Three essays on corporate fraud in Chinese listed companies

A thesis presented in fulfilment of the requirements for the degree of

Doctor of Philosophy

in

Finance

at Massey University

Palmerston North, New Zealand

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2015

ABSTRACT

This thesis investigates the detection, processes and capital market impact of corporate fraud in China. Three specific issues are researched in the Chinese context through three interconnected essays: the identification of fraudulent financial statements; the measurement of illegal tunnelling of company funds by controlling shareholders; the evaluation of the stock market response to the public exposure of firm fraud violations.

First, the link between accounting balance sheet values and the exposure of fraudulent activities in Chinese firms is investigated. Other receivables, inventories, prepaid expenses, employee benefits payables and long-term payables are found to be important indicators of fraudulent Chinese financial statements. The findings from previous studies that document asset accounts that are associated with fraudulent financial statements are confirmed, but previous evidence that overstates the value of total liabilities is challenged. A new model applied to all Chinese listed firms correctly predicts the absence of fraud approximately 81% of the time. Balance sheet accounting values scaled by total assets or sales are found to provide valuable information to predict fraudulent financial statements.

Next, valuable insights are provided into the factors and processes surrounding cash tunnelling, a form of embezzlement by controlling shareholders, in firms accused of fraud. The controlling shareholder's financial motivation for tunnelling is found to be negatively related to the percentage of shareholdings of the top owner, the profitability of the firm, and the costs of tunnelling. A new theoretical model of cash tunnelling is developed, through which the process of tunnelling in the Chinese market is revealed. The overall tunnelling loss in the sample of fraudulent firms is about 5.54 times that of net income.

Lastly, long-term market responses surrounding announcements of firm fraud are investigated. Although fraudulent firms are shown to display worse operating performance, lower dividends and higher other equity distributions than matching firms, long-term abnormal stock returns following the fraud announcements are insignificant. This is consistent with a view that stock market prices in China do not fully reflect the losses incurred by fraudulent firms and that in this regard, the stock market in China is not fully efficient.

ACKNOWLEDGEMENTS

First and foremost, I would like to express my sincere gratitude to my supervisors, Dr. Jianguo Chen, Associate Professor Jing Chi, and Dr. Carolyn Wirth for the continuous support throughout the PhD journey. I have been fortunate to work with my supervisors and I am deeply grateful to them for their expertise, understanding, encouragement, and patience, which added considerably to my PhD experience.

I wish to thank Massey University for offering me the Doctoral Scholarship to pursue my doctoral degree. I am also thankful to Fong Mee Chin for helping me with accessing databases, to Cameron Rhodes for his technical assistance, to Maryke Bublitz and Kim Williams for their administrative supports. I am also grateful to everyone in the School of Economics and Finance for their various forms of support along the course of the study.

I would like to extend my appreciation to participants and discussants for their valuable feedback, insightful comments and suggestions at Financial Management Association (FMA) Asian 2014 held in Tokyo, Japan; New Zealand Finance Colloquium (NZFC) 2014 held in Auckland University of Technology; the 4th Auckland Finance Meeting 2014 held at AUT Business School, Auckland; Massey Business School 2014 PhD Symposium; New Zealand Finance Colloquium (NZFC) 2015 held at the University of Waikato, Hamilton; School of Economics and Finance Seminar series at Massey University, Palmerston North (2015); at Nanjing Agricultural University, China (2015); and at Inner Mongolia Agricultural University, China (2013).

Many thanks to my dear friends and my PhD mates who have helped me overcome setbacks and stay focused on my PhD study. I truly value their friendship and I deeply appreciate their belief in me.

Most importantly, none of this would have been possible without the love and patience of my family. I would like to thank my parents for their love and unconditional support throughout this journey. I sincerely appreciate my parents-in-law for their spiritual support in all aspects of my life. My heart-felt gratitude to my dear husband Feng Ke for his unflinching support, continued and unfailing love throughout this endeavour.

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CHAPTER ONE: INTRODUCTION

This chapter discusses the overall background and motivation of this thesis, which consists of three essays. In particular, it outlines the motivation and the important contribution of each of the three essays. The chapter concludes by outlining a structure for the remainder of the thesis.

1.1 Introduction

The disclosure of high quality financial information is important because it provides reliable financial information to guide investors to make economic decisions and enhances overall market efficiency. Yet, in the Chinese market, a high incidence of financial statement fraud has been detected (Fan, Rui, and Zhao, 2008). This thesis provides direct evidence of the economic implications of the quality of accounting information by studying the impact of fraudulent financial statements (FFS) in Chinese listed companies. This research is particularly relevant to the interests of Chinese minority shareholders, but also has global implications. The sheer size of the Chinese economy at the International Monetary Fund (2014) represents an estimated 13.43% of the world's wealth as measured by GDP[1]. Accordingly, the wealth of the Chinese economy, and threats to that wealth have important implications to China's trading partners.

While there are numerous anecdotes surrounding the quality of financial statements in the Chinese market, there remains a paucity of academic research. Much of the past research focuses on the influence of corporate governance on the detection of FFS in both the US and Chinese markets (e.g., Chen, Firth, Gao, and Rui, 2006). This thesis aims to address the following three research questions and in doing so, offers a comprehensive study of the linkage between FFS and financial decision-making in China. First, how do investors use available Chinese accounting and balance sheet information to detect firms that are alleged to have committed fraudulent activities? Second, how do owners of Chinese firms accused of fraud, manipulate financial accounts to fraudulently divert resources from minority shareholders? Third, what is the

[1] Information is available online at https://en.wikipedia.org/wiki/List_of_countries_by_GDP_(nominal)

relationship between stock performance and accounting performance of Chinese listed companies surrounding the public exposure of their fraudulent activities? The study of these three interrelated topics provides an opportunity to gain a better understanding of regulatory enforcement in the Chinese market.

The rest of the chapter proceeds as follows. Section 1.2 of this chapter gives a brief overview and background information with regard to the Chinese institutional environment, weakness of enforcement actions, the inadequacy of investor protection, and insufficiency of internal and external corporate governance. These unique characteristics of the Chinese market provide the motivation for this thesis. Section 1.3 describes the empirical findings relating to Chinese firms that have been reported to have engaged in fraud, indicates the potential gaps in previous academic literature and develops the three research aims. Section 1.4 outlines some contributions of this thesis. Section 1.5 presents the research outcomes, and Section 1.6 summarises the structure of the remainder of this thesis.

1.2 Background and motivation

The Chinese stock market is one of the fastest growing amongst growth economies, becoming the second largest in the world in 2012 when the Shanghai Stock Exchange (SHSE) and the Shenzhen Stock Exchange (SZSE) merged. In the Chinese setting, government officials or their affiliates are closely involved in the development of the legal system and oversight of the quality of Chinese financial reporting. However, neither the Chinese legal system nor the corporate governance system is well developed (e.g., Allen, Qian, and Qian, 2005). Hence, the study of fraud in the Chinese market provides a unique opportunity to better develop the literature pertaining to financial fraud.

Specifically, state-owned enterprises (SOEs) tend to appoint managers with personal and political connections, requiring a focus on social welfare rather than maximisation of the firm's wealth (e.g., Fan, Wong, and Zhang, 2007). The China Securities Regulatory Commission (CSRC) serves as the major regulatory agency and has the role of protecting shareholders' interests. However, the CSRC is directly overseen by the State Council and the government plays a substantial role in the process of identifying firms with information disclosure violations. Hence, the independence of the CSRC and their legal staff have been inevitably compromised. Moreover, the lack of participation of minority shareholders in the regulatory processes for Chinese listed companies makes the protection for investors deficient (e.g., Chen, Firth, Gao, and Rui, 2005). Furthermore, civil litigation remains relatively primitive in China, so minority shareholders cannot legitimately and effectively secure their interests.

Chinese internal and external corporate governance has improved a lot during the last decades. Nevertheless, the corporate governance framework is still defective. The main contributors to the dysfunctions of internal corporate governance are as follows. First, the Chinese government plays a role of both the controlling shareholder and the regulator in SOEs (e.g., Fan et al., 2007). Accordingly, the SOEs are more likely to pursue political objectives instead of wealth maximisation. Hence, the presence of state ownership and the retention of ultimate decision rights by the government handicaps financial development. Second, Chinese IPO regulations result in concentrated ownership among Chinese listed firms, which creates a potential disparity of interest between controlling shareholders and minority shareholders (e.g., Chen, Jian, and Xu, 2009). The concentrated control power and disproportionate controlling ownership relative to cash flow ownership rights creates major agency problems between controlling shareholders and minority shareholders in China. Third, the lack of independence and expertise of boards of directors, and the lack of legal support and competence of the supervisory boards and audit committees hamper the effectiveness of internal corporate governance in China (e.g., Chen, 2005).

Furthermore, the effectiveness of external corporate governance in Chinese market is also limited. The confluence of short-run investment behaviour by institutional investors, a scarcity of detection of corporate scandals by auditors, the insufficiency of independence and monitoring by banks, the embryonic stage of takeover markets and the incompetence of product market competition mechanisms have together contributed to relatively poor external corporate governance practices in the Chinese market (e.g., Jiang and Kim, 2014).

Overall, the above observations of the apparent underdevelopment of legal frameworks, the inadequacy of protection for minority shareholders, the prevalence of Chinese government interventions and the concentration of ownership after privatisation provide an environment allowing the quality of Chinese listed companies' financial statements to be less reliable and the incidence of FFS to be severe. In addition, in the Chinese context, controlling shareholders have incentives and opportunities to tunnel funds, and in doing so can expropriate benefits from minority shareholders.

The CSRC is the main publisher of information regarding FFS. According to cases released by the CSRC, the average duration from the time when firms first commit fraudulent activities until their detection is about two years (e.g., Chen et al., 2005). Therefore, given the relatively long intervals between the commission and detection of fraudulent activities and relatively weaker systems of investor protection, it is essential for investors to use available information efficiently to filter out firms potentially involved in fraudulent activities. Accordingly, the objectives of this thesis are to identify FFS using indicators from financial reporting and promulgate a better understanding of managerial misconduct. Specifically, this thesis seeks to shed light on the process by which controlling shareholders illegally transfer money from minority shareholders and gain a better understanding of how the unique Chinese institutional environment and corporate governance mechanism impact the economic motivations for conducting financial fraud and tunnelling. To better understand the economic ramifications of financial fraud, this thesis also assesses the associated stock price reaction and accounting performance of Chinese listed companies surrounding the announcements that publicly expose their financial frauds.

1.3 Research aims

Existing studies have investigated various aspects of the quality of financial reporting. One commonly studied aspect has been to identify those characteristics of corporate governance that are associated with FFS. Previous US research finds that the percentage of independent directors (Dahya, Dimitrov, and McConnell, 2008; Uzun, Szewczyk, and Varma, 2004), the presence of directors with accounting or financial backgrounds on the board (Agrawal and Chadha, 2005), and the independence of audit committees (Klein, 2002) are negatively associated with the incidence of FFS. In contrast, the duality of Chairman and CEO (Uzun et al., 2004) increases a firm's propensity to commit fraud. Chinese studies also present evidence that the percentage of directors possessing a financial background (Firth, Rui, and Wu, 2011), the quality of auditors

(Firth, Fung, and Rui, 2006) and a high concentration of ownership (Firth, Fung, and Rui, 2007) significantly influence the incidence of FFS.

How the incentives for conducting FFS in China are triggered mainly by accounting-based regulations and contracts are also investigated. For example, both delisting rules and seasoned equity offering (SEO) regulations require firms to meet a certain return on equity threshold. Firms suffering from financial difficulties and a lack of external financing are more likely to manipulate earnings to satisfy such requirements (Chen and Yuan, 2004; Liu and Lu, 2007). In addition, the incentives to manipulating financial statements are larger when US firms are unable to meet their earnings forecasts (Perols and Lougee, 2011; Rezaee, 2005). Also in the US market, managers are more inclined to commit FFS in order to conceal poor performance and secure their jobs (Denis, Hanouna and Sarin, 2005). To add further insights to the literature on FFS, this thesis identifies "red flags" for fraud detection in financial statements, uncovers the process of misappropriation by controlling shareholders, and distinguishes the long-term stock price and accounting performance after the announcement of FFS. Therefore, this thesis helps to fill gaps in the predominantly US literature by undertaking the research aims described below in three essays.

The first essay focuses on a complete set of accounts in the balance sheet to investigate which accounts are more likely to be employed by managers to manipulate FFS among Chinese listed companies. This study provides a systematic approach to examine popular manipulation vehicles in firms that have been reported to have engaged in fraud. A series of past studies identify selected accounts, principally from the balance sheet, that are frequently manipulated by managers in the developed markets. These accounts include receivables (Feroz, Park, and Pastena, 1991; Simunic, 1980; Spathis, Doumpos, and Zopounidis, 2002; Stice, 1991), inventories (Feroz et al., 1991; Simunic, 1980; Spathis et al., 2002; Stice, 1991), property (Spathis et al., 2002), other tangible assets (Spathis et al., 2002), revenue (Beneish, 1999a; Spathis et al., 2002), and total liabilities (Dechow et al., 1996; Roychowdhury, 2006; Spathis et al., 2002).

In addition, some studies find that higher levels of total liabilities (Chen et al., 2006; Fan et al., 2008) and other receivables (Jiang et al., 2010) are associated with firms engaged in financial fraud in the Chinese market. This essay posits that focusing on only selected accounts can miss important information relevant in the Chinese market. In addition, previously documented findings in the developed markets may not apply to emerging markets such as China. This essay hypothesises that managers may not only manipulate one specific account, but may also use different and multiple accounts in order to decrease the cost of manipulation and decrease the probability of detection. The research is initiated from the proposition that in the Chinese context, every account in the balance sheet is arguably able to be used to conceal fictitious financial performance of the firm. As a result, the first research aim is to undertake a systematic search to identify accounts associated with FFS among a comprehensive set of balance sheet account ratios across firms in China.

The second essay highlights the central agency problem between controlling shareholders and minority shareholders in China. It examines the process by which controlling shareholders illegally extract (or ‘tunnel’) money from minority shareholders. Most studies explore this misappropriation indirectly by examining the relationship between firm value and the illegal transfer by controlling shareholders (Claessens et al., 1999; Lins, 2003; La Porta et al., 2002). They present evidence that ownership structures characterised by controlling shareholders with lower cash flow rights are associated with lower firm value. Other studies directly examine tunnelling in the Asian markets, mainly through related party transactions (Cheung et al., 2006; Cheung et al., 2009), loan guarantees to related parties (Berkman et al., 2009), non-operating components of profit (Bertrand, Mehta, and Mullainathan, 2002) and other receivables (Jiang et al., 2010). These findings suggest that controlling shareholders are able to use different channels to illegally divert resources out of the firm. Yet, no research evidence exists of the multi-period tunnelling process of how controlling shareholders in China directly divert a company's cash (or cash equivalents) to their own personal accounts.

