

**AN EXAMINATION OF OWNERSHIP STRUCTURE, THE
NATURE OF FINANCIAL STATEMENT FRAUD, AND
AUDIT EFFECTIVENESS: EVIDENCE FROM CHINA**

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Key Words: Financial statement fraud, ownership structure, audit effectiveness, China

JEL Classifications: M41, G32

Abstract

This paper examines two types of financial statement fraud (i.e., earnings manipulation fraud and tunneling fraud) and their association with ownership structure and audit effectiveness using a sample of Chinese listed companies. We find that more concentrated ownership tends to induce tunneling fraud and more dispersed ownership tends to induce earnings manipulation fraud. Controlling shareholders tend to over-reach minority shareholders when they become more powerful, but at the same time, they tend to curb earnings manipulation fraud. The second largest shareholder is able to curb earnings manipulation fraud by monitoring management. However, we do not find evidence that they are able to monitor the controlling shareholder and curb tunneling fraud.

We also find that although Chinese auditors are generally effective in detecting earnings manipulation fraud, they are not so effective in detecting tunneling fraud. Moreover, Big-4 audit firms are not significantly different from non-Big-4 firms in terms of detecting financial statement fraud. These findings should further our understanding of the role of incentives and opportunities in financial statement fraud.

1. INTRODUCTION

The existence and persistence of financial statement fraud (FSF)¹ continues to contribute to the financial uncertainty and market volatility, preventing global investors from receiving meaningful financial information to make sound investment decisions. For example, Rezaee and Riley (2009) report that since the passage of the Sarbanes-Oxley Act of 2002, which was primarily intended to combat FSF and related scandals, the Department of Justice has obtained nearly 1,300 fraud convictions. Internationally, PricewaterhouseCoopers' 2007

Global Economic Crime Survey (hereafter, the PwC survey) reports that of the 5,428 companies in 40 countries that took part in the survey, about 12 percent have suffered from accounting fraud between 2005 and 2007 (PwC 2007). Furthermore, the PwC survey concludes that controls designed to detect and prevent fraud have not proven to be uniformly effective, and some companies from the developed economies have found that trying to impose Western controls on companies of emerging markets² simply does not work.

¹ Rezaee and Riley (2009) define FSF as "deliberate misstatements or omissions of amounts or disclosures of financial statements to deceive financial statement users, particularly investors and creditors." We adopt this definition in this paper.

² The emerging markets include Brazil, China, India, Indonesia, Mexico, Russia, and Turkey (PwC 2007).

We empirically examine the association between the nature of the fraud committed by listed companies and related audit effectiveness in one important emerging market, the People's Republic of China (hereafter China). We chose to study Chinese companies because China is the third largest country in the world in terms of area and China's economy is now the world's fourth largest³ with an annual economic growth rate of around 8-9 percent over the last decade, making it one of the most attractive markets for foreign investors. Despite china's growing economy and business popularity worldwide, fraud is rampant in China (Pei 2006; PwC 2007).⁴

Another reason we focused on Chinese listed companies is that the largest four international audit firms have been expanding rapidly in China (Deloitte 2009).⁵ Our results show that Chinese listed companies committed more tunneling fraud⁶ because of their ownership structure, and auditors in China, including international Big-4 firms, have trouble detecting tunneling fraud, which is common in China (Gao and Kling 2008) but uncommon in the US (Coffee 2005).

Our study makes contributions to the literature in the following ways: first, we focus on the underlying conflicts of interest that lead to different types of fraud and thus capture the nature of fraud more effectively. Prior research (e.g., Beasley et al. 1999; Bonner et al. 1998; Gao and Srivastava 2007) has developed many classifications of FSF, but they mainly focus on the deceptive schemes and accounts that fraudsters use and ignore, to

³ The top three are United States, Japan and Germany. See <http://www.nytimes.com/2006/01/25/business/worldbusiness/25cnd-yuan.html>.

⁴ For example, the PwC survey finds that of the 21 percent of corruption cases that involved a perpetrator located overseas, 17 percent of those involved a perpetrator from China.

⁵ For example, Deloitte China has delivered over 20 percent revenue growth in fiscal year 2008 (Deloitte 2009) and is now one of the fastest growing member firms, becoming the fourth largest member firm of Deloitte (Deloitte 2008).

⁶ The tunneling fraud refers to the controlling shareholder's over-reaching minority shareholders by transferring resources out of a company to the controlling shareholder (Johnson et al. 2000).

some extent, the nature of the fraud. We argue that different schemes can be used to achieve the same goal (e.g., either recognizing revenues prematurely or capitalizing expenditure that should be expensed can increase reported earnings) and that the same scheme can be used to benefit different perpetrators (e.g., unfair related party transactions can benefit the management as well as the controlling shareholder).

We classify FSF based on the beneficiary of the fraud and the underlying conflicts of interest (i.e., those between the management and shareholders and those between controlling shareholders and minority shareholders) that lead to the fraud. Therefore, we are able to show how different ownership structures lead to different conflicts of interest, which in turn induce different types of fraud.

Second, although there are numerous studies on financial statement fraud, most focus on short-term earnings manipulation (e.g., National Commission on Fraudulent Financial Reporting 1987; Dechow et al. 1996). In this study, we highlight the rampancy of an alternative type of fraud (i.e., tunneling fraud) in emerging markets and study the factors that are related to tunneling fraud as well as audit effectiveness in detecting this type of fraud. International investors should consider the risks related to the tunneling fraud and the effectiveness of the audit in detecting this fraud when investing in emerging markets.

Third, our results show that auditors are not as effective in detecting tunneling fraud as they are in detecting earnings manipulation. Prior literature suggests that generally, Big-4 firms provide higher quality audits (e.g., Khurana and Raman 2004; Geiger and Rama 2006; Gul 1999; Gul et al. 2009); however, our results do not support the claim that compared with non-Big-4 firms, Big-4 firms in China provide higher audit quality in terms of detecting tunneling fraud. Our evidence suggests that auditors should consider the conflicts of interest and incentives resulting from ownership structure when planning, implementing and completing audits.

Finally, international investors could make more informed decisions when investing in emerging markets such as China by being more aware of warning signs of tunneling fraud and related audit effectiveness. To the best of our knowledge, this study is one of the first attempts to empirically examine the relationship between ownership structure and the different types of FSF as well as audit effectiveness in detecting different types of FSF.

The remainder of this paper is organized as follows: section 2 presents the background, related literature and establishes a classification of FSF; section 3 develops the hypotheses; section 4 presents the research design; section 5 describes sample selection and explains descriptive statistics; section 6 discusses the results; and section 7 concludes the paper.

