further, an external whistleblowing allegation is positively associated with auditors’ propensity to issue an adverse opinion on internal controls (i.e., an internal control deficiency [ICD] opinion) only when the allegation is substantiated, but not when it is frivolous.

Motivated by our interviews with audit practitioners, we run a series of additional tests on auditors’ involvement in reviewing cases of whistleblowing. External whistleblowing allegations typically arise after an unsuccessful internal whistleblowing attempt (Lee and Xiao 2018). We learned from the interviews that, while auditors are likely to be aware of internally reported whistleblowing issues, they might not conduct an extensive investigation at this stage because they

² *Qui tam* is a shortened version of the Latin phrase *qui tam domino rege quam pro se ipso in hac parte sequitur*, meaning that a private individual who assists a prosecution can receive all or part of any penalty imposed.

perceive the firm to be adequately handling the issue,³ or perhaps there are difficulties, such as limited information availability, during an ongoing investigation. To examine the extent to which auditors are aware of—and thus react to—internally reported whistleblowing, we test audit outcomes in the year before the external whistleblowing allegation. We find that audit fees significantly increase before an external whistleblowing event (i.e., for both frivolous and substantiated whistleblowing allegations), but that an external whistleblowing event has no significant effect on auditors' likelihood of issuing an adverse opinion on internal controls in the year before the allegation. Thus, our findings suggest that auditors appear to have access to information that enables them to develop a general idea of the whistleblowing issue before it is revealed externally, but the information acquired at this stage does not significantly affect their opinions on internal controls.

In our interviews, the audit practitioners highlighted that auditors will incorporate previous whistleblowing activities into their risk assessment. As such, we empirically test whether external whistleblowing allegations filed in the current year relate to future audit fees and auditors' opinion on internal controls. We find that audit fees increase significantly in the year after an external whistleblowing allegation, especially in cases of substantiated allegations. The higher audit fees may reflect a projected increase in audit work because the firm's previous whistleblowing allegation increases the risk of material misstatement. However, we do not find that these firms

³ The installation and efficiency of internal whistleblowing hotlines is considered an important element to ensure quality internal control (AS 2110). Auditors may consider claims that are internally received and processed to be an indication that the firm's current internal control is of sufficient quality.

are subject to a higher likelihood of an ICD in the year following the allegations. We also examine whether audit efforts in the whistleblowing allegation year affect financial reporting quality. We show that, with increased auditor effort in the allegation year, a client has a lower likelihood of restating financial statements prepared in that year, consistent with prior evidence that audit effort improves a client's reporting quality (Bentley et al. 2013; Lobo and Zhao 2013).

Our study contributes to the literature in several ways. First, we are among the first to demonstrate that auditors react to external whistleblowing allegations and that their reactions vary according to the substance of the allegations. Thus, our findings suggest that auditors fulfill their fiduciary duties with professional diligence and are more vigilant when their client firm is subject to an external whistleblowing allegation. Second, we extend the literature that analyzes auditor risk control processes by applying the audit risk model. Although the literature generally shows a positive association between audit effort and control risk, there is mixed evidence on the association between inherent risk and audit effort (Bedard and Johnstone 2004; Bentley et al. 2013; Hogan and Wilkins 2008). In our study, we show that audit fees are significantly higher regardless of the substance of an external whistleblowing allegation, while only substantiated (not frivolous) whistleblowing allegations relate to auditors' propensity to issue an adverse opinion on internal controls. This finding suggests that frivolous whistleblowing has no significant effect on control risk, and thus provides initial evidence that auditor effort (i.e., higher audit fees), in the cases of frivolous whistleblowing allegations, is positively related to inherent risk. We further show that firms are associated with higher audit fees in the year after external whistleblowing—even for

frivolous allegations—yet such firms do not face a higher likelihood of receiving an adverse internal control opinion in that year. Again, this finding suggests that a prior whistleblowing event increases the inherent risk of a firm, and auditors tend to price this into their audits.

Relatedly, we show some of the unintended costs of whistleblowing. That is, audit fees increase in response to heightened inherent risk, regardless of the merit of the whistleblowing claims. Further, we demonstrate the role of whistleblowing allegations, especially those that are substantiated, in helping auditors identify the firm's internal control weaknesses. Therefore, this study supplements the literature that examines the auditor's response to an elevated risk of misstatement.

The remainder of this paper proceeds as follows. Section 2 discusses the institutional background of whistleblowing, our interviews, and auditors' involvement in the auditing of whistleblowing. We then develop our hypotheses in Section 3, while Section 4 describes our empirical methodology. Section 5 presents the results, and then Section 6 discusses robustness analyses and additional tests. Finally, Section 7 concludes the paper.

2. Institutional background, the whistleblowing literature, and the whistleblowing process

Institutional background and prior research

The first law enacted in the US to encourage and protect whistleblowers was the FCA, passed in 1863. This Act includes a *qui tam* provision that allows whistleblowers to lodge claims on behalf of the government, and encourages whistleblowers by providing them a percentage of the money recovered and protecting them from employment retaliation. Since then, legislation has been

introduced to support corporate whistleblowers (Dyck et al. 2010). Since the passage of the Sarbanes–Oxley Act (SOX) in the US in 2002, audit committees of listed companies have been required to establish an internal whistleblowing system. The Dodd–Frank Wall Street Reform and Consumer Protection Act (Dodd–Frank Act), enacted in 2010, passed further regulations, thus developing a whistleblowing program in which eligible whistleblowers who reported securities law violations could receive a monetary reward of 10 to 30 percent of the total recovery amount.

Whistleblowing has been increasingly recognized as an important mechanism in detecting fraud. Mary Jo White, a former chair of the SEC, stated that “[i]n the post-financial crisis era when regulators and right-minded companies are searching for new, more aggressive ways to improve corporate culture and compliance, it is past time to stop wringing our hands about whistleblowers” (SEC 2015). Unsurprisingly, whistleblowing has attracted attention from researchers. Current knowledge covers a wide range of topics, including the sources of whistleblowing (Dyck et al. 2010), the characteristics of internal whistleblowing systems (Kaplan and Schultz 2007; Kaplan et al. 2009), the personal characteristics of whistleblowers (Cassematis and Wortley 2013; Curtis and Taylor 2009), the organizational characteristics of whistleblowing (Bowen et al. 2010; Lee and Fargher 2018), the attributes of the wrongdoing or wrongdoer and his or her influence on whistleblowing (Robertson et al. 2011; Robinson et al. 2012), the consequences of external whistleblowing (Baloria et al. 2017; Call et al. 2018; Wilde 2017), and the measures taken by firms to counteract employee incentives to blow the whistle (Call et al. 2016). Evidence shows that external whistleblowing allegations have significant implications for firms. Firms subject to such

allegations are associated with negative market-adjusted returns upon whistleblowing announcements, a greater likelihood of a subsequent lawsuit (Bowen et al. 2010), higher regulatory penalties, and longer enforcement proceedings (Call et al. 2018).

Auditors play a key role in the market by providing assurance over financial reports. While research shows how investors and regulators respond to external whistleblowing allegations (Baloria et al. 2017; Call et al. 2018), whether and how auditors react to such allegations remain unclear. The literature indicates that audit-related outcomes are associated with a firm's probability of misstatement and measures of possible earnings management, such as discretionary accruals (Gul et al. 2003; Lobo and Zhao 2013). However, external whistleblowing allegations are a distinct indicator of the risk of material misstatement for at least two reasons. First, whistleblowing allegations can relate to insider trading, submitting falsified information to obtain government funds, or engaging in a collusive bidding scheme to obtain a contract, which may only indirectly affect the financial statements. Second, the usefulness of whistleblowing information remains ambiguous. It seems reasonable to assume that the concerns reported by whistleblowers are genuine, as they bear large costs, especially when reporting to an external regulatory agency, such as the OSHA or DOJ (Dyck et al. 2010). However, for several reasons, whistleblowers frequently file frivolous claims (Golden et al. 2015) to attract attention (Near and Miceli 1996), to avoid being dismissed from employment (Anechiarico and Jacobs 1996), or as an act of revenge against their employers (Gobert and Punch 2000). Therefore, it is not obvious whether external whistleblowing allegations affect audit-related outcomes.

Anecdotes from interviews

To gain a deeper understanding of auditor involvement in auditing whistleblowing, we interviewed four audit partners and three senior audit practitioners, from September to November 2018. Among the partners, three were from the Big 4 audit firms (e.g., PwC, Deloitte, and KPMG) and one was from a mid-tier audit firm. All had experience with external whistleblowing matters. Their average experience in auditing was 17.75 years, ranging from 15 to 20 years. The three senior auditors were from three mid-tier audit firms. Their overall experience in auditing ranged from four to six years, with an average experience of 4.67 years, and they all had experience with whistleblowing in their client firms. Each interview lasted between 30 and 45 minutes, and follow-up interviews were conducted, if necessary. The interviews were semi-structured and conducted individually with the respondents. Further, we used a questionnaire to guide our interviews (see Appendix A).

Several insights emerged from the interviews. First, all respondents mentioned that auditors conduct audit planning based on a rich set of information that includes assessing internal and external whistleblowing activities that occurred both in the past and at present. Standard audit procedure/practice involves checking the logbook of internal whistleblowing claims on a regular basis. Specifically, an audit partner said, “We check the logbook of our clients quarterly or semiannually.” Part of auditing protocols includes inquiring with management and those charged with governance about the whistleblowing claims and how the claims have been addressed. However, our interviewees also acknowledged that, for allegations that are only internally reported, auditors generally do not conduct an extensive investigation. The auditors explained that, when

the whistleblowing report is still being internally processed, the information they receive from the company is likely to have been filtered or selectively provided. With regard to such impediments, a senior auditor said: “[Insufficient] information creates obstacles for auditors in forming a comprehensive assessment of the nature and substance of the issues.” Further, some respondents indicated that observation of internal whistleblowing claims was insufficient to trigger increased auditor effort or perceived higher risk of internal control issues. Instead, a partner stated that “auditors may consider it a sign of an efficient internal whistleblowing channel.” They continued: “It is unexpected complaints or lack of internal whistleblowing that captures auditors’ attention.”⁴

Second, we learned that auditors become more intensively involved once whistleblowing claims are externally reported. External whistleblowing allegations are subject to greater scrutiny from regulators, and auditors are particularly concerned about their reputation and litigation risk. When whistleblowing allegations become externally known, the risk of material misstatement escalates significantly. A partner stated, “My team had to redo all the audits because of a SEC whistleblowing case, since we would face inquiries from regulators as to how our audits have been conducted and whether sufficient care has been taken given the allegation.” According to our participants, auditors typically respond by increasing their audit effort, such as by seeking a full set of information relating to the whistleblowing claims from multiple sources, including their client. Partners revealed that, depending on the nature of the allegation and the circumstances,

⁴ Information access could be limited because the matter is an ongoing issue under investigation, and hence subject to a certain degree of confidentiality. Thus, auditors are precluded from forming a comprehensive assessment of the substance and severity of the issue.

personnel with various levels of seniority and capacity in an audit firm—including engagement partners, general counsel, and even regional partners—can be involved in the discussion and evaluation of audit risks associated with the allegation. Further, although auditors aim to issue audit reports in a timely manner, serious whistleblowing allegations can cause delay. A partner said, “I once had to halt signing off the report at the last minute because of a whistleblowing allegation [that was] newly filed to the SEC. But it is extremely rare.”

Third, both partners and senior auditors emphasized in the interviews that, when assessing whistleblowing allegations, auditors typically focus on ascertaining whether the issue raised is genuine and relevant to financial reporting and, if so, determining the severity of the issue. Further, auditors are aware that whistleblowers have mixed incentives to file claims—a large percentage of which are either insignificant or irrelevant. A partner said, “Auditors exercise prudence with judgment. For example, if the allegation is about wage theft, auditors may treat it as an isolated incident and not react, unless they consider it a systemic issue that was previously unidentified. However, if the nature of the allegation is severe and systemic, even in case of small amounts, auditors should react. The nature of the allegation is the key.” Another partner offered an example, “There was once an internal whistleblowing case about suspected theft by a department manager’s relatives who were in charge of procurement. We were aware of the kinship and had already considered the potential risk at our planning. We eventually decided not to react to it.” Auditors therefore apply substantial professional care and judgment in assessing the relevance and severity of whistleblowing claims to ensure that audits are performed efficiently and effectively.

We also asked the auditors about how the timing of external whistleblowing allegations during the year may affect their response. One senior auditor stated that more audit work can be planned in response to a whistleblowing allegation when it is revealed closer to the beginning of a fiscal year. Nonetheless, some partners indicated that auditors will fully respond to credible evidence of material misconduct even if it is not discovered until the end of a year.

Auditors' involvement in the auditing of whistleblowing

Figure 1 displays a typical whistleblowing process, which consists of four stages: (1) misconduct observed by an employee, (2) internal whistleblowing by the employee, (3) the firm's response to the internal whistleblowing, and (4) the whistleblower's subsequent response. Employees usually first report observed instances of misconduct to the firm via internal whistleblowing hotlines; such a statement is called an internal whistleblowing allegation. The issues raised by whistleblowers can be ongoing matters or related to the firm's historical practices. Firms take various actions to address the claims, including investigating the allegation, ignoring the claim, or retaliating against the whistleblower (Lee and Xiao 2018).⁵ Whistleblowers evaluate the actions taken by the firm and may choose to resort to external channels if they deem that the firm has undertaken insufficient action or if they have experienced retaliation for whistleblowing. Whistleblowing allegations at this stage (Stage 4) are publicly observable and are the focus of our investigation. As depicted in

⁵ The extent to which internal allegations are adequately resolved depends on several factors. For example, studies show that organizations react more positively to a whistleblowing allegation and take corrective actions when the whistleblower reports to senior management—such as the chief executive officer (CEO), chief financial officer (CFO), or audit committee—and when the organizational culture is more supportive of whistleblowing (Miceli and Near 2002; Near and Jensen 1983).

Figure 1, whistleblowers can choose to file claims with external regulatory agencies, such as the OSHA and SEC, or file *qui tam* actions under the FCA with the DOJ.

When assessing a client facing a whistleblowing allegation, auditors follow a set of standards including AS 2110 (paragraph .56) which highlights that, in evaluating fraud risks, auditors should inquire “whether management (the audit committee) has received tips or complaints regarding the company’s financial reporting (including those received through the audit committee’s internal whistleblower program, if such program exists) and, if so, management’s responses to such tips and complaints.” Thus, the standards require auditors to be aware of whistleblowing claims through discussions with management and the audit committee when the claims are internally filed (Stage 2) and processed (Stage 3). AS 2405 also emphasizes that, when auditors become aware of information concerning a possibly illegal act, they should gain an understanding of the nature of the act, the circumstances under which it occurred, and sufficient other information to evaluate its effect on the financial statements. If management does not provide satisfactory information to ensure that no illegal act has been committed, auditors should apply additional procedures and exert additional effort, including consulting with their client’s legal counsel.

3. Hypotheses development

Whistleblowing and audit fees

Auditors’ primary task is to search for and uncover material misstatements in their clients’ financial records. The audit risk model explains how auditors control risk in their work (Knechel

and Salterio 2017). Audit risk refers to the likelihood of auditors providing a clean opinion on misstated financial statements, which is modeled as a function of inherent risk, control risk, and detection risk, as follows.

$$\text{Audit Risk} = \text{Inherent Risk} * \text{Control Risk} * \text{Detection Risk} \quad (1)$$

Inherent risk is the risk of a material misstatement in the financial statements because of error or omission as a result of factors other than the failure of controls, *control risk* refers to the risk of a material misstatement due to a weak internal control system, and *detection risk* is the risk that the procedures an auditor performs will not detect a material misstatement (AICPA 2017). Model (1) suggests that, to achieve an acceptable level of overall audit risk, auditors must reduce detection risk by increasing audit effort when they perceive high inherent risk or control risk (Dusenbury et al. 2000; Hogan and Wilkins 2008). Higher audit fees will be charged to compensate for the increased audit workload and effort with increased inherent or control risk (Jha and Chen 2015; Kim et al. 2015).

In the context of whistleblowing, an external whistleblowing allegation likely signals increased uncertainty in a firm's business environment, and thus increased inherent risk. Evidence shows that external whistleblowing heightens public and regulatory scrutiny of firm practices (Bowen et al. 2010). Further, firms that experience external whistleblowing allegations are subject to negative consequences, such as legal penalties and shareholder lawsuits (Call et al. 2018). Such increased business uncertainty indicates that there will be greater complexity in a firm's transactions and that tasks to make judgments involved in handling these transactions will become

more challenging. Further, whistleblowing complaints potentially signify a breakdown in a firm's internal controls, as the error/fraud identified by a whistleblowing allegation was not prevented or detected by the firm's internal control system. Evidence indeed shows that firms involved in external whistleblowing allegations have a higher tendency to restate financial statements in subsequent years (Bowen et al. 2010). Thus, auditors may perceive those firms as also being subject to greater control risk.

We argue that increased inherent and control risk associated with external whistleblowing allegations will both contribute to auditors' assessment of the risk of material misstatement and affect the extent of the auditors' resultant detection risk. Auditors will respond to the allegations by altering their audit plan and deploying additional audit resources, such as assigning more experienced personnel, extending the scope of field work, and performing additional reviews (Johnstone and Bedard 2001) to achieve lower detection risk. Given their professional prudence and conservatism, auditors will choose to do so even in cases in which whistleblowing allegations eventually prove to be frivolous. Further, the negative consequences of external whistleblowing allegations have direct implications on audit risk (Bedard and Johnstone 2004; Gietzmann and Pettinicchio 2014). The heightened regulatory scrutiny associated with whistleblowing allegations will increase auditors' exposure to litigation and reputational damage. Thus, we expect auditors to charge higher audit fees to cover their additional workload and potential higher risk premium, regardless of the substance of the whistleblowing allegations. Taken together, these arguments lead to our first hypothesis:

HYPOTHESIS 1. *Ceteris paribus, whistleblowing allegations are associated with higher audit fees.*

Although we predict a positive association between external whistleblowing allegations and audit fees, auditors might consider whistleblowing allegations, on average, to be frivolous or the effect of the allegation to be too limited to change their audit planning. They may also consider that the related issue is adequately covered in their planned audits. In such cases, we would not expect a significant increase in audit fees.

Whistleblowing and auditors' opinion on internal controls

Section 404 of SOX requires external auditors to issue a report of their independent assessment of the effectiveness of client firms' internal controls over financial reporting. In our first hypothesis, we postulate that auditors will perform additional audit work when an external whistleblowing allegation is revealed. In doing so, auditors should have a better understanding of the relevance and substance of the allegation in forming their opinion on internal control quality. We argue that auditors will not issue an adverse opinion on internal controls merely because an external whistleblowing allegation has been filed. Rather, they will consider the merits of the allegation and evaluate the effectiveness of their client firm's internal controls based on the factual evidence.

Professional standards underscore that auditors need to apply due diligence and professional care in the performance of audits. AS 2201 (paragraph .03) specifically states that:

[T]o form a basis for expressing an opinion, the auditor must plan and perform the audit to obtain appropriate evidence that is sufficient to obtain reasonable assurance about whether material weaknesses exist as of the date specified in management's assessment.

Whistleblowing allegations provide auditors clues as to where and how internal controls may fail. Auditors can use the related information and work backward to identify the controls that have indeed failed or never existed. We expect auditors to issue an adverse opinion on internal controls for substantiated whistleblowing allegations, since those allegations indicate ineffective internal controls. In contrast, we expect that auditors will not issue an adverse opinion for frivolous whistleblowing allegations because such allegations do not likely contain credible or useful information that would otherwise affect auditors' assessment of internal controls. We formally state our hypothesis as follows:

HYPOTHESIS 2. Ceteris paribus, whistleblowing allegations are associated with a higher likelihood of auditors issuing an adverse opinion on internal controls only when the allegations are substantiated.

However, there are plausible alternative views to the second hypothesis. An effective internal whistleblowing system is an important part of a firm's internal control system (CIIA 2014; NWC 2007). Even an unsubstantiated whistleblowing allegation may result in a material weakness because the auditors possibly perceive that the firm did not adequately manage the whistleblowing complaint at an internal stage, thereby leading to an external report. While this view would suggest that all types of whistleblowing allegations could affect the auditor's opinion on the firm's internal control, an observation of external whistleblowing allegations does not necessarily indicate failure on behalf of the internal whistleblowing system—the firm may have found nothing wrong in its investigation into the internal whistleblowing complaint. Further, another alternative view is that, for whistleblowing allegations that arise because of retaliation, it could be that an employee was

retaliated against for reporting, even if there was no actual financial misconduct. Thus, even if the whistleblowing claim is meritorious because of retaliation, there might not be a material weakness in the internal control system. All these factors add tension to our second hypothesis.