Moreover, this study categorises accounts into 'soft' and 'solid' based on the discretionary nature of these accounts and identifies those types of financial accounts most likely to be employed to transfer these tunnelled amounts and to record the associated costs. This motivates the second key research aim of this thesis: To investigate the circumstances in which controlling shareholders have greater incentives to conduct tunnelling activities. This study uses a sample of firms subject to fraudulent investigations to study how expropriating owners manipulate financial accounts to transfer resources to their personal pockets.

The third essay examines the long-term market and accounting performance following announcements exposing financial fraud in China in order to assess the financial performance associated with fraudulent activities. The previous evidence on the stock price reaction mainly focuses on short-term stock market responses. They find that firms experience significantly negative abnormal returns or increased costs of capital surrounding announcements of fraud violations (Anderson and Yohn, 2002; Chen et al., 2005; Hribar and Jenkins, 2004; Karpoff, Lee, and Martin, 2008; Palmrose, Richardson, and Scholz, 2004). A few papers have examined the impact of fraudulent activities pertinent to long-term stock price performance in the US market (Bauer and Braun, 2010; Leng, Feroz, Cao, and Davalos, 2011; Marciukaityte et al., 2006). However, only Leng et al. (2011) present evidence that US firms investigated for irregular activities experience significantly negative abnormal returns in the second and third year post-announcement.

One concern raised in the current study is that previous findings of insignificant long-term stock price performance may due to the anticipation of fraudulent news by investors. Hence, an investigation of stock performance before the event years is also essential. Another research motivation is that no empirical evidence exists of the long-term stock price reaction to the exposure of FFS in the Chinese market. Hence, this research fills this gap and the third aim of this thesis is to empirically investigate the implications of the announcement exposing FFS on various metrics of firm performance both before and after the announcement year.

1.4 Contributions of the research

This study makes several contributions to the existing FFS literature. First, this study is based on a hand-collected sample obtained from the disclosure bulletins of the CSRC, SHSE and SZSE between 1994 and 2011. Second, it expands current understanding of the manipulation vehicles employed by firms investigated for financial fraud. To the best of this author's knowledge, this is the first study that systemically examines all account ratios from the balance sheets of FFS in the Chinese market. The first essay presents some common indicators of other receivables, inventories, prepaid expenses, employee benefits payables and long-term payables in Chinese FFS and also cast some doubts about previous findings, especially in the total liability account. The variables in this study are scaled both by total assets and sales to overcome concerns of spurious relationships that may be problematic in previous studies. In addition, evidence provided in the study suggests that balance sheet information is helpful to identify FFS in the Chinese market.

Another key contribution of this thesis is the development of a theoretical model to explain factors associated with tunnelling by controlling shareholders. The second essay defines a new type of tunnelling in the Chinese market: Cash tunnelling, which refers to the direct misappropriation by fraudulent owners through the cash (or equivalent to cash) account. In addition, this essay successfully develops the tunnelling model and presents evidence of a two-step tunnelling process in Chinese fraudulent companies, which enhances the understanding of cash tunnelling in China. Moreover, this study also provides a measure of tunnelling losses for investors, which is about 5.54 times that of net income in the fraudulent firm sample.

Finally, this study also sheds light on the economic implication of FFS. The third essay documents the impact of the public announcement exposing FFS on stock price performance both before and after the event. This helps to mitigate the possibility that investors have already anticipated the fraudulent news by the time of the announcement. Moreover, this study provides three approaches to estimate event-study results and presents robust evidence of an insignificant long-term stock price reaction in both prior and post-event years. It also reveals that firms alleged for fraud improved their operating performance after the fraudulent event. However, relative to matching firms, post-event operating performance and dividends payments in fraudulent firms decline significantly, suggesting that the Chinese stock market does not efficiently reflect the losses. Furthermore, this research uncovers significantly greater non-dividend distributions by fraudulent Chinese firms that by-pass the income statement and directly reduce retained earnings. The aggregate losses from this channel are about twice that of net income, and may represent another potential vehicle for illegally tunnelling firm value.

1.5 Research outputs from the thesis

Essay One:

Wei, Y., Chen, J.G., and Chi, J. (2013). **Balance sheet accounting ratios and fraudulent financial statements**.

- Presented at School of Economics and Finance, **Inner Mongolia Agricultural University** (December, 2013 Seminar Series), China.
- Presented at **New Zealand Finance Colloquium (NZFC)**, Auckland University of Technology, Auckland, New Zealand, 12-14 February, 2014.
- Presented at **Financial Management Association (FMA) Asian**, Tokyo, Japan, 9-11 May, 2014.

Essay Two:

Wei, Y., Chen, J.G., and Chi, J. (2014). **New Model and Evidence of Cash Tunnelling in Chinese firms**.

- Presented at the **4th Annual Interdisciplinary Doctoral Students Research Symposium**, Massey University, New Zealand, 28-29 October, 2014.

— Presented at **Massey Business School 2014 PhD Symposium**, Massey University, 14 November, 2014.

— Presented at the **4th Auckland Finance Meeting**, AUT Business School, Auckland, New Zealand, 18-20 December, 2014.

— Presented at **New Zealand Finance Colloquium (NZFC)**, University of Waikato, Hamilton, New Zealand, 18-20 February, 2015 (**Best PhD Paper Awards**).

— Presented at School of Economics and Finance, **Nanjing Agricultural University** (April, 2015 Seminar Series), China.

— Presented at **the Fifth Young Researcher Workshop**, Sydney, 19-20 November, 2015.

1.6 Structure of the thesis

The remainder of this thesis is structured as follows. Chapter 2 describes the institutional background, characteristics of corporate governance and the economics of FFS in China. The review of the existing literature reveals that the poor quality of Chinese listed firm financial statements is largely a consequence of the unique features of the Chinese business environment.

Chapter 3 (Essay One) addresses the first research aim and uses a sample of Chinese listed firms exposed for financial fraud to identify balance sheet accounts that are important indicators of FFS. Supplementary information such as examples of violation types, further robustness test results, and explanations of spurious relationships are presented in Appendix A.

Chapter 4 (Essay Two) addresses the second research aim and presents evidence of factors and processes associated with cash tunnelling by controlling shareholders in Chinese listed firms. Supplementary information such as a typical fraud case, enforcement action processes and a set of further robustness test results are reported in Appendix B.

Chapter 5 (Essay Three) addresses the third research aim and presents details of an event study of stock price and accounting performance of Chinese listed firms surrounding announcements of financial fraud.

Chapter 6 concludes the thesis by summarizing the major findings and discussing the major conclusions. Chapter 6 also provides some implications and limitations of the study, along with suggestions for further research.

CHAPTER TWO: OVERARCHING LITERATURE REVIEW

This chapter presents the overarching literature review that highlights the key features and structures of Chinese legal environment after the economic reforms. Section 2.1 provides an overview of the features of institutional background in China. Section 2.3 reviews the effectiveness of internal and external corporate governance systems. Section 2.3 presents the economics of fraudulent financial statements in China.

2.1 Institutional background

2.1.1 Overview of China's capital markets

Along with the transformation from a centrally planned economy to a socialist market economy, China's capital markets and accounting system have gone through rapid development. From early 1978 to 1992, state-owned enterprises (SOEs) were corporatised and two stock exchanges were formed: The Shanghai Stock Exchange (SHSE); and the Shenzhen Stock Exchange (SZSE; Chen, 2004).

The corporatisation of SOEs in the early 1980s is one of the most important aspects of China's economic reforms. With corporatisation, managers are given more decision-making autonomy in both structural and operational decisions. The government's liabilities to enterprises are limited and performance contracts between the government and SOEs are formalised (Wang, Xu, and Zhu, 2004). These reforms reportedly improved the productivity of SOEs during the 1980s and the early 1990s (Lin and Zhu, 2001). However, subsequently, the performance of SOEs declined and they suffered significant losses despite more decision-making autonomy being granted to managers. SOEs are blamed for being inefficient due to the competitive environment, social burdens and agency problems (Chen, 2005; Qian, 1996). Chen (2005) finds that soft budget constraints[2] and corruption are typical manifestations of agency problems in China. Managers are appointed by bureaucrats with personal and political connections. Accordingly, the deteriorating performance and high debt to asset ratios in SOEs raise the question of whether SOEs are capable of settling their debt obligations (Lin and Zhu, 2001). Poor performance, such as massive default, may surface.

[2] Soft budget constraint is a term used by Kornai (1979) to describe bail-outs of financially distressed SOEs by the state.

In the mid-1990s, China started to privatise SOEs in order to increase efficiency, innovation and profitability (Chen, Firth, Gao, and Rui, 2005). Another objective of privatisation is for SOEs to raise capital and to reduce high financial leverage by selling equity ownership stakes to the public, as well as to employees (Wang et al., 2004). One advantage is that the political cost of government interference is reduced. However, due to the unique structure of privatised listed firms in China, substantial ownership is still ultimately controlled by the government (Chen et al., 2005). In contrast, when government ownership is diluted, an increase in ownership dispersion can intensify the conflicts of interest between managers and shareholders (Qian, 1996; Wang et al., 2004). Therefore, the *Company Law*[3] has been amended to promote the development of the socialist market economy, maintain the social order, facilitate the effectiveness of corporate governance, improve managerial incentives, and protect the legitimate rights and interests of companies, shareholders and creditors.

2.1.2 Stock markets

The SHSE and SZSE were launched in December 1990 and April 1991, respectively. These two Chinese exchanges operate independently and have expanded rapidly. The SHSE has only one main board. The SZSE is comprised of three boards: A main board; an SME board for small and medium-sized enterprises (established on May 17, 2004); and the ChiNext board (a NASDAQ-type exchange established on October 23, 2009). The SME board provides a direct financing platform for small and medium-sized innovation-oriented enterprises. The ChiNext board is a capital market specialising in

[3] The *Company Law* was adopted on December 29, 1993 and a number of amendments and revisions have since been made.

innovative high-tech start-ups and high-growth businesses. Data from the China Stock Market and Accounting Research (CSMAR) database [4] indicates that the market capitalisation of listed companies in SZSE and SHSE was US$1 trillion and US$2.3 trillion at the 2011 year-end, respectively. As illustrated by Jiang and Kim (2014), if the SHSE and SZSE were combined, the 2012 market capitalisation would be the second largest in the world.

There are six different types of shares in Chinese companies: State; legal person; foreign; management; employee; and individual shares. All shares have the same voting rights and cash flow rights, but their holders differ in trading, motivation, expertise and ability (Firth, Fung, and Rui, 2007). Foreign, management and employee shares account for less than 2% of the outstanding shares. Therefore, these three types of shares do not constitute major voting blocks (Firth et al., 2007; Chen, Firth, and Xu, 2009). State, legal person and individual shares each represent about one-third of all shares. The government is the regulator and also the main shareholder in the Chinese market. In addition, state and legal person shares are not tradable and often account for a large proportion of outstanding shares. Also, the shares owned by the controlling shareholder are not tradable on the stock markets, regardless of who owns them[5]. Tradable shares are held and traded mostly by domestic individuals and institutional investors (A-shares). Some tradable shares are owned by foreign investors (B-shares, N-shares), or by investors in Hong Kong (H-shares).

Most companies listed on Chinese exchanges offer two share classes: A-shares; and B-shares. Initially, A-shares are available for purchase by domestic investors only and are quoted in Chinese Renminbi (RMB), while B-share ownership is restricted to foreign

[4] The database is designed and developed using GTA information technology.
[5] Private controlling shareholdings are also non-tradable. The designation of controlling shareholders is similar to those for state and legal person shares (Firth et al., 2007).

investors, and is denominated in Hong Kong dollars in the SZSE and US dollars in the SHSE. B-share ownership was opened to domestic investors in February 2001. Other foreign shares, such as H-shares and N-shares, are listed in Hong Kong and New York, respectively. A-shares have also been available to foreign investors through the Qualified Foreign Institutional Investor (QFII) system since May 2003. The same voting rights and cash flow rights (dividend rights) are attached to a company issue for both A- and B-shares, though the share price of an A-share is normally much higher than the price of a B-share (Chen, Firth, and Kim, 2002).

There were 714.9 billion A-shares outstanding by the end of 2004, and 64% of them were non-tradable shares. Among these non-tradable shares, 74% were state-owned shares. Due to regulatory constraints, non-tradable shareholders can only sell shares through private placement. Non-tradable shares and tradable shares are entitled to the same dividends, but non-tradable shareholders' wealth is less sensitive to share price. Since non-tradable shareholders cannot easily gain cash flow benefits through the sale of shares, their goals are less likely to be aligned with firm value maximisation (Jiang and Kim, 2014). However, the disparity between non-tradable shareholders and tradable shareholders gradually disappeared after the introduction of the split share structure reform (SSSR) in 2005. More than 97% of A-share firms completed the reform by the end of 2007 (Li, Wang, Cheung, and Jiang, 2011). By 2009, the percentage of tradable shares in nonfinancial listed firms was 71.49%[6]. At this time, individuals owned 30% of tradable A-shares, 18.47% were held by institutional investors[7], and the rest were owned by the state and legal persons.

[6] Source: CSMAR database.
[7] Specifically, mutual funds owned 12.72%, insurance firms owned 1.45%, QFII owned 1.41% and other institutional investors owned 2.89 of tradable A-shares.

The China Securities Regulatory Commission (CSRC) is the major regulatory agency in China and is responsible for shareholder protection. Its duties include approving initial public offerings (IPOs) and rights offerings, as well as delisting listed companies. The CSRC's tasks are to ensure that listing candidates fully comply with the law and regulations, and to make the final decision on public listings and rights offerings.

2.1.3 Chinese accounting and financial reporting practices

In China, the financial reporting requirements are based mainly on accounting laws, standards and regulations issued by the Chinese Ministry of Finance (MOF). Accounting law is comprised of the basic legislative rules and principles that should be followed by firms. Chinese accounting laws originated in 1985 and were further modified between 1993 and 1999. Effective from 1999, the revisions to the *Accounting Law* tightened the requirements for transparent accounting and unbiased auditing, and introduced new penalties for engaging in misleading accounting practices. The important objective of the accounting reform was to improve the quality of accounting and reporting practices in China.