2. BACKGROUND AND RELATED LITERATURE

Institutional Background

Around 2001, a surge of FSF scandals (e.g., Enron, WorldCom, Parmalat, and Ahold) occurred worldwide, arousing considerable concern about the effectiveness of corporate governance, the reliability of public financial information, and audit effectiveness. Coffee (2005) argues that FSF in the U.S. is different in nature from FSF in the Europe: in the U.S., the typical fraud scenario is that management will manipulate earnings for self-serving purposes, while in Europe; it is more common for the controlling shareholder to over-reach minority shareholders.

The differences in the nature of fraud are evidenced by the differences in the perpetrators of the fraud (management vs. the controlling shareholder) and in the schemes used in the fraud (earnings manipulation vs. tunneling fraud). Coffee (2005) attributes the differences in the nature of fraud to different degrees of ownership concentration. In other words, it is the ownership structure (i.e., dispersed or concentrated ownership) that leads to different types of fraud. If Coffee's theory is valid, then it presents a great challenge to investors, accounting professionals, auditors,

regulators, and other stakeholders. Coffee's theory predicts that tunneling fraud should be more prevalent in countries where companies have concentrated ownership, such as developing countries (La Porta et al. 1998).

The PwC survey reveals that the fraud detection and prevention techniques that are effective and efficient in certain countries (e.g., in the U.S.) may not work so well in other countries. For example, the U.S. techniques to detect FSF greatly emphasize the signs of earnings manipulation, which is reasonable because earnings manipulation fraud is much more prevalent in the U.S. However, those techniques may not help the auditor detect the tunneling fraud that is more prevalent in other countries, such as in China. In light of the increasing foreign investments by U.S. investors, we believe that there is an increasing need to examine the nature of different types of FSF and audit effectiveness in detecting this fraud.

Moreover, the laws and regulations that successfully prevent, or at least reduce the occurrences of FSF in certain countries, may not be as effective in other countries if similar laws and regulations are adopted blindly. For example, the Sarbanes-Oxley Act of 2002 requires that auditor's report to the audit committee of the board of directors in order to preserve auditor independence. However, in some other countries, such as Asian countries, concentrated ownership is prevalent (La Porta et al. 1999); in this situation, the audit committee is often subservient to the controlling shareholder, who actually hires external auditors.

The auditors probably cannot monitor the controlling shareholder who hires them, and thus the auditors' independence is greatly weakened. A better mechanism to prevent fraud and protect minority shareholders and other stakeholders may be for minority shareholders to select their own gatekeepers (Coffee 2005). Thus, we argue that different measures should be taken to prevent and detect different types of fraud.

Related Literature

Prior literature has shown that ownership structure is an important explanatory variable for firm performance, firm value, and profitability. For example, Morck et al. (1988) found an inverted U-shaped relationship between ownership by managers and a company's valuation and profitability. Claessens et al. (2002) document that in East Asian economies, firm value increases with the cash-flow ownership of the largest shareholder and falls when the control rights of the largest shareholder exceed its cash-flow ownership.

They find that pyramid schemes, cross-holdings among firms, and the issuance of dual-class shares are all associated with lower corporate valuation. Stulz (1988) presents a model of the roof-shaped relationship between ownership structure and firm performance, which is corroborated by the empirical studies of McConnell and Servaes (1990) and Wruck (1989).

Other studies have examined the relationship between ownership structure and earnings management (e.g., Darrough et al. 1998; Kim and Yi 2006; Siregar and Utama 2008; Ding et al. 2007) but have not examined the relationship between ownership structure and type of fraud. The concept of earnings management could include FSF, depending on the definition adopted, but earnings management does not necessarily lead to FSF. Our study extends the earnings management literature by focusing on the extreme cases of earnings management, i.e., the financial statement fraud.

Prior auditing literature has studied the relationship between audit quality and earnings management (e.g., Becker et al. 1998; Chen et al. 2005b; Van Tendeloo and Vanstraelen 2008), as well as the relationship between audit quality and fraud (e.g., Carcello and Nagy 2004; Firth et al. 2005; Sharma 2004), but audit effectiveness in detecting different types of fraud has not been examined. Our study contributes to the auditing literature by providing evidence on audit effectiveness in detecting different types of fraud.

Classification of Financial Statement Fraud

An appropriate classification of financial statement fraud is crucial in this study. Prior research has established a variety of classifications. For example, Bonner et al. (1998) established 12 general categories of fraud⁷ based mainly on how they affect financial statement elements. Gao and Srivastava (2007) classify fraud schemes into two types, i.e., account schemes and evidence schemes. Account schemes are those through which management perpetrates fraud by manipulating account balances (or disclosure), while evidence schemes are those through which management creates (or hides) evidence to conceal fraud. Although all are valid, these classifications are not clear about how related underlying conflicts of interest and incentives contribute to different types of fraud.

To show the conflicts of interest resulting from ownership structure, we classified FSF into three types: (1) earnings manipulation, (2) tunneling, and (3) all other. The earnings manipulation type of fraud is committed by the top management through earnings manipulation. It can take several forms, including improper revenue recognition, overstatement of assets, understatement of expenses, and inappropriate disclosure, among others (Beasley et al. 1999).

The tunneling type of fraud refers to the controlling shareholder's over-reaching minority shareholders by transferring resources out of a company to the controlling shareholder (Johnson et al. 2000). Tunneling typically takes two forms. One form is when a controlling shareholder simply transfers resources from the company for his own benefit through self-dealing transactions, such as outright theft, transfer pricing, excessive executive

⁷ The categories are (1) fictitious revenues, (2) premature revenue recognition, (3) misclassifications, (4) fictitious assets and/or reductions of expenses/liabilities, (5) overvalued assets and undervalued expenses/liabilities, (6) omitted or undervalued liabilities (affecting expenses or assets), (7) omitted or improper disclosures, (8) equity frauds, (9) related party transactions, (10) frauds going the "wrong way" (those understating income and/or assets), (11) illegal acts, and (12) miscellaneous (including consolidation issues).

compensation (if the controlling shareholder is also a member of the top management team), loan guarantees, and expropriation of corporate opportunities. The other form is when the controlling shareholder increases his share of the firm without transferring any assets, such as through dilutive share issues, minority freeze-outs,⁸ insider trading, creeping acquisitions, or other financial transactions that discriminate against minority shareholders.

