

The Significance of Whistleblowing as an Anti-Fraud Measure

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Introduction

Financial fraud continues to plague both business and society. For example, in just the last two decades the corporate world has been rocked by ethical scandals at Madoff Investment Securities, Enron, Satyam, Vivendi, Royal Ahold, SK Global, WorldCom, YGX, and Livedoor Company, among others (Zahra, Priem, and Rasheed, 2005). Many have even argued that the economic collapse of 2007 and 2008 was initiated by widespread fraud in the subprime mortgage industry, which resulted in severe, long-lasting consequences for economies throughout the world (Albrecht, Holland, Malagueno, Dolan, and Tzafir, 2015). The Fraud Barometer, published by KPMG suggests that while the volume of fraud cases over the last few years has fallen, the total losses from fraud is now more than five times greater than it was in 2015 (KPMG, 2017).

It is easy to see how the detection and prevention of fraudulent schemes often have a significant effect on the financial performance and reputation of organizations (Isbell, 1974; Schmidt, 2005). Thus, business executives, academics, and government policy-makers have redoubled their efforts to create, implement, and monitor effective tools and policies to prevent or detect fraudulent activities.

Whistleblowing, management reviews, internal audits, accidents, account reconciliations, document examinations, external audits, notifications by police, surveillance/monitoring, confessions, internal controls, and other information technology controls are among the most common ways that financial fraud is discovered (Association of Certified Fraud Examiners [ACFE], 2016). There is a need for an increased level of research about these detection tools.

Whistleblowing, arguably the most effectual detection method, is a phenomenon that has been given significant attention in academic research (e.g., Miceli and Near, 1984; Near and Miceli, 1985; Near and Miceli, 1996; Patel, 2003). Much of the research on whistleblowing has focused on the whistleblower, to better understand why some observers of corruption and unethical acts choose to report unethical acts while others do not (Dozier and Miceli, 1985; Miceli and Near, 1988). However, there has been rather little research about whistleblowing in the context of a portfolio of detection methods used by companies. In this study, we take a comparative look at whistleblowing versus other detection methods. Specifically, we focus on elements of the organizational context to identify when whistleblowing is the most likely mechanism to detect fraud relative to alternative detection methods.

Detecting a fraud early, through a whistleblower or some other means, is critical to minimize the negative effects (Albrecht, Albrecht, and Albrecht, 2008). Once fraud occurs there are no winners—the perpetrator loses, the victim organization loses, and, in the end, society loses. And, the larger the fraud, the more difficult it is for the organization to recover. Understanding key detection methods and their effectiveness in various organizational settings is an important step in preventing and minimizing fraud losses. This study provides a clearer picture of when whistleblower complaints are an effective detection method of fraud. The findings inform managers that implement fraud detection systems about the environment in which whistleblowing may be most applicable.

Hypothesis Development

Near and Miceli (1985) define whistleblowing as “the disclosure by organizational members (former or current) of illegal, immoral, or illegitimate practices under the control of their employers, to persons or organizations that may be able to affect action” (p. 4, Near and Miceli, 1985). We expand on this definition to include non-organizational members, such as customers, vendors, and anonymous sources of whistleblowing. Near and Miceli’s definition is definitive in that for whistleblowing to take place a perceived triggering event must be illegal, immoral, or illegitimate. The perceived act may not be real but, in the mind of the whistleblower, he or she must believe that it is real.¹ In other words, for whistleblowing to occur, management or others must be involved in a wrongful act—not simply a philosophical disagreement (King III, 1997).

Whistleblowing may improve long-term organizational effectiveness as whistleblowers provide solutions to organizational challenges (Rothschild and Miethe, 1999; Appelbaum, Iaconi, and Matousek, 2007). Whistleblowing may also increase safety and well-being of organizational members, support codes of ethics, reduce waste, improve morale, help avoid lawsuits and legal regulation, and provide maintenance of goodwill (Miceli and Near, 1992; Liyanarachchi and Newdick, 2008). Whistleblowers have even been lauded in the popular press for their influence on uncovering organizational scandals. For example, Cynthia Cooper, Coleen Rowley, and Sherron Watkins were named as *Time Magazine’s* 2002 Persons of the Year. Each of these individuals blew the whistle within major institutions (i.e., WorldCom, the FBI, and Enron) in the early 2000s.