The legislation informs the statutory accounting systems outlined in *Accounting System for Experimental Listed Companies* and the *Accounting Standards for Business Enterprises (Basic)* in June 1992 and November 1992, respectively. The regulatory framework incorporates common practices from the International Accounting Standards (IAS), instead of using the previously adopted fund accounting concept. The updated accounting standards specify how to recognise and measure accounting elements, as well as how to prepare financial statements (Godfrey and Chalmers, 2007). The standards also require listed firms to disclose three primary financial reports of parent companies along with consolidated financial statements, including balance sheets, income statements and statements of changes in financial position. For firms that exclusively issue A-shares, financial reports are required to follow Chinese Accounting Standards (CAS). The financial reporting regulatory requirement for firms issuing shares to both domestic and foreign investors is compliance with International Financial Reporting Standards (IFRS). In addition to complying with IFRS, a company issuing both A-shares and B-shares is also required to release accounting numbers based on CAS on the same day as their IFRS reports are issued. Therefore, investors have more available information to assist them in monitoring their investments.

However, these standards do not account for distinctions between different industries' production processes and business operating structures, which mean that it is inappropriate to apply the same accounting practices to all enterprises in China. It is a requirement that specific accounting treatments are employed for different types of companies in different industries (Avery, Zhu, and Cai, 2011). Yet most A-shares are held by individuals, who are uninformed speculators and lack the experience and expertise to monitor accounting information. Lin and Chen (2005) argue that financial reporting and information disclosure in China lacks the transparency and reliability needed for investor decision-making. A typical example of an accounting scandal in the Chinese listed markets is the falsification of accounting records by company *Zheng Bai Wen*, which resulted in a dramatic decrease in stock price. In addition, some firms have been found to have 'managed' their earnings by accelerating credit sales (Aharony, Lee, and Wong, 2000) and through inappropriate related party transactions (CSRC, 2000). Such practices have damaged the credibility of financial reports and the undermined the confidence of investors.

Accounting standards are important determinants of financial reporting quality. In response to the prevalence of related party transactions, in 1997 the MOF promulgated the first detailed accounting standard of *Disclosure of Related Party Relationships and Transactions*. Listed companies are required to disclose information about all related-party transactions which commonly involve loans, loan guarantees, and raw material purchases. However, many companies take advantage of the loan guarantees from the third parties to conceal debt obligations. Hence, loan guarantees from the third parties are required to disclose in Chinese listed companies. Correspondingly, in 1998, the MOF required listed firms to release both the direct and indirect versions of cash flow statements. The disclosure of *Statement of Cash Flow* helps investors to better assess the stability and predict firms' future performance (Ding, Jeanjean, and Stolowy, 2006). By the end of 2001, 16 specific accounting standards were promulgated by the MOF[8]. Between 1997 and 2001, public companies were required to adopt the newly promulgated standards, while unlisted companies were only encouraged to follow the standards.

In 2000, the MOF also issued *Accounting System for Business Enterprises*, which is the fundamental framework of accounting practices and integrates Chinese social features' accounting practices and the IFRS. In 2000, the number of accounting rules increased to 52 articles after further emendations regarding responsibility, internal audit, control and penalties for misstatements in financial statements (Firth et al., 2007). In addition, other supplementary regulations and rules (such as accounting standards) were issued to regulate financial reporting and are increasingly being revised to maintain and increase

[8] These 16 detailed standards are; disclosures of related party relationships and transactions (1997), events occurring after the balance sheet date (1998), revenue (1998), investments (1998), construction contracts (1998), changes in accounting policies and accounting estimates, and corrections of accounting errors (1998), cash flow statements (1998), debt restructuring (1998), non-monetary transactions (1999), contingencies (2000), intangible assets (2001), borrowing costs (2001), leases (2001), interim financial reporting (2001), fixed assets (2001), and inventories (2001).

their consistency with IFRS. However, due to weak market surveillance, substantial divergences between IFRS and Chinese Generally Accepted Accounting Principles (GAAP) still remain (Archer, Delvaille, and McLeay, 1995; Chen, Firth, and Kim, 2002). Chen, Sun, and Wang (2002) find that excessive earnings management and low audit quality are the main sources of divergence between Chinese GAAP and IFRS. For example, earnings management was enabled by virtue of the 1998 revised regulation on *Bad Debt Allowance,* which required the amount of the allowance to be set by company managers. The new accounting practices are reported to provide more accurate information for investors, but accrual accounting is argued to provide managers with more discretion to fabricate accounts (Chen, Sun, and Wang, 2002). Financial reports under IFRS or Hong Kong GAAP must be audited by international Big 4 auditors (Gul, Kim, and Qiu, 2010). However, there is no such requirement for CAS-based reports.

The Chinese Certified Public Accounting (CPA) profession was established in 1981 and the *Chinese Institute of Certified Public Accountants* (CICPA) was created by the MOF in 1988. The MOF delegates power to the CICPA, which is responsible for exercising professional management and servicing functions to CPAs. In China, only CPAs and CPA firms jointly authorised by the CSRC and the MOF can provide audit services to listed companies. For example, only 105 out of 7,000 CPA firms were licensed to audit listed firms in 1997. Many CPAs are affiliated with government agencies, which raises concerns regarding the credibility of the auditor's opinion. As surveyed by the CICPA in 1997, 54% CPA firms were affiliated with government units (Lin and Chan, 2000). The lack of professional expertise and independence in China makes the competency and recognition of accounting information by CPAs less reliable. In addition, there was no litigation threat for CPAs under the government protection (Yang, Tang, Kilgore, and Jiang, 2001). CPAs may not be thorough in their detection of falsified financial information and may even fail to report managerial misconduct. For example, the *ShengLi Oil Field Dynamic Group* scandal in 1996 resulted in the suspension of the Shandong accounting firm from practice for six months and the firm had to pay 400,000RMB in fines to the CSRC[9]. Gul, Sami, and Zhou (2009) show that the majority of investors lost confidence in audit accounting information in 1995. The restructure and recommendation for audit independence was made by the MOF in 1997 to improve the ethical and quality problems in the accounting profession (Lin and Chan, 2000). DeFond, Wong, and Li (2000) employ the relative frequency of auditors issuing modified audit reports as a proxy for the independence of auditors, and find that auditor independence increases in China after the new Chinese auditing standards are introduced in 1996. Fan and Wong (2005) find that independent auditors play an important role in reducing agency costs between ownership and management. Audit quality is difficult to measure in China; many previous studies employ audit firm size to proxy for audit quality (DeAngelo, 1981; Chen, Firth, Gao, and Rui, 2006). The higher the CPA firm's size, the better the audit quality is presumed to be. Gul et al. (2009) find that smaller auditors have a higher probability of issuing modified audit reports than bigger auditors.

Prior studies find that firms use asset impairments to engage in earnings management (Chen, Wang, and Zhao, 2009; Duh, Lee, and Lin, 2009; Yang, Rohrback, and Chen, 2005; Zhang, Lu, and Ye, 2010). Chen et al. (2009) find that about half of listed firms reverse asset impairments from 2003 to 2006. Many of these firms are motivated to reduce the probability of trading suspension. In addition, Duh et al. (2009) finds that firms with high levels of impairment losses are likely to reverse subsequently in order

[9] The Shandong accounting firm failed to disclose significant changes of ownership structure in the ShengLi Oilfield Dynamic Group.

to smooth earnings. To deal with this issue and to harmonise Chinese accounting standards with IFRS, on 15 February 2006, the MOF promulgated *CAS 2006*, which included 38 specific standards for accounting[10]. In particular, *CAS No. 8* prohibits the reversal of previous long-lived asset impairment write-downs and allows the reversal of short-term asset impairment losses (Zhang et al., 2010). This accounting practice forbids managers to use long-term asset impairments to manipulate earnings. Moreover, according to *CAS 2006*, a complete set of financial statements should include a balance sheet, an income statement (profit and loss account), a cash flow statement, a statement of changes in owners' equity and notes to the financial statements.

The CSRC also plays an important role in promoting the disclosure of high quality financial information. Although the CSRC does not set accounting standards and auditing standards, it has issued more than 50 disclosure requirements based on *Company Law* and *Security Law* to strictly regulate and audit accounting and reporting practices for companies.

2.1.4 Fraudulent financial statement (FFS) and regulatory agencies

Corporate fraud is usually categorised into two groups; misappropriation of assets (employee fraud), and financial reporting (or management) fraud (Statement on Auditing Standards [SAS], No. 82). This research focuses on one form of management fraud; namely fraudulent financial statements. As defined in the SAS No. 82 of the American Institute of Certified Public Accountants, financial reporting fraud mainly refers to intentional misstatements by omission in financial statements (Rezaee, 2005).

[10] The CAS 2006 is more in harmony with IFRS, especially in the areas of deferred taxation, business combination under non-common control, share-based payments, financial instruments and assessment for asset impairment (CAS, 2006).

The promulgation of the Securities Law in 1998 establishes an overall legal framework for the Chinese securities market. The Securities Law regulates the transitions and trading in the securities markets, protects the legitimate rights and interests of investors, maintains social and economic order and public interest, and promotes the development of the socialist market economy (Article 1). Chinese firms listed in the SZSE and SHSE are required to publicly disclose both regular reports and temporary reports. Regular reports include "annual reports and interim report[s]", and temporary reports include "resolutions of the board of directors, the board of supervisors, and shareholder meetings, the purchase and sale of assets, related-party transactions, magnitude issues (warnings of loss, material litigation and arbitration), abnormal fluctuations of stock trading, and corporate mergers and divestitures" (Chen et al., 2005, p. 459). Listed firms must disclose this information truly, accurately, and integrated without misleading presentation or omissions (Chen et al., 2005). Nevertheless, the percentage of fraudulent financial statements is argued to be high in China and investors tend to be critical of the financial statements of Chinese firms (Fan, Rui, and Zhao, 2008). According to MOF Inspection Bulletin No. 5 (10th July 2001), among 159 investigated firms, 147 firms fraudulently reported total assets, 155 firms falsified shareholders' equities, and 157 firms fabricated income.

Though the revision, revolution, and development of the legal framework in China has been happening for over two decades, the quality and actual law enforcement are still of a low standard (Pistor and Xu, 2005). Similar to the Securities and Exchange Commission (SEC) in the US and the Securities and Futures Commission (SFC) in Hong Kong, the CSRC regulations have also been periodically modified to increase the capability to identify firms with financial misrepresentations, or culpable managers who are derelict in their duties. At the beginning of the economic restructuring and regulatory reforms, China had three main regulatory agencies; the People's Bank of China, the State Council Securities Commission (SCSC), and the CSRC (Chen et al., 2005; Chen, Firth, Gao, and Rui, 2006). Both the SCSC and CSRC emerged in October 1992. The underlying framework for these three regulatory agencies was problematic in its infancy, especially the overlapping regulatory power, mutually inconsistent systems and dispersed supervision. The integration of the SCSC and CSRC was a milestone. Meanwhile, the supervisory power of the People's Bank of China has been transferred to the CSRC. The CSRC is a ministry level regulator of the securities and futures markets operating directly under the State Council (which is the Central People's Government and is the highest state administrative authority in China) since April 1998. The CSRC is based in Beijing and has 36 regulatory bureaus that cover different geographic regions of China.

The CSRC also delegates some power to the SHSE and SZSE. These two exchanges are self-regulatory organisations, but are ultimately controlled by the CSRC. To ensure the consistency and efficiency of the regulatory system, the SHSE and SZSE are required to report to the CSRC. The CSRC and the two stock exchanges supervise securities markets by using detailed criteria. One of the main duties of the CSRC is to identify, investigate, and penalise firms that disclose false information (Chen, et al., 2005; Jiang and Kim, 2014). The CSRC regularly reviews and randomly inspects companies and securities firms (Chen et al., 2006). It also responds to information and complaints of fraud allegations from investors, employees, and the media. The outcomes of investigations are released to the public if violations are found. Cases with no violation or minor infractions are not disclosed. The average time lapsed from when firms first engage in fraudulent activities until detection is about two years (Chen et al., 2005).

The CSRC divides sanctions of companies into five categories; internal criticism, public criticism, public condemnation, official warning, and monetary fines (Mao, 2002). The SHSE and SZSE mainly sanctions violating firms by internal criticism, public criticism, and public condemnation[11]. For firms with serious wrongdoings, the CSRC will impose sanctions in the form of official warnings, suspension of trading and monetary fines (Chen et al., 2005). The monetary fines are between 30,000RMB and 300,000RMB. According to the enforcement actions in the CSRC website, the most frequent penalties are public condemnation and official warnings. In addition, more than 21% of firms are punished for more than one offense. The CSRC has been criticised for being ineffective in identifying and prosecuting fraud (Chen et al., 2005). Hence, the level of retribution applied to firms with information disclosure violations appears to be weak in China.

Similarly, Pistor and Xu (2005) report that monetary fines and other sanctions imposed by Chinese public law enforcement agencies are weak. It seems that listed firms require more stringent monitoring and stronger enforcement mechanisms. Furthermore, the actual CSRC reports provide few details of each disclosed case, with many of the reports described in less than one page (Chen et al., 2005). Hence, investors arguably do not have enough information and knowledge to understand the real accounting practices conducted by the firms receiving the enforcement actions. The CSRC is directly administered by the State Council and government interference in its processes is substantial. Therefore, the independence of the CSRC has inevitably been questioned. For example, China's administrative governance adopted a quota system to tightly control the IPO process from 1993 to 2000. Corporations must have obtained quota

[11] Internal criticism means that the information regarding sanctions is released to all listed companies in each stock exchange. Public criticism and public condemnation are official written reports disclosed in the designated newspapers and websites. If a firm suffers public condemnation, it will impact on the firm's public offering, private placement, and equity incentive mechanism.

credit from the relevant governance agencies before going public. Given that the quota system is a government stated criterion, the CSRC has been more likely to assign a listing quota to SOEs than non-SOEs (Aharony et al., 2000; Liu and Lu, 2007). Therefore, preferences and ties with government agencies promote the presence of regional decentralisation at the IPO stage (Pistor and Xu, 2005) and provide "rent-seeking" opportunities for local bureaucrats to select the IPO candidates (Liu and Lu, 2007).