The Parmalat scandal is a typical example of the tunneling type of fraud (Galloni and Reilly 2004). A more recent example of tunneling is the China Sun Bio-Chem Technology Group Company scandal. In February 2009, China Sun Bio-Chem Technology's auditor, PricewaterhouseCoopers, discovered about 592 million yuan⁹ (roughly USD 93 million) missing from the company's bank accounts. The auditors were unable to find evidence to support the explanation provided by the company's management that the money had been used to buy raw materials (Chan 2009; Yeow 2009). Our third category includes all other types of fraud besides earnings manipulation and tunneling, e.g., employee embezzlement and disclosure fraud.

3. HYPOTHESIS DEVELOPMENT

Controlling Shareholder

Shleifer and Vishny (1997) show that as ownership gets beyond a certain point, large owners gain nearly full control of the company and may use the company to generate private benefits of control that are not shared by minority shareholders. Coffee (2005) argues that it is the differences in the concentration of ownership that account for the differences in the nature of the fraud and the identity of the perpetrators. The different degree of ownership concentration, dispersed or concentrated, leads to different patterns

⁸ Freeze-out refers to the situation that majority shareholders in a company use their power to deprive one or more minority shareholders of their role in governing the company. This is done to force the minority shareholders to sell their stock at the reduced price and exit the company.

⁹ Yuan is the unit of currency in the People's Republic of China.

of corporate governance and in turn facilitates different financial statement fraud.

Coffee (2006) further explains that in the dispersed ownership system, small shareholders cannot easily take coordinated action; thus, managers have enhanced power and discretion, which they may use in low-visibility ways to further their own interest. In contrast, in concentrated ownership systems, the controlling shareholders or control group can favor their own interests over those of the minority or public shareholders by engaging in self-dealing transactions with the firm. Roe (2006) also points out that agency cost can take the form of either theft or mismanagement, which vary by ownership system. Theft is the more serious agency cost in concentrated ownership systems and mismanagement is the more serious one in dispersed ownership systems.

In the situation of concentrated ownership, a controlling shareholder has more incentive to collect information and monitor management to avoid the “free rider” problem prevalent in firms with dispersed ownership. More rigorous monitoring from the controlling shareholders tends to curb earnings manipulation fraud committed by management. Therefore, the occurrence of earnings manipulation should be less in a concentrated ownership situation. However, the controlling shareholder has the incentive and ability to take actions to benefit themselves at the expense of minority shareholders through tunneling fraud. Hence, we hypothesize that:

H1a: There is a negative relationship between the percentage ownership by a controlling shareholder and the possibility of the occurrence of earnings manipulation fraud.

H1b: There is a positive relationship between the percentage ownership by a controlling shareholder and the possibility of the occurrence of tunneling fraud.

Second Largest Shareholder

Edwards and Weichenrieder (2004) argue that greater holdings by the second largest shareholder raise a firm's value. The second largest shareholder tends to monitor the controlling

shareholder, thus reducing the tunneling effect. In their study of 97 listed corporations in Germany, they found that increases in the control rights of the second largest shareholders have a significant positive effect on share valuation. Bennedsen and Wolfenzon (2000) and Gomes and Novaes (2005) discuss the role of the second largest shareholder in upholding the rights of minority shareholders. The second largest shareholder could monitor both the controlling shareholder and the management, thus reducing the occurrence of both types of FSF.

Therefore, we hypothesize that:

H2a: There is a negative relationship between the percentage ownership of the second largest shareholder and the probability of the occurrence of earnings manipulation fraud.

H2b: There is a negative relationship between the percentage ownership of the second largest shareholder and the probability of the occurrence of tunneling fraud.

Nature of the Controlling Shareholder

When the controlling shareholder is an individual or a family, the incentive to over-reach minority shareholders tends to be stronger because the controlling shareholder can directly benefit from such actions. When the controlling shareholder is an organization, there tends to be no direct link between the interest of the management and that of the shareholders of that controlling organization.

Claessens et al. (2000) document that in: Hong Kong, Indonesia, Korea, Malaysia, Philippines, Taiwan, and Thailand, companies that are controlled by families have the most separation of ownership and control, and minority shareholders are over-reached to a greater extent. Oswald et al. (2009) also find a negative relationship between family control and firm performance, even after controlling for firm size, firm age and industry. Their results provide evidence of a management entrenchment effect and solidify the idea that agency cost is greater when family members control the top management team. Therefore we hypothesize that:

H3a: When the controlling shareholder is an individual or family, the probability of the occurrence of tunneling fraud increases.

In order to protect their interest in the company, large shareholders, especially those that are individuals or families, tend to monitor management more closely. The reason is clear: excessive cost by the management is a direct loss to the shareholders. Burkart et al. (2003) developed an analytical model showing that a firm's founder has more or less economic incentives to monitor the management, dependent upon the quality of legal protection.

In other words, in countries with weak legal protection such as China, individual or family controlling shareholders will monitor the management more closely. Consistent with this argument, Villalonga and Amit (2006) find that family ownership creates value when the founder serves as the Chairman, with a hired CEO. Thus, we hypothesize that:

H3b: When the controlling shareholder is an individual or a family, the probability of the occurrence of earnings manipulation fraud decreases.

Audit Effectiveness in Detecting Fraud

Generally, auditors are experts in financial statements audit and have the responsibility to identify significant fraud. Prior studies typically show that auditors could curb earnings management to some extent, especially Big-4 auditors. For example, Becker et al. (1998) find that clients of non-Big-6 auditor's report discretionary accruals (which proxy for earnings management) that are, on average, 1.5-2.1 percent of total assets higher than the discretionary accruals reported by clients of Big-6 auditors¹⁰. The mean and median of the absolute value of discretionary accruals was found to be greater for firms with non-

¹⁰ Big-6 auditing firms of Arthur Andersen, Coopers & Lybrand, Deloitte & Touché, Ernst & Young, KPMG and Price Waterhouse became Big-5 in July 1998 when Price Waterhouse merged with Coopers & Lybrand and they became Big-4 after the demise of Arthur Andersen in 2002.

Big-6 auditors. Using data on private firms in European countries, Van Tendeloo and Vanstraelen (2008) document that Big-4 audit firms provide a constraint on earnings management. Therefore we predict that:

H4a: Auditors are effective in detecting the earnings manipulation type of fraud, and Big-4 auditors are more effective than non-Big-4 auditors.

As discussed in the previous sections, audit procedures designed to detect earnings manipulation fraud may not be effective when used to detect tunneling fraud. In addition to the PwC survey suggesting that internal controls from Western countries simply do not work in emerging markets, Chen et al. (2007) document that audit quality deteriorates when an auditor faces a family-controlled client, which has a concentrated ownership structure. Hence, we hypothesize that:

H4b: Auditors are less effective in detecting tunneling type of fraud than earnings manipulation type of fraud.