Fraud has been described as a generic term that includes all the ways that human ingenuity can devise, by which one individual takes advantage of another individual, by false representations (Webster, 1964). Occupational fraud specifically describes the use of one’s occupation for personal enrichment through the deliberate misuse of the employing organization’s resources or assets (Sen, 2007, ACFE, 2016). Financial fraud may include various forms of corruption, asset misappropriation and financial statement fraud (Wells, 2011). While there are many reasons individuals provide whistleblower complaints, our focus in this paper is on the relationships between financial fraudulent activity and whistleblower complaints.

The number of corporate frauds at the turn of the century provoked significant legislation through the Sarbanes-Oxley Act, also known as SOX (Dyck, Morse, and Zingales, 2010). The purpose of this legislation was to minimize financial statement fraud and provide more financial transparency of public corporations and protections for whistleblowers (Rapp, 2007; Coates IV, 2007). Section 806 of the SOX Act states that civil liability may be imposed on public companies that take retaliatory action against employees who provide information about actual or potential corporate frauds (Dworkin, 2007). SOX also requires companies to set up whistleblower hotlines or other procedures for the confidential, anonymous submission of employee complaints and concerns (Rauhofer, 2007).

To further encourage whistleblowing and minimize financial statement fraud losses, Section 922 of the *Dodd-Frank Wall Street Reform and Consumer Protection Act* allows the U.S. Securities and Exchange Commission (SEC) to pay awards to eligible whistleblowers that voluntarily provide the SEC with original information that leads to an enforcement action with monetary sanctions of over one million dollars. In September 2014, the SEC paid out its highest reward to date, giving over thirty million dollars to a key whistleblower (U.S. SEC, 2014).

Based on such efforts by government policy makers and corporate top management teams, we propose the following baseline hypothesis:

H1: When fraud is reported, whistleblowing will be the most likely detection method.

¹ Our definition includes only real or perceived illegal, immoral, or illegitimate triggering acts. We recognize that some people submit whistleblower complaints for fictitious and phony reasons such as a desire to get even with someone, a desire to cause embarrassment, etc. We do not include these acts as whistleblower complaints.

Research has suggested that many occupational frauds are perpetrated by multiple players working together (The Committee of Sponsoring Organizations [COSO] of the Treadway Commission, 2002; ACFE, 2016). In many large-scale financial statement scandals, such as Enron, for example, entire organizational cultures were involved in the destructive behavior (O’Connell, 2004; Rezaee, 2005). Oftentimes, as the complexity and size of the fraudulent behavior increases, the need to expand the circle of individual actors will also increase (Albrecht, et al., 2015).

Research has suggested that as the number of participants in the fraud scheme increases, it is more difficult for the primary perpetrators of the fraud to control the information flow and ultimately conceal the fraud (Zyglidopoulos and Flemming, 2008). As perpetrators are forced to enlist additional individuals to assist in the perpetration or cover-up of the fraud, it becomes more likely that the suspicions of one or more of the new recruits will be raised (Zyglidopoulos and Flemming, 2009). Logic would suggest then that as the number of primary or secondary collaborators increases, the likelihood that a whistleblower will expose the fraud also increases. Thus, we hypothesize that:

H2: The more individuals involved in perpetrating the fraud scheme, the more likely the fraud scheme will be detected by whistleblowing.