The Chinese capital market lacks monitoring by investors. For example, civil proceedings can be accepted only after a CSRC investigation and are notoriously slow (Chen et al., 2006). In the US market, besides the SEC filing an administrative release, the enforcement actions commonly include civil and criminal proceedings (Karpoff, Lee, and Martin, 2008a). In contrast, in China civil litigation is still primitive and rare, especially before 2002. Investors experience the development of private enforcement action over four stages, 'dismiss cases by the court' (before September 20, 2001), 'the court rejected cases due to lack of the condition to accept and hear this type of cases' (between September 21, 2001 and January 14, 2002), 'the court started to accept cases under conditions' (between January 15, 2002 and January 31, 2003), and 'the court accepted cases broadly' (February 1, 2003 onwards; Zhang, 2005). China's legal environment and regulatory rules have been improving, but the legal protection for investors is still argued to be weak (Allen, Qian, and Qian, 2005). Class action lawsuits are costly and time consuming for individual investors and the probability of success is low. The case of fabricating listing qualifications and inflating profits by *Hongguang Company* was the first successful civil suit in the first 12 years of the stock markets. Eleven investors received 248,995RMB as compensation when the case concluded on

November 25, 2002[12]. The prosecution against the *Daqing Lianyi Company* was the first accepted civil lawsuit for fraudulent activities, commencing on January 24, 2002 and concluding on December 23, 2004[13]. A total of 679 investors accused the *Daqing Lianyi Company* of making fraudulent financial statements, and received 8.85 million RMB as compensation. The apparent insufficiency of regulatory scrutiny over publicly traded Chinese companies leaves considerable room for improvement.

2.1.5 Conclusion

In the Chinese setting, the presence of political intervention, the underdeveloped legal framework, and the lack of protective litigation for investors has led to the disclosed information by Chinese listed companies which are less credible and reliable. This unique Chinese context enables us to review the main causes of low accounting transparency and managerial misconduct. The exposed scandals suggest that the link between a weak legal mechanism and misappropriation is intuitively plausible. The specific corporate events of regulatory enforcement by the CSRC and the two stock exchanges provide an opportunity for us to investigate the quality, or accuracy, of accounting information from a new perspective. The next section will explore the interaction between market development and governance structures.

[12] Available online at http://www.chinanews.com/2002-11-27/26/247554.html
[13] Available online at http://finance.sina.com.cn/stock/yjdt/20130315/020014837230.shtml

2.2 Corporate governance

Good corporate governance is expected to reduce agency costs and increase the returns of shareholders (Allen, Qian, and Qian, 2005; Bai, Liu, Lu, Song, and Zhang, 2004). There is some US evidence of a positive association between better firm corporate governance and both better performance and higher valuation. For example, Gompers, Ishii and Metrick (2003) find that firms with better corporate governance have higher firm value, higher profits and higher sales growth. Similarly, Dittmar and Mahrt-Smith (2007) find that good corporate governance improves US firms' operating performance.

China has a relatively underdeveloped legal environment compared to the US. La Porta, Lopez-De-Silanes, Shleifer, and Vishny (1998, 2002) and Roe (2002) demonstrate that the legal environment could significantly affect firm performance and governance structures. Furthermore, China has unique ownership characteristics and corporate governance (Clarke, 2003). Chinese stock markets have been criticised as being inefficient, with prices failing to reflect fundamental values of listed firms (Bai et al., 2004). In China, managers frequently engage in misappropriation of funds or related-party transactions to expropriate minority shareholders when firms' corporate governance is weak (Liu and Lu, 2007). Claessens, Fan, Djankov, and Lang (1999) find that the weak capital market institutions and low accounting transparency in Asian markets results in greater tunnelling behaviour.

After some well-known accounting scandals in the Chinese market, some major changes in corporate governance rules have taken place. Ownership structure, board independence, audit committees, institutional shareholdings and auditor quality are the common factors of corporate governance examined in China (Chen and Cheng, 2007). Based on previous empirical literature of a particular aspect of governance, this study provides a comprehensive examination of both internal and external corporate governance structures in China and attempt to address the following questions: What are the main agency conflicts in China? What are the key Chinese listed companies' corporate governance problems? These corporate governance practices may serve as the basis of inefficiencies and mismanagement in corporate behaviour of listed companies, which provides the link between agency problems and FFS or expropriation.

2.2.1 Internal governance

2.2.1.1 Ownership structure

2.2.1.1.1 Different types of ownership

On average, approximately 30% of listed Chinese firm shares are privately-controlled (Cumming, Hou, and Lee, 2011). In addition, about 30% of Chinese listed shares are held by the state and another 30% are owned by legal entities, most of which are SOEs controlled by the central, or the local, government. In general, shares owned by state and legal entities are not tradable. Individual shares are tradable. In addition, tradable shares and non-tradable shares have the same voting rights and the same rights to cash dividends, although different types of ownership may have different objectives (Firth et al., 2007). However, different types of stockholders in Chinese listed firms have different cash flow rights and voting rights. The divergence between cash flow rights and voting rights leads to different influences on listed firms (Chen et al., 2006).

Although the Chinese government has been actively improving corporate governance practices, the interference of government is still a concern. The state has a role as both the controlling shareholder and the regulator (Clarke, 2003; Firth, Fung, and Rui, 2006). Under this corporate governance structure, the moral hazard problems can be severe. For example, Aharony, Lee, and Wong (2000) find that an SOE may carve out the most profitable business units for public offering and retain the unprofitable units. The controlling shareholders of the SOE may manage earnings in the SOE's subsidiary in order to meet the rules of the listing criteria and attract investors. Then the parent SOE can use the subsidiary as a vehicle to siphon these profits back in later years. In addition, Liu (2006) states that subsidiaries tend to have complicated operations and lack accounting transparency. Liu (2006) shows that 78.9% of Chinese listed companies have a parent during the period of 1999 to 2001. Furthermore, Bai et al. (2004) find that when the Chinese government is the largest shareholder, firm value decreases. In contrast, Tian and Estrin (2008) find that the relationship between the size of government shareholding and firm value is U-shaped in China. Hence, the strong grip of the state in Chinese firms may come at a considerable cost to all shareholders.

Along with the economic reforms, the operating decision rights of SOEs have been largely decentralised to managers (Qian, 1996). Nevertheless, the government retains some ultimate decision rights, such as decision rights on the appointment of CEOs (Fan, Wong, and Zhang, 2007). Yet managers' shareholdings are rare in the Chinese market and, hence, in some circumstances their interests are not closely aligned with increasing the firm's value. According to data collected from the CSMAR database, the proportion of shares held by top managers in listed SOEs was less than 0.1% in 1999 and increased slightly to 0.39% in 2012. The low cash flow rights of Chinese managers are due to the control of the government. In addition, the government officials are more likely to appoint CEOs without sufficient professional background and those who are more likely to pursue political objectives (Fan et al., 2007). Top managers' shareholdings in non-SOEs are significantly larger, increasing from 8% in 2007 to 16.58% in 2012. Hence the state monopoly is a major hurdle to financial development.

As opposed to individual investors, foreign investors (B- or H-shares) are clairvoyant and competent institutional investors, who can gain more firm-specific information (Gul, Kim, and Qiu, 2010). The previous literature finds high transparency and low information asymmetries with foreign ownership (Jiang and Kim, 2004; Kang and Stulz, 1997; Kim and Yi, 2009). If firms issue A- and B-shares, or A- and H-shares, then earnings information reflected in stock returns is higher than for those firms that only issue A-shares (Gul et al., 2010). Moreover, Firth, Fung, and Rui (2007) show that firms make higher quality financial disclosures when they have foreign shareholders. Due to trading segmentation, A- and B-shares are exposed only to the emerging market environment (Brockman and Chung, 2003). In contrast, the Hong Kong market is a developed market and has efficient investor protection mechanisms. Hence, firms issuing both A- and H-shares are exposed to two different institutional-level investor protection environments (Gul et al., 2010). Therefore, these firms disclose more earnings information to investors compared with firms issuing only A- and B-shares.

2.2.1.1.2 The 2005 split share reform

In the early 1990s, almost all tradable shares were owned by individual investors. As a result of the development and growth of private institutions, by the end of 2005 individual investors held only 69.82% of tradable shares. State shares and legal entities' shares are non-tradable shares, which can only be transferred through private placement, or irregularly scheduled auctions. In addition, the shares of all Chinese listed firms owned by controlling shareholders are also non-tradable. Specifically, if the government is the ultimate controller of a given firm, then the controlling shareholders need approval from local or central government entities before disposing of any shares in the listed companies (Chen, Jian, and Xu, 2009). In such a situation, there are impediments that prevent controlling shareholders from realising the value of their holdings through trading actions. Chen et al. (2009) and Lee and Xiao (2004) present evidence that large shareholders use cash dividends to tunnel money from tradable shareholders. Due to this, the different trading rights and limited ownership benefits provide incentives for non-tradable shareholders to engage in fraudulent activities in order to extract personal benefits.

In order to narrow the divergent interests of majority shareholders and minority shareholders, the split share structure reform (SSSR) was introduced on April 29, 2005. Non-tradable shareholders compensated tradable shareholders in forms such as cash, additional shares and warrants. Li, Wang, Cheung, and Jiang (2011) find that an effect of this reform is the provision of diversification benefits for investors in China with better risk sharing and lower agency costs. Nevertheless, it takes some time for these shares to become tradable[14]. More than 99% of listed firms completed the reform by the end of 2012 (Guo, 2013).

Since 2005, legal person and state shareholders are referred to as ordinary institutional investors. After the SSSR, individual shareholdings and mutual funds shareholdings decreased gradually, while ordinary institutional investors' holdings increased. By the end of 2012, the breakdown in the ownership of tradable shares was 25.33% owned by

[14] According to the guidelines issued by the CSRC (2005, article 27), in the first twelve months of the implementation of the reform plan, non-tradable shares cannot be traded or transferred. In addition, the number of newly tradable shares cannot exceed 5% and 10% of the A-share float within one year and two years after the implementation of the reform, respectively.

individuals, 57.28% by ordinary institutional investors, and 17.39% by institutional investors[15]. Firth et al. (2007) find that firms are associated with higher quality financial disclosure when there are a lot of tradable shares. Individual investors in Chinese market have very short-term investment horizons. Allen et al. (2005) present evidence of high volatility in medium- and small-cap Chinese stocks. In 1994, SZSE and SHSZ investors on average held a stock for approximately two months and one month, respectively. However, since institutional investors have increasingly become major participants in the Chinese stock market, the turnover of trading has reduced slightly (Jiang and Kim, 2014). In 2012, individual investors on the SZSE (SHSZ) on average held a stock for approximately four months (one year).

2.2.1.1.3 Ownership concentration

One unique characteristic of Chinese listed firms is high ownership concentration. Chinese IPO regulations have led to concentrated ownership in listed companies (Chen, Jian, and Xu, 2009)[16]. According to the CSMAR database, the average percentage of shares held by the largest shareholders decreased from 45.48% in 1998 to 36.84% in 2012. In addition, the top five largest shareholders owned an average of 59.33% of

[15] The data is obtained from CSMAR database.
[16] Since the formation of the SHSE and SZSE in the 1990s, China began partially privatizing SOEs through the IPO of minority portions of corporate shares in order to increase efficiency and raise capital (Fan, Wong, and Zhang, 2005). By the end of 2001, more than 700 firms were taken public in China; however, substantial ownership of these firms ultimately remains controlled by local governments. Specifically, there are two different ways in organizing the ownership and control structure of a listed company by a local government. One way is that the local government directly owns the majority of shares through a state asset management agency. Alternatively, the local government can indirectly own a controlling stake of the listed company through a pyramid consisting of one to multiple intermediate layers. Furthermore, the emergence of private controlled listed firms is similar to SOEs except that entrepreneurs sometimes allow outside equity holders to participate in the intermediate companies. Hence, the pyramidal ownership is widely adopted in Chinese listed companies.

outstanding shares in 1998, decreasing slightly to 53.20% in 2012[17]. Gul, Kim, and Qiu (2010) find that, in the Chinese market between 1996 and 2003, on average the largest shareholder owned 42.8% of outstanding shares, and 66% of such controlling shareholders are government related. This is potentially problematic, because government ownership is argued to lead to inefficient corporate governance, such as poor investor protection for minority shareholders (Shleifer, 1998).

Concentrated ownership also provides more discretionary power for controlling shareholders to divert resources for personal benefit. Given that shares held by the largest shareholder are normally non-tradable in the Chinese market, there is potential for a disparity of interests between controlling shareholders and minority shareholders. Concentrated ownership and the disproportionate share of controlling rights relative to cash flow rights has led to greater incentives to use insider information to expropriate the benefits of minority shareholders. For example, in August 2001, Sanjiu Pharmaceutical's controlling shareholders and related parties extracted more than 2.5 billion RMB from the company, accounting for 96% of the company's net assets. Johnson, La Porta, Lopez-de-Silanes, and Shleifer (2000) use the term tunnelling to portray the behaviour of expropriation of funds from minority shareholders by controlling shareholders. Some prior studies find that concentration of control power hinders firm-specific information, increases the cost of private information, and results in an environment with high information synchronicity (Fernandes and Ferreira, 2009; Morck et al., 2000). Therefore, the presence of concentrated ownership in Chinese firms has hindered the development of capital markets and has diminished protection for minority shareholders.

[17] The data is obtained from the CSMAR database and excludes firms in the financial industry.

In 2002, the CSRC conducted research on 1175 listed firms and found evidence of tunnelling in 676 listed companies. The total funds illegally taken from all fraudulent activities by controlling shareholders were 96.67 billion RMB[18]. Weak legal investor protection and ineffective corporate governance facilitate the diversion of resources by controlling shareholders. In order to restrain tunnelling behaviour by large shareholders, the CSRC and the State-Owned Assets Supervision and Administration Commission of the State Council (SASAC) jointly announced “Some Issues on Regulating the Funds between Listed Companies and Associated Parties and Listed Companies’ Provision of Guaranty to Other Parties” on August 28, 2003. Specifically, this document regulated the funds flow between listed companies and controlling shareholders or other related parties. The aim of the regulation was to control the risk of indiscriminate use of funds by controlling shareholders and protect the lawful rights and interests of investors.