4. Research design and data

Whistleblowing data sources

Our investigation period is from 2004 to 2014. We follow the literature and obtain external whistleblowing cases relating to financial misconduct (Bowen et al. 2010; Dyck et al. 2010). As shown in Figure 1, whistleblowing events become publicly observable when a whistleblower files a claim with an external regulatory agency (Stage 4). First, whistleblowers can report to the OSHA when they believe that their employer or any organization member has retaliated against them for reporting on matters that are in violation of SOX or the Consumer Protection Financial Act (CFPA, Title X of the Dodd–Frank Act) (Bowen et al. 2010).⁶ We obtain information on SOX or CFPA whistleblowing through a request under the Freedom of Information Act (FOIA).⁷ These SOX and CFPA whistleblowing cases should generally involve financial-related misconduct. For example,

⁶ These acts protect whistleblowers who report financial misconduct under Section 806 of SOX and Section 1057 of the Dodd–Frank Act. Specifically, the SOX Act (18 US Code §1514A) protects whistleblowers who report on mail, wire, bank, or securities fraud. The Dodd–Frank Act (§1057(b)) protects whistleblowers who perform tasks related to offering or providing a consumer financial product or service. Other types of OSHA claims are less likely to be related to financial matters.

⁷ Effective July 5, 1967, the FOIA is a federal freedom of information law that requires full or partial disclosure of previously unreleased information and documents controlled by the US Government upon request. Similar to our study, Call et al. (2018) collected OSHA whistleblower complaints from the FOIA during a sample period of 2002 to 2012. The difference in the sample size between Call et al. (2018) and our study mainly relates to sample selection. Call et al. (2018) focus on enforcement actions, while our sample mainly consists of large firms, as we restrict our sample to accelerated and large accelerated filers subject to SOX Section 404(b). Note that certain information in the OSHA cases—including information that would help a reader identify the specific contents of a claim—is redacted for a sizeable amount of the OSHA cases that we obtain from the FOIA.

Eileen Foster, a former Executive Vice President of the Fraud Risk Management division at Bank of America, filed an OSHA case under SOX against the bank in 2008 for firing her after she reported concerns regarding forged mortgage documents, faked data, and other egregious financial misconduct with the organization. In her allegation, Foster also claimed that employees in the company suffered persistent retaliation for reporting similar concerns. Such an allegation increases the inherent and control risks of the firm, as it suggests that there may be weaknesses in internal controls, operational issues, and subsequently increased litigation risk for the firm.⁸

The OSHA whistleblowing process occurs as follows. Whistleblowers initially lodge their claim with the OSHA. Upon receipt of a complaint, the named person(s) of the filing will be notified. The OSHA will investigate and issue its findings within 60 days of the complaint filing.⁹ After the OSHA issues its findings, either party involved in the case can request a full hearing by an Administrative Law Judge (ALJ) within 30 days. The ALJ's decision can be further appealed to the Administrative Review Board (ARB). Cases heard by the ALJ and ARB are publicly available from the DOL's Office of Administrative Law Judges (OALJ) website. Thus, we retrieve relevant information from the OALJ website to confirm the information that we initially obtain from the FOIA.

⁸ The elevated risks can be substantiated by the fact that the OSHA stated in its ruling (September 13, 2011) that, following the investigation of Foster's allegation, six branches of the bank in the Boston area were shut down and 44 employees were terminated.

⁹ A whistleblower can also seek a *de novo* review of the complaint by a US district court if the OSHA does not issue a final decision within 180 days after the initial filing of the complaint, and there is no evidence that such delay is due to the bad faith of the whistleblower (OSHA 2015).

Whistleblowing claims can also be filed under the FCA. Distinct from whistleblowing cases lodged with the OSHA, the FCA contains a *qui tam* provision that allows whistleblowers to file a suit against an individual or entity that has defrauded governmental programs. An FCA *qui tam* lawsuit must be filed under seal (i.e., the complaint is only available to the DOJ, the local US Attorney, and the assigned judge of the district court). To allow the DOJ time to determine whether to intervene in the whistleblower's lawsuit, the complaint must remain under seal for at least 60 days. After the DOJ makes its decision, it will make an order to unseal the case. We manually collect FCA whistleblowing cases through the LexisNexis database by searching for legal cases using the search terms "*qui tam*" and "*31 U.S.C. §3729*." Further, FCA cases that have reached a settlement are sometimes announced by the DOJ as press releases on its website. We use these press releases to corroborate the FCA data we collect from the LexisNexis search.¹⁰ We read through all FCA cases obtained and include in our sample those that are financial-related or have financial implications.

Variable definitions

Dependent variables

Our dependent variables are audit fees and auditor opinions on internal controls. We take the natural logarithm of audit fees, *AUDITFEE*, to account for the negative skewness of fees (Engel

¹⁰ As shown in Figure 1, a whistleblower can file a claim with the SEC. However, we are unable to obtain data from this source because, to protect confidentiality, the SEC does not disclose information that could directly or indirectly reveal the identity of the whistleblower or the company. Another data approach is to collect news press articles on whistleblowing reporting (Bowen et al. 2010; Dyck et al. 2010). We choose not to construct our whistleblowing sample using media articles because of the media's bias in selecting firms to cover (Bowen et al. 2010; Miller 2006), whereas our approach mitigates such a bias.

et al. 2010). We measure an auditor's opinion on a client firm's internal control effectiveness using an indicator variable (*ICD*), which equals 1 if the auditor discloses one or more material weaknesses in the SOX 404 report, and 0 otherwise.

Whistleblowing allegations

To examine auditor responses to external whistleblowing allegations, we identify the year in which auditors should have been aware of external allegations. For OSHA cases, that is the year in which the OSHA complaint was initially filed, because part 1980 of Title 29 of the Code of Federal Regulations requires that firms be notified of a complaint upon the OSHA's receipt of it.¹¹ For FCA cases, it is the year in which the whistleblowing case was unsealed and therefore known to the public, with timing determined through relevant documents obtained from the DOL database or through LexisNexis searches. The variable *WB_ALL* equals 1 if either an OSHA complaint was filed or an FCA case was unsealed that year, and 0 otherwise. Firms can be subject to multiple whistleblowing allegations in a year. We collapse such cases into a single firm-year observation.

We use an ex-post measure to capture the substance of a whistleblowing allegation based on whistleblowing outcomes as decided by the DOL. We consider whistleblowing cases to be substantiated if the case was meritorious or reached a settlement. If a case was dismissed, we consider it frivolous. The variable *WB_SUB* equals 1 if an external whistleblowing allegation reported in the year was subsequently found to be substantiated, and 0 otherwise. The variable

¹¹ Given that the client firm will be aware of the whistleblowing allegation at this date, we assume that auditors would also become aware of the allegation.

WB_FRI equals 1 if an external whistleblowing allegation reported in the year was subsequently found to be frivolous, and 0 otherwise.¹² Panel A in Table 1 reports the distribution of whistleblowing allegations in our sample by year. Our sample has 770 whistleblowing allegation firm–years, with the number mildly declining in more recent years. Among those whistleblowing allegation firm–years, 237 are found to be substantiated and 533 are found to be frivolous.

Empirical models

Audit fee model

We estimate the following ordinary least squares (OLS) model using the natural logarithm of audit fees as the dependent variable (Bruynseels and Cardinaels 2014; Jha and Chen 2015; Kim et al. 2015):

$$AUDITFEE = \beta_0 + \beta_1 WB (WB_ALL \text{ or } WB_SUB \text{ and } WB_FRI) + \sum \beta_i CONTROL_i + \sum \beta_j YEAR_j + \sum \beta_k INDUSTRY_k + \varepsilon \quad (2)$$

where all the variables are measured in year t , defined in Appendix B, and ε is an error term. The inclusion of control variables follows the extant literature, including audit-related variables, such as those representing whether the auditor was one of the Big 4, whether the audit occurred during busy season, whether the firm was late in filing, auditor tenure, whether it was the initial year of an audit engagement, and whether the auditor was an industry leader. Firm and CEO characteristics

¹² When a firm experienced both substantiated and frivolous whistleblowing cases in a year (17 firm–years in our sample), we code the firm–year as substantiated whistleblowing. Our results remain consistent when we drop these observations. In total, 511 (283) firm–years experienced an OSHA (FCA) allegation in our sample, of which 33 percent (24 percent) were found to be substantiated. In 24 firm–year observations, a firm experienced both an OSHA and FCA allegation. Further, we check the robustness of findings using the number of external (substantiated vs. frivolous) whistleblowing allegations, and our main findings remain consistent.

include firm size, performance, growth, leverage, liquidity, firm age, business complexity, whether announcing restatements this year, whether receiving auditors' ICD opinions this year, percentage of non-audit fees in the current year, audit committee-related features, CEO tenure, and CEO-chairperson duality (Abbott et al. 2004; Bruynseels and Cardinaels 2014; Carcello et al. 2002; Naiker and Sharma 2009). We expect whistleblowing allegations to be associated with higher audit fees, and subsequently predict a positive sign for β_1 in model (2).

ICD model

We employ the following logistic model to estimate the likelihood of auditors issuing an adverse opinion on internal controls (Bruynseels and Cardinaels 2014; Lim and Tan 2008; Naiker and Sharma 2009):

$$ICD = F(\gamma_0 + \gamma_1 WB (WB_ALL \text{ or } WB_SUB \text{ and } WB_FRI) + \sum \gamma_i CONTROL_i + \sum \beta_j YEAR_j + \sum \beta_k INDUSTRY_k) + \delta \quad (3)$$

where all the variables are measured in year t , defined in Appendix B, and δ is an error term. We follow prior research and include a host of control variables, such as firm size, performance, growth, leverage, liquidity, business complexity, CEO and audit committee characteristics, and auditor features (Bruynseels and Cardinaels 2014; Lim and Tan 2008; Naiker and Sharma 2009). A significantly positive coefficient on WB , γ_1 in model (3) would suggest that whistleblowing allegations are associated with a higher propensity of auditors issuing an adverse opinion on internal controls. In both models (2) and (3), we include year and industry dummies (defined by

the first two digits of the Standard Industrial Classification [SIC] codes) to control for year and industry fixed effects (Bruynseels and Cardinaels 2014; Hoitash et al. 2009).

Sample and entropy balancing

Our initial sample consists of 56,123 firm–years over the period 2004 to 2014, with available information on financials, internal control deficiencies, and other audit-related data. We obtain financial information from Compustat and retrieve ICDs and audit-related information from Audit Analytics. Given that only large filers are subject to an integrated audit, our sample mainly includes larger firms. We then remove 20-F and 40-F firms, given their unique regulatory requirements, and merge the sample with BoardEx data on corporate governance and CEO characteristics. Our final sample consists of 23,923 firm–year observations, of which 770 are subject to whistleblowing allegations.

A firm’s involvement in whistleblowing allegations is not random (Bowen et al. 2010; Call et al. 2018). We follow the literature and apply entropy balancing as a preprocessing technique to achieve covariate balance within a binary treatment—that is, being subject to a whistleblowing allegation ($WB_ALL = 1$) in our case (Hainmueller 2012; McMullin and Schonberger 2018).¹³ The control sample consists of non-whistleblowing observations ($WB_ALL = 0$). We implement entropy balancing by adjusting inequalities in the covariate distributions with respect to the first

¹³ As explained by Hainmueller (2012, 26), entropy balancing “involves a reweighting scheme that directly incorporates covariate balance into the weight function that is applied to the sample units” and “searches for the set of weights that satisfied the balance constraints [pre-specified] but remains as close as possible (in an entropy sense) to a set of uniform base weights to retain information.” By recalibrating unit weights using entropy balancing, we can effectively adjust for “systematic and random inequalities in representation” without sacrificing observations (Hainmueller 2012, 26).

(mean), second (variance), and third (skewness) moments. Panel B of Table 1 reports the descriptive statistics of the variables used in our analyses, both in the full sample and after applying entropy balancing with *WB_ALL* as the treatment and adjusting on the three moments. Further, we notice that all three moments of the covariates between whistleblowing and non-whistleblowing observations are similar after entropy balancing, suggesting the effectiveness of our method in achieving a sufficient balance between the treatment and control groups.

5. Main results

Main results of audit fees

Our first hypothesis predicts a positive association between external whistleblowing allegations and audit fees. We test our hypothesis using model (2), where *AUDITFEE* is the dependent variable. Table 2 reports the results of the OLS regressions. In column 1, we report the results of a base model without including our variables of interest, while column 2 exhibits the results of model (2), where *WB_ALL* is employed to indicate the occurrence of an external whistleblowing allegation. We also examine whether the substance of whistleblowing allegations (i.e., *WB_SUB* and *WB_FRI*) explains the variation in audit fees, with the results reported in column 3 of Table 2. We first compare the goodness of fit across the models (Feng et al. 2009; Larcker and Rusticus 2010). Our results show that, relative to the base model, adding *WB_ALL* in column 2 significantly improves the explanatory power of the model (F-statistics = 162.91, p -value < 0.01), as does including both *WB_SUB* and *WB_FRI* in column 3 (F-statistics = 112.78, p -value < 0.01).

Next, we examine the coefficients of whistleblowing variables. The significantly positive coefficient on *WB_ALL* in column 2 (p -value < 0.01) is in line with H1, and suggests that firms subject to whistleblowing allegations pay higher audit fees. Specifically, the coefficient on *WB_ALL* is 0.093, indicating that, on average, the audit fees of a firm in our sample targeted by whistleblowing allegations are approximately 9.30 percent higher than those that did not experience whistleblowing in the year. In terms of the substance of whistleblowing allegations, the results in column 3 of Table 2 show that the coefficients on *WB_SUB* (coefficient = 0.151, p -value < 0.01) and *WB_FRI* (coefficient = 0.065, p -value < 0.01) are both significantly positive, indicating that audit fees are higher for both types of allegations, compared with firms without whistleblowing allegations. We further compare the difference between the coefficients, and find that the coefficient on *WB_SUB* is statistically significantly larger than that on *WB_FRI* (F -statistics = 4.09, p -value < 0.05), suggesting that audit fees are significantly larger for substantiated (vs. frivolous) whistleblowing allegations.¹⁴ Economically, our findings suggest that audit fees increase from the median by \$362,770 (\$156,159) when substantiated (frivolous) whistleblowing allegations occur. The substantial increase in audit fees in the case of frivolous allegations implies that frivolous allegations tend to be costly. In addition, the results on the control

¹⁴ We further compare the audit fee effect of whistleblowing allegations between small and large firms. The coefficient on *WB_ALL* is 0.145 (0.073) for observations in the second (fourth) quintile of *LNTA*. The difference in coefficients is statistically significant (p -value < 0.10). In terms of economic significance, the audit fee increase related to whistleblowing allegations is about \$152,293 (\$160,018) for small (large) firms. Thus, it appears that the effect of whistleblowing allegations on audit fees has a fixed component—smaller firms are affected more as a percentage of audit fees than are larger firms.

variables are consistent with prior research (Bruynseels and Cardinaels 2014; Jha and Chen 2015; Kim et al. 2015).

To summarize, our results show that whistleblowing allegations are associated with higher audit fees, regardless of the substance of the claims, while the increase in audit fees is larger for substantiated allegations. This finding is consistent with our expectation that external whistleblowing allegations signal a client firm's heightened risk of material misreporting.

Main results of auditor's opinion on internal controls

Next, we examine the association between external whistleblowing allegations and auditors' opinions on internal controls by estimating a logit model—that is, model (3). Table 3 presents the results. Specifically, we report the results of the base model in column 1, where our variables of interest are excluded. Column 2 reports the results of model (3) with *WB_ALL* included. In column 3, we use *WB_SUB* and *WB_FRI* (in place of *WB_ALL*) to examine the substance of the whistleblowing allegations. We refer to McFadden's pseudo R^2 to assess the goodness of fit of the logit models (McFadden 1974). A value of McFadden's pseudo R^2 between 0.20 and 0.40 represents “an excellent fit” for a logistic regression (McFadden 1977, 35). We find that the values of McFadden's pseudo R^2 of model (3) are well in that range, which suggests a satisfactory goodness of fit of the model in predicting the likelihood of ICDs. In addition, we include Cox and Snell's R^2 as an alternative indicator for model fit, given that its interpretation tends to be similar to that of a generalized R^2 (i.e., OLS R^2) (Cox and Snell 1989; Cragg and Uhler 1970; Maddala 1983). Through estimating our regression model without entropy balancing, we further confirm

the predictive ability of our model using the area under the receiver operating characteristic curve (ROC). An ROC value of 0.70 and higher is often considered to indicate a satisfactory model fit (Rice and Harris 2005). The values of ROC in columns 1 to 3 of Table 3 are all above this critical value.

The significant and positive coefficient on *WB_ALL* (p -value < 0.01) in column 2 suggests that whistleblowing allegations, on average, increase auditors' propensity to issue an adverse opinion on internal controls of the firm involved in the allegation. In H2, we expect that auditors will issue ICDs based on the substance of the external whistleblowing allegations. Column 3 reports our results. We find that the coefficient on *WB_SUB* is significantly positive (p -value < 0.01), but the coefficient on *WB_FRI* is not statistically significant. These coefficients are also statistically significantly different (chi-squared = 7.93, p -value < 0.01). We further examine the economic significance of our results in marginal effects. Holding our controls constant, firms facing substantiated whistleblowing allegations will have the probability of receiving ICDs increase to 18.72 percent from a baseline probability of 5.90 percent.¹⁵ Further, the results for the control variables are in line with the literature (Bruynseels and Cardinaels 2014; Lim and Tan 2008; Naiker and Sharma 2009).

¹⁵ The coefficient on *WB_SUB* is 1.301. Note that the estimated effect of whistleblowing allegations on the probability of receiving ICDs depends on the baseline probability, p_0 , used to measure change. Given that the mean *ICD* is 0.059, we set $p_0 = 0.059$, and then the probability (p_1) will increase to 18.72 percent for firms subject to substantiated whistleblowing allegations. To explain:

$$\ln\left(\frac{\text{odds}_1}{\text{odds}_0}\right) = \ln\left[\frac{p_1/(1-p_1)}{p_0/(1-p_0)}\right] = \hat{\gamma} = 1.301$$

Substituting 0.059 for p_0 in the equation and solving for p_1 gives $p_1 = 0.1872$.

Overall, our results are consistent with H2, indicating that auditors issue adverse opinions on internal controls for substantiated cases, but not for frivolous cases. Thus, these findings support the view that auditors are able to separate out the noise in whistleblowing allegations.

6. Additional analyses and robustness tests

Analysis of auditor involvement

Prior to the revelation of external whistleblowing allegations

In this section, we run a series of additional tests to study auditors' involvement in the auditing of whistleblowing. First, internal whistleblowing typically precedes external whistleblowing. Auditors could, to a certain degree, be aware of internally reported issues, per auditing standards (e.g., AS 2110) and insight from our interviews. To explore this issue, we re-estimate models (2) and (3), with *WB_SUB* and *WB_FRI* measured in year $t + 1$ and all the other variables measured in year t . The results are summarized in panel A of Table 4. Column 1 shows that audit fees are significantly higher for both frivolous and substantiated cases in year t (i.e., the year before whistleblowing is externally revealed). The results suggest that auditors are aware of the issue when it is at an internal whistleblowing stage and thus are already increasing their audit effort accordingly.¹⁶ When comparing the coefficients in column 1, we find that the fee increase in this stage is no higher for substantiated allegations than frivolous ones. We also examine auditors' tendency to issue adverse opinions on internal controls in the year before whistleblowing

¹⁶ Although we infer increased audit effort based on higher audit fees, we are mindful of the inability to directly measure effort.

allegations. The results in column 2 of panel A in Table 4 show that auditors do not have a greater propensity to issue ICDs in this year, even for those allegations eventually deemed substantiated. This result is consistent with our interview findings that auditors receive limited information on internal whistleblowing claims or would typically consider internal controls to be adequate because internal whistleblowing allegations are received and addressed.

Past whistleblowing allegations

From our interviews, we learned that a client's history of whistleblowing is an important input for audit risk assessments. We next examine how external whistleblowing allegations in the prior year relate to audit fees and internal control opinions in the current year. We re-run models (2) and (3), with *WB_SUB* and *WB_FRI* measured in year $t - 1$ and all other variables in year t . The results reported in column 1, panel B of Table 4 show that prior-year external whistleblowing allegations, regardless of the substance, relate to higher audit fees in the current year. When comparing the coefficients of *WB_SUB* and *WB_FRI*, we further find that audit fees in year t are higher when a substantiated, compared with a frivolous, whistleblowing allegation was filed in year $t - 1$ (F-statistics = 4.15, p -value < 0.05). Collectively, the results suggest the importance of past whistleblowing activities in audit planning and pricing.

In contrast, neither *WB_SUB* nor *WB_FRI* are statistically significant in column 2, panel B of Table 4, where an auditor's opinion on internal controls in year t is the dependent variable. This finding indicates that prior-year whistleblowing allegations do not predict a higher likelihood of an auditor issuing an adverse opinion on internal controls in the current year. An explanation for

this result could be that the issuance of ICDs in year $t - 1$ prompted the client firm to take action to remediate the material weaknesses. To probe this speculation, we search the 10-Q and 10-K filings of firms in our sample subject to external whistleblowing allegations and auditors' ICD opinion in the same year. In particular, we use keywords such as "whistleblowing," "remediation," and "*qui tam*" in the searches. We find that, in the year after external whistleblowing, some firms disclose that they have undertaken measures to remediate the identified internal control deficiencies. For example, L-3 Communications (presently known as L3 Technologies) faced a whistleblowing allegation and received an adverse ICD opinion from the auditor in the fiscal year 2014.¹⁷ In its 2015 10-Q (filed on April 30, 2015, 51), the company disclosed its remediation plans that appear to concern the issues raised in the whistleblowing case:

In response to these identified material weaknesses,^[18] our management, with oversight from our audit committee, is dedicating significant resources to improve our ICFR and to remediate the identified material weaknesses. These efforts are ongoing and are focused on strengthening the Company's control environment and organizational structure.