4. RESEARCH DESIGN

We used both univariate and multivariate analyses to test our hypotheses. First, we employed univariate analysis to test whether there are significant differences between companies engaging in FSF and those not engaging in FSF. Second, we used the following logistic models (1) and (2) to test H1 – H3, controlling for company size (total assets), other minority shareholders (the shareholdings of the third to the tenth largest shareholders), leverage, profitability (ROA), and total shares outstanding.

Demsetz and Lehn (1985) argue that the larger the company, the greater the market value of a given fraction of ownership it tends to have, and the higher price of the given fraction of ownership should reduce the degree of ownership concentration given that investors have limited fund. Therefore larger companies tend to have a more dispersed ownership structure. In addition, Claessens et al. (2000) document that small companies are most likely to have a larger wedge between cash

flow and control rights regardless of ownership type, which suggests that small companies have a more serious entrenchment effect. Therefore we controlled for firm size for the possible size effect. Following Welker (1995) and Becher and Frye (2009), we also controlled for total shares outstanding because companies with a greater amount of shares outstanding have a broader investment base, higher liquidity and thus lower information asymmetry. The empirical models are as follows:

$$\begin{aligned} \text{Prob(EARNG)} = & f(\beta_0 + \beta_1 \text{CTLSHARE} + \beta_2 \text{SECDSHARE} \\ & + \beta_3 \text{D1} + \beta_4 \text{D1} * \text{CTLSHARE} + \beta_5 \text{D2} \\ & + \beta_6 \text{D2} * \text{SECDSHARE} + \beta_7 \text{TA} + \beta_8 \text{LEV} \\ & + \beta_9 \text{ROA} + \beta_{10} \text{SHARE} \\ & + \beta_{11} \text{OTHERSHARE} + \varepsilon_1) \end{aligned} \quad (1)$$

and

$$\begin{aligned} \text{Prob(TUNL)} = & f(\gamma_0 + \gamma_1 \text{CTLSHARE} + \gamma_2 \text{SECDSHARE} \\ & + \gamma_3 \text{D1} + \gamma_4 \text{D1} * \text{CTLSHARE} + \gamma_5 \text{D2} \\ & + \gamma_6 \text{D2} * \text{SECDSHARE} + \gamma_7 \text{TA} + \gamma_8 \text{LEV} \\ & + \gamma_9 \text{ROA} + \gamma_{10} \text{SHARE} + \gamma_{11} \text{OTHERSHARE} \\ & + \varepsilon_2) \end{aligned} \quad (2)$$

where

$f(\bullet)$ is the logistic function;

EARNG = 1 if the company engaged in earnings manipulation fraud and 0 otherwise;

TUNL = 1 if the company engaged in tunneling fraud and 0 otherwise;

CTLSHARE = the percentage ownership of the largest shareholder;

SECDSHARE = the percentage ownership of the second largest shareholder;

D1 = 1 if the controlling shareholder is an individual or a family, and 0 otherwise;

D2 = 1 if the second largest shareholder is an individual or a family, and 0 otherwise;

TA = total assets;

LEV = leverage, which equals to total liabilities divided by total assets.

ROA = return on assets;

SHARE = total outstanding shares; and

OTHERSHARE = the percentage ownership of the third to the tenth largest shareholders.

To examine whether auditors are effective in detecting different types of fraud, we first used the full sample that consisted of all the companies engaging in FSF and applied the following logistic models:

$$\text{Prob(AUDIT)} = f(\alpha_0 + \alpha_1 \text{Big4} + \alpha_2 \text{EARNG} + \alpha_3 \text{Big4} * \text{EARNG} + \varepsilon_3) \quad (3)$$

and

$$\text{Prob(AUDIT)} = f(\theta_0 + \theta_1 \text{Big4} + \theta_2 \text{TUNL} + \theta_3 \text{Big4} * \text{TUNL} + \varepsilon_4) \quad (4)$$

where

$f(\bullet)$ is the logistic function;

AUDIT = 1 if the auditor issued a qualified opinion, adverse opinion, or disclaimer opinion;

Big4 = 1 if the audit was conducted by one of the Big-4 audit firms and 0 otherwise;

EARNG = 1 if the company engaged in earnings manipulation fraud and 0 otherwise; and

TUNL = 1 if the company engaged in tunneling fraud and 0 otherwise.

If auditors are ineffective in detecting earnings manipulation fraud or tunneling fraud, α_2 and θ_2 should be non-positive because the type II error rate should be high. α_1 and α_3 (θ_1 and θ_3) reflect the incremental effectiveness of Big-4 auditors in detecting earnings manipulation fraud (tunneling fraud), which are expected to be positive if they are more effective than non-Big-4 auditors.

We further examined whether Big-4 firms have lower type II errors in detecting earnings manipulation fraud by restricting the sample to companies that committed earnings manipulation fraud, controlling for other variables that potentially affect the likelihood of fraudulent activity and audit effectiveness. Specifically, we controlled for company size, controlling shareholder, the second largest shareholder, the nature of the controlling shareholder and the second largest shareholder, other minority shareholders, leverage, profitability, and total shares outstanding. Similar procedures were taken to examine whether Big-4 firms have lower type II errors in detecting tunneling fraud. The empirical models are as follows:

$$\begin{aligned} \text{Prob(AUDIT)} = f(\delta_0 + \delta_1 \text{Big4} + \delta_2 \text{CTLSHARE} \\ + \delta_3 \text{SECDSHARE} + \delta_4 \text{D1} + \delta_5 \text{D1} \\ * \text{CTLSHARE} + \delta_6 \text{D2} + \delta_7 \text{D2} \\ * \text{SECDSHARE} + \delta_8 \text{TA} + \delta_9 \text{LEV} + \delta_{10} \text{ROA} \\ + \delta_{11} \text{SHARE} + \delta_{12} \text{OTHERSHARE} + \varepsilon_5) \end{aligned} \quad (5)$$

$$\begin{aligned} \text{Prob(AUDIT)} = f(\lambda_0 + \lambda_1 \text{Big4} + \lambda_2 \text{CTLSHARE} \\ + \lambda_3 \text{SECDSHARE} + \lambda_4 \text{D1} + \lambda_5 \text{D1} \\ * \text{CTLSHARE} + \lambda_6 \text{D2} + \lambda_7 \text{D2} \\ * \text{SECDSHARE} + \lambda_8 \text{TA} + \lambda_9 \text{LEV} + \lambda_{10} \text{ROA} \\ + \lambda_{11} \text{SHARE} + \lambda_{12} \text{OTHERSHARE} + \varepsilon_6) \end{aligned} \quad (6)$$

where AUDIT = 1 if the auditor issued a qualified opinion, adverse opinion, or disclaimer opinion; and other variables are as defined before.