There are certain restrictions on the misappropriation of listed companies’ funds pursuant to the above regulation and, subsequently, the amount of tunnelling has decreased to about 57.7 billion RMB[19]. Some controlling shareholders have proposed specific plans to correct previous transfers. However, in practice, most controlling shareholders are not in a financial position to remediate funds. Hence, the effect of the new regulation has been limited. According to SHSE statistics, by the end of 2003, of 506 companies listed on the SHSE, 317 suffered from embezzlement by their controlling shareholders. On July 27, 2004, the CSRC and the SASAC issued a policy relating to debt-equity swaps, thereby providing a channel for controlling shareholders to repay debt and remedy tunnelling behaviour. However, there were no specific measures to price, supervise, and regulate the debt-equity swaps. So, by the end of 2004,

[18] The information is available from http://finance.sina.com.cn/roll/20030730/0616386731.shtml
[19] The information is available from http://finance.sina.com.cn/stock/t/20051105/09292096004.shtml

the misappropriation was still in excess of 50 billion RMB. In October 2005, the SCSC approved a ruling by the CSRC requiring all listed firms to resolve the problem of the cash reparation by the end of 2006. This regulation was effective and 380 listed companies subsequently remedied the misappropriations. On November 7, 2006, the CSRC further announced that if listed firms failed to resolve the debt by December 31, 2006, the controlling shareholders would face disciplinary actions such as employment termination and civil court prosecution.

2.2.1.2 Board structure

2.2.1.2.1 Board of directors

Chinese listed firms' unique two-tier internal board structure is comprised of a board of directors and a supervisory board. Internal managers are regarded as the most influential members of the board (Beasley, 1996). However, if the board is dominated by management, the monitoring effectiveness of the board may be diminished. In addition, the CEO would have more discretionary power in the financial reporting. Some researchers suggest that an effective board should combine both inside and outside directors (Fama, 1980; Fama and Jensen, 1983). Following the promulgation of the CSRC's guidelines (CSRC, 2001b), independent non-executive directors have been brought into Chinese listed firms. Independent directors do not have an operating relationship with the company. The CSRC strongly suggests that firms should have both executive and non-executive directors, which is similar to developed countries' boards of directors. Moreover, since 2003, at least one-third of directors must be independent. The percentage of independent directors was 0.76% in 1999 and increased to 32.75% in 2003. Some evidence suggests that shareholders' wealth increases with increases in board independence (Lee, Rosenstein, Rangan, and Davidson III, 1992). Likewise, the CSRC strongly suggests listed firms separate the role of Chairman and CEO. Hence, the board plays a role in monitoring managers.

The board of directors is another instrument allowing shareholders to monitor the behaviour of managers. Karamanou and Vafeas (2005) find that firms with a high percentage of outside directors have higher financial disclosure quality in the US market. Similarly, Ajinkya et al. (2005) show that US firms are more likely to provide useful information to investors, such as accurate earnings forecasts, when the proportion of outside directors is high. However, the effectiveness of boards of directors in China is different from those developed countries. Bai et al. (2004) find no evidence of an association between the percentage of independent directors and Chinese firm value. They argue that Chinese outside directors are not really independent. Dahya et al. (2008) provide a worldwide analysis of 22 countries and indicate that firm value is positively correlated with the proportion of board directors who are not affiliated with the dominant shareholder. This relationship is more evident in countries with weak legal shareholder protection (Dahya et al., 2008). Chen, Firth, Gao, and Rui (2006) suggest that the chairman in China is typically a full-time executive with considerable power. In addition, Chinese boards are characterised by the duality of the positions of Chairman and CEO. According to data collected from the CSMAR database, the incidence of such duality in Chinese market was about 10.91% and 21.53% in SOEs and non-SOEs, respectively during the period from 1999 to 2012. Bai et al. (2004) find that the dual position of Chairman and CEO reduces firm values. Furthermore, as reported by Fan et al. (2007), between 1993 and 2001, roughly 27% of CEOs served as a current or former government bureaucrat. Many top executives were previously government officials and, therefore, they may have different objectives to, and have a less sufficient professional background than, executives in US firms. The influence of independent directors may be attenuated if managers dominate the board (Bai et al., 2004). The state retains board control and has more power relative to independent directors (Chen, 2005). Therefore, independent directors cannot fully and effectively protect the legitimate entitlements of minority shareholders. The 2001 CSRC compulsory regulation regarding independent directors indeed improved the enforcement mechanism of accounting practices, but only to a limited extent.

2.2.1.2.2 Supervisory boards

According to the CSRC, the supervisory board should have at least three members and should be independent from the board of directors. The major responsibility of the supervisory board is to supervise the board of directors, including ensuring the accuracy and authenticity of financial statements. Xiao, Dahya, and Lin (2004) demonstrate that a supervisory board is the best detection department. In another study, Firth et al. (2007) find that larger and more active supervisory boards can improve the quality of financial statements. In contrast, Jia, Ding, Li, and Wu (2009) find that the efficiency of Chinese supervisory boards falls below social expectations and can be described as dysfunctional. Jia et al. (2009) find that an extra supervisory board member increases the probability of being sanctioned by the CSRC by 27%; if the supervisory board membership is more than four, then each additional supervisory board member increases the probability of being sanctioned by the CSRC by 36%. In addition, Jia et al. (2009) present evidence that Chinese supervisory boards take actions only after investigations or sanctions. Similarly, Xi (2006) states that Chinese supervisory boards lack in expertise and legal support, and play a trivial role in monitoring governance mechanisms.

2.2.1.2.3 Audit committees

After some well-known accounting scandals in the US market, some major changes in corporate governance rules have been taking place. A recommendation for the independence of US audit committees was promulgated in 1999[20]. The law required the audit committee to have only independent directors; moreover, effective from December 2003, the audit committee must have at least one member possessing financial expertise (Agrawal and Chadha, 2005). However, the findings regarding the impact of audit committees on corporate governance are mixed. Agrawal and Chadha (2005) find that the probability of restating earnings is 31% lower in firms when the audit committee includes a financial expert. Klein (2002) shows that the larger the proportion of independent directors on US listed firm audit committees, the lower the abnormal accounting accruals, implying less earnings management is taking place. In contrast, Beasley (1996) finds no significant relationship between financial statement fraud and audit committees in the US market. Agrawal and Chadha (2005) indicate that the independence of audit committees is not related to the incidence of firm earnings restatements.

Following the example of IFRS, in January 2002 the CSRC and the National Economic and Trade Commission (NETC) issued the "Criterion Of The Management Of Listed

[20] In 1999, the NYSE started to require that each firm has an audit committee comprising of exclusive independent directors. Moreover, NASDAQ required that independent auditors dominate firm's audit committees; the American Stock Exchange (AMEX) only strongly suggests firms have independent audit committees.

Companies”. This document outlines that the board of directors can establish the audit nomination, nomination committee, strategy committee, and the compensation and evaluation committee, among others. Specifically, more than half the members of audit, nomination, compensation and evaluation committees must be independent. The audit committee must have at least one independent director with financial expertise and the chairman of the audit committee should be an independent director. The audit committee’s responsibilities include: (1) Propositions to appoint or dismiss the external auditor; (2) supervision of the firm’s internal control system and its implementation; (3) coordination of the communication between internal and external auditors; (4) review of the firm’s financial information and its disclosure; and (5) evaluation of the firm’s internal control system[21]. However, the establishment of an audit committee is voluntary. According to Chen and Cheng (2007), in 2003 only 30% of the listed firms in their sample had an audit committee. From 2004, the CSRC required SOEs to establish an independent audit committee. Since 2007, in an attempt to improve the effectiveness of audit committees, the CSRC has also required listed companies to disclose whether or not firm boards had established the audit nomination committee, strategy committee, and the compensation and evaluation committee, and whether or not these committees have exercised their duties efficiently.

Nevertheless, research evidence suggests that the effectiveness of audit committees in China has been poor. Lin, Xiao and Tang (2008) find that, although a large percentage of listed firms have formed audit committees, the audit committee does not play an effective role, especially with respect to enhancing the quality of financial reporting and reducing the firm’s illegal activities. Firth et al. (2007) also present evidence that the

[21] Article 54, Section 6, Chapter 3 ‘The code of corporate governance for listed companies in China’ (CSRC, 2002).

audit firm has no significant impact on earnings information response and modified audited opinions (MAOs) in the Chinese market.

2.2.2 External governance

2.2.2.1 Institutional investors

Many studies report a positive effect of institutional investors on alleviating managers' self-serving behaviour (McConnell and Servaes, 1990; Shleifer and Vishny, 1986, 1997). Incentives for institutional investors to monitor management depend on the size of their shareholding. Large percentages of shares are less marketable and are normally held for a longer period (Maug, 1998). Chung, Firth, and Kim (2002) find that large institutional investors in the US market can monitor the behaviour of managers and constrain earnings manipulation behaviour. McConnell and Servaes (1990) indicate that there is a positive relationship between the value of a firm and the percentage shareholding of institutional investors. In contrast, other studies do not find any association between institutional shareholdings and corporate performance (Agrawal and Knoeber, 1996; Duggal and Millar, 1999; Faccio and Lasfer, 2000; Karpoff et al., 1996). Some authors find that institutional investors often invest for short-term periods; managers may feel a short-term pressure that influences them to use positive accounting accruals in an attempt to improve financial profitability (Graves and Waddock, 1990; Lang and McNichols, 1998; Porter, 1992). It is argued that institutional investors can sell shareholdings before the market fully recognises the transitory nature of these earnings (Chung et al., 2002).

Institutional shareholders emerged in the Chinese stock market from 1997. Key institutional investors in China include mutual funds, insurance firms and QFII. Kim, Ho, and Giles (2003) find that China's institutional investors account for about 10% of outstanding shareholdings. In 2005, the percentage of institutional shareholders increased to 25.66%[22]. However, since the majority of Chinese listed firms are dominated by state-level stakeholders, it is difficult for institutional investors to monitor and discipline managers' behaviour (Chen, 2005). The percentage of institutional investors gradually dropped from 29.60% in 2007 to 17.40% in 2012; however, the turnover ratio of institutional investors is still high. In 2011, the average stock holding time by mutual funds was about six months (Jiang and Kim, 2014). The above implies that institutional investors engage in short-term speculation instead of long-run investment in the Chinese market. Therefore, the monitoring effect of institutional investors is weak in the Chinese market.

2.2.2.2 Auditor quality

Audit quality is defined to be the joint probability of discovering and reporting a breach in a client's accounting system (DeAngelo, 1981). The external auditor can monitor potential agency costs and asymmetric information between majority and minority shareholders (Ashbaugh and Warfield, 2003; Cohen, Krishnamoorthy, and Wrightet, 2002; Fan and Wong, 2005; Watts, 1977). Becker et al. (1998) witness a positive effect of audit quality on financial reporting quality.

[22] According to the CSMAR database, the percentage of mutual funds, insurance firms, QFII and other institutional investors is 17.20%, 1.13%, 2.26%, and 5.07%, respectively.

In an attempt to increase credibility in financial reporting, in November 1988 the MOF issued the CICPA. The size of auditing firms is positively related to audit quality (DeAngelo, 1981; Chen, et al., 2006); therefore, large auditing firms are expected to play an effective monitoring role in financial reporting[23]. The higher the quality of auditors (i.e., the larger the size of the auditing firm), the more effective they are at detecting earnings management (Balsam et al., 2003; Francis and Krishnan, 1999). Alternatively, a high quality auditor can decrease a firm's propensity to commit fraud (Firth et. al, 2006).

Research evidence on the quality of audit firms in China and their effectiveness in monitoring management is mixed. Fan and Wong (2005) find that Chinese firms with high agency costs are more likely to employ high quality auditors to mitigate the agency problems. DeFond, Wong, and Li (2000) illustrate that high quality auditors are more likely to issue qualified opinions in China. Gul et al. (2010) find that firms that appoint international big 4 auditors provide more firm-specific information than domestic non-big 4 auditors. Copley and Douthett (2002) suggest that audit fees are the important element in evaluating the demand for audit quality. Similarly, Defond et al. (2000) argue that audit fees may also impact auditor choice. Nevertheless, many Chinese listed firms do not disclose information on audit fees. Some researchers present evidence that the quality of audits has improved a lot during the past decade (Chen, Chen, and Su, 2001; DeFond et al., 2000; Yang, Tang, Kilgore, and Hong, 2001), yet substantial corporate scandals continue to be reported (Firth, Mo, and Wong, 2005). Firms with weaker internal corporate governance mechanisms are more likely to hire non-top 10

[23] This size information can be obtained from the CICPA website at http://www.cicpa.org.cn/Notice_tips/201107/W020110725577411675208.pdf. The top ten auditors are Price Waterhouse Coopers, Deloitte, Ernst &Young Hua Ming, KPMG, RSM China, Shu Lun Pan Certified Public Accountants Co. Ltd., Pan-China Certified Public Accountants Co. Ltd, ShineWing Certified Public Accountants, and Daxin Certified Public Accountants.

auditors (Lin and Liu, 2010). Based on the new Statement on Auditing Standards (SAS) No. 99 (AICPA, 2005), auditors are expected to be able to detect material misstatements and fraud. Similarly, the CSRC issues enforcement actions to sanction auditors when the CSRC believes that the auditors have failed to uncover detectable fraud. Therefore, auditor choices in Chinese market are associated with firms' internal corporate governance mechanisms.

2.2.2.3 Debt disciplines (bank monitoring)

Bank loans are a form of "inside" debt, based on both public information and the information gained from monitoring of clients (Fama, 1985). In order to mitigate the moral hazard problem, banks investigate and monitor borrowers before making decisions. This logic implicitly assumes that banks are more likely to lend funds to the highest quality borrowers. James (1987) finds that a borrowing firm's stock prices react positively to the announcement of bank loans. In contrast, Eckbo (1986) finds that there is no response, or slightly negative abnormal returns, when the public issuance of bonds or other securities is announced. This is likely due to the fact that "outside" debt (such as seasonal equity offerings and bond issues) reflects only public information. As such, bank loans convey more information to the markets than "outside" debt.

The Chinese stock market has grown rapidly, ranking eleventh in the world in terms of total market capitalisation at the end of 2002. This rapid growth has created problems in low working capital for Chinese listed firms, so the majority of these firms have raised additional capital through SEOs in the two years after the IPO (Lee and Xiao, 2004). Rights issues in China need to meet a set of stringent CSRC regulations, while the issuance of corporate bonds is still rare. Therefore, bank lending is a dominant external financial source. In 2000, total bank credit comprised 111% of gross domestic product (GDP; Allen et al., 2005). In 2004, the size of total bank credit was 1.38 times larger than the GDP, while the two stock exchanges accounted for 27.1% of GDP (Bailey, Huang, and Yang, 2011).