¹⁷ According to DOJ documentation revealed on February 12, 2014, the whistleblowing complaint alleges violations of the False Claims Act for false labor charges on contract with the US army.

¹⁸ Specifically, L-3 Communications noted that: "1. The Company did not maintain an effective control environment at its Aerospace Systems segment due to: (a) the inadequate execution of existing controls related to the annual review and approval of contract (revenue arrangement) estimates, (b) not following established Company accounting policies, controls and procedures, and (c) the intentional override of numerous transactional and monitoring internal controls at its Army Sustainment division, with regard to the: (i) valuation of inventories, unbilled contract receivables and billed receivables; (ii) preparation of contract invoices; (iii) preparation, review and approval of contract estimates; (iv) recognition of costs overruns on a fixed-price maintenance and logistics support contract; (v) review and analysis of division quarterly financial statements; (vi) physical counts of inventory; and (vii) preparation, review and approval of journal entries. 2. Company personnel did not perform reviews of certain employee concerns regarding violations of the Company's accounting policies and ICFR in a sufficient and effective manner, including assigning those matters to the appropriate subject matter experts for resolution, and informing appropriate members of senior management and the audit committee about the nature of the concerns and the scope and results of the reviews" (filed on April 30, 2015, 51-52).

The company also mentioned the following in its 2015 10-K (filed on February 26, 2016, 73):

The Company tested the controls and found them to be effective. As a result, the Company has concluded that, as of December 31, 2015, these two material weaknesses have been remediated.

Further, the company did not receive any adverse ICD opinion from the auditor for the fiscal year 2015.¹⁹

Timeliness of reporting and timing of whistleblowing allegations

We next investigate whether a whistleblowing allegation negatively affects a firm's timeliness in issuing financial statements. We perform the analysis in the whistleblowing allegation sample (770 firm-year observations). We construct an indicator variable to identify an allegation that is filed later (relative to earlier) in a year. To construct this indicator, we obtain the date of the initial filing with the OSHA (for OSHA cases) and the date when the whistleblowing lawsuit was unsealed (for FCA cases). We consider an allegation filed late if the number of days between the whistleblowing allegation date and audit report date is below the sample median. We fit a logit model and use an indicator variable (*FILELATE*) for delayed 10-K filings in a year as the dependent variable (Bartov and Konchitchki 2017).²⁰ We regress *FILELATE* on the indicator for allegations filed late in a year.

¹⁹ In another test, we read into ICD codes obtained from Audit Analytics and identify specific ICDs that are more likely related to whistleblowing issues, including management/board/audit committee investigation(s); ethical or compliance issues with personnel; or senior management competency, tone, or reliability issues. We replicate model (3) using the alternatively defined ICD measure as the dependent variable and find consistent results. However, we are mindful that it is challenging to relate ICDs to whistleblowing allegations on a case-by-case basis.

²⁰ For accelerated filers, the 10-K filing deadline is 90 days after fiscal year end before December 15, 2003, and is 75 days after fiscal year end on or after December 15, 2003. For large accelerated filers, the 10-K filing deadline is 90 days after fiscal year end before December 15, 2003; 75 days after fiscal year end on or after December 15, 2003; and 60 days after fiscal year end on or after December 15, 2005.

The inclusion of other right-hand variables follows model (2), except for *FILELATE*. Untabulated results show that the allegation late filing dummy is associated with a higher likelihood of a delay in 10-K filing (coefficient = 1.882; p -value < 0.10). It appears that early whistleblower complaints give the auditor more time to plan and involve more staff to deal with the issue, suggesting that reporting is less likely to be late.

We further investigate the effect of the timing of whistleblowing allegations on auditors' action. We split the whistleblowing allegation sample based on the values of the indicator for allegations filed later in a year. We then re-run models (2) and (3) in the two subsamples, respectively. In particular, a control group consisting of non-whistleblowing observations is used in both sub-sample analyses. We further compare the coefficients on the whistleblowing allegation indicators across the subsamples. Our results are reported in panel C of Table 4. When audit fees are used as the dependent variable, the coefficient of *WB_SUB* (*WB_FRI*) in column 2 (early) is greater than the coefficient of the same variable in column 1 (late), with z -statistics = 8.39 for *WB_SUB*, p -value < 0.01; z -statistics = 6.14 for *WB_FRI*, p -value < 0.01. Thus, the results suggest that auditors charge higher audit fees when the whistleblowing allegation occurs further from the audit report date, consistent with the view expressed in our interviews that auditors are in a better position to plan and adjust their audit when a whistleblowing allegation occurs earlier in a year. For issuance of ICD opinions, the coefficient of *WB_SUB* in column 4 (early) is significantly higher than that in column 3 (late), with chi-square = 7.21 for *WB_SUB*, p -value < 0.01, while *WB_FRI* is not significant in either column. Our results suggest that, when the whistleblowing

allegation is revealed further from the audit report date, auditors have sufficient time to investigate and react in issuing ICD opinions.²¹

Analysis of auditor effort

We further explore whether increasing audit effort in the allegation year, as proxied by abnormal audit fees (Doogar et al. 2015; Eshleman and Guo 2014), is effective in improving the client's reporting quality. We compute abnormal audit fees (*ABAF*) by extracting the error term from an audit fee model; that is, we estimate model (2) without the whistleblowing variable. We assume that higher abnormal audit fees suggest greater audit effort. We measure the reporting quality of a client in a whistleblowing allegation year by the probability of its subsequently restating financial reports prepared in the allegation year (*RESTATE*). Specifically, we estimate a model in which *RESTATE* is the dependent variable, and the control variables follow Lobo and Zhao (2013).²² We further include an interaction term between abnormal audit fees and *WB_ALL* in the model. The results are reported in Table 5. In column 1, the coefficient on the interaction term between *ABAF* and *WB_ALL* is significantly negative (p -value < 0.10). We follow Norton et al. (2004) and

²¹ One concern is that auditors may underreact to allegations that occur later in the year and sacrifice audit quality because of time, budget, or other constraints. To investigate whether auditors sacrifice audit quality, we test whether substantiated whistleblowing allegations that are filed later in the year are more likely to result in subsequent misstatements, or have higher absolute or signed discretionary accruals. Our results show that such firms have a similar likelihood of subsequent misstatements to firms that received substantiated whistleblowing allegations earlier in the year. Further, we do not find significant differences in absolute (signed) discretionary accruals. As such, while we provide evidence that auditors are able to adjust their audits and perform more work when an allegation is filed earlier in the year, we do not find evidence that audit quality is significantly sacrificed when the allegation is filed later in a year.

²² Lobo and Zhao (2013) include an indicator variable for total liabilities greater than total assets in their model. This variable drops out when we apply the same model specification in our sample.

confirm the significance of the interaction term in our non-linear model with binary response.²³ To summarize, our findings indicate that the likelihood of subsequently restating financial statements is lower when auditors invest greater effort in a whistleblowing allegation year. Thus, our finding provides consistent support for auditors' role in improving reporting quality in the context of whistleblowing allegations.

Other tests

We run several other tests to check the robustness of our findings. As a falsification test, we adjust model (2) and regress audit fees in year $t - 2$ on whistleblowing allegations in year t . Our results show that the current whistleblowing allegations do not have a significant association with audit fees in year $t - 2$, which suggests that it is less likely that our main findings on audit fees are because of a correlated omitted variable problem. We also examine how long the effect of whistleblowing allegations on increased audit fees will persist. Specifically, we regress audit fees in year t on a string of whistleblowing allegation indicators from years $t - 4$ to $t - 2$. We find that current audit fees have a significantly positive association with the allegation indicators, except for year $t - 4$, suggesting that the effect on audit fees dissipates three years after the allegation.²⁴ Our evidence thus suggests that the effect of whistleblowing allegations on audit fees spans five

²³ We calculate the value of the interaction term based on regression estimates. We find that, for observations with a non-zero interaction term, 62 percent (38 percent) of them have a negative (positive) value. We also plot the moderating effect of *ABAF* and find that the association between whistleblowing allegations and predicted likelihood of restatements significantly varies in low versus high *ABAF* groups, as expected.

²⁴ We further compare the coefficients on whistleblowing allegation dummies between year $t - 2$ and year $t - 3$. The results show that the coefficients are not significantly different from each other. Note that our tests compare whistleblowing firms with non-whistleblowing firms on future audit fees. We do not focus on the changes of audit fees for whistleblowing firms over time.

years, from the year before to three years after. Further, because our investigation period covers the recent financial crisis, which could have influenced both whistleblowing and auditor actions, we drop observations for 2007 and 2008. We also replicate our analysis by excluding financial firms (Chan et al. 1993; Fields et al. 2004) and clustering standard errors by year. In all tests, we obtain inferentially consistent results.

7. Conclusions

This study examines the associations between external whistleblowing allegations and auditors' responses, as observed in audit fees and their opinion on internal controls. We find that firms targeted by employee whistleblowers have significantly higher audit fees, regardless of the substance of the allegation, whereas auditors tend to issue adverse opinions on internal controls only when the allegation is substantiated, but not frivolous. In additional tests, we show that audit fees increase prior to an external revelation of misconduct, suggesting that auditors are likely aware of whistleblowing when it is internally reported, and thereby incorporate this information into their audit planning. We also show that, when auditors invest greater effort into the audit of whistleblowing allegation years, the reporting quality of the firms involved in these allegations is higher. Taken together, our findings suggest that a whistleblowing allegation represents a red flag of potential financial misconduct and that auditors play an important role in the context of whistleblowing.

Our findings should be interpreted with caution because it is difficult to validate a causal relation between whistleblowing allegations and audit fees (internal control opinion). Nevertheless,

we employ various approaches to address potential endogeneity concerns. Specifically, we include a battery of control variables in the regression models and employ various balancing and matching strategies to mitigate potential confounding effects. Even if we cannot entirely remove the endogeneity, the co-movement in whistleblowing allegations and auditor actions could suggest that whistleblowing is informative about corporate financial misconduct, and hence provides useful information to the public.

As with other archival auditing research (e.g., Hogan and Wilkins 2008), we are unable to disentangle the two drivers of increased audit fees—that is, whether the increased fees represent a risk premium or extra auditor efforts. Further, our sample consists of large companies, and our findings could have limited generalizability to smaller firms. Despite these limitations, this study offers initial evidence about auditors' involvement in assessing whistleblowing, thereby extending current knowledge about the economic consequences of whistleblowing allegations and the importance of auditors in improving reporting quality. Overall, our results suggest that external whistleblowing increases auditor effort and the increased effort likely lowers the likelihood of subsequent misstatements.

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Appendix A

Interview design

1. We began the interview with the following question to understand the interviewee's experience in auditing and with whistleblowing allegations: *Please describe your experience with whistleblowing matters during the audit process.* When necessary, prompts were used to provide us with an understanding of the protocols and normal procedure applied by their firm regarding whistleblowing matters during the audit process, as well as their views on the internal reporting channels (such as whistleblowing hotlines) of established client firms, and their effect on the audit process.
2. The second set of questions sought to understand auditors' decision making and response in the context of whistleblowing:
 - a. *How do auditors apply their professional judgment with respect to whistleblowing matters during the audit process? How would auditors judge the materiality of a whistleblowing claim?*
 - b. *How do auditors respond to whistleblowing allegations? What types of information do they use (e.g., provided by a client firm or acquired from another party, such as regulators)?*
 - c. *Will auditors treat frivolous whistleblowing cases differently from substantiated ones?*
 - d. *Does observation or acknowledgement of whistleblowing (internal or external) allegations affect audit fees?*
 - e. *Does observation or acknowledgement of whistleblowing (internal or external) allegations affect auditors' opinion on internal controls?*
3. The third set of questions were designed to learn more about the timing of auditors' involvement in whistleblowing matters:
 - a. *Before an allegation is externally revealed, to what extent do auditors have information about or are involved in whistleblowing matters that are filed internally?*
 - b. *How do auditors respond when a whistleblowing matter was internally versus externally reported?*
 - c. *Does the timing of whistleblowing allegations (e.g., earlier vs. later in the year) affect the auditor's response?*

4. We concluded the interview with a broad question to understand how auditors view their role when it comes to whistleblowing matters: *What is the auditor's role when a client firm is subject to whistleblowing allegations?*

Appendix B

Variable definitions

Variable	Definition	Data source
<i>Variables of interest</i>		
<i>AUDITFEE</i>	= Natural logarithm of audit fees.	Audit Analytics
<i>ICD</i>	= Indicator variable that equals 1 if the auditor discloses one or more material weaknesses in their initial opinion in the SOX 404 report and 0 otherwise.	
<i>Whistleblowing variables</i>		
<i>WB_ALL</i>	= Indicator variable that equals 1 if an OSHA or FCA whistleblowing allegation is made against a firm in a given year and 0 otherwise.	OSHA, DOL website, and DOJ
<i>WB_SUB</i>	= Indicator variable that equals 1 if a whistleblowing case ended in a favorable manner for the whistleblower (i.e., a meritorious case or a case that reached a private settlement) and 0 otherwise.	
<i>WB_FRI</i>	= Indicator variable that equals 1 if a whistleblowing case ended in an unfavorable decision for the whistleblower (i.e., case was dismissed) and 0 otherwise.	
<i>Audit-related variables</i>		
<i>BIG4</i>	= Indicator variable that equals 1 if a firm engages a Big 4 auditor and 0 otherwise.	Audit Analytics
<i>BUSY</i>	= Indicator variable that equals 1 when the firm's fiscal year ends in December and 0 otherwise.	
<i>INITIAL</i>	= Indicator variable that equals 1 if it is the initial year of the audit-client relationship and 0 otherwise.	
<i>LEADER</i>	= Indicator variable that equals 1 if the audit office has the highest market share in an industry for a given year, where the market share is calculated as the total audit fees of an audit office divided by the total audit fees in an industry for a given year. Industries are defined using two-digit SIC codes.	
<i>FILELATE</i>	= Indicator variable that equals 1 if the firm files after the date of the filing deadline and 0 otherwise.	
<i>AUDTENURE</i>	= Number of successive years that the audit firm has been engaged by the firm.	
<i>ABAF</i>	= Abnormal audit fees. Residual extracted from model (3) estimated without the whistleblowing variables.	
<i>Firm economic and operating characteristics</i>		
<i>LNTA</i>	= Natural logarithm of total assets at the end of the year.	Compustat

Variable	Definition	Data source
<i>INVREC</i>	= Inventory plus receivables, divided by total assets at the end of the year.	
<i>LNSEG</i>	= Natural logarithm of the number of segments.	
<i>FOREIGN</i>	= Indicator variable that equals 1 if the firm has foreign transactions during the year and 0 otherwise.	
<i>LEV</i>	= Leverage ratio that equals total liabilities divided by total assets at the end of the year.	
<i>LIQ</i>	= Liquidity ratio that equals current assets divided by current liabilities at the end of the year.	
<i>ROA</i>	= Operating income divided by total assets at the end of the year.	
<i>LOSS</i>	= Indicator variable that equals 1 if the current net income or net income last year was less than zero and 0 otherwise.	
<i>RESANC</i>	= Indicator variable that equals 1 if a restatement was announced in the year and 0 otherwise.	Audit Analytics
<i>RESTATE</i>	= Indicator variable that equals 1 if financial statements for the year were subsequently restated and 0 otherwise.	
<i>NONAF</i>	= Percentage of non-audit fees in total fees.	
<i>RESTRUCT</i>	= Indicator variable that equals 1 if the change in total assets during the year is over 50% and 0 otherwise.	Compustat
<i>OCF</i>	= Operating cash flows divided by total assets at the end of the year.	
<i>INVEST</i>	= Cash plus short-term investment divided by total assets at the end of the year.	
<i>BTM</i>	= Book-to-market ratio, calculated as tangible common equity divided by the market value at the end of the year.	
<i>FAGE</i>	= Firm age, defined as the number of years for which a firm has data available from Compustat.	
<i>ZSCORE</i>	= Altman's (1968) Z-score, calculated as $Z = 1.2 \times \text{working capital}/\text{total assets} + 1.4 \times \text{retained earnings}/\text{total assets} + 3.3 \times \text{earnings before interest and taxes}/\text{total assets} + 0.6 \times \text{market value equity}/\text{book value of total debt} + 0.999 \times \text{sales}/\text{total assets}$. The variable <i>ZSCORE</i> is coded as 2 if <i>Z</i> is less than 1.81, as 1 if <i>Z</i> is between 1.81 and 2.99, and as 0 if <i>Z</i> is greater than 3. A lower score indicates a higher probability of firm distress.	
<i>CURR_ACC</i>	= One-year change in non-cash current assets (change in current assets less change in cash and short-term investments, less change in current liabilities, less	

Variable	Definition	Data source
	change in current debt, less change in taxes payable) divided by the average of total assets in year t and $t - 1$.	
<i>SALESGR</i>	= One-year change in sales.	
<i>FIN</i>	= Indicator variable that equals 1 if the sum of new long-term debt and new equity issuance exceeds two percent of lagged total assets, and 0 otherwise.	
<i>EXTFINDEM</i>	= External financing demand. Indicator variable that equals 1 if free cash flow is below -0.5 and 0 otherwise. Free cash flow is computed as the sum of cash from operations minus average capital expenditures in the last three years, divided by current assets.	
<i>INVINTCOV</i>	= Inverse interest coverage, which is computed as interest expense divided by operating income before depreciation. <i>INVINTCOV</i> is capped at 2 and is assigned a value of 2 if operating income before depreciation is below zero.	
<i>MERGER</i>	= Indicator variable that equals 1 if there was an acquisition that contributed to sales, and 0 otherwise.	
<i>PSCORE</i>	= Predicted probability of misstatements based on the Dechow et al. (2011) model: $RESTATE_t = f(TOT_ACC_t, \Delta REC_t, \Delta INV_t, SOFTASSETS_t, \Delta CSALE_t, \Delta ROA_t, ISSUE_t, \Delta EMP_t, LEASE_t, ABRET_t, ABRET_{t-1})$	
<i>TOT_ACC</i>	= One-year change in non-cash assets (non-cash total assets minus total liabilities and preferred stock) divided by the average of total assets in year t and $t - 1$.	
ΔREC	= One-year change in accounts receivables.	
ΔINV	= One-year change in inventories.	
<i>SOFTASSETS</i>	= Soft assets divided by total assets. Soft assets is computed as total assets less the sum of cash and short-term investments and property, plant, and equipment.	
$\Delta CSALE$	= Percentage change in cash sales, where cash sales is computed as sales minus change in receivables.	
ΔROA	= One-year change in <i>ROA</i> .	
<i>ISSUE</i>	= Indicator variable that equals 1 if the company issued debt or equity securities during the year, and 0 otherwise.	
ΔEMP	= One-year change in number of employees.	
<i>LEASE</i>	= Indicator variable that equals 1 if future operating lease obligations are greater than zero, and 0 otherwise.	
<i>ABRET</i>	= Annual buy-and-hold stock return minus annual buy-and-hold value-weighted NYSE/AMEX/NASDAQ index return.	CRSP

Variable	Definition	Data source
<i>Corporate governance variables</i>		
<i>ACEXP</i>	= Proportion of audit committee members with financial expertise.	BoardEx
<i>DUALITY</i>	= Indicator variable that equals 1 if the CEO is also the chairperson and 0 otherwise.	
<i>CEOTENURE</i>	= Number of years the CEO has remained in the role.	