In the *Report to the Nation on Occupational Fraud and Abuse* (2016) the ACFE examined various types of anti-fraud measures or controls. Anti-fraud measures may include:

- fraud hotline or other anonymous reporting mechanisms
- an internal audit or fraud examination department
- surprise audits performed on a frequent basis
- independent audits of the organization’s financial statements (conducted by external auditors)
- independent audits of the organization’s internal controls over financial reporting
- regular management review (of internal controls, processes, accounts, or transactions)
- mandatory rotation of job duties or mandatory vacations, rewards for whistleblowers
- a fraud awareness or ethics training program for employees
- a fraud awareness or ethics training program for managers/executives
- a formal anti-fraud or fraud prevention policy
- a formal code of conduct
- an independent audit committee
- management certification of the organization’s financial statements, and employee support programs (such as drug, family, or financial counseling programs)

As can be expected, such anti-fraud measures are expensive for organizations, but especially expensive for small businesses. While some of these measures are intended to prevent fraud (i.e., preventative measures), some are intended to detect fraud (i.e., detective measures). For example, internal controls such as segregation of duties, a system of authorizations, physical controls, and a code of conduct are considered preventative fraud measures. On the other hand, independent checks, audits, documents and records, certifications and verifications are considered detective measures. Research has suggested that fraud prevention, not fraud detection is the most cost-effective way of dealing with fraud (Albrecht, et al., 2008). However, because eliminating all opportunities to commit fraud is cost prohibitive, organizations must consistently make cost-benefit tradeoffs when deciding to institute or choose between preventative and detective measures.

While it is generally understood that the more explicit and well-known anti-fraud measures are, the more difficult it is for employees and others to rationalize fraudulent acts as acceptable or to even commit fraud. And, the more individuals understand what is and is not acceptable, the more likely they are to report suspected fraud or other illegitimate activities. We expand the ACFE studies by aggregating the anti-fraud measures. With more anti-fraud measures in place, frauds are more likely to be seen by others in an

organization because the controls, audits and other anti-fraud measures allow them to see what they perceive as symptoms or red flags of the fraud. Because rationalizations and perceived opportunities are necessary for fraud to occur,² we hypothesize that more explicit anti-fraud measures will lead to an increased number of whistleblower complaints and propose the following hypothesis:

H3: The more anti-fraud measures an organization has in place, the more likely that whistleblowing will be the most probable detection method.

However, in many frauds, one never actually sees the fraudulent acts being committed. Rather, all that is recognized are lifestyle, personality, analytical, documentary, and control symptoms or “red flags”. Since red flags are often the only indicator(s) observed, it is difficult to know that fraud is being committed. This perception of a dishonest act is what leads individuals in organizations to lodge a whistleblower complaint, knowing that trusted individuals inside or outside the organization with sufficient resources to follow-up will investigate their complaint.

In our research, we identify internal control weaknesses which may lead to fraud. Termed as “contributing factors”, these internal control weaknesses include:

- lack of internal controls
- lack of management review
- override of existing controls
- poor tone at the top
- lack of competent personnel in oversight roles
- lack of independent checks/audits
- lack of employee fraud education
- lack of clear lines of authority and a lack of reporting mechanism

One could assume that the more contributing factors an organization has, the more likely fraud is to occur. With more frauds, it is easier for others to see red flags associated with the dishonest acts. Thus, we hypothesize that the more “contributing factors” there are, the more likely that fraud will take place and whistleblowing will, once again, be the most common way by which a fraud is discovered. As a result, we hypothesize that:

H4: The more “contributing factors” that a fraud scheme has, the more likely whistleblowing will be the most probable detection method.

In H4, we suggest that when there are loose controls, or a weak environment (contributing factors) within the organization, the organization will experience more frauds. This increase in the number of frauds will likely generate more fraud symptoms leading to additional whistleblower complaints. As such, H4 hypothesizes that the most common way these frauds will be detected continues to be through whistleblower complaints. We do expect that with more frauds being committed, all types of detection methods will see an increase in frequency; however, our hypothesis is that the percentage of these detected through whistleblower complaints will still be higher than other detection methods.