5. SAMPLE SELECTION AND DESCRIPTIVE STATISTICS

Sample Selection

The sample was comprised of Chinese listed companies that were sanctioned by the China Securities Regulatory Commission (CSRC). The CSRC is the regulatory body that enforces securities laws and regulations in China. Somewhat akin

to the SEC in the US, the CSRC carries out investigations to identify and prosecute financial fraud. The companies engaging in fraudulent activities were identified by enforcement releases published by the CSRC between January 2002 and April 2009, which equaled a total of 277 releases.

We chose this time period because this was the period with releases available on the CSRC's website (<http://www.csrc.gov.cn>) when we collected the data. Chen et al. (2005a) show that the CSRC has credibility and that the CSRC's actions and enforcement releases are influential. Enforcement releases are not only related to financial statement fraud, but are also related to other irregularities, such as untimely disclosure of material corporate issues.

Of the 277 releases, we identified 222 companies involved in financial statement fraud. Of the 222 FSF cases, 80 cases were related to earnings manipulation fraud (36%) and 126 cases were related to tunneling fraud (56.8%), suggesting that tunneling fraud is more prevalent than earnings manipulation fraud, although both types are rampant.¹¹ The study setting provides a unique opportunity to test our hypotheses in that we are able to get a sufficient number of cases for both types of fraud. Some other countries, in contrast, are dominated by one type of fraud, and the number of cases identified does not support powerful statistical tests.¹²

We first analyzed the content of CSRC enforcement releases to decide if the case is related to earnings manipulation fraud or tunneling fraud. Then we hand-collected data of ownership structure, auditor's opinion, and corporate financial data from each company's annual reports published on the websites of Shanghai Stock Exchange (www.sse.com.cn) and Shenzhen Stock Exchange (www.szse.cn).

¹¹ The remaining cases were only related to untimely disclosure of material corporate issues.

¹² For example, tunneling is unusual in the US, and we could not find enough cases to get satisfactory results.

The data were collected from consolidated financial statements to avoid cross-holding issues because all cross-holdings should be canceled out in consolidated statements. More importantly, when identifying the largest and the second largest shareholders, we combined the shareholdings of “persons acting in concert” because they are not independent and in fact act together in controlling the company. We identified persons acting in concert through reading the notes to the financial statements. Table 1 lists definitions of variables used.

Descriptive Statistics

Table 2 shows the descriptive statistics of the variables. Note that there is significant variation in company size and percentage ownership. The largest company has 16,785 million yuan of assets, while the smallest company has only 8.6 million yuan.

The largest controlling shareholder has 73 percent of ownership, while the smallest controlling shareholder has only 11 percent. However, all the largest shareholders have an ownership above 10 percent, suggesting they are influential and are able to control the company. The second largest shareholder has a mean ownership of 10.26 percent.

Overall, the second largest shareholders are likely to be able to monitor the controlling shareholders as well as the management. Collectively, the third to the tenth largest shareholders have 9.12 percent of ownership on average, which is less than that of the second largest shareholder.¹³

There were more occurrences of tunneling fraud (57 percent of all cases) and fewer occurrences of earnings manipulation fraud (36 percent of all cases) in our sample, suggesting that tunneling fraud is more prevalent. On average, auditors issued unqualified opinions 27 percent of all the times that

¹³ The third and fourth largest shareholders have a mean shareholding of 3.30 percent and 1.91 percent, respectively, which is much less than that of the second largest shareholder (untabulated), and thus they are unlikely to be able to monitor the management or the controlling shareholder effectively.

companies committed FSF. Notice that our sample consists of all the companies committing FSF, and therefore the statistics suggest that auditors have a type II error rate of about 0.27.

Untabulated results suggest that when the sample was confined to those companies that committed earnings manipulation fraud, auditors issued an unqualified opinion in about 19 percent of the cases, suggesting a type II error rate of about 0.19. When the sample was confined to those companies that committed tunneling fraud, auditors issued an unqualified opinion in about 34 percent of the cases, suggesting a type II error rate of about 0.34. Auditors in China seem to have a higher type II error rate for tunneling fraud than for earnings manipulation fraud.

Table 3 reports the Pearson and Spearman correlation coefficients of the variables. As shown, Pearson and Spearman correlation coefficients are quite consistent with each other. CTLSHARE was negatively correlated with SECDSHARE, which suggests that the second largest shareholder might prefer diversifying its investments to reduce investment risks to obtaining more shares and monitoring the controlling shareholder. The sign of the correlation between CTLSHARE and TUNL and that of the correlation between CTLSHARE and EARNG are in the predicted direction but insignificant. The sign of the correlation between SECDSHARE and TUNL and that of the correlation between SECDSHARE and EARNG are both negative and consistent with H2a and H2b; however, they are insignificant.

AUDIT was significantly negatively correlated with CTLSHARE, suggesting that auditors are less likely to issue a qualified opinion, adverse opinion, or disclaimer opinion when the controlling shareholder's percentage ownership increases. AUDIT was also significantly positively correlated with EARNG but not significantly correlated with TUNL, suggesting that auditors are more effective in detecting earnings manipulation fraud than tunneling fraud.

6. RESULTS AND ANALYSES

Univariate Analyses

Table 4 reports the results of the univariate tests. In Panel A, the auditor's opinion and the likelihood of the occurrence of tunneling fraud were significantly different between the groups with and without earnings manipulation fraud. When there is earnings manipulation fraud, the likelihood that the auditor issues a qualified, adverse, or disclaimer opinion is .811, and when there is no earnings manipulation fraud (but there are other types of fraud), the likelihood that the auditor issues a qualified, adverse, or disclaimer opinion is .685, suggesting that auditors are generally more effective in detecting earnings manipulation fraud compared with other types of fraud. TUNL of the earnings manipulation group is significantly less than that of non-earnings manipulation group, suggesting that tunneling is less likely to occur when there is earnings manipulation.

This suggests that the relationship between earnings manipulation and tunneling is substitutive. Controlling shareholder's ownership and the second largest shareholder's ownership were not significantly different between the groups with and without earnings manipulation, which may be due to the fact that we did not control for other confounding variables in the univariate tests. Therefore, the interpretation should be taken with caution.