Figure 1 Whistleblowing process

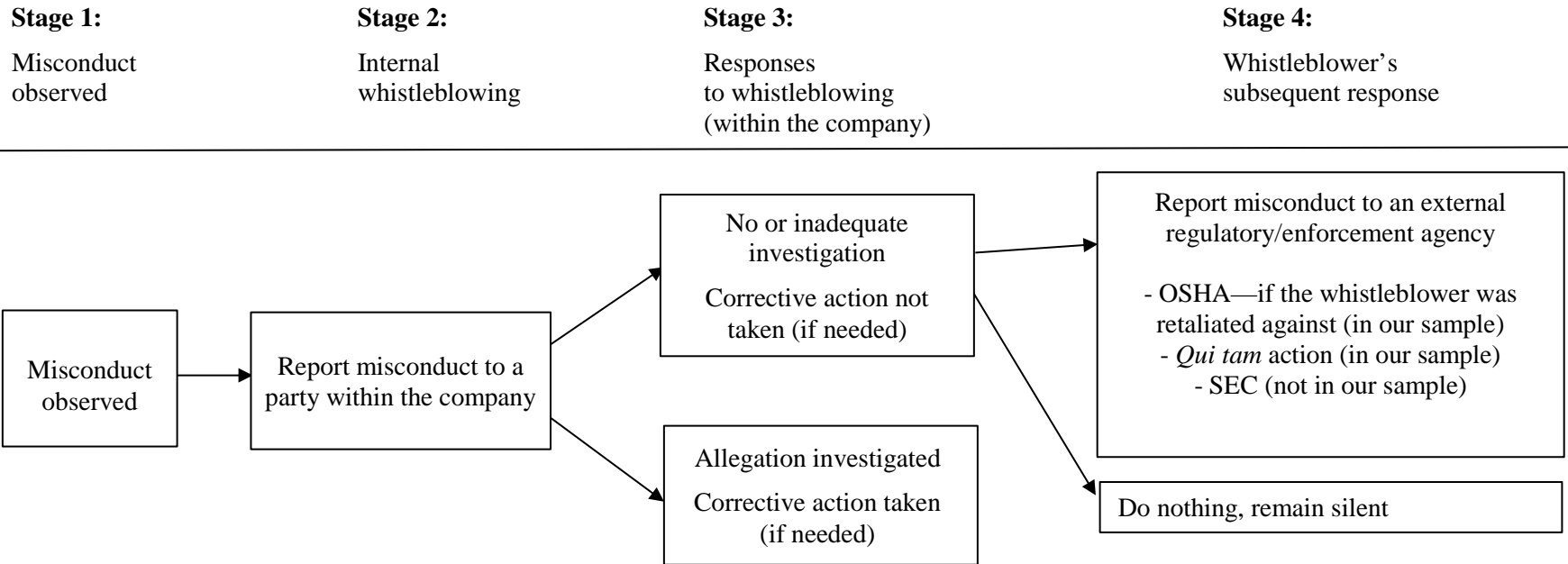


TABLE 1
Descriptive statistics

Panel A: Sample distribution by year

Year	<i>WB_ALL</i> = 0	<i>WB_SUB</i> = 1	<i>WB_FRI</i> = 1
2004	1,599	7	44
2005	2,469	19	64
2006	2,505	31	49
2007	2,461	25	63
2008	2,343	29	44
2009	2,191	24	65
2010	2,083	29	40
2011	2,073	17	44
2012	2,034	19	56
2013	2,037	27	47
2014	1,358	10	17
Total	23,153	237	533

Panel B: Descriptive statistics

Variable	Full sample						After entropy balancing							
	N	Mean	SD	25%	50%	75%	<i>WB_ALL</i> = 1				<i>WB_ALL</i> = 0			
							N	Mean	Variance	Skewness	N	Mean	Variance	Skewness
<i>AUDITFEE</i>	23,923	14.056	1.090	13.342	13.975	14.692	770	15.341	1.552	0.026	23,153	14.013	1.118	0.222
<i>ICD</i>	23,923	0.059	0.235	0.000	0.000	0.000	770	0.062	0.059	3.621	23,153	0.062	0.058	3.619
<i>LNTA</i>	23,923	7.072	1.798	5.790	6.999	8.228	770	8.979	3.546	-0.322	23,153	8.977	3.545	-0.319
<i>LEV</i>	23,923	0.527	0.236	0.343	0.534	0.703	770	0.597	0.037	-0.147	23,153	0.597	0.037	-0.145
<i>LIQ</i>	23,923	2.310	2.671	0.879	1.701	2.875	770	1.603	1.645	2.957	23,153	1.603	1.645	2.958
<i>OCF</i>	23,923	0.061	0.152	0.024	0.074	0.125	770	0.093	0.007	-1.665	23,153	0.093	0.007	-1.672
<i>ROA</i>	23,923	0.045	0.157	0.020	0.064	0.112	770	0.091	0.008	-2.613	23,153	0.091	0.008	-2.617
<i>BTM</i>	23,923	0.372	0.486	0.112	0.304	0.569	770	0.150	0.150	1.017	23,153	0.150	0.150	1.017
<i>LOSS</i>	23,923	0.315	0.465	0.000	0.000	1.000	770	0.201	0.161	1.490	23,153	0.202	0.161	1.488
<i>INVEST</i>	23,923	0.180	0.211	0.029	0.093	0.252	770	0.127	0.018	2.229	23,153	0.127	0.018	2.230
<i>FOREIGN</i>	23,923	0.352	0.478	0.000	0.000	1.000	770	0.330	0.221	0.724	23,153	0.330	0.221	0.722
<i>INVREC</i>	23,923	0.255	0.213	0.083	0.203	0.359	770	0.239	0.030	1.134	23,153	0.239	0.030	1.135
<i>ZSCORE</i>	23,923	0.924	0.904	0.000	1.000	2.000	770	0.868	0.724	0.256	23,153	0.867	0.724	0.256
<i>RESANC</i>	23,923	0.085	0.279	0.000	0.000	0.000	770	0.092	0.084	2.819	23,153	0.092	0.084	2.818
<i>LNSEG</i>	23,923	0.998	1.043	0.000	1.099	1.946	770	1.159	1.216	0.354	23,153	1.159	1.216	0.354
<i>FAGE</i>	23,923	22.319	16.276	10.000	17.000	30.000	770	33.750	387.5	0.143	23,153	33.740	387.4	0.144
<i>RESTRUCT</i>	23,923	0.293	0.455	0.000	0.000	1.000	770	0.421	0.244	0.321	23,153	0.421	0.244	0.320
<i>BIG4</i>	23,923	0.829	0.377	1.000	1.000	1.000	770	0.964	0.035	-4.954	23,153	0.964	0.035	-4.950
<i>FILELATE</i>	23,923	0.155	0.362	0.000	0.000	0.000	770	0.078	0.072	3.149	23,153	0.158	0.133	1.880

Variable	Full sample						After entropy balancing							
	N	Mean	SD	25%	50%	75%	<i>WB_ALL</i> = 1				<i>WB_ALL</i> = 0			
							N	Mean	Variance	Skewness	N	Mean	Variance	Skewness
<i>NONAF</i>	23,923	0.156	0.145	0.044	0.122	0.230	770	0.189	0.019	0.883	23,153	0.155	0.021	1.561
<i>BUSY</i>	23,923	0.812	0.391	1.000	1.000	1.000	770	0.855	0.125	-2.011	23,153	0.854	0.125	-2.009
<i>INITIAL</i>	23,923	0.047	0.212	0.000	0.000	0.000	770	0.025	0.024	6.128	23,153	0.025	0.024	6.125
<i>LEADER</i>	23,923	0.562	0.496	0.000	1.000	1.000	770	0.653	0.227	-0.644	23,153	0.653	0.227	-0.642
<i>AUDTENURE</i>	23,923	4.268	2.808	2.000	4.000	6.000	770	4.834	7.928	0.374	23,153	4.833	7.926	0.375
<i>ACEXP</i>	23,923	0.441	0.314	0.250	0.333	0.667	770	0.496	0.108	0.334	23,153	0.496	0.108	0.335
<i>DUALITY</i>	23,923	0.502	0.500	0.000	1.000	1.000	770	0.639	0.231	-0.579	23,153	0.639	0.231	-0.577
<i>CEOTENURE</i>	23,923	5.457	5.722	1.600	3.800	7.400	770	4.855	27.690	2.534	23,153	4.854	27.690	2.535

Notes: Panel A reports the sample distribution by year. Panel B reports the descriptive statistics for the sample after entropy balancing. Variable definitions are provided in Appendix B.

TABLE 2
Whistleblowing and audit fees

Variable	Dependent variable: <i>AUDITFEE</i>		
	(1)	(2)	(3)
<i>WB_ALL</i>		0.093*** (4.331)	
<i>WB_SUB</i>			0.151*** (4.099)
<i>WB_FRI</i>			0.065*** (2.656)
<i>LNTA</i>	0.553*** (68.797)	0.551*** (68.999)	0.551*** (69.126)
<i>LEV</i>	-0.091 (-0.909)	-0.092 (-0.930)	-0.085 (-0.881)
<i>LIQ</i>	-0.011 (-0.730)	-0.013 (-0.854)	-0.014 (-0.889)
<i>OCF</i>	-0.541*** (-2.773)	-0.549*** (-2.821)	-0.534*** (-2.762)
<i>ROA</i>	-0.281 (-1.379)	-0.287 (-1.400)	-0.310 (-1.526)
<i>BTM</i>	-0.200*** (-4.958)	-0.207*** (-5.152)	-0.205*** (-5.050)
<i>LOSS</i>	0.176*** (5.133)	0.174*** (5.055)	0.174*** (5.054)
<i>INVEST</i>	0.244*** (2.651)	0.256*** (2.759)	0.243*** (2.613)
<i>FOREIGN</i>	0.098*** (4.558)	0.095*** (4.433)	0.096*** (4.471)
<i>INVREC</i>	0.664*** (5.573)	0.667*** (5.598)	0.668*** (5.601)
<i>ZSCORE</i>	-0.069*** (-3.491)	-0.071*** (-3.595)	-0.072*** (-3.705)
<i>RESANC</i>	0.075* (1.790)	0.076* (1.835)	0.077* (1.882)
<i>LNSEG</i>	0.104*** (6.599)	0.105*** (6.690)	0.104*** (6.649)
<i>ICD</i>	0.378*** (7.181)	0.379*** (7.293)	0.371*** (7.143)
<i>FAGE</i>	0.007*** (9.253)	0.007*** (9.130)	0.007*** (9.099)
<i>BIG4</i>	0.218*** (4.072)	0.222*** (4.205)	0.225*** (4.316)
<i>FILELATE</i>	0.033	0.033	0.030

Variable	Dependent variable: <i>AUDITFEE</i>		
	(1)	(2)	(3)
	(0.674)	(0.659)	(0.605)
<i>NONAF</i>	-0.222***	-0.219***	-0.216***
	(-2.694)	(-2.653)	(-2.609)
<i>BUSY</i>	0.009	0.009	0.010
	(0.329)	(0.319)	(0.364)
<i>INITIAL</i>	-0.096	-0.098	-0.093
	(-1.366)	(-1.429)	(-1.353)
<i>LEADER</i>	0.001	0.003	0.003
	(0.047)	(0.133)	(0.105)
<i>AUDTENURE</i>	-0.008	-0.008	-0.008
	(-1.213)	(-1.295)	(-1.313)
<i>ACEXP</i>	0.148***	0.149***	0.145***
	(4.713)	(4.747)	(4.665)
<i>DUALITY</i>	0.044*	0.045*	0.047**
	(1.918)	(1.948)	(2.035)
<i>CEOTENURE</i>	-0.006***	-0.006***	-0.006***
	(-3.363)	(-3.352)	(-3.478)
Intercept	9.545***	9.537***	9.528***
	(59.731)	(60.241)	(60.202)
Year fixed effects	Included	Included	Included
Industry fixed effects	Included	Included	Included
N	23,923	23,923	23,923
Adjusted R ²	0.814	0.816	0.816
F-statistics		162.91***	112.78***

Notes: This table reports the OLS regression results of the association between whistleblowing and audit fees (*AUDITFEE*). The *t*-statistics are reported in parentheses. ***, **, * indicate significance at 1 percent, 5 percent, and 10 percent levels (two-tailed), respectively. Variable definitions are provided in Appendix B.

TABLE 3
Whistleblowing and ICD

Variable	Dependent variable: <i>ICD</i>		
	(1)	(2)	(3)
<i>WB_ALL</i>		0.692*** (3.556)	
<i>WB_SUB</i>			1.301*** (4.843)
<i>WB_FRI</i>			0.290 (1.130)
<i>LNTA</i>	-0.334*** (-4.249)	-0.359*** (-4.397)	-0.356*** (-4.405)
<i>LEV</i>	1.747*** (2.593)	1.793*** (2.638)	1.852*** (2.730)
<i>LOSS</i>	0.556** (2.028)	0.586** (2.092)	0.573** (2.040)
<i>OCF</i>	-0.351 (-0.195)	-0.526 (-0.290)	-0.669 (-0.346)
<i>ROA</i>	-0.735 (-0.458)	-0.503 (-0.310)	-0.537 (-0.318)
<i>BTM</i>	0.580** (2.119)	0.510* (1.874)	0.507* (1.762)
<i>RESTRUCT</i>	0.267 (1.147)	0.262 (1.103)	0.217 (0.906)
<i>LNSEG</i>	-0.252* (-1.648)	-0.229 (-1.465)	-0.266 (-1.619)
<i>FAGE</i>	-0.009 (-1.197)	-0.010 (-1.321)	-0.008 (-1.067)
<i>RESANC</i>	2.048*** (9.432)	2.082*** (9.457)	2.106*** (9.642)
<i>BIG4</i>	-0.659 (-1.609)	-0.635 (-1.568)	-0.623 (-1.576)
<i>INITIAL</i>	0.972** (2.424)	0.965** (2.386)	1.049*** (2.723)
<i>LEADER</i>	-0.489** (-2.273)	-0.478** (-2.150)	-0.482** (-2.166)
<i>AUDTENURE</i>	-0.176** (-2.271)	-0.179** (-2.385)	-0.189** (-2.567)
<i>ACEXP</i>	0.551 (1.578)	0.591* (1.694)	0.598* (1.747)
<i>DUALITY</i>	-0.311 (-1.436)	-0.273 (-1.245)	-0.304 (-1.356)
<i>CEOTENURE</i>	-0.007 (-0.334)	-0.008 (-0.385)	-0.015 (-0.691)

Variable	Dependent variable: <i>ICD</i>		
	(1)	(2)	(3)
Intercept	0.366 (0.373)	0.356 (0.354)	0.158 (0.149)
Year fixed effects	Included	Included	Included
Industry fixed effects	Included	Included	Included
N	23,745	23,745	23,745
McFadden's pseudo R ²	0.342	0.351	0.362
Cox-Snell R ²	0.345	0.354	0.365
ROC	0.849	0.799	0.799

Notes: This table reports the logistic regression results of the association between whistleblowing and auditors' propensity to issue an adverse opinion on internal controls (*ICD*). The *z*-statistics are reported in parentheses. ***, **, * indicate significance at 1 percent, 5 percent, and 10 percent levels (two-tailed), respectively. Variable definitions are provided in Appendix B.

TABLE 4

Analysis of the involvement of auditors in the whistleblowing process

Panel A: Audit fee (opinion on internal controls) in year t and whistleblowing allegations in year $t + 1$

Variable	Dependent variable: <i>AUDITFEE</i>		Dependent variable: <i>ICD</i>	
	(1)		(2)	
<i>WB_SUB</i> ($t + 1$)	0.108***		0.566	
	(2.980)		(1.606)	
<i>WB_FRI</i> ($t + 1$)	0.060**		0.386	
	(2.256)		(1.372)	
Controls	Included		Included	
N	18,550		18,326	
Adjusted R ²	0.828			
McFadden's pseudo R ²			0.302	
Cox-Snell R ²			0.304	
ROC			0.811	

Panel B: Audit fee (opinion on internal controls) in year t and whistleblowing allegations in year $t - 1$

Variable	Dependent variable: <i>AUDITFEE</i>		Dependent variable: <i>ICD</i>	
	(1)		(2)	
<i>WB_SUB</i> ($t - 1$)	0.137***		-0.320	
	(3.446)		(-0.623)	
<i>WB_FRI</i> ($t - 1$)	0.044*		0.226	
	(1.676)		(0.727)	
Controls	Included		Included	
N	18,550		18,303	
Adjusted R ²	0.820			
McFadden's pseudo R ²			0.288	
Cox-Snell R ²			0.290	
ROC			0.792	

Panel C: Timing of whistleblowing allegation

Variable	Dependent variable: <i>AUDITFEE</i>		Dependent variable: <i>ICD</i>	
	Late	Early	Late	Early
	(1)	(2)	(3)	(4)
<i>WB_SUB</i>	0.076***	0.220***	0.306	1.936***
	(6.275)	(17.957)	(0.664)	(5.822)
<i>WB_FRI</i>	0.021**	0.099***	0.298	0.425
	(2.428)	(10.817)	(0.908)	(1.290)
Controls	Included	Included	Included	Included
N	23,536	23,540	23,358	23,362
Adjusted R ²	0.819	0.811		

Variable	Dependent variable: <i>AUDITFEE</i>		Dependent variable: <i>ICD</i>	
	Late (1)	Early (2)	Late (3)	Early (4)
McFadden's pseudo R ²			0.365	0.357
Cox-Snell R ²			0.367	0.359
ROC			0.798	0.798

Notes: Panel A summarizes the results of the association between whistleblowing and one-year prior audit fees (auditor's opinion on internal controls). Panel B summarizes the results of the association between whistleblowing and one-year ahead audit fees (auditor's opinion on internal controls). Panel C summarizes the results of the association between audit fees (auditor's opinion on internal controls) and the timing of the whistleblowing allegation. Specifically, we split the sample into a "late" group and an "early" group based on whether the number of days between the whistleblowing allegation date and audit report date is below the sample median or not. The *t*-(*z*-)statistics are reported in parentheses. ***, **, * indicate significance at 1 percent, 5 percent, and 10 percent levels (two-tailed), respectively. Variable definitions are provided in Appendix B.

TABLE 5

Audit effort in the year of whistleblowing and the likelihood of subsequent restatement

Variable	Dependent variable: <i>RESTATE</i>	
	(1)	
<i>ABAF</i>	0.034	(0.907)
<i>WB_ALL</i>	0.029	(0.328)
<i>WB_ALL</i> × <i>ABAF</i>	-0.309*	(-1.751)
<i>PSCORE</i>	3.021**	(2.201)
<i>LNTA</i>	-0.008	(-0.550)
<i>LEV</i>	0.009	(0.087)
<i>LOSS</i>	0.015	(0.332)
<i>CURR_ACC</i>	-0.011	(-0.041)
<i>BTM</i>	0.026	(0.632)
<i>SALESGR</i>	0.007	(0.115)
<i>FIN</i>	0.097***	(2.626)
<i>EXTFINDEM</i>	-0.008	(-0.090)
<i>INVINTCOV</i>	0.043	(1.274)
<i>RESTATE</i> (<i>lag</i>)	1.933***	(53.767)
<i>MERGER</i>	0.088**	(2.040)
<i>BIG4</i>	0.113*	(1.926)
<i>LEADER</i>	0.054	(1.498)
<i>AUDTENURE</i>	0.003	(0.330)
Constant	-2.251***	(-7.482)
Year fixed effects	Included	

Industry fixed effects	Included
Observations	12,184
McFadden's pseudo R ²	0.336
Cox-Snell R ²	0.339
ROC	0.844

Notes: This panel summarizes the results of the association between whistleblowing, audit effort, and the likelihood of a subsequent restatement of financial statements (*RESTATE*). The *z*-statistics are reported in parentheses. ***, **, * indicate significance at 1 percent, 5 percent, and 10 percent levels (two-tailed), respectively. Variable definitions are provided in Appendix B.

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Whistleblowing Allegations, Audit Fees, and Internal Control Deficiencies*

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BO QIN, *The University of Melbourne*

ABSTRACT

We investigate whether audit fees and auditors' opinions on internal controls are associated with whistleblowing allegations externally filed to regulatory agencies. We find that firms subject to whistleblowing allegations have significantly higher audit fees, regardless of the substance of these allegations, whereas an auditor is more likely to issue an adverse opinion on internal controls when the allegation is substantiated, rather than frivolous. Further, our findings suggest that auditors are involved in the auditing of whistleblowing when the allegation is still in an internal stage. We also show that firms subject to external whistleblowing allegations have a lower likelihood of restating financial statements prepared in the allegation year when greater audit effort is made in that year. Our study is among the first to demonstrate the role of auditors in the context of whistleblowing.

Keywords: *Whistleblowing; audit risk; audit fees; internal control*

JEL descriptors: M41; M42; M48

Data availability: Data used in this study are available from the sources identified in the text.

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1. Introduction

Whistleblowing is an action undertaken by a person who exposes any kind of information or activity that is deemed illegal or unethical concerning an organization. Given that whistleblowing can expose financial misdeeds, auditors may consider such allegations against client firms to be a signal of heightened risk of material misstatement, and act accordingly (Taylor and Thomas 2013). However, the substance of whistleblowing allegations can be a subject of great uncertainty, as whistleblowers often incorrectly assess the situation (Bowen et al. 2010; Near and Miceli 1996) or possess mixed incentives and file frivolous whistleblowing claims (Anechiarico and Jacobs 1996; Gobert and Punch 2000).¹ In this study, we are interested in understanding how auditors respond to whistleblowing allegations filed to an external regulatory agency, such as the United States (US) Government's Occupational Safety and Health Administration Office (OSHA)—an agency of the Department of Labor (DOL)—or the Department of Justice (DOJ). Specifically, we focus on external whistleblowing allegations relating to financial matters and empirically examine the relationship between a whistleblowing allegation and audit outcomes, including audit fees and auditors' opinion on internal controls.

Auditing standards require auditors to compile information from all relevant sources—including whistleblowing tips—in their risk assessment (AS 2110). Evidence shows that firms subject to external whistleblowing allegations may subsequently face a higher litigation risk and a greater likelihood of accounting restatements (Bowen et al. 2010; Call et al. 2018), thereby suggesting that a whistleblowing allegation is informative for a financial statement audit. Auditing standards also require auditors to consider possible illegal acts that could affect financial

¹ Government statistics on financial whistleblowing indicate that frivolous claims are often filed. Statistics from the United States Government's Occupational Safety and Health Administration (OSHA) website report that, among all whistleblowing claims filed under the Sarbanes–Oxley Act (SOX) of 2002, between 2006 and 2016, only 20 percent saw positive outcomes for the whistleblower, while the majority (66 percent) of all cases were dismissed by the OSHA.

statements by applying audit procedures to ascertain whether that act has occurred (AS 2405). Hence, auditors have good reasons to react to external whistleblowing allegations, and their responses should be reflected in audit-related outcomes, such as audit fees and internal control opinions. However, some anecdotes indicate that auditors have chosen not to act upon whistleblowing tips. For example, Ernst and Young did not follow through on whistleblowers' claims over unethical accounting in Lehman Brothers (Clark 2010) and KPMG played down whistleblowing tips over HBOS (Bambrough 2015). Similar cases involving Deloitte and PwC have also been reported (Garside 2014). Thus, the association between external whistleblowing allegations and audit-related outcomes warrants an empirical investigation.