Research has suggested that many fraud perpetrators are repeat offenders (Dorminey, Fleming, Kranacher, and Riley, 2012). As a result, background checks can be an effective tool in fraud prevention (Blumstein and Nakamura, 2009; Albrecht, 2014). While background checks can complicate the hiring process, research has suggested that background checks can minimize negligent hiring lawsuits, weed out dishonest applicants (Connerley, Arvey, and Bernardy, 2001), and protect the reputation of the hiring institution (Burns, Frank-Stromborg, Teytelman, and Herren, 2004). In many industries, such as the financial services

² The iconic fraud triangle states that three elements are necessary to have a fraud: (1) some kind of perceived pressure, (2) some kind of perceived opportunity, and (3) an ability to rationalize the dishonest act as acceptable. For a more extensive description of the fraud triangle, see Albrecht, 2014.

industry, background checks are a mandatory element of the hiring process. We expect that the existence of background checks communicates to employees that the organization is committed to hiring ethical employees and creating a fraud-free environment. In such an environment, we posit that employees and coworkers will feel less threatened, and even encouraged, to report unethical acts and, as such, are more likely to “blow the whistle” when they see possible red flags. We therefore expect that employers who perform background checks will be more likely to have whistleblowers report instances of fraud, which leads to our final hypothesis:

H5: The more that companies engage in employee background checks, the more likely that whistleblowing will be the most probable detection method.

Data and Methods

The data used in this study came from the ACFE. In 1996, the ACFE released its inaugural *Report to the Nation on Occupational Fraud and Abuse*. The report was based on actual cases of fraud collected from the experience of over 2,500 certified fraud examiners. Collectively, this group of individuals had investigated more than one million cases of criminal and civil fraud. Because most frauds are quietly handled and never made public, the 1996 report immediately became one of the most referenced and credible sources of fraud research, providing a much-needed framework and taxonomy for those interested in preventing, detecting and investigating fraud.

Because the ACFE’s 1996 report was so successful, the ACFE continued with subsequent reports, including biennial releases since 2002 with the latest report being published in 2016. Each of these subsequent reports was prepared with new data made available by the organization’s more than 70,000 certified fraud examiners. Although the ACFE has collected one of the richest longitudinal fraud databases, it had never made its data available for academic use until several years ago, when it made the database available through the Institute for Fraud Prevention (IFP), the academic arm of the ACFE. Only a few select research teams were granted access to the ACFE database including the authors of this article. With formal IFP board approval, our research team became one of three research teams to gain access to the ACFE’s *Report to the Nation on Occupational Fraud and Abuse* rich survey data.

Research Design

Table I summarizes our test and control variables. As discussed above, we obtained our data from the ACFE database. Because the data does not include information about the fraud firms’ identities, we were unable to compare our observations directly with non-ACFE database firms. However, we were able to investigate characteristics of frauds that allowed us to address the hypotheses of this article. [see Table I, pg 10]

Regression Model

We use logistic regression analysis to test our research design. Because our sample does not disclose company names and identifying information, we were not able to do a matched sample design. Therefore, we followed research such as Erickson, Hanlon, and Maydew (2006). We used logistic regressions on our “how caught measure” (whistleblower versus other detection method) to test whether the number of individuals involved in perpetrating the fraud scheme, the number of anti-fraud measures the organization has in place, the quantity of contributing factors, and whether the company performs background checks on its employees increases the likelihood that fraud detection will come from a whistleblower. Our regression model is:

$$\begin{aligned} \text{Whistleblower} = & \alpha + \beta_1 \text{Perps} + \beta_2 \text{Anti-Fraud} + \beta_3 \text{Contributing} + \beta_4 \text{Background} \\ & + \beta_5 \text{Org_Size} + \beta_6 \text{Org_Type} + \beta_7 \text{Gender} + \beta_8 \text{Age} \\ & + \beta_9 \text{Length_Employ} + \beta_{10} \text{Education} + \beta_{11} \text{Position} + \beta_{12} \text{Industry} \\ & + \beta_{13} \text{Department} + \beta_{14} \text{Country} + \varepsilon \end{aligned} \quad (1)$$

where the variables are as described in Table I.