The disclosure of bank loan news is mandated in Chinese market. China's banking sector is mainly dominated by four large state-owned banks[24]. The government plays a role as both lender and borrower for SOEs (Tian and Estrin, 2007). Allen et al. (2005) find that the majority of bank loans are used by the state sector, however, a large amount of SOE loans are nonperforming loans that are issued due to political or other noneconomic reasons (Allen et al., 2005). Listed firms rarely pay back to the banks either interest or principal on these "policy loans". In China, government-owned banks and firms have soft budget constraints, as the government has the objectives of maintaining social stability and improving financial returns. Bailey et al. (2011) find that firms with bad financial performance and higher managerial expenses are more likely to require bank loans. Yet under such soft budget constraints, debts do not assist to curtail agency problems, but rather increase managerial discretion to waste resources and expropriate personal benefits.

The incidence of nonperforming loans and high overhead costs cause China's banking system to be inefficient (Allen et al., 2005). Nevertheless, reforms of the Chinese banking system have been undertaken in order to improve profitability and efficiency. The evolution of joint-equity banks, city commercial banks, policy banks and rural credit cooperatives has helped to alleviate the monopoly power of state-owned banks.

[24] Four state-owned commercial banks are; China Industrial and Commercial Bank, Bank of China, China Construction Bank, and Agricultural Bank of China.

In addition, the domestic financial sector was opened to foreigners under the World Trade Organization (WTO). Three of the big four state-owned banks went public in 2005 and 2006, with the intention of providing more transparency and good quality information to investors. The involvement of foreigners is expected to play a supervisory and monitoring role and attract additional capital for the banks (Bailey et al., 2011).

Nevertheless, China's banking system remains dominated by the government and accounts for the majority of funds in the financial system. Bailey et al. (2011) show that by June 2006, the four big state-owned banks still accounted for 50% of banking assets, while bank loans comprised 87% of the total funds raised by the Chinese non-financial sector. Furthermore, share ownership by foreigners is low, so the influence of foreigners is limited. State-owned banks receive their reserves from the government; therefore, the risk of bank default is minimal. Despite this, Bailey et al. (2011) find that Chinese loan recipient firm investors react unfavourably to the announcement of bank loans during 1999 to 2004. The negative effect is more severe for firms with frequent related-party transactions, suggesting that investors perceive considerable risk with respect to such firms. Investors recognise that bank loan announcements do not send a clear positive signal about Chinese loan recipient firms, especially when poorly performing firms obtain bank loans, borrowing firms acquire funds from the four big state-owned banks, borrowing firms have high state ownership, or borrowing firms have frequent related-party transactions. Hence, it appears that bank loans do not provide effective corporate governance for Chinese listed companies.

2.2.2.4 Takeover markets

Extensive literature in the US markets shows that the takeover market is an important external governance mechanism to maximise shareholder value. Denis and McConnell (2003) argue that an active takeover market can reduce agency problems between managers and shareholders. In general, if a weak firm is taken over by a strong firm (i.e., acquirers), the weak firm's management team tends to be fired. Therefore, managers have strong incentives to work in the best interests of the firm to secure their jobs. In contrast, the takeover markets have been found to provide only a weak governance function in China (Allen et al., 2005; Fan and Wong, 2005; Xu and Wang, 1999).

Grossman and Hart (1980) show that ownership structure affects a firm's incentives to engage in the takeover market. If a firm's ownership is well dispersed, the benefits gained from the takeover for any individual shareholder may not cover the monitoring costs incurred in monitoring the management. Prior to the reform of non-tradable shares, Xu and Wang (1999) present evidence that highly concentrated ownership and restricted trading on state shares and legal person shares cause the takeover market in China to be less active. Shleifer and Vishny (1986) emphasise that a certain degree of concentrated ownership is desirable for the takeover market to work efficiently. Liu (2006) states that the value of merger and acquisition (M&A) transactions in China is only a small percentage of GDP, and this market is still in its infancy. Jiang and Kim (2014) state that the takeover market is nascent in Chinese market, mainly due to the trading restrictions on SOEs and the concentrated ownership. In the current context of Chinese listed firms, most non-tradable shares have completed the split share structure reform (SSSR) and become tradable; this means that state shareholders are free to sell their SOEs to other firms. In addition, ownership concentration has gradually decreased, with the percentage of the largest shareholding declining from 45.48% in 1998 to 36.84% in 2012. Therefore, the takeover market may be more effective in disciplining managers in the future.

2.2.2.5 Product market competition

Product market competition is also an important external governance mechanism (Bai et al., 2004; Liu, 2006). Market competition can decrease agency costs between managers and shareholders. Many Chinese listed firms adopt the practices of 'benchmark competition", where firms compare their own performance with the average industry performance, or with the top-performing firm in the same industry. Managers will work efficiently to maximise firm value in order to prevent the financial failure of the firm (Bai et al., 2004). Bai et al. argue that increased market competition alleviates the risk of expropriation by controlling shareholders.

However, Liu (2006) argues that the capability of product market competition to discipline managers depends on the efficiency of the institutional framework. For example, it is argued that politically-connected managers need to work harder to maintain the reputation of the SOEs that employ them (Jiang and Kim, 2014). Conversely, Li and Zhang (2007) show that firms are able to engage in unethical behaviour to gain competitive advantages when the institutional infrastructure is dysfunctional.

2.2.3 Conclusion

China has an economic advantage in its lower costs of production, but the poor quality of Chinese listed firm's financial statements obstructs and decreases the capital inflows to the economy. Chinese internal corporate governance and external corporate governance has been improving and this may constrain the opportunistic self-serving behaviour of insiders. However, corporate governance in China remains weak. The dysfunction of corporate governance in China is mainly due to highly concentrated ownership, strong political intervention, the limited independence and expertise of supervisory boards and board of directors, the lack of active takeover markets, and ineffective institutional infrastructure. Most listed firms in China are partially privatised with highly concentrated ownership structures. Concentrated ownership provides incentives and discretionary power for controlling shareholders to use insider information to tunnel firm assets to the detriment of minority shareholders. In addition, the government's first priority is the pursuit of social welfare rather than the maximisation of firm value. In some circumstances, managers are able to waste resources and engage in earnings management when their incentives are not aligned with firm goals. Therefore, the poor-quality of financial reporting has even more negative implications in the Chinese context. Improvements in firm-level governance and the strengthening of institution-level investor protection need to be further advanced. The efficacy of high quality financial information motivates us, in the next section of this paper, to examine how the unique setting for corporate governance in China affects the disclosure of accounting information. To further enhance the understanding of managerial misconduct, this paper examines the nature of FFS by investigating a set of specific aspects of these opportunistic activities. Specifically, this investigation seeks to identify FFS using indicators from financial reporting, shed light on how weak governance affects the economic motivations of conducting FFS and tunnelling, and assess investors' responses to FFS enforcement announcements given changes in the legal environment.

2.3 The economics of FFS

China is the largest emerging market in the world, but is also associated with substantial levels of fraudulent activities. Throughout China's economic changes from a planned to a market-oriented economy, the legal environment and regulatory rules have been changing as well. Transition economies are considered to provide much scope for corporate fraud, with many companies taking advantage of new constraints to improve financial performance by releasing fraudulent information (Chen et al., 2006). For example, in 2002, Shenyang Lantian falsified bank statements and inflated profits by 38.7 million RMB [25]. In the Chinese context, managers may use related-party transactions to divert debt for their personal benefit. Related party transactions are common in China. Peng, Wei, and Yang (2011) report 1311 related-party transactions between 1998 and 2004 in the Chinese market. This opens the door to potential abuse, whereby controlling shareholders and managers of listed firms can use related party transactions to siphon funds. Jiang et al. (2010) find that controlling shareholders directly divert resources to their personal benefit through corporate borrowing. Bank loans do not provide an effective monitoring role for Chinese listed companies. Even struggling companies with poor financial performance may receive bank loans, as state-owned banks can experience pressure to maintain social stability or meet political mandates, with these agendas taking precedence over commercial concerns (Bailey et

[25] Available online at http://business.sohu.com/26/52/article207245226.shtml

al., 2011). In particular, Bailey et al. (2011) argue that some controlling shareholders even sold off heavily indebted listed firms after extracting assets or cash from these listed companies. Hence, the quality of financial information and the expropriation of controlling shareholders are the major concern in the Chinese market.

A number of recent studies focus on institutional factors to explain the quality of financial reports and agency problems (Firth et al., 2011, Jiang and Kim, 2004; Kim and Yi, 2009). As argued by Ball et al. (2003), financial reporting quality is influenced by market demands and political intervention in each country. Moreover, high transparency and low information asymmetries with foreign ownership are found in the previous literature (Kang and Stulz, 1997; Jiang and Kim, 2004; Kim and Yi, 2009). Institutional factors consist of country level attributes and firm level attributes. The former mainly comprises information transparency, the legal environment, economic conditions, and the regulatory framework, while the latter involves governance of firms and business conditions.

2.3.1 Country level attributes

2.3.1.1 Information transparency

The quality of information disclosure is purported to be relatively low in China. Many firms disclose false information to mislead investors' decision-making. Reviewing the Chinese stock markets, Aharony et al. (2000) argue that monitoring and surveillance from investors, regulatory agencies and auditors is insufficient. In addition, they find that Chinese listed companies lack transparency in financial disclosure, which provides managers with considerable discretion for managing earnings. Prior research finds that more firm specific information (high transparency) diminishes information asymmetries, reduces the cost of equity, and increases capital market valuation (Bhattacharya, Daouk, and Welker, 2003; Healy, Hutton, and Palepu, 1999). Healy et al. (1999) find that firms with expanded voluntary disclosure benefit from an increase in stock returns, institutional ownership, analyst following, and stock liquidity. Bhattacharya et al. (2003) find that low transparency is associated with an increase in the cost of equity and a decrease in trading activity. In China, the main motivation for managers to disclose less firm-specific information and misrepresent financial statements is to cover up the illegal behaviour of managers, disguise the poor performance of firms, and attract funds from investors.

2.3.1.2 Legal environment

Prior studies present evidence that country-level investor protection affects firm value (Claessens et al., 1999; La Porta et al., 1998; Lins, 2003). Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2008) find that, in most countries, the law's effectiveness in regulating the tunnelling problem is an important component of shareholder protection. Klapper and Love (2004) employ data from 25 emerging markets and find that firm-level governance and performance is lower in countries with weaker investor protection. Allen et al. (2005) employ the same measure as La Porta et al. (1998), and find that China's investor protection systems are less developed than most of the countries in La Porta et al.'s study. In Hong Kong, Cheung, Rau, and Stouraitis (2006) find that firms whose ultimate owners are in China are associated with more related party transactions, which provides direct evidence of the impact of the legal environment on expropriation by controlling shareholders from minority shareholders. Furthermore, Hong Kong firms whose ultimate owners are in China are more likely to have poor information disclosure and to violate the exchange's listing rules when engaging in related party transactions. In addition, Firth et al. (2011) find that, in China, firms located in less developed regions tend to have more fraudulent financial statements. Fan, Gillan, and Yu (2013) also find that low transparency (less firm-specific information) is related to poor provincial-level intellectual property rights (IPR) protection. Therefore, the above evidence suggests that the legal environment in China fails to sufficiently protect investors' interests. In addition, the investor protection tends to be weaker in less developed regions within China.

2.3.1.3 Economic conditions

Povel, Singh, and Winton (2007) find that the likelihood of committing fraud is greater during economic booms, even when investors are perfectly rational. Similarly, Wang, Winton, and Yu (2010) find that the incidence of corporate financial fraud is positively associated with investors' optimism about business conditions. This is based on the argument that when investors are optimistic about the state of the economy, their monitoring focus is on those firms with negative public information. Therefore, the management of such firms has large incentives to commit fraud to cover for poor performance. In addition, strict regulation such as the requirement for precise disclosure of firm information can improve the quality of financial information to some extent. Nevertheless, it may result in an increased incidence of fraud when the economy is prosperous, as investors' vigilance may be impaired (Povel et al., 2007). Therefore, managers of firms with poor prospects may conduct fraudulent activities to embellish publicly available information and attract investors during economic booms. However, the probability of committing fraud is lower when investors are extremely optimistic about business conditions because investors may fail to monitor negative public information, thereby allowing poorly performing firms to obtain funds from investors (Povel et al., 2007; Wang et al., 2010). In contrast, when investors are pessimistic about the economic state, the probability of conducting fraud is low because investors are circumspect about all reports, including those showing good performance. Strict scrutiny by investors decreases the incentives for managers to report FFS. Hence, relatively good economic conditions encourage financial fraud and misrepresentation by firms.

2.3.1.4 Regulatory framework

Along with the Chinese transition from a planned economy to a market economy, the accounting and financial disclosure system has experienced reforms and modifications (Chow, Chau, and Gray, 1995). A rapidly changing environment, regulatory pressures and financial needs are argued to provide opportunities for listed firms to engage in fraudulent activities (Baucus and Near, 1991; Szwajkowski, 1985). In particular, it is contended that Chinese accounting-based regulations and contracts provide incentives for managers to manipulate numbers (Chen and Yuan, 2004). Specifically, the CSRC modified a regulation in 1999 to require a three-year average ROE of at least 10%, as well as a minimum of 6% in each of the three years prior to a rights issue[26] (CSRC

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Date of Guideline	Profitability requirement
Nov. 17, 1993	Two years' profits
Sep. 30, 1994	Three years' profit and three-year average ROE≥10%
Jan. 24, 1996	ROE≥10% in each of previous three years
Mar. 17, 1999	Three-year average ROE≥10% and ROE≥6% in each of the previous three years

Notice No.17, 1996; CSRC Notice No.12, 1999)[27]. For example, some previous studies find that firms manipulate earnings to satisfy the minimum return on equity (ROE) requirements for rights issues in the Chinese market (Chen and Yuan, 2004; Liu and Lu, 2007; Jia, et al., 2009). In addition, firms may be motivated to manipulate profits to qualify for an IPO or to avoid receiving a special treatment (ST) designation (Jia et al., 2009; Liu and Lu, 2007). Furthermore, the CSRC documents that if a listed company sustains losses for three consecutive years, it will be temporarily delisted by the CSRC. Consequently, China's listed firms have a strong motivation to withhold reports of negative earnings and manage earnings in order to maintain the minimum ROE requirements.