To analyze the effects of external whistleblowing allegations on auditor actions, we employ the audit risk model—a framework that explains the relationship among overall audit risk, inherent risk, control risk, and detection risk (Bell et al. 2001; Dusenbury et al. 2000; Hogan and Wilkins 2008). We argue that auditors will respond to external whistleblowing allegations because such claims increase a client's inherent and control risks. Further, the increased public scrutiny and attention directed toward a client firm involved in an external whistleblowing allegation is likely to raise reputation concerns and litigation risk in audits (Pae and Yoo 2001). Auditors should carefully consider the allegations and design their audit strategies accordingly—such as increasing the amount of fieldwork—to ensure an acceptable level of audit risk. Both increased auditor effort and litigation risk suggest higher audit fees. Thus, we expect audit fees to increase when a firm is involved in an external whistleblowing allegation.

An external whistleblowing allegation can also help the auditor identify deficiencies in a firm's internal controls. Whistleblowing tips provide auditors specific information on potential misstatements and produce a more thorough audit. For example, upon becoming aware of external

whistleblowing allegations, auditors can work backward to identify whether related internal controls have, indeed, failed. In doing so, auditors will gain deeper insight into the substance of the whistleblowing allegation and be in a better position to evaluate the validity or materiality of the possible misstatement and the effectiveness of a firm's internal controls. If there is no substance to the allegation, there is unlikely to be a misstatement, or a corresponding control failure, which will also be discovered by auditors following up on the information in the whistleblowing allegation. To summarize, we predict that auditors will judge that internal controls are ineffective only when the external whistleblowing allegation has substance.

To investigate this issue, we first interview audit practitioners on their views about the importance of external whistleblowing allegations in audits. The insights gained from these interviews suggest that auditors apply professional judgment and assess the relevance and significance of whistleblowing events to reporting quality on a case-by-case basis. We next perform empirical analysis to examine our expectations. We collect information on external whistleblowing allegations filed with the OSHA and *qui tam* actions filed under the False Claims Act (FCA) with the DOJ.² Given the non-random occurrence of whistleblowing allegations (Bowen et al. 2010), we employ entropy balancing in the analysis, balancing on all three moments, as a multivariate reweighting method to address the covariate imbalance (Hainmueller 2012; McMullin and Schonberger 2018).

Using a sample of firm-years, from 2004 to 2014, we find results consistent with our expectations. First, occurrences of external whistleblowing allegations, irrespective of their substance, are associated with higher audit fees. In addition, audit fees are significantly greater for substantiated (compared with frivolous) allegations (i.e., cases found to be favorable to

² *Qui tam* is a shortened version of the Latin phrase *qui tam domino rege quam pro se ipso in hac parte sequitur*, meaning that a private individual who assists a prosecution can receive all or part of any penalty imposed.

whistleblowers based on administrative enforcement or court outcomes). Further, an external whistleblowing allegation is positively associated with auditors' propensity to issue an adverse opinion on internal controls (i.e., an internal control deficiency [ICD] opinion) only when the allegation is substantiated, but not when it is frivolous.

Motivated by our interviews with audit practitioners, we run a series of additional tests on auditors' involvement in reviewing cases of whistleblowing. External whistleblowing allegations typically arise after an unsuccessful internal whistleblowing attempt (Lee and Xiao 2018). We learned from the interviews that, while auditors are likely to be aware of internally reported whistleblowing issues, they might not conduct an extensive investigation at this stage because they perceive the firm to be adequately handling the issue,³ or perhaps there are difficulties, such as limited information availability, during an ongoing investigation. To examine the extent to which auditors are aware of—and thus react to—internally reported whistleblowing, we test audit outcomes in the year before the external whistleblowing allegation. We find that audit fees significantly increase before an external whistleblowing event (i.e., for both frivolous and substantiated whistleblowing allegations), but that an external whistleblowing event has no significant effect on auditors' likelihood of issuing an adverse opinion on internal controls in the year before the allegation. Thus, our findings suggest that auditors appear to have access to information that enables them to develop a general idea of the whistleblowing issue before it is revealed externally, but the information acquired at this stage does not significantly affect their opinions on internal controls.

³ The installation and efficiency of internal whistleblowing hotlines is considered an important element to ensure quality internal control (AS 2110). Auditors may consider claims that are internally received and processed to be an indication that the firm's current internal control is of sufficient quality.

In our interviews, the audit practitioners highlighted that auditors will incorporate previous whistleblowing activities into their risk assessment. As such, we empirically test whether external whistleblowing allegations filed in the current year relate to future audit fees and auditors' opinion on internal controls. We find that audit fees increase significantly in the year after an external whistleblowing allegation, especially in cases of substantiated allegations. The higher audit fees may reflect a projected increase in audit work because the firm's previous whistleblowing allegation increases the risk of material misstatement. However, we do not find that these firms are subject to a higher likelihood of an ICD in the year following the allegations. We also examine whether audit efforts in the whistleblowing allegation year affect financial reporting quality. We show that, with increased auditor effort in the allegation year, a client has a lower likelihood of restating financial statements prepared in that year, consistent with prior evidence that audit effort improves a client's reporting quality (Bentley et al. 2013; Lobo and Zhao 2013).

Our study contributes to the literature in several ways. First, we are among the first to demonstrate that auditors react to external whistleblowing allegations and that their reactions vary according to the substance of the allegations. Thus, our findings suggest that auditors fulfill their fiduciary duties with professional diligence and are more vigilant when their client firm is subject to an external whistleblowing allegation. Second, we extend the literature that analyzes auditor risk control processes by applying the audit risk model. Although the literature generally shows a positive association between audit effort and control risk, there is mixed evidence on the association between inherent risk and audit effort (Bedard and Johnstone 2004; Bentley et al. 2013; Hogan and Wilkins 2008). In our study, we show that audit fees are significantly higher regardless of the substance of an external whistleblowing allegation, while only substantiated (not frivolous) whistleblowing allegations relate to auditors' propensity to issue an adverse opinion on internal

controls. This finding suggests that frivolous whistleblowing has no significant effect on control risk, and thus provides initial evidence that auditor effort (i.e., higher audit fees), in the cases of frivolous whistleblowing allegations, is positively related to inherent risk. We further show that firms are associated with higher audit fees in the year after external whistleblowing—even for frivolous allegations—yet such firms do not face a higher likelihood of receiving an adverse internal control opinion in that year. Again, this finding suggests that a prior whistleblowing event increases the inherent risk of a firm, and auditors tend to price this into their audits.

Relatedly, we show some of the unintended costs of whistleblowing. That is, audit fees increase in response to heightened inherent risk, regardless of the merit of the whistleblowing claims. Further, we demonstrate the role of whistleblowing allegations, especially those that are substantiated, in helping auditors identify the firm's internal control weaknesses. Therefore, this study supplements the literature that examines the auditor's response to an elevated risk of misstatement.

The remainder of this paper proceeds as follows. Section 2 discusses the institutional background of whistleblowing, our interviews, and auditors' involvement in the auditing of whistleblowing. We then develop our hypotheses in Section 3, while Section 4 describes our empirical methodology. Section 5 presents the results, and then Section 6 discusses robustness analyses and additional tests. Finally, Section 7 concludes the paper.

2. Institutional background, the whistleblowing literature, and the whistleblowing process

Institutional background and prior research

The first law enacted in the US to encourage and protect whistleblowers was the FCA, passed in 1863. This Act includes a *qui tam* provision that allows whistleblowers to lodge claims on behalf of the government, and encourages whistleblowers by providing them a percentage of the money

recovered and protecting them from employment retaliation. Since then, legislation has been introduced to support corporate whistleblowers (Dyck et al. 2010). Since the passage of the Sarbanes–Oxley Act (SOX) in the US in 2002, audit committees of listed companies have been required to establish an internal whistleblowing system. The Dodd–Frank Wall Street Reform and Consumer Protection Act (Dodd–Frank Act), enacted in 2010, passed further regulations, thus developing a whistleblowing program in which eligible whistleblowers who reported securities law violations could receive a monetary reward of 10 to 30 percent of the total recovery amount.

Whistleblowing has been increasingly recognized as an important mechanism in detecting fraud. Mary Jo White, a former chair of the SEC, stated that “[i]n the post-financial crisis era when regulators and right-minded companies are searching for new, more aggressive ways to improve corporate culture and compliance, it is past time to stop wringing our hands about whistleblowers” (SEC 2015). Unsurprisingly, whistleblowing has attracted attention from researchers. Current knowledge covers a wide range of topics, including the sources of whistleblowing (Dyck et al. 2010), the characteristics of internal whistleblowing systems (Kaplan and Schultz 2007; Kaplan et al. 2009), the personal characteristics of whistleblowers (Cassematis and Wortley 2013; Curtis and Taylor 2009), the organizational characteristics of whistleblowing (Bowen et al. 2010; Lee and Fargher 2018), the attributes of the wrongdoing or wrongdoer and his or her influence on whistleblowing (Robertson et al. 2011; Robinson et al. 2012), the consequences of external whistleblowing (Baloria et al. 2017; Call et al. 2018; Wilde 2017), and the measures taken by firms to counteract employee incentives to blow the whistle (Call et al. 2016). Evidence shows that external whistleblowing allegations have significant implications for firms. Firms subject to such allegations are associated with negative market-adjusted returns upon whistleblowing

announcements, a greater likelihood of a subsequent lawsuit (Bowen et al. 2010), higher regulatory penalties, and longer enforcement proceedings (Call et al. 2018).

Auditors play a key role in the market by providing assurance over financial reports. While research shows how investors and regulators respond to external whistleblowing allegations (Baloria et al. 2017; Call et al. 2018), whether and how auditors react to such allegations remain unclear. The literature indicates that audit-related outcomes are associated with a firm's probability of misstatement and measures of possible earnings management, such as discretionary accruals (Gul et al. 2003; Lobo and Zhao 2013). However, external whistleblowing allegations are a distinct indicator of the risk of material misstatement for at least two reasons. First, whistleblowing allegations can relate to insider trading, submitting falsified information to obtain government funds, or engaging in a collusive bidding scheme to obtain a contract, which may only indirectly affect the financial statements. Second, the usefulness of whistleblowing information remains ambiguous. It seems reasonable to assume that the concerns reported by whistleblowers are genuine, as they bear large costs, especially when reporting to an external regulatory agency, such as the OSHA or DOJ (Dyck et al. 2010). However, for several reasons, whistleblowers frequently file frivolous claims (Golden et al. 2015) to attract attention (Near and Miceli 1996), to avoid being dismissed from employment (Anechiarico and Jacobs 1996), or as an act of revenge against their employers (Gobert and Punch 2000). Therefore, it is not obvious whether external whistleblowing allegations affect audit-related outcomes.

Anecdotes from interviews

To gain a deeper understanding of auditor involvement in auditing whistleblowing, we interviewed four audit partners and three senior audit practitioners, from September to November 2018. Among the partners, three were from the Big 4 audit firms (e.g., PwC, Deloitte, and KPMG) and one was

from a mid-tier audit firm. All had experience with external whistleblowing matters. Their average experience in auditing was 17.75 years, ranging from 15 to 20 years. The three senior auditors were from three mid-tier audit firms. Their overall experience in auditing ranged from four to six years, with an average experience of 4.67 years, and they all had experience with whistleblowing in their client firms. Each interview lasted between 30 and 45 minutes, and follow-up interviews were conducted, if necessary. The interviews were semi-structured and conducted individually with the respondents. Further, we used a questionnaire to guide our interviews (see Appendix A).

Several insights emerged from the interviews. First, all respondents mentioned that auditors conduct audit planning based on a rich set of information that includes assessing internal and external whistleblowing activities that occurred both in the past and at present. Standard audit procedure/practice involves checking the logbook of internal whistleblowing claims on a regular basis. Specifically, an audit partner said, “We check the logbook of our clients quarterly or semiannually.” Part of auditing protocols includes inquiring with management and those charged with governance about the whistleblowing claims and how the claims have been addressed. However, our interviewees also acknowledged that, for allegations that are only internally reported, auditors generally do not conduct an extensive investigation. The auditors explained that, when the whistleblowing report is still being internally processed, the information they receive from the company is likely to have been filtered or selectively provided. With regard to such impediments, a senior auditor said: “[Insufficient] information creates obstacles for auditors in forming a comprehensive assessment of the nature and substance of the issues.” Further, some respondents indicated that observation of internal whistleblowing claims was insufficient to trigger increased auditor effort or perceived higher risk of internal control issues. Instead, a partner stated that

“auditors may consider it a sign of an efficient internal whistleblowing channel.” They continued: “It is unexpected complaints or lack of internal whistleblowing that captures auditors’ attention.”⁴

Second, we learned that auditors become more intensively involved once whistleblowing claims are externally reported. External whistleblowing allegations are subject to greater scrutiny from regulators, and auditors are particularly concerned about their reputation and litigation risk. When whistleblowing allegations become externally known, the risk of material misstatement escalates significantly. A partner stated, “My team had to redo all the audits because of a SEC whistleblowing case, since we would face inquiries from regulators as to how our audits have been conducted and whether sufficient care has been taken given the allegation.” According to our participants, auditors typically respond by increasing their audit effort, such as by seeking a full set of information relating to the whistleblowing claims from multiple sources, including their client. Partners revealed that, depending on the nature of the allegation and the circumstances, personnel with various levels of seniority and capacity in an audit firm—including engagement partners, general counsel, and even regional partners—can be involved in the discussion and evaluation of audit risks associated with the allegation. Further, although auditors aim to issue audit reports in a timely manner, serious whistleblowing allegations can cause delay. A partner said, “I once had to halt signing off the report at the last minute because of a whistleblowing allegation [that was] newly filed to the SEC. But it is extremely rare.”

Third, both partners and senior auditors emphasized in the interviews that, when assessing whistleblowing allegations, auditors typically focus on ascertaining whether the issue raised is genuine and relevant to financial reporting and, if so, determining the severity of the issue. Further,

⁴ Information access could be limited because the matter is an ongoing issue under investigation, and hence subject to a certain degree of confidentiality. Thus, auditors are precluded from forming a comprehensive assessment of the substance and severity of the issue.

auditors are aware that whistleblowers have mixed incentives to file claims—a large percentage of which are either insignificant or irrelevant. A partner said, “Auditors exercise prudence with judgment. For example, if the allegation is about wage theft, auditors may treat it as an isolated incident and not react, unless they consider it a systemic issue that was previously unidentified. However, if the nature of the allegation is severe and systemic, even in case of small amounts, auditors should react. The nature of the allegation is the key.” Another partner offered an example, “There was once an internal whistleblowing case about suspected theft by a department manager’s relatives who were in charge of procurement. We were aware of the kinship and had already considered the potential risk at our planning. We eventually decided not to react to it.” Auditors therefore apply substantial professional care and judgment in assessing the relevance and severity of whistleblowing claims to ensure that audits are performed efficiently and effectively.

We also asked the auditors about how the timing of external whistleblowing allegations during the year may affect their response. One senior auditor stated that more audit work can be planned in response to a whistleblowing allegation when it is revealed closer to the beginning of a fiscal year. Nonetheless, some partners indicated that auditors will fully respond to credible evidence of material misconduct even if it is not discovered until the end of a year.

Auditors’ involvement in the auditing of whistleblowing

Figure 1 displays a typical whistleblowing process, which consists of four stages: (1) misconduct observed by an employee, (2) internal whistleblowing by the employee, (3) the firm’s response to the internal whistleblowing, and (4) the whistleblower’s subsequent response. Employees usually first report observed instances of misconduct to the firm via internal whistleblowing hotlines; such a statement is called an internal whistleblowing allegation. The issues raised by whistleblowers can be ongoing matters or related to the firm’s historical practices. Firms take various actions to

address the claims, including investigating the allegation, ignoring the claim, or retaliating against the whistleblower (Lee and Xiao 2018).⁵ Whistleblowers evaluate the actions taken by the firm and may choose to resort to external channels if they deem that the firm has undertaken insufficient action or if they have experienced retaliation for whistleblowing. Whistleblowing allegations at this stage (Stage 4) are publicly observable and are the focus of our investigation. As depicted in Figure 1, whistleblowers can choose to file claims with external regulatory agencies, such as the OSHA and SEC, or file *qui tam* actions under the FCA with the DOJ.

When assessing a client facing a whistleblowing allegation, auditors follow a set of standards including AS 2110 (paragraph .56) which highlights that, in evaluating fraud risks, auditors should inquire “whether management (the audit committee) has received tips or complaints regarding the company’s financial reporting (including those received through the audit committee’s internal whistleblower program, if such program exists) and, if so, management’s responses to such tips and complaints.” Thus, the standards require auditors to be aware of whistleblowing claims through discussions with management and the audit committee when the claims are internally filed (Stage 2) and processed (Stage 3). AS 2405 also emphasizes that, when auditors become aware of information concerning a possibly illegal act, they should gain an understanding of the nature of the act, the circumstances under which it occurred, and sufficient other information to evaluate its effect on the financial statements. If management does not provide satisfactory information to ensure that no illegal act has been committed, auditors should apply

⁵ The extent to which internal allegations are adequately resolved depends on several factors. For example, studies show that organizations react more positively to a whistleblowing allegation and take corrective actions when the whistleblower reports to senior management—such as the chief executive officer (CEO), chief financial officer (CFO), or audit committee—and when the organizational culture is more supportive of whistleblowing (Miceli and Near 2002; Near and Jensen 1983).

additional procedures and exert additional effort, including consulting with their client's legal counsel.

3. Hypotheses development

Whistleblowing and audit fees

Auditors' primary task is to search for and uncover material misstatements in their clients' financial records. The audit risk model explains how auditors control risk in their work (Knechel and Salterio 2017). Audit risk refers to the likelihood of auditors providing a clean opinion on misstated financial statements, which is modeled as a function of inherent risk, control risk, and detection risk, as follows.

$$\text{Audit Risk} = \text{Inherent Risk} * \text{Control Risk} * \text{Detection Risk} \quad (1)$$

Inherent risk is the risk of a material misstatement in the financial statements because of error or omission as a result of factors other than the failure of controls, *control risk* refers to the risk of a material misstatement due to a weak internal control system, and *detection risk* is the risk that the procedures an auditor performs will not detect a material misstatement (AICPA 2017). Model (1) suggests that, to achieve an acceptable level of overall audit risk, auditors must reduce detection risk by increasing audit effort when they perceive high inherent risk or control risk (Dusenbury et al. 2000; Hogan and Wilkins 2008). Higher audit fees will be charged to compensate for the increased audit workload and effort with increased inherent or control risk (Jha and Chen 2015; Kim et al. 2015).

In the context of whistleblowing, an external whistleblowing allegation likely signals increased uncertainty in a firm's business environment, and thus increased inherent risk. Evidence shows that external whistleblowing heightens public and regulatory scrutiny of firm practices (Bowen et al. 2010). Further, firms that experience external whistleblowing allegations are subject

to negative consequences, such as legal penalties and shareholder lawsuits (Call et al. 2018). Such increased business uncertainty indicates that there will be greater complexity in a firm's transactions and that tasks to make judgments involved in handling these transactions will become more challenging. Further, whistleblowing complaints potentially signify a breakdown in a firm's internal controls, as the error/fraud identified by a whistleblowing allegation was not prevented or detected by the firm's internal control system. Evidence indeed shows that firms involved in external whistleblowing allegations have a higher tendency to restate financial statements in subsequent years (Bowen et al. 2010). Thus, auditors may perceive those firms as also being subject to greater control risk.

We argue that increased inherent and control risk associated with external whistleblowing allegations will both contribute to auditors' assessment of the risk of material misstatement and affect the extent of the auditors' resultant detection risk. Auditors will respond to the allegations by altering their audit plan and deploying additional audit resources, such as assigning more experienced personnel, extending the scope of field work, and performing additional reviews (Johnstone and Bedard 2001) to achieve lower detection risk. Given their professional prudence and conservatism, auditors will choose to do so even in cases in which whistleblowing allegations eventually prove to be frivolous. Further, the negative consequences of external whistleblowing allegations have direct implications on audit risk (Bedard and Johnstone 2004; Gietzmann and Pettinicchio 2014). The heightened regulatory scrutiny associated with whistleblowing allegations will increase auditors' exposure to litigation and reputational damage. Thus, we expect auditors to charge higher audit fees to cover their additional workload and potential higher risk premium, regardless of the substance of the whistleblowing allegations. Taken together, these arguments lead to our first hypothesis:

HYPOTHESIS 1. *Ceteris paribus, whistleblowing allegations are associated with higher audit fees.*

Although we predict a positive association between external whistleblowing allegations and audit fees, auditors might consider whistleblowing allegations, on average, to be frivolous or the effect of the allegation to be too limited to change their audit planning. They may also consider that the related issue is adequately covered in their planned audits. In such cases, we would not expect a significant increase in audit fees.