Panel B of Table 4 shows that EARNNG was significantly larger for non-tunneling group than for tunneling group. Moreover, given that there is tunneling fraud, the likelihood that the auditor issues a qualified, adverse, or disclaimer opinion is .70; given that there is no tunneling fraud, the likelihood that the auditor issues a qualified, adverse, or disclaimer opinion is .763. However, the difference was not significant, suggesting that auditors are not effective in detecting tunneling fraud.

Multivariate Analyses

Table 5 reports the effect of ownership structure on the likelihood of FSF. Panel A of Table 5 shows that the coefficient on CTLSHARE is significantly negative, supporting H1a, which predicts that when the controlling shareholder's ownership increases the likelihood of earnings manipulation tends to decrease.

The coefficient on SECDSHARE is also significantly negative, supporting H2a, which states that when the second largest shareholder's ownership increases the likelihood of earnings manipulation tends to be lower. Therefore the monitoring by the second largest shareholder seems to be effective. The coefficients on D1 and the interaction of D1 and CTLSHARE are not significant, suggesting that individual or family controlling shareholders are not more effective in monitoring the management and in reducing the likelihood of earnings manipulation fraud.

Therefore, H3b is not supported. This may be due to the fact that individuals who are not financial experts lack the knowledge and skills to detect financial statement fraud. Among control variables, LEV was significantly negative, suggesting that creditors help reduce the likelihood of earnings manipulation fraud. This is consistent with prior literature and highlights the importance of external corporate governance mechanisms. Profitability (ROA) is significantly positive, suggesting that more profitable companies provide more opportunities and incentives to fraudsters.

Panel B of Table 5 reports the results of the relationship between ownership structure and tunneling fraud, and shows that the coefficient on CTLSHARE is significantly positive, supporting H1b, which predicts that when the controlling shareholder's ownership increases the likelihood of tunneling fraud tends to increase. The coefficient on SECDSHARE is negative but insignificant, which does not support H2b that predicts that when the second largest shareholder's ownership increases the likelihood of tunneling tends to be lower. This may be due to the difficulty in

detecting tunneling fraud by the second largest shareholder (e.g., they lack the skills and knowledge to detect tunneling fraud).

In addition, institutional controlling shareholders are as likely to commit tunneling fraud as are individual or family controlling shareholders, given that D1 and the interaction of D1 and CTLSHARE are not significant. This result may suggest that individual or family controlling shareholders also use the firms they control to commit tunneling fraud in addition to their committing tunneling fraud directly. Among the control variables, the coefficient on SHARE is significantly negative, suggesting that with more shares outstanding and thus more liquidity and less information asymmetry, the likelihood of tunneling fraud is reduced.

This suggests that the market is an effective external corporate governance mechanism in monitoring the firm. The coefficient on LEV is again significantly negative, suggesting that another external corporate governance mechanism, i.e., monitoring by creditors, plays an important role in reducing tunneling fraud. ROA is again significantly positive, suggesting that the more profitable the company is the more incentives fraudsters have to commit tunneling fraud.

Table 6 presents the results of the tests for audit effectiveness in detecting different types of fraud using the full sample. Panel A of Table 6 reports the results of audit effectiveness in detecting earnings manipulation fraud. The coefficient on EARNNG is significantly positive, suggesting that the existence of earnings manipulation fraud sensitizes auditors, and auditors are more likely to issue a qualified, adverse, or disclaimer opinion.

However, the coefficients on Big4 and the interaction of Big4 and EARNNG are not significant, suggesting that Big-4 firms are not more effective than non-Big-4 firms in detecting earnings manipulation fraud. Therefore H4a is partially supported. Panel B of Table 6 reports the results of audit effectiveness in detecting tunneling fraud. The coefficient on TUNL is significantly negative rather than positive, which means when there is tunneling fraud

auditors are less likely to issue a qualified, adverse, or disclaimer opinion. This suggests that auditors have a serious type II error problem when detecting tunneling fraud, and therefore the result supports H4b.

Additionally, Big-4 auditors are not more effective in detecting tunneling fraud since the coefficients on Big4 and the interaction of Big4 and TUNL are insignificant. This result of no significant difference between Big-4 auditors and non-Big-4 auditors is consistent with some prior studies (e.g., Dechow et al. 1996; Beneish 1997; Sharma 2004).

Next, we restricted the sample to companies that committed earnings manipulation fraud and examined whether Big-4 firms are more effective than non-Big-4 firms in avoiding type II errors as related to earnings manipulation fraud. We control for firm size, leverage, profitability, ownership concentration and the nature of shareholders in the test. Panel A of Table 7 shows that the coefficient on Big4 is not significant, suggesting that Big-4 firms in China are not more effective than non-Big-4 firms in avoiding type II errors regarding earnings manipulation fraud.

The coefficient on OTHERSHARE is significantly positive, suggesting that auditors are more conservative (i.e., more likely to issue unqualified, adverse, or disclaimer opinions) when there are more minority shareholders. This may be due to auditor's concerns about increased probability of litigation by minority shareholders.

We applied similar procedures to examine whether Big-4 firms were more effective than non-Big-4 firms in avoiding type II errors as related to tunneling fraud. We restricted the sample to firms that committed tunneling fraud and regressed AUDIT on Big4 using logistic regression. Panel B of Table 7 presents the results.

Once again, the coefficient on Big4 is not significant, suggesting that Big-4 firms in China are not more effective in detecting tunneling fraud when compared with non-Big-4 firms. ROA is significantly negative, suggesting that auditors are more conservative with less profitable companies when there is

tunneling fraud. However, auditors are unable to find out the existence of the tunneling fraud although they are somewhat suspicious.

To examine the robustness of our results, we used total equity to proxy for company size, ROE to proxy for profitability, and repeated all the procedures above. The main results are qualitatively unchanged. The results reinforced that ownership structure is associated with different types of fraud, and auditors commit more type II errors when detecting tunneling fraud than when detecting earnings manipulation fraud. We do not find evidence that Big-4 firms are more effective in detecting fraud as compared with non-Big-4 firms.

7. CONCLUSIONS AND LIMITATIONS

We examined the relationship between ownership structure and types of FSF as well as audit effectiveness in detecting different types of fraud. Through univariate and multivariate analyses, our results show that different conflicts of interest induced by distinct ownership structures provide various incentives and opportunities for fraudsters to engage in different types of FSF.

More concentrated ownership induces tunneling fraud, and more dispersed ownership induces earnings manipulation fraud. Controlling shareholders tend to over-reach minority shareholders when they become more powerful, but at the same time they tend to curb earnings manipulation committed by the management. The second largest shareholder is able to monitor the management and curb the earnings manipulation fraud.