We suspect that because there are many different types of background checks performed, the type of background check performed could matter. To better understand background checks, we replaced the *Background* variable with more detailed measures representing different types of background checks. Our regression model is modified below:

$$\begin{aligned} \text{Whistleblower} = & \alpha + \beta_1 \text{Perps} + \beta_2 \text{Anti-Fraud} + \beta_3 \text{Contributing} \\ & + \beta_4 \text{Back_Criminal} + \beta_5 \text{Back_Employ} + \beta_6 \text{Back_Credit} \\ & + \beta_7 \text{Back_Other} + \beta_{10} \text{Org_Size} + \beta_{11} \text{Org_Type} + \beta_{12} \text{Gender} \\ & + \beta_{13} \text{Age} + \beta_{14} \text{Length_Employ} + \beta_{15} \text{Education} + \beta_{16} \text{Position} \\ & + \beta_{17} \text{Industry} + \beta_{18} \text{Department} + \beta_{19} \text{Country} + \varepsilon \end{aligned} \quad (2)$$

where the variables are as described in Table I.

Model 2 replaces Background with four types of background checks: criminal background check (*Back_Criminal*); employment background check (*Back_Employ*); credit history background check (*Back_Credit*); or some other non-classified background check (*Back_Other*).

Results and Discussion

The purpose of this research was to better understand the relationship between whistleblowing and fraud prevention and detection. While controlling for multiple variables, our results show that whistleblowing can be an effective tool in the fight against fraud and corruption. The initial results of our analysis support H1 where we find that the T-test calculated to determine if whether a fraud will be identified by a whistleblower or another method is significant at the $P < 0.01$ level, providing evidence that whistleblowing is the most common fraud detection method. This result confirms the ACFE conclusion about detection methods and shows that the difference between whistleblowing and other detections methods is strongly significant. Table II presents the various ways in which the fraud was identified. Of the 4,943 frauds for which we have complete data, 1,774 (35.9 percent of the sample) were detected through a whistleblower. The next closest identification method was through internal controls, 1,057 (21.4 percent). This result shows how important it is that every organization has a whistleblower system in place that is functioning properly. [see Table II, pg 11]

To test hypotheses H2 through H5 we again run logit regressions. Table III: Model 1 presents our results. Several significant differences are noted between whistleblower and non-whistleblower fraud detection. Specifically, as the number of perpetrators (*Perps*) involved in the fraud scheme increases, the fraud is increasingly likely to be detected at by a whistleblower (significant at the $p < 0.01$ level.). Table III: Model 2 reports our de-composed background check results. We find that only one type of background check is significant. Those that have a criminal background check performed are more likely to have a whistleblower report the fraud at the $p < 0.01$ level.³ [see Table III, pg 12]

Our logit regression analysis supports H2 at the $p < 0.01$ level suggesting that when more individuals are involved in a fraud scheme, it is more likely that whistleblowing will be the principal detection method. While we know from this result that an increase in the number of perpetrators increases the likelihood of whistleblowing as the detection method, we do not know who the whistleblowers are. It is possible that it is one of the perpetrators, someone that one of the perpetrators talked to, or someone who independently saw red flags that blew the whistle.

Our results also support H3 at the $p < 0.01$ level suggesting that the more anti-fraud measures an organization has in place, the more likely it is that whistleblowing will be the most common detection method. While the data only provide answers to what the data say and not why, the data potentially suggest that anti-fraud

³ We tested for multicollinearity and find no evidence of it in our models.

measures increase awareness that fraud is wrong, leading to an increased number of complaints when red flags are observed.

Similarly, our results support H4 at the $p < 0.01$ level that the more “contributing factors” that a fraud scheme has, the more likely whistleblowing will be the most common detection method. As discussed previously, we attribute this mostly to an increased number of frauds and an increased number of red flags being observed. These red flags do not show that fraud is occurring but only that fraud could be occurring. The whistleblowers expect that someone with authority and resources will follow up on their complaints.

Unfortunately, our analysis does not provide support for H5 which stated that the more that companies engage in employee background checks, the more likely that whistleblowing will be the most common detection method. Because we did not understand this result, we decided to rerun our data focusing on different types of background checks.