Whistleblowing and auditors' opinion on internal controls

Section 404 of SOX requires external auditors to issue a report of their independent assessment of the effectiveness of client firms' internal controls over financial reporting. In our first hypothesis, we postulate that auditors will perform additional audit work when an external whistleblowing allegation is revealed. In doing so, auditors should have a better understanding of the relevance and substance of the allegation in forming their opinion on internal control quality. We argue that auditors will not issue an adverse opinion on internal controls merely because an external whistleblowing allegation has been filed. Rather, they will consider the merits of the allegation and evaluate the effectiveness of their client firm's internal controls based on the factual evidence.

Professional standards underscore that auditors need to apply due diligence and professional care in the performance of audits. AS 2201 (paragraph .03) specifically states that:

[T]o form a basis for expressing an opinion, the auditor must plan and perform the audit to obtain appropriate evidence that is sufficient to obtain reasonable assurance about whether material weaknesses exist as of the date specified in management's assessment.

Whistleblowing allegations provide auditors clues as to where and how internal controls may fail. Auditors can use the related information and work backward to identify the controls that have indeed failed or never existed. We expect auditors to issue an adverse opinion on internal controls

for substantiated whistleblowing allegations, since those allegations indicate ineffective internal controls. In contrast, we expect that auditors will not issue an adverse opinion for frivolous whistleblowing allegations because such allegations do not likely contain credible or useful information that would otherwise affect auditors' assessment of internal controls. We formally state our hypothesis as follows:

HYPOTHESIS 2. *Ceteris paribus, whistleblowing allegations are associated with a higher likelihood of auditors issuing an adverse opinion on internal controls only when the allegations are substantiated.*

However, there are plausible alternative views to the second hypothesis. An effective internal whistleblowing system is an important part of a firm's internal control system (CIIA 2014; NWC 2007). Even an unsubstantiated whistleblowing allegation may result in a material weakness because the auditors possibly perceive that the firm did not adequately manage the whistleblowing complaint at an internal stage, thereby leading to an external report. While this view would suggest that all types of whistleblowing allegations could affect the auditor's opinion on the firm's internal control, an observation of external whistleblowing allegations does not necessarily indicate failure on behalf of the internal whistleblowing system—the firm may have found nothing wrong in its investigation into the internal whistleblowing complaint. Further, another alternative view is that, for whistleblowing allegations that arise because of retaliation, it could be that an employee was retaliated against for reporting, even if there was no actual financial misconduct. Thus, even if the whistleblowing claim is meritorious because of retaliation, there might not be a material weakness in the internal control system. All these factors add tension to our second hypothesis.

4. Research design and data

Whistleblowing data sources

Our investigation period is from 2004 to 2014. We follow the literature and obtain external whistleblowing cases relating to financial misconduct (Bowen et al. 2010; Dyck et al. 2010). As shown in Figure 1, whistleblowing events become publicly observable when a whistleblower files a claim with an external regulatory agency (Stage 4). First, whistleblowers can report to the OSHA when they believe that their employer or any organization member has retaliated against them for reporting on matters that are in violation of SOX or the Consumer Protection Financial Act (CFPA, Title X of the Dodd–Frank Act) (Bowen et al. 2010).⁶ We obtain information on SOX or CFPA whistleblowing through a request under the Freedom of Information Act (FOIA).⁷ These SOX and CFPA whistleblowing cases should generally involve financial-related misconduct. For example, Eileen Foster, a former Executive Vice President of the Fraud Risk Management division at Bank of America, filed an OSHA case under SOX against the bank in 2008 for firing her after she reported concerns regarding forged mortgage documents, faked data, and other egregious financial misconduct with the organization. In her allegation, Foster also claimed that employees in the company suffered persistent retaliation for reporting similar concerns. Such an allegation increases

⁶ These acts protect whistleblowers who report financial misconduct under Section 806 of SOX and Section 1057 of the Dodd–Frank Act. Specifically, the SOX Act (18 US Code §1514A) protects whistleblowers who report on mail, wire, bank, or securities fraud. The Dodd–Frank Act (§1057(b)) protects whistleblowers who perform tasks related to offering or providing a consumer financial product or service. Other types of OSHA claims are less likely to be related to financial matters.

⁷ Effective July 5, 1967, the FOIA is a federal freedom of information law that requires full or partial disclosure of previously unreleased information and documents controlled by the US Government upon request. Similar to our study, Call et al. (2018) collected OSHA whistleblower complaints from the FOIA during a sample period of 2002 to 2012. The difference in the sample size between Call et al. (2018) and our study mainly relates to sample selection. Call et al. (2018) focus on enforcement actions, while our sample mainly consists of large firms, as we restrict our sample to accelerated and large accelerated filers subject to SOX Section 404(b). Note that certain information in the OSHA cases—including information that would help a reader identify the specific contents of a claim—is redacted for a sizeable amount of the OSHA cases that we obtain from the FOIA.

the inherent and control risks of the firm, as it suggests that there may be weaknesses in internal controls, operational issues, and subsequently increased litigation risk for the firm.⁸

The OSHA whistleblowing process occurs as follows. Whistleblowers initially lodge their claim with the OSHA. Upon receipt of a complaint, the named person(s) of the filing will be notified. The OSHA will investigate and issue its findings within 60 days of the complaint filing.⁹ After the OSHA issues its findings, either party involved in the case can request a full hearing by an Administrative Law Judge (ALJ) within 30 days. The ALJ's decision can be further appealed to the Administrative Review Board (ARB). Cases heard by the ALJ and ARB are publicly available from the DOL's Office of Administrative Law Judges (OALJ) website. Thus, we retrieve relevant information from the OALJ website to confirm the information that we initially obtain from the FOIA.

Whistleblowing claims can also be filed under the FCA. Distinct from whistleblowing cases lodged with the OSHA, the FCA contains a *qui tam* provision that allows whistleblowers to file a suit against an individual or entity that has defrauded governmental programs. An FCA *qui tam* lawsuit must be filed under seal (i.e., the complaint is only available to the DOJ, the local US Attorney, and the assigned judge of the district court). To allow the DOJ time to determine whether to intervene in the whistleblower's lawsuit, the complaint must remain under seal for at least 60 days. After the DOJ makes its decision, it will make an order to unseal the case. We manually collect FCA whistleblowing cases through the LexisNexis database by searching for legal cases

⁸ The elevated risks can be substantiated by the fact that the OSHA stated in its ruling (September 13, 2011) that, following the investigation of Foster's allegation, six branches of the bank in the Boston area were shut down and 44 employees were terminated.

⁹ A whistleblower can also seek a *de novo* review of the complaint by a US district court if the OSHA does not issue a final decision within 180 days after the initial filing of the complaint, and there is no evidence that such delay is due to the bad faith of the whistleblower (OSHA 2015).

using the search terms “*qui tam*” and “31 U.S.C. §3729.” Further, FCA cases that have reached a settlement are sometimes announced by the DOJ as press releases on its website. We use these press releases to corroborate the FCA data we collect from the LexisNexis search.¹⁰ We read through all FCA cases obtained and include in our sample those that are financial-related or have financial implications.

Variable definitions

Dependent variables

Our dependent variables are audit fees and auditor opinions on internal controls. We take the natural logarithm of audit fees, *AUDITFEE*, to account for the negative skewness of fees (Engel et al. 2010). We measure an auditor’s opinion on a client firm’s internal control effectiveness using an indicator variable (*ICD*), which equals 1 if the auditor discloses one or more material weaknesses in the SOX 404 report, and 0 otherwise.

Whistleblowing allegations

To examine auditor responses to external whistleblowing allegations, we identify the year in which auditors should have been aware of external allegations. For OSHA cases, that is the year in which the OSHA complaint was initially filed, because part 1980 of Title 29 of the Code of Federal Regulations requires that firms be notified of a complaint upon the OSHA’s receipt of it.¹¹ For FCA cases, it is the year in which the whistleblowing case was unsealed and therefore known to the public, with timing determined through relevant documents obtained from the DOL database

¹⁰ As shown in Figure 1, a whistleblower can file a claim with the SEC. However, we are unable to obtain data from this source because, to protect confidentiality, the SEC does not disclose information that could directly or indirectly reveal the identity of the whistleblower or the company. Another data approach is to collect news press articles on whistleblowing reporting (Bowen et al. 2010; Dyck et al. 2010). We choose not to construct our whistleblowing sample using media articles because of the media’s bias in selecting firms to cover (Bowen et al. 2010; Miller 2006), whereas our approach mitigates such a bias.

¹¹ Given that the client firm will be aware of the whistleblowing allegation at this date, we assume that auditors would also become aware of the allegation.

or through LexisNexis searches. The variable WB_ALL equals 1 if either an OSHA complaint was filed or an FCA case was unsealed that year, and 0 otherwise. Firms can be subject to multiple whistleblowing allegations in a year. We collapse such cases into a single firm–year observation.

We use an ex-post measure to capture the substance of a whistleblowing allegation based on whistleblowing outcomes as decided by the DOL. We consider whistleblowing cases to be substantiated if the case was meritorious or reached a settlement. If a case was dismissed, we consider it frivolous. The variable WB_SUB equals 1 if an external whistleblowing allegation reported in the year was subsequently found to be substantiated, and 0 otherwise. The variable WB_FRI equals 1 if an external whistleblowing allegation reported in the year was subsequently found to be frivolous, and 0 otherwise.¹² Panel A in Table 1 reports the distribution of whistleblowing allegations in our sample by year. Our sample has 770 whistleblowing allegation firm–years, with the number mildly declining in more recent years. Among those whistleblowing allegation firm–years, 237 are found to be substantiated and 533 are found to be frivolous.

Empirical models

Audit fee model

We estimate the following ordinary least squares (OLS) model using the natural logarithm of audit fees as the dependent variable (Bruynseels and Cardinaels 2014; Jha and Chen 2015; Kim et al. 2015):

$$AUDITFEE = \beta_0 + \beta_1 WB (WB_ALL \text{ or } WB_SUB \text{ and } WB_FRI) + \sum \beta_i CONTROL_i + \sum \beta_j YEAR_j + \sum \beta_k INDUSTRY_k + \varepsilon \quad (2)$$

¹² When a firm experienced both substantiated and frivolous whistleblowing cases in a year (17 firm–years in our sample), we code the firm–year as substantiated whistleblowing. Our results remain consistent when we drop these observations. In total, 511 (283) firm–years experienced an OSHA (FCA) allegation in our sample, of which 33 percent (24 percent) were found to be substantiated. In 24 firm–year observations, a firm experienced both an OSHA and FCA allegation. Further, we check the robustness of findings using the number of external (substantiated vs. frivolous) whistleblowing allegations, and our main findings remain consistent.

where all the variables are measured in year t , defined in Appendix B, and ε is an error term. The inclusion of control variables follows the extant literature, including audit-related variables, such as those representing whether the auditor was one of the Big 4, whether the audit occurred during busy season, whether the firm was late in filing, auditor tenure, whether it was the initial year of an audit engagement, and whether the auditor was an industry leader. Firm and CEO characteristics include firm size, performance, growth, leverage, liquidity, firm age, business complexity, whether announcing restatements this year, whether receiving auditors' ICD opinions this year, percentage of non-audit fees in the current year, audit committee-related features, CEO tenure, and CEO–chairperson duality (Abbott et al. 2004; Bruynseels and Cardinaels 2014; Carcello et al. 2002; Naiker and Sharma 2009). We expect whistleblowing allegations to be associated with higher audit fees, and subsequently predict a positive sign for β_1 in model (2).

ICD model

We employ the following logistic model to estimate the likelihood of auditors issuing an adverse opinion on internal controls (Bruynseels and Cardinaels 2014; Lim and Tan 2008; Naiker and Sharma 2009):

$$ICD = F \left(\gamma_0 + \gamma_1 WB (WB_ALL \text{ or } WB_SUB \text{ and } WB_FRI) + \sum \gamma_i CONTROL_i + \sum \beta_j YEAR_j + \sum \beta_k INDUSTRY_k \right) + \delta \quad (3)$$

where all the variables are measured in year t , defined in Appendix B, and δ is an error term. We follow prior research and include a host of control variables, such as firm size, performance, growth, leverage, liquidity, business complexity, CEO and audit committee characteristics, and auditor features (Bruynseels and Cardinaels 2014; Lim and Tan 2008; Naiker and Sharma 2009). A significantly positive coefficient on WB , γ_1 in model (3) would suggest that whistleblowing allegations are associated with a higher propensity of auditors issuing an adverse opinion on

internal controls. In both models (2) and (3), we include year and industry dummies (defined by the first two digits of the Standard Industrial Classification [SIC] codes) to control for year and industry fixed effects (Bruynseels and Cardinaels 2014; Hoitash et al. 2009).

Sample and entropy balancing

Our initial sample consists of 56,123 firm–years over the period 2004 to 2014, with available information on financials, internal control deficiencies, and other audit-related data. We obtain financial information from Compustat and retrieve ICDs and audit-related information from Audit Analytics. Given that only large filers are subject to an integrated audit, our sample mainly includes larger firms. We then remove 20-F and 40-F firms, given their unique regulatory requirements, and merge the sample with BoardEx data on corporate governance and CEO characteristics. Our final sample consists of 23,923 firm–year observations, of which 770 are subject to whistleblowing allegations.

A firm’s involvement in whistleblowing allegations is not random (Bowen et al. 2010; Call et al. 2018). We follow the literature and apply entropy balancing as a preprocessing technique to achieve covariate balance within a binary treatment—that is, being subject to a whistleblowing allegation ($WB_ALL = 1$) in our case (Hainmueller 2012; McMullin and Schonberger 2018).¹³ The control sample consists of non-whistleblowing observations ($WB_ALL = 0$). We implement entropy balancing by adjusting inequalities in the covariate distributions with respect to the first (mean), second (variance), and third (skewness) moments. Panel B of Table 1 reports the descriptive statistics of the variables used in our analyses, both in the full sample and after applying

¹³ As explained by Hainmueller (2012, 26), entropy balancing “involves a reweighting scheme that directly incorporates covariate balance into the weight function that is applied to the sample units” and “searches for the set of weights that satisfied the balance constraints [pre-specified] but remains as close as possible (in an entropy sense) to a set of uniform base weights to retain information.” By recalibrating unit weights using entropy balancing, we can effectively adjust for “systematic and random inequalities in representation” without sacrificing observations (Hainmueller 2012, 26).

entropy balancing with *WB_ALL* as the treatment and adjusting on the three moments. Further, we notice that all three moments of the covariates between whistleblowing and non-whistleblowing observations are similar after entropy balancing, suggesting the effectiveness of our method in achieving a sufficient balance between the treatment and control groups.

5. Main results

Main results of audit fees

Our first hypothesis predicts a positive association between external whistleblowing allegations and audit fees. We test our hypothesis using model (2), where *AUDITFEE* is the dependent variable. Table 2 reports the results of the OLS regressions. In column 1, we report the results of a base model without including our variables of interest, while column 2 exhibits the results of model (2), where *WB_ALL* is employed to indicate the occurrence of an external whistleblowing allegation. We also examine whether the substance of whistleblowing allegations (i.e., *WB_SUB* and *WB_FRI*) explains the variation in audit fees, with the results reported in column 3 of Table 2. We first compare the goodness of fit across the models (Feng et al. 2009; Larcker and Rusticus 2010). Our results show that, relative to the base model, adding *WB_ALL* in column 2 significantly improves the explanatory power of the model (F-statistics = 162.91, p -value < 0.01), as does including both *WB_SUB* and *WB_FRI* in column 3 (F-statistics = 112.78, p -value < 0.01).

Next, we examine the coefficients of whistleblowing variables. The significantly positive coefficient on *WB_ALL* in column 2 (p -value < 0.01) is in line with H1, and suggests that firms subject to whistleblowing allegations pay higher audit fees. Specifically, the coefficient on *WB_ALL* is 0.093, indicating that, on average, the audit fees of a firm in our sample targeted by whistleblowing allegations are approximately 9.30 percent higher than those that did not experience whistleblowing in the year. In terms of the substance of whistleblowing allegations, the

results in column 3 of Table 2 show that the coefficients on *WB_SUB* (coefficient = 0.151, p -value < 0.01) and *WB_FRI* (coefficient = 0.065, p -value < 0.01) are both significantly positive, indicating that audit fees are higher for both types of allegations, compared with firms without whistleblowing allegations. We further compare the difference between the coefficients, and find that the coefficient on *WB_SUB* is statistically significantly larger than that on *WB_FRI* (F -statistics = 4.09, p -value < 0.05), suggesting that audit fees are significantly larger for substantiated (vs. frivolous) whistleblowing allegations.¹⁴ Economically, our findings suggest that audit fees increase from the median by \$362,770 (\$156,159) when substantiated (frivolous) whistleblowing allegations occur. The substantial increase in audit fees in the case of frivolous allegations implies that frivolous allegations tend to be costly. In addition, the results on the control variables are consistent with prior research (Bruynseels and Cardinaels 2014; Jha and Chen 2015; Kim et al. 2015).

To summarize, our results show that whistleblowing allegations are associated with higher audit fees, regardless of the substance of the claims, while the increase in audit fees is larger for substantiated allegations. This finding is consistent with our expectation that external whistleblowing allegations signal a client firm's heightened risk of material misreporting.

Main results of auditor's opinion on internal controls

Next, we examine the association between external whistleblowing allegations and auditors' opinions on internal controls by estimating a logit model—that is, model (3). Table 3 presents the results. Specifically, we report the results of the base model in column 1, where our variables of

¹⁴ We further compare the audit fee effect of whistleblowing allegations between small and large firms. The coefficient on *WB_ALL* is 0.145 (0.073) for observations in the second (fourth) quintile of *LNTA*. The difference in coefficients is statistically significant (p -value < 0.10). In terms of economic significance, the audit fee increase related to whistleblowing allegations is about \$152,293 (\$160,018) for small (large) firms. Thus, it appears that the effect of whistleblowing allegations on audit fees has a fixed component—smaller firms are affected more as a percentage of audit fees than are larger firms.

interest are excluded. Column 2 reports the results of model (3) with *WB_ALL* included. In column 3, we use *WB_SUB* and *WB_FRI* (in place of *WB_ALL*) to examine the substance of the whistleblowing allegations. We refer to McFadden's pseudo R^2 to assess the goodness of fit of the logit models (McFadden 1974). A value of McFadden's pseudo R^2 between 0.20 and 0.40 represents "an excellent fit" for a logistic regression (McFadden 1977, 35). We find that the values of McFadden's pseudo R^2 of model (3) are well in that range, which suggests a satisfactory goodness of fit of the model in predicting the likelihood of ICDs. In addition, we include Cox and Snell's R^2 as an alternative indicator for model fit, given that its interpretation tends to be similar to that of a generalized R^2 (i.e., OLS R^2) (Cox and Snell 1989; Cragg and Uhler 1970; Maddala 1983). Through estimating our regression model without entropy balancing, we further confirm the predictive ability of our model using the area under the receiver operating characteristic curve (ROC). An ROC value of 0.70 and higher is often considered to indicate a satisfactory model fit (Rice and Harris 2005). The values of ROC in columns 1 to 3 of Table 3 are all above this critical value.

The significant and positive coefficient on *WB_ALL* (p -value < 0.01) in column 2 suggests that whistleblowing allegations, on average, increase auditors' propensity to issue an adverse opinion on internal controls of the firm involved in the allegation. In H2, we expect that auditors will issue ICDs based on the substance of the external whistleblowing allegations. Column 3 reports our results. We find that the coefficient on *WB_SUB* is significantly positive (p -value < 0.01), but the coefficient on *WB_FRI* is not statistically significant. These coefficients are also statistically significantly different (chi-squared = 7.93, p -value < 0.01). We further examine the economic significance of our results in marginal effects. Holding our controls constant, firms facing substantiated whistleblowing allegations will have the probability of receiving ICDs

increase to 18.72 percent from a baseline probability of 5.90 percent.¹⁵ Further, the results for the control variables are in line with the literature (Bruynseels and Cardinaels 2014; Lim and Tan 2008; Naiker and Sharma 2009).

Overall, our results are consistent with H2, indicating that auditors issue adverse opinions on internal controls for substantiated cases, but not for frivolous cases. Thus, these findings support the view that auditors are able to separate out the noise in whistleblowing allegations.