However, they are not so effective in reducing the occurrence of tunneling fraud. We find that although auditors are generally effective in detecting earnings manipulation fraud, they are not so effective in detecting tunneling fraud. Moreover, Big-4 audit firms in China are not significantly different from non-Big-4 firms in detecting fraud. These results further our understanding of the nature and types of FSF and their association with audit effectiveness and ownership structure.

Our results have policy implications for policymakers, regulators and standard setters in establishing corporate governance measures that prevent and detect both types of FSF. Auditors in China should especially focus more of their attention on detecting FSF.

This paper has several limitations. First, our sample is solely comprised of Chinese listed companies; and thus, the results may not be generalizable to other countries due to differences in legal systems, economic regimes, and culture. Future research should examine whether the relationships reported here will hold in other countries.

Another limitation is that due to data availability we only included a limited number of explanatory and control variables although we tried to include a comprehensive set of variables. The complexity and persistence of fraud demands the consideration of other important factors that potentially affect the relationship between ownership structure and the nature of fraud. Future research should examine whether the inclusion of more explanatory variables would significantly improve our results.

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Table 1
Definition of variables

Variable	Definition
TUNL	Dummy variable, taking on 1 if it is a tunneling type of fraud; 0 otherwise.
EARNG	Dummy variable, taking on 1 if it is an earnings manipulation type of fraud; 0 otherwise.
CTLSHARE ^a	The percentage ownership of the largest shareholder.
SECDSHARE ^a	The percentage ownership of the second largest shareholder.
OTHERSHARE ^a	The percentage ownership of the third to the tenth largest shareholders.
SHARE ^a	Total shares outstanding (in millions).
D1	Dummy variable, taking on 1 if the largest shareholder is an individual or a family and 0 otherwise.
D2	Dummy variable, taking on 1 if the second largest shareholder is an individual or a family and 0 otherwise.
AUDIT ^b	Dummy variable, taking on 1 if the auditor issued a qualified opinion, adverse opinion, or disclaimer opinion for the financial report of the year fraud was committed.
Big4	Dummy variable, taking on 1 if the audit was conducted by one of the Big-4 audit firms and 0 otherwise. Big-4 audit firms are PricewaterhouseCoopers, KPMG, Deloitte, and Ernst & Young. We also include Arthur Anderson as a Big-4 firm before 2002.
TA ^a	Total assets of the company. The measurement unit is one million yuan.

Table 1 (Cont'd)
Definition of variables

ROA ^a	Return on assets, defined as net income divided by total assets.
LEV ^a	Leverage, defined as total liabilities divided by total assets.
^a The data were collected from the financial report prepared one year prior to the year fraud was committed.	
^b The data were collected from the financial report of the year fraud was committed.	

Table 2
Descriptive statistics

Variable	Mean	SD	Minimum	Maximum
CTLSHARE ^a	39.148	14.820	11.444	72.973
SECDSHARE ^a	10.257	8.960	.100	30.820
OTHERSHARE ^a	9.119	8.848	.000	46.850
D1	.057	.124	0	1
D2	.031	.260	0	1
AUDIT	.730	.444	0	1
SHARE	238.742	207.773	25.600	1,530
TA	1,363	1,757	8.631	16,785
ROA	.030	.243	-.161	.412
ROE	.056	.689	-.302	.530
LEV	.610	.433	.020	.811
TUNL	.568	.497	0	1
EARNNG	.360	.481	0	1

The sample size is 222.

^a Minimum and maximum data are presented in percentage.

See table 1 for variable definitions.

Table 3
Pearson and Spearman correlation coefficients

	CTLSHARE	SECDSHARE	D1	AUDIT	SHARE	TA	TUNL	EARNG
CTLSHARE		-0.517‡	-0.070	-0.149†	0.049	0.061	0.048	-0.048
SECDSHARE	-0.611‡		0.059	0.096	-0.221‡	-0.144†	-0.001	-0.052
D1	-0.076	0.083		-0.079	-0.100	-0.002	0.028	-0.008
AUDIT	-0.158†	0.099	-0.079		0.154†	0.085	-0.082	0.137*
SHARE	0.109	-0.259‡	-0.161	0.138*		0.861‡	-0.085	-0.106
TA	0.149†	-0.185‡	0.014	0.080	0.645‡		-0.028	-0.099
TUNL	0.063	-0.0121	0.028	-0.082	-0.048	0.073		-0.273‡
EARNG	-0.060	-0.027	-0.008	0.137*	-0.072	-0.078	-0.273‡	

The sample size is 222.

Pearson correlation coefficients are above the diagonal, and Spearman correlation coefficients below the diagonal.

*, †, and ‡ represent the statistical significance at 0.1, 0.05, and 0.01 levels, respectively.

See table 1 for variable definitions.

Table 4
Univariate tests (t-tests)

Panel A: Comparison between groups with and without earnings manipulation

	Non-Earnings Manipulation (n=142)	Earnings Manipulation (n=80)	Difference
Variable	Mean	Mean	Pr > t
CTLSHARE	39.685	38.205	0.506
SECDSHARE	10.607	9.642	0.474
AUDIT	0.685	0.811	0.053*
SHARE	255.617	209.942	0.131
TA	1495.810	1135.700	0.156
TUNL	0.669	0.388	<.001***

*, *** represent the statistical significance at .1 and .01 levels, respectively.

Panel B: Comparison between groups with and without tunneling

	Non-Tunneling (n=96)	Tunneling (n=126)	Difference
Variable	Mean	Mean	Pr > t
CTLSHARE	38.357	39.784	0.508
SECDSHARE	10.251	10.261	0.994
AUDIT	0.763	0.700	0.246
SHARE	258.541	222.973	0.227
TA	1418.980	1318.620	0.685
EARNG	0.510	0.246	<.001***

*** represent the statistical significance at .01 level.
See table 1 for variable definitions.

Table 5
Relationship between ownership structure and fraud

Panel A: Relationship between ownership structure and earnings manipulation fraud

$$\text{Prob(EARNG)} = f(\beta_0 + \beta_1 \text{CTLSHARE} + \beta_2 \text{SECDSHARE} + \beta_3 \text{D1} + \beta_4 \text{D1} * \text{CTLSHARE} + \beta_5 \text{D2} + \beta_6 \text{D2} * \text{SECDSHARE} + \beta_7 \text{TA} + \beta_8 \text{LEV} + \beta_9 \text{ROA} + \beta_{10} \text{SHARE} + \beta_{11} \text{OTHERSHARE} + \varepsilon_1)$$

Parameter	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	.403	.791	.260	.610
CTLSHARE	-.022	.013	3.063	.080*
SECDSHARE	-.032	.019	2.738	.098*
D1	782.682	190,232	.000	.997
D1*CTLSHARE	-28.436	6,866	.000	.997
D2	-.445	1.146	.151	.698
D2*SECDSHARE	.236	.906	.068	.794
Control Variables				
TA	.000	.004	1.094	.296
LEV	-.727	.420	3.005	.083*
ROA	3.903	1.656	5.596	.018**
SHARE	-.001	.002	.242	.623
OTHERSHARE	.006	.028	.040	.842

The sample size is 222.