Conclusions and Discussion

Whistleblowing is an important fraud detection tool. While controlling for several variables, our results suggest that whistleblowing can be an effective tool in the fight against fraud and corruption. Like the ACFE report, our research suggests that whistleblower complaints are the most common fraud detection method. However, unlike the ACFE report, our research builds upon that report by statistically showing that the whistleblower probability of detection increases when more individuals are involved in the fraud (H2), when a company puts more anti-fraud measures in place (H3), when there are more contributing factors to a fraud (H4) and when criminal background checks are performed (H5 partial). These findings should be helpful to companies that implement whistleblower systems and that monitor their effectiveness. Because whistleblower complaints are the number one detection method, organizations should always make sure they monitor and test that their whistleblower system is working properly and make sure that employees are educated about how to use the whistleblower system. Frauds prevented or detected early can save organizations millions of dollars.

When a company has a fraud, its net income is reduced one dollar for every dollar of fraud losses. And, since net income is only a percentage of total revenues, usually ten to fifteen percent, significantly more revenues than the amount of the fraud must be generated to restore income to what it would have been without the fraud. Because of the additional effort that is needed to restore net income to its pre-fraud level, frauds, especially large frauds, put companies at significant disadvantages to their competitors. An effective whistleblower system, together with pro-active anti-fraud measures can save organizations from financial losses, embarrassment, loss of reputation and wasted management time. This research provides evidence about the frequency of whistleblower complaints as a detective method and when whistleblower complaints are most common. Additional research that helps us understand the elements that make whistleblower systems increasingly effective is needed.

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Table I: Variable Definitions	
Variable Name	Definition
<u>Dependent Variable</u>	
<i>Whistleblower</i>	Indicator variable = 1, where the fraud was first discovered by a tip or complaint from an employee, customer, vendor, or other source; 0 otherwise.
<u>Primary Variables of Interest</u>	
<i>Perps</i>	Total number of individuals that perpetrated the fraud.
<i>Anti-Fraud</i>	Total number of anti-fraud measures the victim organization had in use at the time of the fraud.
<i>Contributing</i>	The number of contributing factors to the fraud.
<i>Background</i>	Indicator variable = 1, The victim organization conducted a background check on the perpetrator prior to the investigation of the fraud (either at the time of hire or during the employment period); 0 otherwise.
<i>Back_Criminal</i>	Indicator variable = 1, where a criminal history background check was performed prior to the investigation of the fraud; 0 otherwise.
<i>Back_Employ</i>	Indicator variable = 1, where an employment history background check was performed prior to the investigation of the fraud; 0 otherwise.
<i>Back_Credit</i>	Indicator variable = 1, where a credit history background check was performed prior to the investigation of the fraud; 0 otherwise.
<i>Back_Other</i>	Indicator variable = 1, where any other type of background check was performed prior to employment by the firm; 0 otherwise.
<u>Control Variables</u>	
<i>Org_Size</i>	Size of the victim organization, measured as the number of employees.
<i>Org_Type</i>	Organizations were classified as Government, Not-for-profit, Publicly Traded, or Privately Held.
<i>Gender</i>	Indicator variable = 1, where the lead perpetrator was male; 0 otherwise.
<i>Age</i>	Age of the perpetrator of the fraud at the time of discovery.
<i>Length_Employ</i>	Number of years the lead perpetrator was employed at the organization.
<i>Education</i>	The principal perpetrator's education level.
<i>Position</i>	The principal perpetrators position within the organization: employee, manager/supervisor, owner/executive/officer/director, or other position.
<i>Industry</i>	The primary industry of the victim company.
<i>Department</i>	The primary department in which the lead perpetrator worked.
<i>Country</i>	Country where the fraud was perpetrated.