6. Additional analyses and robustness tests

Analysis of auditor involvement

Prior to the revelation of external whistleblowing allegations

In this section, we run a series of additional tests to study auditors' involvement in the auditing of whistleblowing. First, internal whistleblowing typically precedes external whistleblowing. Auditors could, to a certain degree, be aware of internally reported issues, per auditing standards (e.g., AS 2110) and insight from our interviews. To explore this issue, we re-estimate models (2) and (3), with WB_SUB and WB_FRI measured in year $t + 1$ and all the other variables measured in year t . The results are summarized in panel A of Table 4. Column 1 shows that audit fees are significantly higher for both frivolous and substantiated cases in year t (i.e., the year before whistleblowing is externally revealed). The results suggest that auditors are aware of the issue when it is at an internal whistleblowing stage and thus are already increasing their audit effort

¹⁵ The coefficient on WB_SUB is 1.301. Note that the estimated effect of whistleblowing allegations on the probability of receiving ICDs depends on the baseline probability, p_0 , used to measure change. Given that the mean ICD is 0.059, we set $p_0 = 0.059$, and then the probability (p_1) will increase to 18.72 percent for firms subject to substantiated whistleblowing allegations. To explain:

$$\ln\left(\frac{odds_1}{odds_0}\right) = \ln\left[\frac{p_1/(1-p_1)}{p_0/(1-p_0)}\right] = \hat{\gamma} = 1.301$$

Substituting 0.059 for p_0 in the equation and solving for p_1 gives $p_1 = 0.1872$.

accordingly.¹⁶ When comparing the coefficients in column 1, we find that the fee increase in this stage is no higher for substantiated allegations than frivolous ones. We also examine auditors' tendency to issue adverse opinions on internal controls in the year before whistleblowing allegations. The results in column 2 of panel A in Table 4 show that auditors do not have a greater propensity to issue ICDs in this year, even for those allegations eventually deemed substantiated. This result is consistent with our interview findings that auditors receive limited information on internal whistleblowing claims or would typically consider internal controls to be adequate because internal whistleblowing allegations are received and addressed.

Past whistleblowing allegations

From our interviews, we learned that a client's history of whistleblowing is an important input for audit risk assessments. We next examine how external whistleblowing allegations in the prior year relate to audit fees and internal control opinions in the current year. We re-run models (2) and (3), with *WB_SUB* and *WB_FRI* measured in year $t - 1$ and all other variables in year t . The results reported in column 1, panel B of Table 4 show that prior-year external whistleblowing allegations, regardless of the substance, relate to higher audit fees in the current year. When comparing the coefficients of *WB_SUB* and *WB_FRI*, we further find that audit fees in year t are higher when a substantiated, compared with a frivolous, whistleblowing allegation was filed in year $t - 1$ (F -statistics = 4.15, p -value < 0.05). Collectively, the results suggest the importance of past whistleblowing activities in audit planning and pricing.

In contrast, neither *WB_SUB* nor *WB_FRI* are statistically significant in column 2, panel B of Table 4, where an auditor's opinion on internal controls in year t is the dependent variable. This

¹⁶ Although we infer increased audit effort based on higher audit fees, we are mindful of the inability to directly measure effort.

finding indicates that prior-year whistleblowing allegations do not predict a higher likelihood of an auditor issuing an adverse opinion on internal controls in the current year. An explanation for this result could be that the issuance of ICDs in year $t - 1$ prompted the client firm to take action to remediate the material weaknesses. To probe this speculation, we search the 10-Q and 10-K filings of firms in our sample subject to external whistleblowing allegations and auditors' ICD opinion in the same year. In particular, we use keywords such as "whistleblowing," "remediation," and "*qui tam*" in the searches. We find that, in the year after external whistleblowing, some firms disclose that they have undertaken measures to remediate the identified internal control deficiencies. For example, L-3 Communications (presently known as L3 Technologies) faced a whistleblowing allegation and received an adverse ICD opinion from the auditor in the fiscal year 2014.¹⁷ In its 2015 10-Q (filed on April 30, 2015, 51), the company disclosed its remediation plans that appear to concern the issues raised in the whistleblowing case:

In response to these identified material weaknesses,^[18] our management, with oversight from our audit committee, is dedicating significant resources to improve our ICFR and to remediate the identified material weaknesses. These efforts are ongoing and are focused on strengthening the Company's control environment and organizational structure.

The company also mentioned the following in its 2015 10-K (filed on February 26, 2016, 73):

¹⁷ According to DOJ documentation revealed on February 12, 2014, the whistleblowing complaint alleges violations of the False Claims Act for false labor charges on contract with the US army.

¹⁸ Specifically, L-3 Communications noted that: "1. The Company did not maintain an effective control environment at its Aerospace Systems segment due to: (a) the inadequate execution of existing controls related to the annual review and approval of contract (revenue arrangement) estimates, (b) not following established Company accounting policies, controls and procedures, and (c) the intentional override of numerous transactional and monitoring internal controls at its Army Sustainment division, with regard to the: (i) valuation of inventories, unbilled contract receivables and billed receivables; (ii) preparation of contract invoices; (iii) preparation, review and approval of contract estimates; (iv) recognition of costs overruns on a fixed-price maintenance and logistics support contract; (v) review and analysis of division quarterly financial statements; (vi) physical counts of inventory; and (vii) preparation, review and approval of journal entries. 2. Company personnel did not perform reviews of certain employee concerns regarding violations of the Company's accounting policies and ICFR in a sufficient and effective manner, including assigning those matters to the appropriate subject matter experts for resolution, and informing appropriate members of senior management and the audit committee about the nature of the concerns and the scope and results of the reviews" (filed on April 30, 2015, 51-52).

The Company tested the controls and found them to be effective. As a result, the Company has concluded that, as of December 31, 2015, these two material weaknesses have been remediated.

Further, the company did not receive any adverse ICD opinion from the auditor for the fiscal year 2015.¹⁹

Timeliness of reporting and timing of whistleblowing allegations

We next investigate whether a whistleblowing allegation negatively affects a firm's timeliness in issuing financial statements. We perform the analysis in the whistleblowing allegation sample (770 firm-year observations). We construct an indicator variable to identify an allegation that is filed later (relative to earlier) in a year. To construct this indicator, we obtain the date of the initial filing with the OSHA (for OSHA cases) and the date when the whistleblowing lawsuit was unsealed (for FCA cases). We consider an allegation filed late if the number of days between the whistleblowing allegation date and audit report date is below the sample median. We fit a logit model and use an indicator variable (*FILELATE*) for delayed 10-K filings in a year as the dependent variable (Bartov and Konchitchki 2017).²⁰ We regress *FILELATE* on the indicator for allegations filed late in a year. The inclusion of other right-hand variables follows model (2), except for *FILELATE*. Untabulated results show that the allegation late filing dummy is associated with a higher likelihood of a delay in 10-K filing (coefficient = 1.882; p -value < 0.10). It appears that early whistleblower complaints

¹⁹ In another test, we read into ICD codes obtained from Audit Analytics and identify specific ICDs that are more likely related to whistleblowing issues, including management/board/audit committee investigation(s); ethical or compliance issues with personnel; or senior management competency, tone, or reliability issues. We replicate model (3) using the alternatively defined ICD measure as the dependent variable and find consistent results. However, we are mindful that it is challenging to relate ICDs to whistleblowing allegations on a case-by-case basis.

²⁰ For accelerated filers, the 10-K filing deadline is 90 days after fiscal year end before December 15, 2003, and is 75 days after fiscal year end on or after December 15, 2003. For large accelerated filers, the 10-K filing deadline is 90 days after fiscal year end before December 15, 2003; 75 days after fiscal year end on or after December 15, 2003; and 60 days after fiscal year end on or after December 15, 2005.

give the auditor more time to plan and involve more staff to deal with the issue, suggesting that reporting is less likely to be late.

We further investigate the effect of the timing of whistleblowing allegations on auditors' action. We split the whistleblowing allegation sample based on the values of the indicator for allegations filed later in a year. We then re-run models (2) and (3) in the two subsamples, respectively. In particular, a control group consisting of non-whistleblowing observations is used in both sub-sample analyses. We further compare the coefficients on the whistleblowing allegation indicators across the subsamples. Our results are reported in panel C of Table 4. When audit fees are used as the dependent variable, the coefficient of *WB_SUB* (*WB_FRI*) in column 2 (early) is greater than the coefficient of the same variable in column 1 (late), with z -statistics = 8.39 for *WB_SUB*, p -value < 0.01; z -statistics = 6.14 for *WB_FRI*, p -value < 0.01. Thus, the results suggest that auditors charge higher audit fees when the whistleblowing allegation occurs further from the audit report date, consistent with the view expressed in our interviews that auditors are in a better position to plan and adjust their audit when a whistleblowing allegation occurs earlier in a year. For issuance of ICD opinions, the coefficient of *WB_SUB* in column 4 (early) is significantly higher than that in column 3 (late), with chi-square = 7.21 for *WB_SUB*, p -value < 0.01, while *WB_FRI* is not significant in either column. Our results suggest that, when the whistleblowing allegation is revealed further from the audit report date, auditors have sufficient time to investigate and react in issuing ICD opinions.²¹

²¹ One concern is that auditors may underreact to allegations that occur later in the year and sacrifice audit quality because of time, budget, or other constraints. To investigate whether auditors sacrifice audit quality, we test whether substantiated whistleblowing allegations that are filed later in the year are more likely to result in subsequent misstatements, or have higher absolute or signed discretionary accruals. Our results show that such firms have a similar likelihood of subsequent misstatements to firms that received substantiated whistleblowing allegations earlier in the year. Further, we do not find significant differences in absolute (signed) discretionary accruals. As such, while we provide evidence that auditors are able to adjust their audits and perform more work when an allegation is filed earlier in the year, we do not find evidence that audit quality is significantly sacrificed when the allegation is filed later in a year.

Analysis of auditor effort

We further explore whether increasing audit effort in the allegation year, as proxied by abnormal audit fees (Doogar et al. 2015; Eshleman and Guo 2014), is effective in improving the client's reporting quality. We compute abnormal audit fees (*ABAF*) by extracting the error term from an audit fee model; that is, we estimate model (2) without the whistleblowing variable. We assume that higher abnormal audit fees suggest greater audit effort. We measure the reporting quality of a client in a whistleblowing allegation year by the probability of its subsequently restating financial reports prepared in the allegation year (*RESTATE*). Specifically, we estimate a model in which *RESTATE* is the dependent variable, and the control variables follow Lobo and Zhao (2013).²² We further include an interaction term between abnormal audit fees and *WB_ALL* in the model. The results are reported in Table 5. In column 1, the coefficient on the interaction term between *ABAF* and *WB_ALL* is significantly negative (p -value < 0.10). We follow Norton et al. (2004) and confirm the significance of the interaction term in our non-linear model with binary response.²³ To summarize, our findings indicate that the likelihood of subsequently restating financial statements is lower when auditors invest greater effort in a whistleblowing allegation year. Thus, our finding provides consistent support for auditors' role in improving reporting quality in the context of whistleblowing allegations.

Other tests

We run several other tests to check the robustness of our findings. As a falsification test, we adjust model (2) and regress audit fees in year $t - 2$ on whistleblowing allegations in year t . Our results

²² Lobo and Zhao (2013) include an indicator variable for total liabilities greater than total assets in their model. This variable drops out when we apply the same model specification in our sample.

²³ We calculate the value of the interaction term based on regression estimates. We find that, for observations with a non-zero interaction term, 62 percent (38 percent) of them have a negative (positive) value. We also plot the moderating effect of *ABAF* and find that the association between whistleblowing allegations and predicted likelihood of restatements significantly varies in low versus high *ABAF* groups, as expected.

show that the current whistleblowing allegations do not have a significant association with audit fees in year $t - 2$, which suggests that it is less likely that our main findings on audit fees are because of a correlated omitted variable problem. We also examine how long the effect of whistleblowing allegations on increased audit fees will persist. Specifically, we regress audit fees in year t on a string of whistleblowing allegation indicators from years $t - 4$ to $t - 2$. We find that current audit fees have a significantly positive association with the allegation indicators, except for year $t - 4$, suggesting that the effect on audit fees dissipates three years after the allegation.²⁴ Our evidence thus suggests that the effect of whistleblowing allegations on audit fees spans five years, from the year before to three years after. Further, because our investigation period covers the recent financial crisis, which could have influenced both whistleblowing and auditor actions, we drop observations for 2007 and 2008. We also replicate our analysis by excluding financial firms (Chan et al. 1993; Fields et al. 2004) and clustering standard errors by year. In all tests, we obtain inferentially consistent results.

7. Conclusions

This study examines the associations between external whistleblowing allegations and auditors' responses, as observed in audit fees and their opinion on internal controls. We find that firms targeted by employee whistleblowers have significantly higher audit fees, regardless of the substance of the allegation, whereas auditors tend to issue adverse opinions on internal controls only when the allegation is substantiated, but not frivolous. In additional tests, we show that audit fees increase prior to an external revelation of misconduct, suggesting that auditors are likely aware of whistleblowing when it is internally reported, and thereby incorporate this information into their

²⁴ We further compare the coefficients on whistleblowing allegation dummies between year $t - 2$ and year $t - 3$. The results show that the coefficients are not significantly different from each other. Note that our tests compare whistleblowing firms with non-whistleblowing firms on future audit fees. We do not focus on the changes of audit fees for whistleblowing firms over time.

audit planning. We also show that, when auditors invest greater effort into the audit of whistleblowing allegation years, the reporting quality of the firms involved in these allegations is higher. Taken together, our findings suggest that a whistleblowing allegation represents a red flag of potential financial misconduct and that auditors play an important role in the context of whistleblowing.

Our findings should be interpreted with caution because it is difficult to validate a causal relation between whistleblowing allegations and audit fees (internal control opinion). Nevertheless, we employ various approaches to address potential endogeneity concerns. Specifically, we include a battery of control variables in the regression models and employ various balancing and matching strategies to mitigate potential confounding effects. Even if we cannot entirely remove the endogeneity, the co-movement in whistleblowing allegations and auditor actions could suggest that whistleblowing is informative about corporate financial misconduct, and hence provides useful information to the public.

As with other archival auditing research (e.g., Hogan and Wilkins 2008), we are unable to disentangle the two drivers of increased audit fees—that is, whether the increased fees represent a risk premium or extra auditor efforts. Further, our sample consists of large companies, and our findings could have limited generalizability to smaller firms. Despite these limitations, this study offers initial evidence about auditors' involvement in assessing whistleblowing, thereby extending current knowledge about the economic consequences of whistleblowing allegations and the importance of auditors in improving reporting quality. Overall, our results suggest that external whistleblowing increases auditor effort and the increased effort likely lowers the likelihood of subsequent misstatements.

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Appendix A

Interview design

1. We began the interview with the following question to understand the interviewee's experience in auditing and with whistleblowing allegations: *Please describe your experience with whistleblowing matters during the audit process.* When necessary, prompts were used to provide us with an understanding of the protocols and normal procedure applied by their firm regarding whistleblowing matters during the audit process, as well as their views on the internal reporting channels (such as whistleblowing hotlines) of established client firms, and their effect on the audit process.
2. The second set of questions sought to understand auditors' decision making and response in the context of whistleblowing:
 - a. *How do auditors apply their professional judgment with respect to whistleblowing matters during the audit process? How would auditors judge the materiality of a whistleblowing claim?*
 - b. *How do auditors respond to whistleblowing allegations? What types of information do they use (e.g., provided by a client firm or acquired from another party, such as regulators)?*
 - c. *Will auditors treat frivolous whistleblowing cases differently from substantiated ones?*
 - d. *Does observation or acknowledgement of whistleblowing (internal or external) allegations affect audit fees?*
 - e. *Does observation or acknowledgement of whistleblowing (internal or external) allegations affect auditors' opinion on internal controls?*
3. The third set of questions were designed to learn more about the timing of auditors' involvement in whistleblowing matters:
 - a. *Before an allegation is externally revealed, to what extent do auditors have information about or are involved in whistleblowing matters that are filed internally?*
 - b. *How do auditors respond when a whistleblowing matter was internally versus externally reported?*
 - c. *Does the timing of whistleblowing allegations (e.g., earlier vs. later in the year) affect the auditor's response?*
4. We concluded the interview with a broad question to understand how auditors view their role when it comes to whistleblowing matters: *What is the auditor's role when a client firm is subject to whistleblowing allegations?*

Appendix B

Variable definitions

Variable	Definition	Data source
<i>Variables of interest</i>		
<i>AUDITFEE</i>	= Natural logarithm of audit fees.	Audit Analytics
<i>ICD</i>	= Indicator variable that equals 1 if the auditor discloses one or more material weaknesses in their initial opinion in the SOX 404 report and 0 otherwise.	
<i>Whistleblowing variables</i>		
<i>WB_ALL</i>	= Indicator variable that equals 1 if an OSHA or FCA whistleblowing allegation is made against a firm in a given year and 0 otherwise.	OSHA, DOL website, and DOJ
<i>WB_SUB</i>	= Indicator variable that equals 1 if a whistleblowing case ended in a favorable manner for the whistleblower (i.e., a meritorious case or a case that reached a private settlement) and 0 otherwise.	
<i>WB_FRI</i>	= Indicator variable that equals 1 if a whistleblowing case ended in an unfavorable decision for the whistleblower (i.e., case was dismissed) and 0 otherwise.	
<i>Audit-related variables</i>		
<i>BIG4</i>	= Indicator variable that equals 1 if a firm engages a Big 4 auditor and 0 otherwise.	Audit Analytics
<i>BUSY</i>	= Indicator variable that equals 1 when the firm's fiscal year ends in December and 0 otherwise.	
<i>INITIAL</i>	= Indicator variable that equals 1 if it is the initial year of the audit–client relationship and 0 otherwise.	
<i>LEADER</i>	= Indicator variable that equals 1 if the audit office has the highest market share in an industry for a given year, where the market share is calculated as the total audit fees of an audit office divided by the total audit fees in an industry for a given year. Industries are defined using two-digit SIC codes.	
<i>FILELATE</i>	= Indicator variable that equals 1 if the firm files after the date of the filing deadline and 0 otherwise.	
<i>AUDTENURE</i>	= Number of successive years that the audit firm has been engaged by the firm.	
<i>ABAF</i>	= Abnormal audit fees. Residual extracted from model (3) estimated without the whistleblowing variables.	
<i>Firm economic and operating characteristics</i>		
<i>LNNTA</i>	= Natural logarithm of total assets at the end of the year.	Compustat
<i>INVREC</i>	= Inventory plus receivables, divided by total assets at the end of the year.	
<i>LNSEG</i>	= Natural logarithm of the number of segments.	
<i>FOREIGN</i>	= Indicator variable that equals 1 if the firm has foreign transactions during the year and 0 otherwise.	
<i>LEV</i>	= Leverage ratio that equals total liabilities divided by total assets at the end of the year.	

Variable	Definition	Data source
<i>LIQ</i>	= Liquidity ratio that equals current assets divided by current liabilities at the end of the year.	
<i>ROA</i>	= Operating income divided by total assets at the end of the year.	
<i>LOSS</i>	= Indicator variable that equals 1 if the current net income or net income last year was less than zero and 0 otherwise.	
<i>RESANC</i>	= Indicator variable that equals 1 if a restatement was announced in the year and 0 otherwise.	Audit Analytics
<i>RESTATE</i>	= Indicator variable that equals 1 if financial statements for the year were subsequently restated and 0 otherwise.	
<i>NONAF</i>	= Percentage of non-audit fees in total fees.	
<i>RESTRUCT</i>	= Indicator variable that equals 1 if the change in total assets during the year is over 50% and 0 otherwise.	Compustat
<i>OCF</i>	= Operating cash flows divided by total assets at the end of the year.	
<i>INVEST</i>	= Cash plus short-term investment divided by total assets at the end of the year.	
<i>BTM</i>	= Book-to-market ratio, calculated as tangible common equity divided by the market value at the end of the year.	
<i>FAGE</i>	= Firm age, defined as the number of years for which a firm has data available from Compustat.	
<i>ZSCORE</i>	= Altman's (1968) Z-score, calculated as $Z = 1.2 \times \text{working capital/total assets} + 1.4 \times \text{retained earnings/total assets} + 3.3 \times \text{earnings before interest and taxes/total assets} + 0.6 \times \text{market value equity/book value of total debt} + 0.999 \times \text{sales/total assets}$. The variable <i>ZSCORE</i> is coded as 2 if <i>Z</i> is less than 1.81, as 1 if <i>Z</i> is between 1.81 and 2.99, and as 0 if <i>Z</i> is greater than 3. A lower score indicates a higher probability of firm distress.	
<i>CURR_ACC</i>	= One-year change in non-cash current assets (change in current assets less change in cash and short-term investments, less change in current liabilities, less change in current debt, less change in taxes payable) divided by the average of total assets in year <i>t</i> and <i>t</i> - 1.	
<i>SALESGR</i>	= One-year change in sales.	
<i>FIN</i>	= Indicator variable that equals 1 if the sum of new long-term debt and new equity issuance exceeds two percent of lagged total assets, and 0 otherwise.	
<i>EXTFINDEM</i>	= External financing demand. Indicator variable that equals 1 if free cash flow is below -0.5 and 0 otherwise. Free cash flow is computed as the sum of cash from operations minus average capital expenditures in the last three years, divided by current assets.	
<i>INVINTCOV</i>	= Inverse interest coverage, which is computed as interest expense divided by operating income before	

Variable	Definition	Data source
	depreciation. <i>INVINTCOV</i> is capped at 2 and is assigned a value of 2 if operating income before depreciation is below zero.	
<i>MERGER</i>	= Indicator variable that equals 1 if there was an acquisition that contributed to sales, and 0 otherwise.	
<i>PSCORE</i>	= Predicted probability of misstatements based on the Dechow et al. (2011) model: $RESTATE_t = f(TOT_ACC_t, \Delta REC_t, \Delta INV_t, SOFTASSETS_t, \Delta CSALE_t, \Delta ROA_t, ISSUE_t, \Delta EMP_t, LEASE_t, ABRET_t, ABRET_{t-1})$	
<i>TOT_ACC</i>	= One-year change in non-cash assets (non-cash total assets minus total liabilities and preferred stock) divided by the average of total assets in year t and $t - 1$.	
ΔREC	= One-year change in accounts receivables.	
ΔINV	= One-year change in inventories.	
<i>SOFTASSETS</i>	= Soft assets divided by total assets. Soft assets is computed as total assets less the sum of cash and short-term investments and property, plant, and equipment.	
$\Delta CSALE$	= Percentage change in cash sales, where cash sales is computed as sales minus change in receivables.	
ΔROA	= One-year change in <i>ROA</i> .	
<i>ISSUE</i>	= Indicator variable that equals 1 if the company issued debt or equity securities during the year, and 0 otherwise.	
ΔEMP	= One-year change in number of employees.	
<i>LEASE</i>	= Indicator variable that equals 1 if future operating lease obligations are greater than zero, and 0 otherwise.	
<i>ABRET</i>	= Annual buy-and-hold stock return minus annual buy-and-hold value-weighted NYSE/AMEX/NASDAQ index return.	CRSP
<i>Corporate governance variables</i>		
<i>ACEXP</i>	= Proportion of audit committee members with financial expertise.	BoardEx
<i>DUALITY</i>	= Indicator variable that equals 1 if the CEO is also the chairperson and 0 otherwise.	
<i>CEOTENURE</i>	= Number of years the CEO has remained in the role.	