Pseudo $R^2 = .152$

*, ** represent the statistical significance at .1 and .05 levels, respectively.

Table 5 (Cont'd)

Relationship between ownership structure and fraud

Panel B: Relationship between ownership structure and tunneling fraud

$$\text{Prob(TUNL)} = f(\gamma_0 + \gamma_1 \text{CTLSHARE} + \gamma_2 \text{SECDSHARE} + \gamma_3 \text{D1} + \gamma_4 \text{D1} * \text{CTLSHARE} + \gamma_5 \text{D2} + \gamma_6 \text{D2} * \text{SECDSHARE} + \gamma_7 \text{TA} + \gamma_8 \text{LEV} + \gamma_9 \text{ROA} + \gamma_{10} \text{SHARE} + \gamma_{11} \text{OTHERSHARE} + \varepsilon_2)$$

Parameter	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	.800	.765	1.094	.296
CTLSHARE	.033	.019	2.805	.094*
SECDSHARE	-.008	.020	.163	.687
D1	115.811	145.346	.000	.999
D1*CTLSHARE	-4.032	4,976.822	.000	.999
D2	-.002	1.139	.000	.998
D2*SECDSHARE	1.318	1.636	.649	.421
Control Variables				
TA	-.005	.023	.045	.833
LEV	-.351	.204	2.966	.085*
ROA	1.513	.792	3.652	.056*
SHARE	-.003	.002	2.754	.097*
OTHERSHARE	.036	.027	1.792	.181

The sample size is 222.

Pseudo $R^2 = .155$

See Table 1 for variable definitions.

*, ** represent the statistical significance at .1 and .05 levels, respectively.

Table 6**Audit effectiveness – full sample**

Panel A: Audit effectiveness in detecting earnings manipulation fraud

$$\text{Prob}(\text{AUDIT}) = f(\alpha_0 + \alpha_1 \text{Big4} + \alpha_2 \text{EARNG} + \alpha_3 \text{Big4} * \text{EARNG} + \varepsilon_3)$$

	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	-.808	.198	16.653	.000***
Big4	.520	.789	.435	.510
EARNG	.688	.365	3.548	.060*
Big4* EARNG	.282	1.489	.036	.850

The sample size is 222.

Pseudo $R^2 = .123$

*, *** represent the statistical significance at .1 and .01 levels, respectively.

Panel B: Audit effectiveness in detecting tunneling fraud

$$\text{Prob}(\text{AUDIT}) = f(\theta_0 + \theta_1 \text{Big4} + \theta_2 \text{TUNL} + \theta_3 \text{Big4} * \text{TUNL} + \varepsilon_4)$$

	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	-.747	.234	10.191	.001***
Big4	-.245	.542	.204	.651
TUNL	-.548	.330	2.758	.097*
Big4*TUNL	.220	1.232	.032	.858

The sample size is 222.

Pseudo $R^2 = .137$

See Table 1 for variable definitions.

*, *** represent the statistical significance at .1 and .01 levels, respectively.

Table 7
Audit effectiveness – restricted sample

Panel A: Audit effectiveness in detecting earnings manipulation fraud

$$\text{Prob(AUDIT)} = f(\delta_0 + \delta_1 \text{Big4} + \delta_2 \text{CTLSHARE} + \delta_3 \text{SECDSHARE} + \delta_4 \text{D1} + \delta_5 \text{D1} * \text{CTLSHARE} + \delta_6 \text{D2} + \delta_7 \text{D2} * \text{SECDSHARE} + \delta_8 \text{TA} + \delta_9 \text{LEV} + \delta_{10} \text{ROA} + \delta_{11} \text{SHARE} + \delta_{12} \text{OTHERSHARE} + \varepsilon_5)$$

	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	-.530	2.227	.057	.812
Big4	-2.395	2.259	1.124	.289
CTLSHARE	.054	.034	2.522	.112
SECDSHARE	-.016	.044	.132	.716
D1	67.784	4,105.386	.000	.987
D2	49.678	6,192.370	.000	.994
D1* CTLSHARE	.740	1,490	.000	1.000
D2* SECDSHARE	-11.133	5,088.504	.000	.998
LEV	-2.480	2.652	.874	.350
TA	.001	.001	1.000	.317
ROA	-2.169	4.239	.262	.609
SHARE	-.004	.005	.640	.424
OTHERSHARE	.154	.065	5.613	.018**

The sample size is 80.

Pseudo $R^2 = .078$

** represents the statistical significance at 0.05 level.

Table 7 (Cont'd)**Audit effectiveness – restricted sample**

Panel B: Audit effectiveness in detecting tunneling fraud

$$\text{Prob(AUDIT)} = f(\lambda_0 + \lambda_1 \text{Big4} + \lambda_2 \text{CTLSHARE} + \lambda_3 \text{SECDSHARE} + \lambda_4 \text{D1} \\ + \lambda_5 \text{D1} * \text{CTLSHARE} + \lambda_6 \text{D2} + \lambda_7 \text{D2} * \text{SECDSHARE} \\ + \lambda_8 \text{TA} + \lambda_9 \text{LEV} + \lambda_{10} \text{ROA} + \lambda_{11} \text{SHARE} \\ + \lambda_{12} \text{OTHERSHARE} + \varepsilon_6)$$

	Estimate	Standard Error	Wald Chi-Square	Pr > ChiSq
Intercept	.444	1.842	.058	.810
Big4	-1.499	1.398	1.149	.284
CTLSHARE	.007	.029	.058	.809
SECDSHARE	-.026	.032	.660	.417
D1	370.152	9,242.981	.002	.968
D2	-1.341	1.468	.834	.361
D1* CTLSHARE	-13.330	1,189.455	.000	.991
D2* SECDSHARE	1.126	1.326	.721	.396
TA	.000	.001	.000	1.000
LEV	1.099	1.477	.554	.457
ROA	-9.481	4.508	4.423	.035**
SHARE	.002	.003	.444	.505
OTHERSHARE	.007	.047	.022	.882

The sample size is 126.

Pseudo $R^2 = .140$

See Table 1 for variable definitions.

** represents the statistical significance at 0.05 level.