Table II: How was the Fraud Perpetrator Caught?		
<u>How Caught</u>	<u>Number of Frauds</u>	<u>Percent</u>
Whistleblowing	1,774	35.9%
Internal controls	1,057	21.4%
Internal audit	628	12.7%
Accident	556	11.2%
Multiple	285	5.8%
Other	259	5.2%
External audit	255	5.2%
Law enforcement	89	1.8%
Confession	40	0.8%
Total	<u>4,943</u>	<u>100.0%</u>
Whistleblowing	1,774	35.9%
Other	<u>3,169</u>	<u>64.1%</u>
Total	<u>4,943</u>	<u>100.0%</u>
T-test	52.59774	<0.0001

Table III: Logistic Regression Analysis—Testing Hypothesis H2–H5						
Parameter	Model 1			Model 2		
		Estimate	Wald ChiSq		Estimate	Wald ChiSq
<i>Intercept</i>		-1.7178	19.3163 ***		-1.6798	18.4289 ***
<i>Perps</i>	H2	0.0305	10.3781 ***		0.0306	10.4007 ***
<i>Anti-Fraud</i>	H3	0.0293	7.9747 ***		0.0296	7.8174 ***
<i>Contributing</i>	H4	0.5917	33.2530 ***		0.5396	26.9781 ***
<i>Background</i>	H5	0.1109	2.5368			
<i>Back_Criminal</i>	H5				0.2987	7.4580 ***
<i>Back_Employ</i>	H5				-0.0593	0.3433
<i>Back_Credit</i>	H5				-0.2026	2.9868 *
<i>Back_Other</i>	H5				0.0212	0.0133
<i>Size</i>		0.0000	0.0117		0.0000	0.0202
<i>Org_Type: Government</i>		0.1674	0.8880		0.1526	0.7362
<i>Org_Type: Not_Profit</i>		0.0070	0.0017		0.0051	0.0009
<i>Org_Type: Private</i>		-0.2413	2.5475		-0.2416	2.5546
<i>Org_Type: Public</i>		-0.0507	0.1086		-0.0565	0.1348
<i>Gender</i>		0.0111	0.0219		0.0154	0.0420
<i>Age</i>		0.0052	1.6874		0.0050	1.5935
<i>Length_Employ</i>		0.0027	0.0046		0.0061	0.0233
<i>Education</i>		0.0292	1.2855		0.0335	1.6861
<i>Position: Employee</i>		0.0752	0.1878		0.0725	0.1745
<i>Position: Manager</i>		0.3265	3.5767 *		0.3248	3.5352 *
<i>Position: Owner</i>		0.3827	4.0394 **		0.3781	3.9423 **
N			4,943			4,943
Pseudo-R ²			0.1084			0.1100
Likelihood Ratio			406.7698 ***			412.9826 ***
Wald chi-square			358.5276 ***			364.5893 ***
*p <0.10; **p <0.05; ***p <0.01.						

The dependent variable is *Whistleblower*, which is an indicator variable = 1, where the fraud was first discovered by a tip or complaint from an employee, customer, vendor, or other source; 0 otherwise. The primary variables of interest are *Perps* = total number of individuals that perpetrated the fraud. *Anti-Fraud* = Total number of anti-fraud measures the victim organization had in use at the time of the fraud. *Contributing* = the number of contributing factors to the fraud. *Background* = 1, where the victim organization conducted a background check on the perpetrator prior to the investigation of the fraud (either at the time of hire or during the employment period); 0 otherwise. *Back_Criminal* = 1, where a criminal history background check was performed prior to the investigation of the fraud; 0 otherwise. *Back_Employ* = 1, where an employment history background check was performed prior to the investigation of the fraud; 0 otherwise. *Back_Credit* = 1, where a credit history background check was performed prior to the investigation of the fraud; 0 otherwise. *Back_Other* = 1, where any other type of background check was performed prior to employment by the firm; 0 otherwise. Control Variables: *Org_Size* = Size of the victim

organization, measured as the number of employees. *Org_Type* = were classified as Government, Not-for-profit, Publicly Traded, or Privately Held. *Gender* = 1, where the lead perpetrator was male; 0 otherwise. *Age* = Age of the perpetrator of the fraud at the time of discovery. *Length_Employ* = Number of years the lead perpetrator was employed at the organization. *Education* = The principal perpetrator's education level. *Position* = The principal perpetrators position within the organization: employee, manager/supervisor, owner/executive/officer/director, or other position.