Figure 1 Whistleblowing process

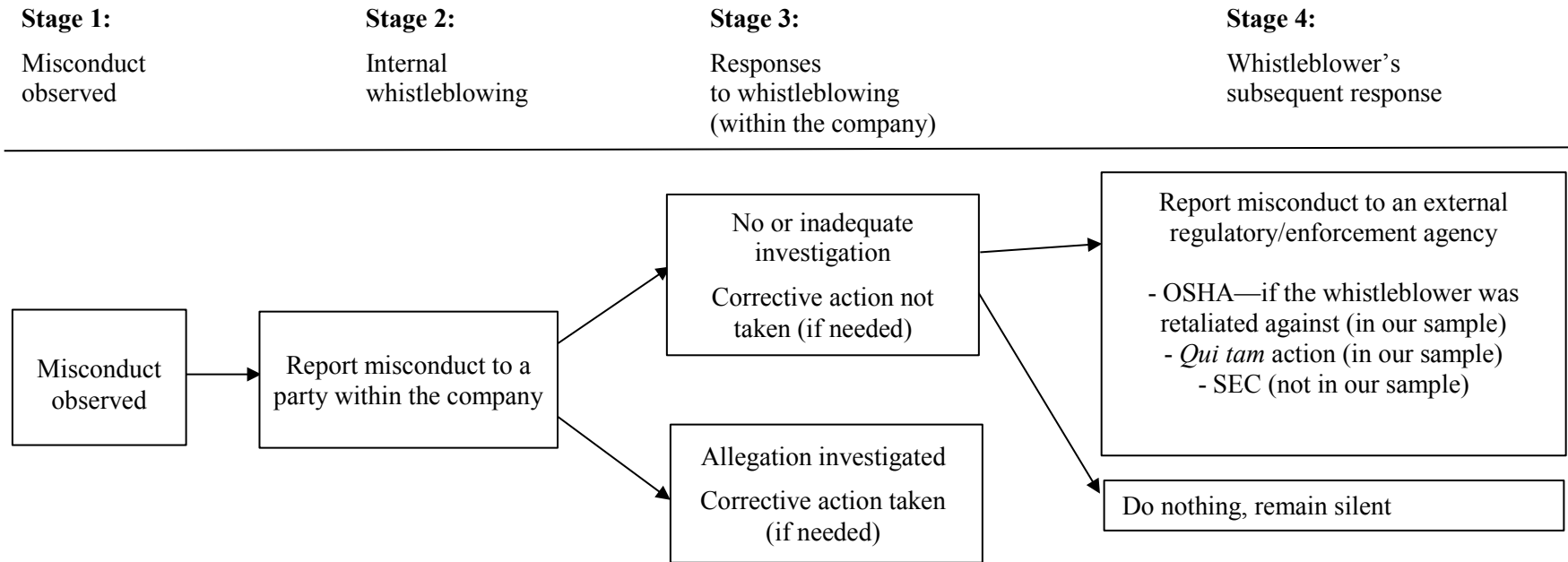


TABLE 1
Descriptive statistics

Panel A: Sample distribution by year

Year	<i>WB_ALL</i> = 0	<i>WB_SUB</i> = 1	<i>WB_FRI</i> = 1
2004	1,599	7	44
2005	2,469	19	64
2006	2,505	31	49
2007	2,461	25	63
2008	2,343	29	44
2009	2,191	24	65
2010	2,083	29	40
2011	2,073	17	44
2012	2,034	19	56
2013	2,037	27	47
2014	1,358	10	17
Total	23,153	237	533

Panel B: Descriptive statistics

Variable	Full sample						After entropy balancing							
	N	Mean	SD	25%	50%	75%	<i>WB_ALL</i> = 1				<i>WB_ALL</i> = 0			
							N	Mean	Variance	Skewness	N	Mean	Variance	Skewness
<i>AUDITFEE</i>	23,923	14.056	1.090	13.342	13.975	14.692	770	15.341	1.552	0.026	23,153	14.013	1.118	0.222
<i>ICD</i>	23,923	0.059	0.235	0.000	0.000	0.000	770	0.062	0.059	3.621	23,153	0.062	0.058	3.619
<i>LNTA</i>	23,923	7.072	1.798	5.790	6.999	8.228	770	8.979	3.546	-0.322	23,153	8.977	3.545	-0.319
<i>LEV</i>	23,923	0.527	0.236	0.343	0.534	0.703	770	0.597	0.037	-0.147	23,153	0.597	0.037	-0.145
<i>LIQ</i>	23,923	2.310	2.671	0.879	1.701	2.875	770	1.603	1.645	2.957	23,153	1.603	1.645	2.958
<i>OCF</i>	23,923	0.061	0.152	0.024	0.074	0.125	770	0.093	0.007	-1.665	23,153	0.093	0.007	-1.672
<i>ROA</i>	23,923	0.045	0.157	0.020	0.064	0.112	770	0.091	0.008	-2.613	23,153	0.091	0.008	-2.617
<i>BTM</i>	23,923	0.372	0.486	0.112	0.304	0.569	770	0.150	0.150	1.017	23,153	0.150	0.150	1.017
<i>LOSS</i>	23,923	0.315	0.465	0.000	0.000	1.000	770	0.201	0.161	1.490	23,153	0.202	0.161	1.488
<i>INVEST</i>	23,923	0.180	0.211	0.029	0.093	0.252	770	0.127	0.018	2.229	23,153	0.127	0.018	2.230
<i>FOREIGN</i>	23,923	0.352	0.478	0.000	0.000	1.000	770	0.330	0.221	0.724	23,153	0.330	0.221	0.722
<i>INVREC</i>	23,923	0.255	0.213	0.083	0.203	0.359	770	0.239	0.030	1.134	23,153	0.239	0.030	1.135
<i>ZSCORE</i>	23,923	0.924	0.904	0.000	1.000	2.000	770	0.868	0.724	0.256	23,153	0.867	0.724	0.256
<i>RESANC</i>	23,923	0.085	0.279	0.000	0.000	0.000	770	0.092	0.084	2.819	23,153	0.092	0.084	2.818
<i>LNSEG</i>	23,923	0.998	1.043	0.000	1.099	1.946	770	1.159	1.216	0.354	23,153	1.159	1.216	0.354
<i>FAGE</i>	23,923	22.319	16.276	10.000	17.000	30.000	770	33.750	387.5	0.143	23,153	33.740	387.4	0.144
<i>RESTRUCT</i>	23,923	0.293	0.455	0.000	0.000	1.000	770	0.421	0.244	0.321	23,153	0.421	0.244	0.320
<i>BIG4</i>	23,923	0.829	0.377	1.000	1.000	1.000	770	0.964	0.035	-4.954	23,153	0.964	0.035	-4.950
<i>FILELATE</i>	23,923	0.155	0.362	0.000	0.000	0.000	770	0.078	0.072	3.149	23,153	0.158	0.133	1.880
<i>NONAF</i>	23,923	0.156	0.145	0.044	0.122	0.230	770	0.189	0.019	0.883	23,153	0.155	0.021	1.561
<i>BUSY</i>	23,923	0.812	0.391	1.000	1.000	1.000	770	0.855	0.125	-2.011	23,153	0.854	0.125	-2.009
<i>INITIAL</i>	23,923	0.047	0.212	0.000	0.000	0.000	770	0.025	0.024	6.128	23,153	0.025	0.024	6.125
<i>LEADER</i>	23,923	0.562	0.496	0.000	1.000	1.000	770	0.653	0.227	-0.644	23,153	0.653	0.227	-0.642
<i>AUDTENURE</i>	23,923	4.268	2.808	2.000	4.000	6.000	770	4.834	7.928	0.374	23,153	4.833	7.926	0.375

Variable	Full sample						After entropy balancing							
	N	Mean	SD	25%	50%	75%	<i>WB_ALL</i> = 1				<i>WB_ALL</i> = 0			
							N	Mean	Variance	Skewness	N	Mean	Variance	Skewness
<i>ACEXP</i>	23,923	0.441	0.314	0.250	0.333	0.667	770	0.496	0.108	0.334	23,153	0.496	0.108	0.335
<i>DUALITY</i>	23,923	0.502	0.500	0.000	1.000	1.000	770	0.639	0.231	-0.579	23,153	0.639	0.231	-0.577
<i>CEOTENURE</i>	23,923	5.457	5.722	1.600	3.800	7.400	770	4.855	27.690	2.534	23,153	4.854	27.690	2.535

Notes: Panel A reports the sample distribution by year. Panel B reports the descriptive statistics for the sample after entropy balancing. Variable definitions are provided in Appendix B.

TABLE 2
Whistleblowing and audit fees

Variable	Dependent variable: <i>AUDITFEE</i>		
	(1)	(2)	(3)
<i>WB_ALL</i>		0.093*** (4.331)	
<i>WB_SUB</i>			0.151*** (4.099)
<i>WB_FRI</i>			0.065*** (2.656)
<i>LNTA</i>	0.553*** (68.797)	0.551*** (68.999)	0.551*** (69.126)
<i>LEV</i>	-0.091 (-0.909)	-0.092 (-0.930)	-0.085 (-0.881)
<i>LIQ</i>	-0.011 (-0.730)	-0.013 (-0.854)	-0.014 (-0.889)
<i>OCF</i>	-0.541*** (-2.773)	-0.549*** (-2.821)	-0.534*** (-2.762)
<i>ROA</i>	-0.281 (-1.379)	-0.287 (-1.400)	-0.310 (-1.526)
<i>BTM</i>	-0.200*** (-4.958)	-0.207*** (-5.152)	-0.205*** (-5.050)
<i>LOSS</i>	0.176*** (5.133)	0.174*** (5.055)	0.174*** (5.054)
<i>INVEST</i>	0.244*** (2.651)	0.256*** (2.759)	0.243*** (2.613)
<i>FOREIGN</i>	0.098*** (4.558)	0.095*** (4.433)	0.096*** (4.471)
<i>INVREC</i>	0.664*** (5.573)	0.667*** (5.598)	0.668*** (5.601)
<i>ZSCORE</i>	-0.069*** (-3.491)	-0.071*** (-3.595)	-0.072*** (-3.705)
<i>RESANC</i>	0.075* (1.790)	0.076* (1.835)	0.077* (1.882)
<i>LNSEG</i>	0.104*** (6.599)	0.105*** (6.690)	0.104*** (6.649)
<i>ICD</i>	0.378*** (7.181)	0.379*** (7.293)	0.371*** (7.143)
<i>FAGE</i>	0.007*** (9.253)	0.007*** (9.130)	0.007*** (9.099)
<i>BIG4</i>	0.218*** (4.072)	0.222*** (4.205)	0.225*** (4.316)
<i>FILELATE</i>	0.033 (0.674)	0.033 (0.659)	0.030 (0.605)
<i>NONAF</i>	-0.222*** (-2.694)	-0.219*** (-2.653)	-0.216*** (-2.609)
<i>BUSY</i>	0.009 (0.329)	0.009 (0.319)	0.010 (0.364)
<i>INITIAL</i>	-0.096 (-1.366)	-0.098 (-1.429)	-0.093 (-1.353)

Variable	Dependent variable: <i>AUDITFEE</i>		
	(1)	(2)	(3)
<i>LEADER</i>	0.001 (0.047)	0.003 (0.133)	0.003 (0.105)
<i>AUDTENURE</i>	-0.008 (-1.213)	-0.008 (-1.295)	-0.008 (-1.313)
<i>ACEXP</i>	0.148*** (4.713)	0.149*** (4.747)	0.145*** (4.665)
<i>DUALITY</i>	0.044* (1.918)	0.045* (1.948)	0.047** (2.035)
<i>CEOTENURE</i>	-0.006*** (-3.363)	-0.006*** (-3.352)	-0.006*** (-3.478)
Intercept	9.545*** (59.731)	9.537*** (60.241)	9.528*** (60.202)
Year fixed effects	Included	Included	Included
Industry fixed effects	Included	Included	Included
N	23,923	23,923	23,923
Adjusted R ²	0.814	0.816	0.816
F-statistics		162.91***	112.78***

Notes: This table reports the OLS regression results of the association between whistleblowing and audit fees (*AUDITFEE*). The *t*-statistics are reported in parentheses. ***, **, * indicate significance at 1 percent, 5 percent, and 10 percent levels (two-tailed), respectively. Variable definitions are provided in Appendix B.

TABLE 3
Whistleblowing and ICD

Variable	Dependent variable: <i>ICD</i>		
	(1)	(2)	(3)
<i>WB_ALL</i>		0.692*** (3.556)	
<i>WB_SUB</i>			1.301*** (4.843)
<i>WB_FRI</i>			0.290 (1.130)
<i>LNTA</i>	-0.334*** (-4.249)	-0.359*** (-4.397)	-0.356*** (-4.405)
<i>LEV</i>	1.747*** (2.593)	1.793*** (2.638)	1.852*** (2.730)
<i>LOSS</i>	0.556** (2.028)	0.586** (2.092)	0.573** (2.040)
<i>OCF</i>	-0.351 (-0.195)	-0.526 (-0.290)	-0.669 (-0.346)
<i>ROA</i>	-0.735 (-0.458)	-0.503 (-0.310)	-0.537 (-0.318)
<i>BTM</i>	0.580** (2.119)	0.510* (1.874)	0.507* (1.762)
<i>RESTRUCT</i>	0.267 (1.147)	0.262 (1.103)	0.217 (0.906)
<i>LNSEG</i>	-0.252* (-1.648)	-0.229 (-1.465)	-0.266 (-1.619)
<i>FAGE</i>	-0.009 (-1.197)	-0.010 (-1.321)	-0.008 (-1.067)
<i>RESANC</i>	2.048*** (9.432)	2.082*** (9.457)	2.106*** (9.642)
<i>BIG4</i>	-0.659 (-1.609)	-0.635 (-1.568)	-0.623 (-1.576)
<i>INITIAL</i>	0.972** (2.424)	0.965** (2.386)	1.049*** (2.723)
<i>LEADER</i>	-0.489** (-2.273)	-0.478** (-2.150)	-0.482** (-2.166)
<i>AUDTENURE</i>	-0.176** (-2.271)	-0.179** (-2.385)	-0.189** (-2.567)
<i>ACEXP</i>	0.551 (1.578)	0.591* (1.694)	0.598* (1.747)
<i>DUALITY</i>	-0.311 (-1.436)	-0.273 (-1.245)	-0.304 (-1.356)
<i>CEOTENURE</i>	-0.007 (-0.334)	-0.008 (-0.385)	-0.015 (-0.691)
Intercept	0.366 (0.373)	0.356 (0.354)	0.158 (0.149)
Year fixed effects	Included	Included	Included
Industry fixed effects	Included	Included	Included
N	23,745	23,745	23,745
McFadden's pseudo R ²	0.342	0.351	0.362
Cox-Snell R ²	0.345	0.354	0.365
ROC	0.849	0.799	0.799

Notes: This table reports the logistic regression results of the association between whistleblowing and auditors' propensity to issue an adverse opinion on internal controls (*ICD*). The *z*-statistics are reported in parentheses. ***, **, * indicate significance at 1 percent, 5 percent, and 10 percent levels (two-tailed), respectively. Variable definitions are provided in Appendix B.

TABLE 4

Analysis of the involvement of auditors in the whistleblowing process

Panel A: Audit fee (opinion on internal controls) in year t and whistleblowing allegations in year $t + 1$

Variable	Dependent variable: <i>AUDITFEE</i>		Dependent variable: <i>ICD</i>	
	(1)		(2)	
<i>WB_SUB</i> ($t + 1$)	0.108***		0.566	
	(2.980)		(1.606)	
<i>WB_FRI</i> ($t + 1$)	0.060**		0.386	
	(2.256)		(1.372)	
Controls	Included		Included	
N	18,550		18,326	
Adjusted R ²	0.828			
McFadden's pseudo R ²			0.302	
Cox-Snell R ²			0.304	
ROC			0.811	

Panel B: Audit fee (opinion on internal controls) in year t and whistleblowing allegations in year $t - 1$

Variable	Dependent variable: <i>AUDITFEE</i>		Dependent variable: <i>ICD</i>	
	(1)		(2)	
<i>WB_SUB</i> ($t - 1$)	0.137***		-0.320	
	(3.446)		(-0.623)	
<i>WB_FRI</i> ($t - 1$)	0.044*		0.226	
	(1.676)		(0.727)	
Controls	Included		Included	
N	18,550		18,303	
Adjusted R ²	0.820			
McFadden's pseudo R ²			0.288	
Cox-Snell R ²			0.290	
ROC			0.792	

Panel C: Timing of whistleblowing allegation

Variable	Dependent variable: <i>AUDITFEE</i>		Dependent variable: <i>ICD</i>	
	Late	Early	Late	Early
	(1)	(2)	(3)	(4)
<i>WB_SUB</i>	0.076***	0.220***	0.306	1.936***
	(6.275)	(17.957)	(0.664)	(5.822)
<i>WB_FRI</i>	0.021**	0.099***	0.298	0.425
	(2.428)	(10.817)	(0.908)	(1.290)
Controls	Included	Included	Included	Included
N	23,536	23,540	23,358	23,362
Adjusted R ²	0.819	0.811		
McFadden's pseudo R ²			0.365	0.357
Cox-Snell R ²			0.367	0.359
ROC			0.798	0.798

Notes: Panel A summarizes the results of the association between whistleblowing and one-year prior audit fees (auditor's opinion on internal controls). Panel B summarizes the results of the association between whistleblowing and one-year ahead audit fees (auditor's opinion on internal controls). Panel C summarizes

the results of the association between audit fees (auditor's opinion on internal controls) and the timing of the whistleblowing allegation. Specifically, we split the sample into a "late" group and an "early" group based on whether the number of days between the whistleblowing allegation date and audit report date is below the sample median or not. The t -(z -)statistics are reported in parentheses. ***, **, * indicate significance at 1 percent, 5 percent, and 10 percent levels (two-tailed), respectively. Variable definitions are provided in Appendix B.

TABLE 5

Audit effort in the year of whistleblowing and the likelihood of subsequent restatement

Variable	Dependent variable: <i>RESTATE</i>	
	(1)	
<i>ABAF</i>	0.034	(0.907)
<i>WB_ALL</i>	0.029	(0.328)
<i>WB_ALL</i> × <i>ABAF</i>	-0.309*	(-1.751)
<i>PSCORE</i>	3.021**	(2.201)
<i>LNTA</i>	-0.008	(-0.550)
<i>LEV</i>	0.009	(0.087)
<i>LOSS</i>	0.015	(0.332)
<i>CURR_ACC</i>	-0.011	(-0.041)
<i>BTM</i>	0.026	(0.632)
<i>SALESGR</i>	0.007	(0.115)
<i>FIN</i>	0.097***	(2.626)
<i>EXTFINDEM</i>	-0.008	(-0.090)
<i>INVINTCOV</i>	0.043	(1.274)
<i>RESTATE (lag)</i>	1.933***	(53.767)
<i>MERGER</i>	0.088**	(2.040)
<i>BIG4</i>	0.113*	(1.926)
<i>LEADER</i>	0.054	(1.498)
<i>AUDTENURE</i>	0.003	(0.330)
Constant	-2.251***	(-7.482)
Year fixed effects	Included	
Industry fixed effects	Included	
Observations	12,184	
McFadden's pseudo R ²	0.336	
Cox-Snell R ²	0.339	
ROC	0.844	

Notes: This panel summarizes the results of the association between whistleblowing, audit effort, and the

likelihood of a subsequent restatement of financial statements (*RESTATE*). The z -statistics are reported in parentheses. ***, **, * indicate significance at 1 percent, 5 percent, and 10 percent levels (two-tailed), respectively. Variable definitions are provided in Appendix B.