Top managers may commit fraud when they face extra pressure to meet high standards. Firth, Rui, and Wu (2011) find that Chinese firms planning to make equity issues are more likely to manipulate financial statements. Moreover, managers may experience market pressures that give them further incentives to mislead investors. For example, abnormally large negative stock returns have been observed when growth firms have failed to meet investors' expectations (Skinner and Sloan, 2002). Rezaee (2005) shows that in the US, economic pressures and incentives to meet analysts' forecasts are the primary drivers that motivate managers to engage in fraudulent financial statements. Perols and Lougee (2011) find that fraudulent firms are more likely to meet or beat analyst forecasts and inflate revenue than non-fraudulent firms. In addition, they find that firms which managed earnings previously are more likely to commit fraudulent

May. 22, 2000	Three-year average ROE≥10%
Mar. 15, 2001	Three-year average ROE≥10%
July. 24, 2002	Three-year average ROE≥10% and ROE≥10% in each of the previous three years

[27] For companies in the energy, raw materials, infrastructure, agriculture, and high-tech sectors, the average ROE is reduced to 9%.

activities. In particular, managers are likely to commit accounting misstatements when firm performance is poor (Denis, Hanouna and Sarin, 2006). Hence, the evidence strongly suggests that market as well as regulatory pressures to achieve sustained good performance can motivate some Chinese managers to falsify their financial statements.

One of the fundamental purposes of corporate accounting is to facilitate the monitoring of managers. Since the disparity of ownership and control generates conflicts of interest between managers and shareholders, it is also costly and difficult for shareholders to monitor executives' behaviour. Therefore, boards of directors write executive compensation contracts based on stock prices or accounting earnings. Such compensation contracts not only produce incentives for executives to focus on maximising firm value (Baber, Janakiraman and Kang, 1996; Hartzell and Starks, 2003; Hillgeist, 2003; Mehran, 1995; Morgan and Poulsen, 2001; Yermack, 1995), but can also create incentives to report fraudulent accounting numbers (Denis et al., 1997; Gao and Shrieves, 2002; Hotchkiss and Strickland, 2003; Johnson, Ryan, and Tian, 2003). Hence, normal processes to reduce agency costs are not necessarily effective in eliminating these issues.

2.3.2 Firm level attributes

2.3.2.1 Corporate governance

Klapper and Love (2004) find that, in countries with weak legal environments, firms with better corporate governance practices can improve their financial performance and investor protection. Bai et al. (2004) present evidence that good corporate governance practices increase shareholders' returns and ensure that share prices reflect fundamental values. Yet, in the Chinese market, there is hardly any evidence of a relationship between share prices and fundamental values (Bai et al., 2004). Beasley, Carcello, Hermanson, and Lapides (2000) investigate the incidence of financial statement fraud in three volatile US industries[28] and find that fraudulent companies have weaker corporate governance than non-fraudulent companies. Cheung et al. (2006) find that Hong Kong firms with concentrated ownership are more likely to conduct related party transactions, and abnormal returns are negatively associated with the percentage of ownership by the controlling shareholder. In another study, Firth et al. (2007) present evidence that the percentage of shareholdings held by the controlling shareholder are negatively associated with accounting quality in the Chinese market. Hence, weaker corporate governance, such as shareholding concentration, is a hurdle to high quality financial reporting.

There are suggestions that state ownership can also be problematic. Firth, Rui, and Wu (2011) find that Chinese firms controlled by the central government are associated with more fraudulent financial statements. In addition, Cheung, Jing, Lu, Rau, and Stouraitis (2009) present evidence that Chinese firms engaged in tunnelling and propping have higher state ownership. Similarly, Hou and Moore (2010) find that state ownership in Chinese private companies is positively related to enforcement activities; nevertheless, greater state ownership in Chinese SOEs is associated with a lower incidence of fraud. This is due to the dual roles played by the state, state shareholders and regulators. The regulatory commission is independent of non-SOEs, though the state retains some state ownership. However, SOEs have strong political connections, which could disentangle them from fraud inspections (Hou and Moore, 2010).

[28] Technology, health care, and financial services.

There has been some research to ascertain the reasons why Chinese state ownership may lack a commercial orientation. Since state shareholders have strong job security in China, Cumming, Hou, and Lee (2011) argue that state shareholders are more sensitive to political, but not to profit-maximising, achievements. In addition, state agencies lack experience in monitoring and controlling public firms. The government would be more likely to appoint a CEO with less professional background who is more sympathetic to the political objectives of the government (Fan et al., 2007). The conflict of interest between shareholders and government bureaucrats can reduce firm value (Shleifer and Vishny, 1994, 1998). Bai, Li, Tao, and Wang (2000) find that SOEs maintain social welfare objectives rather than profit incentives, thereby contributing to poor financial performance during the privatisation period. Similarly, Fan et al. (2007) find that firms with politically connected CEOs tend to exhibit poor long-term financial performance. Furthermore, due to restricted trading in state shares before the split share structure reform (SSSR), executives' compensation in SOEs does not provide effective monitoring incentives for state shareholders to ensure the credibility of financial reports because their wealth is not sensitive to the stock price (Firth et al., 2006; Hou and Moore, 2010). Therefore, Chinese state shareholders have fewer incentives to improve the quality of financial statement.

Some studies have examined how the presence of external investors may affect management misbehaviour. Cheung et al. (2009) find that compared with tunnelling firms, propped up firms are more likely to be associated with foreign shareholders and to be cross-listed abroad. Furthermore, tunnelling firms tend to have less information disclosure for related party transactions than propped up firms. Cheung et al. (2009) find that cross-listing and foreign investors can help to mitigate the problem of expropriation. This suggests that strengthened accounting standards and the involvement of foreign investors in emerging markets can provide additional protection for investors.

Several studies have investigated the association between the characteristics of boards of directors and financial disclosure quality. Uzun, Szewczyk, and Varma (2004) find that the percentage of independent directors is negatively correlated with corporate fraud in the US market. This suggests that independent directors are able to exert a monitoring influence on the quality of accounting. Similarly, Dahya, Dimitrov, and McConnell (2008) investigate the relation between firm value and the percentage of independent directors in firms with a controlling shareholder across 22 countries. They present evidence of a positive relation between firm value and the percentage of independent directors, especially in countries with weak legal protection for investors. This suggests that a strong board can offset some value discount from the risk of expropriation by a controlling shareholder. Dahya et al. (2008) argue that there is a trade-off for dominant shareholders when choosing independent boards. The cost of a strong board for a dominant shareholder is the loss of the perquisites of control; the dominant shareholder is more likely to appoint independent directors when a firm intends to issue equity. In contrast, in China, Firth, Rui, and Wu (2011) find no association between FFS and the percentage of independent directors, or the board presence of a CFO. However, similar to the US findings of Agrawal and Chadha (2005), they find that Chinese firms with a higher percentage of directors with an accounting or financial background are less likely to be associated with FFS. Collectively, the effectiveness of independent directors in performing the monitoring role is not as strong as in the US.

Other board characteristics have also been employed to examine the relation between the effectiveness of the board and the informativeness of financial reports. Uzun et al. (2004) find that corporate fraud is more likely in firms whose CEO also holds the position of board chair. In addition, Karamanou and Vafeas (2005) suggest that US firms with larger boards are associated with a greater frequency of earnings forecast revisions. However, according to Jensen (1993), higher monitoring and internal costs lead to less efficiency on larger boards. Some scholars find that firm performance is improved more by smaller boards (Cheng, Evans III, and Nagarajan, 2008; Del Guercio, Dann, and Partch, 2003; Yermack, 1996). In contrast, no relation exists in China between the quality of financial reports and the dual position of CEO and board chair, or the size of the board (Chen et al., 2006; Firth et al., 2007). Hence, the duality of the chairman and the CEO, and the size of the board are not important board characteristics in explaining corporate fraud in China.

Some research has investigated the role of audit quality in the incidence of corporate financial fraud. Becker et al. (1998) witness a positive effect of audit quality on financial reports. Indeed, a high quality auditor can decrease a firm's propensity to commit fraud in the Chinese market (Firth et al., 2006). Lin and Liu (2010) report that high-quality auditors can signal good corporate governance and lower firms' costs of capital, however, firms that switch to low quality auditors could be motivated by earnings manipulation or tunnelling behaviour. They find that engaging a low quality auditor is more likely when firms have a large controlling shareholder and a CEO who also serves as chairman. Therefore, high quality auditors in China cannot effectively provide sufficient and authentic information for minority shareholders, as their impacts can be diminished by the weak corporate governance.

Finally, these findings suggest that board characteristics, ownership structures and audit quality are associated with the incidence of corporate financial fraud. Prior studies find that, for firms in weak investor protection countries, strong corporate governance can partially help to enhance the credibility and reliability of financial reporting.

2.3.2.2 Firm-level risk

The incentives to commit fraud are also associated with firm-level business risk attributes. Prior studies have found that weak financial conditions and poor financial performance provide incentives for management to misstate financial statements (Carcello and Palmrose, 1994; Dechow et al., 1996; Rezaee, 2005). Firth, Rui, and Wu (2011) find that Chinese firms with high debt levels are more likely to manipulate financial statements. In addition, Berkman, Cole, and Fu (2009) find that tunnelling is positively related to leverage. Similarly, Cheung et al. (2009) find that, when related party transactions are announced, high firm debt levels are negatively related to market returns. Berkman et al. (2009) find that more profitable firms and firms with higher growth prospects are less likely to issue related guarantees in China. Cheung et al. (2009) find that propped up firms are more likely to have poor operating performance prior to the announcement of related party transactions compared with tunnelling firms. Thus, motivational factors, such as the presence of poor financial performance and a high level of leverage, are positively associated with misconduct by management.

2.3.2.3 How to measure tunnelling

In practice, there are two main agency problems that cause a conflict of interest, and they arise between shareholders and managers, and between controlling shareholders and minority shareholders. La Porta et al. (1998) present that the central agency problem in large corporations is the expropriation by controlling shareholders at the expense of minority shareholders. However, the US market has high legal protection; hence the main conflict is between management and shareholders (Dahya et al., 2008). The legal protection for minority shareholders and creditors in China is regarded as one of the weakest in the world (Allen et al., 2005). Management shareholdings are also rare in China. The agency problem between controlling shareholders and minority shareholders predominates mainly in non-SOEs, while the predominant agency problem in SOEs is between shareholders and management (Liu and Tian, 2012). Though SOEs may also have a large ownership wedge between controlling shareholders and minority shareholders, the controlling power of controlling shareholders have already been decentralized to managers (Fan et al., 2005; Wang et al., 2015). In addition, state controlling shareholders are not as effective in monitoring managers relative to controlling shareholders in non-SOEs. Hence, the agency problem between shareholders and management is severe in Chinese SOEs.

A number of papers have examined the indirect relationship between the expropriation by the controlling shareholder and firm value. The cash flow holdings held by controlling shareholders are directly aligned with firm performance. Claessens et al. (1999) investigate data from nine East Asian countries and find that a high concentration of cash flow rights is positively related to market valuation. In addition, Claessens et al. (1999) present evidence that a larger wedge between cash flow rights and control rights exaggerates the decline of market valuation. Lins (2003) present similar results, but extends the study to 18 emerging markets, finding that firm values are inversely related to the wedge between a management group’s control rights and a management group’s cash flow rights. These effects are more pronounced in countries with less protection for investors. La Porta, Lopez-de-Silanes, Shleifer, and Vishny (2002) use the level of investor protection from 27 countries as an indirect measure for tunnelling and find that firm value is enhanced in countries with better protection of minority shareholders. La Porta et al. (2002) argue that since expropriation is costly, then a higher percentage of cash flow ownership to controlling ownership is associated with less expropriation. In particular, shares owned by Chinese controlling shareholders are normally non-tradable, which amplifies the wedge between cash flow rights and control rights.

Some studies directly examine the diversion of resources by controlling shareholders in the Asian markets. Cheung et al. (2006) uses related party transactions to measure expropriation in the Hong Kong market and finds that abnormal returns are negatively related to the percentage of shareholdings by the controlling shareholder. Similarly, Cheung et al. (2009) employ related party transactions in China to examine the incentives of controlling shareholders to conduct propping and tunneling, and find that the majority of firms suffer a reduction in firm value with an announcement of related party transactions. Likewise, Berkman et al. (2009) use loan guarantees to related parties to proxy for tunnelling in China. They argue that profitable firms and firms with higher growth prospects undertake less tunnelling because gains from tunnelling will be negated by deteriorating future cash flows to the firms. Bertrand, Mehta, and Mullainathan (2002) provide evidence of tunnelling through pyramid ownership in India, whereby controlling shareholders divert cash flows from firms in which they have low cash flow rights to firms in which they have high cash flow rights. In addition, Bertrand et al. (2002) find that the source of funds from which controlling shareholders tunnel large amounts of resources is the non-operating components of profit. These findings suggest that controlling shareholders are able to use different channels to divert resources for their personal benefit.

In general, there is a trade-off between the managerial entrenchment effect and the incentive alignment effect for controlling shareholders. Under the entrenchment perspective, the controlling shareholder has an incentive to engage in self-dealing at the expense of outside shareholders (Claessens, Djankov, Fan, and Lang, 2002; Fan and Wong, 2002; Morck, Yeung, and Yu, 2000). Additionally, Shleifer and Vishny (1989) find that entrenched managers can utilise relationship-specific contracts or investments, which reduce the probability of being replaced. Controlling shareholders can release incomplete information, or even false information, to cover fraudulent activities. In contrast, some studies find that ownership concentration can help to reduce agency costs between controlling and minority shareholders, as per the incentive alignment perspective (Grossman and Hart, 1980; Lins, 2003; Mitton, 2002; Shleifer and Vishny, 1986, 1997). As argued by Gomes (2000), controlling shareholders may not expropriate the interests of minority shareholders in order to avoid suffering substantial reputation costs. In the unique institutional environment of the Chinese market, the large divergence between cash-flow rights and voting rights leads to the entrenchment effect dominating the alignment effect. In a typical example, trading in the shares of ST Happiness was suspended after the largest shareholder (ST Happiness Group) pledged almost all the operating assets of ST Happiness (250 million RMB) against a related party loan, which the largest shareholder failed to repay.

2.3.3 Consequences of related party transactions and fraud

The costs associated with fraudulent activities are substantial and firms frequently need to restate their financial statements pursuant to the revelation of fraud. A listed company's financial information can have a great impact on the fluctuation of prices in the secondary market. From the debt holder's perspective, Graham, Li, and Qiu (2008) find that US restating firms suffered higher loan spreads, shorter bank loan maturities and more debt covenant restrictions than non-restating firms. Some studies find a significant loss in shareholder value and an increase in the cost of equity after the restatement (Anderson and Yohn, 2002; Hribar and Jenkins, 2004; Palmrose, Richardson, and Scholz, 2004). In the Hong Kong market, Cheung et al. (2006) report negative abnormal returns in both the ten days and one year after the announcement of related party transactions, which is often indicative of FFS. Additionally, Cheung et al. (2006) show that investors also heavily discount Hong Kong firms prior to the announcement of related party transactions. In the Chinese market, Chen et al. (2005) present evidence that fraudulent firms' stock prices are reduced on average by 1-2% after the announcement of enforcement actions. Moreover, Johnson, Xie, and Yi (2014) find that US firms suffer costly customer reputational sanctions after the detection of fraud, such as an increase of selling costs, leading to a decrease in operating performance. Therefore, firms involved in financial misconduct suffer reputational losses in respective of debt holders, equity holders and product markets.

2.3.4 Conclusion

Given the weak legal environment in China, the task of reforming and improving the legal infrastructure should be a major priority. In countries with weak legal infrastructure and pyramid ownership, the major agency problem is the risk of expropriation of minority shareholders by the controlling shareholders. While strong corporate governance cannot completely substitute for the absence of strong legal systems, good governance practices can improve investor protection and minority shareholder rights.

Overall, the literature shows that controlling shareholders in some Chinese firms are motivated to issue FFS, or conduct tunnelling, for several economic reasons. The review of the existing literature shows that the legal environment, ownership structure and governance mechanism are associated with corporate fraud in China. However, few studies directly link the financial statement with corporate fraud in the Chinese market. By using documented cases of fraud in Chinese firms' financial statements, Essay One seeks to identify FFS using publicly available balance sheet account information. In addition, the major agency problem in China is the risk of expropriation of minority shareholders by the controlling shareholders. Many studies present evidence of tunnelling by controlling shareholders. However, they do not explain the process of how the controlling shareholders divert resources in fraudulent firms. Understanding the tricks played by controlling shareholders can help investors to select good firms. The process of tunnelling in fraudulent firms will be addressed in Essay Two. Investors, creditors and customers will penalise firms when fraudulent activities are detected. Most research focuses on the short-term effects after the announcement of enforcement actions. However, there is a possibility that the market recognises the partial impact before the announcement. In addition, there is a set of regulatory rules released to curtail expropriation by controlling shareholders. It would be interesting to investigate whether the market reacts to the regulatory rules as well. The Third Essay will examine the market reaction before and after the announcement of enforcement actions and regulatory rules in both the short and long-term, respectively. The Third Essay will discuss the implications of the results.

CHATPER THREE: ESSAY ONE: DETECTING FRAUD IN CHINESE LISTED COMPANIES USING BALANCE SHEET ACCOUNTING VALUES

This chapter presents the first essay that examines the relationship between accounting values in Chinese listed companies' balance sheets and the exposure of their fraudulent activities. A brief overview of the study is presented in Section 3.1. Section 3.2 overviews the literature and develops the hypotheses. Section 3.3 describes the data and methodology used in this study. Section 3.4 discusses the empirical findings. Section 3.5 provides the robustness tests while Section 3.6 concludes. The chapter's appendices and references are presented in Appendix A and the Reference list sections, respectively.

Detecting fraud in Chinese listed companies using balance sheet accounting values

Abstract

This study investigates the links between accounting values in Chinese listed companies' balance sheets and the exposure of their fraudulent activities. This study proposes that every balance sheet account can potentially be used as a vehicle to manipulate financial statements. Analyses and findings in this study show that other receivables, inventories, prepaid expenses, employee benefits payables and long-term payables are important indicators of fraudulent financial statements. This study confirms that asset account manipulation is frequently carried out and cast doubt on earlier conclusions by researchers that inflation of liabilities is the most common source of financial statements' manipulation. Balance sheet values scaled by assets or sales effectively detect fraudulent financial statements and provide a useful fraud prediction tool for Chinese auditors, regulators and investors.

JEL classification: G30; G31

Keywords: Fraudulent Statements; Accounting Ratios; China

3.1 Introduction

This study investigates the role of accounting balance sheet values in detecting fraudulent financial statements. Weak capital market regulatory oversight and a lack of transparency in corporate governance and financial reporting practices foster opportunities for earnings management in the Asian market. The need for managers to exercise subjective judgement in financial reporting allows for earnings management opportunities that can lead to stock mispricing and the extraction of private benefits. Since corporate governance mechanisms are also very weak in China, the controlling shareholders have an incentive to commit accounting fraud to achieve corporate financial targets (such as SEO requirements), especially when executive compensation is related to financial performance (Denis et al., 2006). Hence, the distinct features of the Chinese financial system, combined with the rapidly changing environment, provide opportunities for controlling shareholders and managers of listed firms to engage in fraudulent activities (Baucus and Near, 1991).

Fraud is rife in China and many cases of fraud have been exposed recently in the Chinese stock markets (Jia, et al., 2009). With information that has become newly available, this study is among the first to forecast the incidence of fraud in Chinese listed firms by examining balance sheet accounts. The analysis is based on Chinese financial reporting that follows Chinese Generally Accepted Accounting Principles (GAAP), and differs from the requirements of international financial reporting standards (IFRSs).

The China Securities Regulatory Commission (CSRC) is the main regulator of securities markets in China. The CSRC has a practice of regular reviews as well as random inspections of companies (Chen et al., 2006). The CSRC also investigates cases of fraud and carries out enforcement action. The CSRC exposes the fraudulent behaviour of Chinese listed firms, but on a superficial level; rarely are full details disclosed to the public. For example, the Koyo Group was punished by the Shenzhen Stock Exchange (SZSE) and the CSRC in 2005 because Koyo Group concealed significant information, including a large amount of lending, illegal diversion of funds to controlling shareholders, and the identity of the true owner of the firm. Such cases raise questions for investors. For example, how did the Koyo Group manage to hide substantial economic transactions in its account balances? In 2007, two years after the fraudulent exposure by the CSRC, the details were finally made public. The Koyo Group was found to have fabricated a series of 'bank statements' and to have falsified 'prepaid expenses in-progress projects' in order to conceal its real operating activities, such as the significant loss of three high-tech projects of 1.4 billion RMB. [29] From 2000 to 2003, the Koyo Group inflated construction in-progress, other receivables, biochemical construction, fixed assets and management fees by a total of 169 million RMB.

Yet, from the information announced by the CSRC in 2005, it is difficult for market participants to identify the true extent of financial manipulation by the firm. Therefore, to assist the timely identification of fraudulent behaviour, this study proposes to use accounting values in balance sheets to detect the incidence of fraudulent financial statements (FFS).

To be able to do this is important because at present financial statements of Chinese firms are criticized by investors as having insufficient disclosure. The percentage of fraudulent financial statements is high, with the CSRC reporting that approximately 20%

[29] The information is available from Xinhua News (http://news.xinhuanet.com/stock/2007-02/14/content_5737234.htm).

of listed firms have committed serious fraud since the Chinese stock markets were established in the early 1990s (Sun and Zhang, 2006). As disclosed by the CSRC, 581 enforcement actions were taken against listed firms between 1994 and 2007 (Chen et al., 2006). Many researchers have successfully detected falsified financial statements, but much of the research has focused on the causes and consequences of such fraud in terms of corporate governance, in both China and developed countries (e.g., Agrawal and Chadha, 2005; Chen and Yuan, 2004; Jian and Wong, 2010; Liu and Lu, 2007). However, the emphasis of this study is not on corporate governance variables. Rather, this study finds evidence of corporate fraud by Chinese listed firms by identifying special relationships between balance sheet accounts.

This study contributes to the literature in several ways. First, all balance sheet accounts are used to identify FFS; this study develops a hand-collected database of CSRC enforcement actions relating to fraudulent activities by Chinese listed companies; specific balance sheet accounts are identified to predict each different type of financial statement violation; and through robustness tests this study shows that these relationships continue to hold. Hence, this study first hypothesises that every account in the balance sheet may be used as a vehicle for identifying fraudulent financial statements. The intuition is as follows. Top management has paramount influence within a firm (Luo and Hassan, 2009). In contrast to practices in developed countries, Chinese managers frequently possess total control over the accounting system. As a result, in China, management can hide its fraudulent behaviour in the accounts with less chance of being discovered.

Second, the hand-collection of a database of CSRC enforcement actions allows us to better understand the relationships between certain unique features of the Chinese market and Chinese managers' motivations for engaging in fraudulent activities. These unique features are: a high concentration of state ownership; the extremely low number of shares owned by insider managers and directors; the two-tier internal governance structure; a weak legal structure; deficient market control mechanisms; a lack of enforcement law; and an inefficient managerial labour market (Firth et al., 2007).

Third, much of the existing literature focuses on one particular aspect of corporate fraud (Agrawal and Chadha, 2005; Chen and Yuan, 2004; Jian and Wong, 2010). Chen et al. (2006) find that ownership and certain boardroom characteristics are related to the occurrence of corporate financial fraud. Chen and Yuan (2004) and Liu and Lu (2007) provide evidence that Chinese listed firms manage earnings to satisfy the return on equity (ROE) requirements for rights issue. Chen et al. (2009) find evidence that firms with concentrated ownership tunnel firm value by adopting higher dividend payouts. In contrast, this study identifies relationships between reported corporate fraud and firms' balance sheet accounts with a view to predict the incidence of different types of fraud. For example, related-party transactions between controlling firms and their affiliates are a frequent means of engaging in corporate fraud. Other violations involve untimely postponement or delay in the disclosure of financial information. This study finds patterns in balance sheet accounts in fraudulent firms that are associated with each type of fraudulent practice.

Fourth, this study substantiates the results by scaling the variables in the probit regressions using both assets and sales in order to model the multivariate relationships with fraud.

Results show evidence of a link between balance sheet accounting values and subsequent detection of FFS by the CSRC. Chinese firms tend to show higher ratios in many asset accounts, such as other receivables, other current assets and intangible assets. The tendency of other receivables is generally consistent with the behaviour predicted and observed in developed markets (Spathis et al., 2002); however, the other two accounts are not frequently examined. This study also sheds light on the previously identified relationship between leverage and fraud (Chen et al., 2006). This study finds similar results on leverage overall, but only in respect of short-term debt, accounts payable, employee benefits payable and long-term payable accounts. Notes payable does not show evidence of any association with FFS. Furthermore, the previous practices of standardizing accounting values by assets produce a spurious relationship between leverage and FFS. This study shows that the positive relationship of short-term debt with fraud is not confirmed when variables are scaled by sales.

This study also assesses the usefulness of the probit model as a classification tool. The model can make two types of error: classifying a firm as a non-fraudulent firm when it is a fraudulent firm (a Type I error); and classifying a firm as a fraudulent firm when it is a non-fraudulent firm (a Type II error). The prediction results show that correct predictions of fraudulent firms and non-fraudulent firms are above 56% for in-sample tests. In terms of out-of-sample tests, this study finds consistently correct predictions which are above 50% only in consecutive samples. This study also finds that, after applying the model (built from the sub-sample data) to the whole population (all listed Chinese firms), the correct prediction of non-fraudulent firms is above 80%. Thus, the evidence indicates that the investigation of balance sheet information is helpful towards the identification of FFS.

The remainder of this paper proceeds as follows. Section 3.2 reviews the literature on fraudulent activities and related theories. Section 3.3 describes the sample, data, and methods used in the study. Section 3.4 presents the empirical results and robustness check results are shown in Section 3.5. Section 3.6 concludes the paper with the implications of these results.

3.2 Literature Review and hypothesis development

Corporate fraud is usually categorized into two groups: financial reporting fraud (management fraud) and misappropriation of assets (employee fraud; Statement on Auditing Standards [SAS], No. 82). This research focuses on one form of management fraud, namely fraudulent financial statements. As defined in the SAS No. 82 of the American Institute of Certified Public Accountants, financial reporting fraud mainly refers to intentional misstatements by omission in financial statements (Rezaee, 2005).

Fraudulent financial statements have been prevalent in recent decades (e.g., Enron, WorldCom, Qwest) and auditors are increasingly under pressure to identify potential fraud. SAS 82 identifies some ‘red flag’ indicators of management fraud, such as “reluctance to provide information to auditors; management decisions being dominated by an individual or small group; a weak internal control environment; an excessive number of checking accounts; an excessive number of year-end transactions; [and] service contracts that result in no product; photocopied or missing documents” (Hancox, 2012, pp. 6-7). When this study examines the history of firms subject to enforcement action, this study may find that relevant information is buried among reported financial statements. The empirical question is how to detect and identify them in a timely manner to minimize the loss of minority shareholders’ funds.

Many researchers have conducted studies on the detection of FFS. The most frequently occurring fraudulent behaviour identified in balance sheets are overstatements of income (or assets) or understatements of expenses (or liabilities) (Bonner et al., 1998; Feroz et al., 1991; Spathis et al., 2002). Spathis et al. (2002) emphasize that fraudulent statements often overstate revenue before it is earned, overstate assets by understating allowances for receivables, or overstate the value of inventory, property, and other tangible assets. Beneish (1999a) finds that the three main techniques for manipulating profits are changing accounting methods, counterfeiting financial records, and recording expenses and revenues prematurely or fictitiously.

Previous empirical findings identify certain asset-related financial statement variables that are often manipulated by firms under investigation for fraud. These accounts include accounts receivable (Bonner et al., 1998), other receivables (Jiang et al., 2010) and allowance for doubtful accounts and inventory (Stice, 1991). Managers have more discretion in setting the values of the latter two accounts. Stice (1991) shows that there is generally a higher risk of error in an account if its value is derived from subjective judgement. When such accounts represent a relatively large portion of total assets, the percentage of FFS is found to increase.

Management may increase accounts receivable by recording sales prior to the period in which they are earned (Feroz et al., 1991; Simunic, 1980; Stice, 1991). They may also manipulate inventory levels (Simunic, 1980; Stice, 1991). For example, firms may manipulate the value of obsolete inventory to misstate the cost of goods sold. Spathis et al. (2002) employ financial ratios including receivables/sales, inventories/sales, and working capital/total assets and find that fraudulent firms have higher receivables and inventories but lower working capital (presumably through high current liabilities).

Simunic (1980) argues that auditing both receivables and inventories are complex tasks for auditors. These two variables require a forecast of future events, and are regarded as risky balance sheet components. Simunic (1980) also expects exposure to liabilities will be in proportion to size of receivables and inventories. In a sample of 58 US firms from 1982 to 1989, Feroz et al. (1991) find the incidence of misstated accounts of receivables and inventories to be 50% and 24%, respectively. Among non-listed companies, the respective percentages are 55% and 14%. In general, previous studies find that asset-related accounts requiring subjective judgement are associated with lower quality in financial statements.

Debt accounts have also been found to be a common source of FFS. Chen et al. (2006) reveal that fraudulent firms have greater financial leverage than matched firms. Spathis et al. (2002) find many firms in financial distress are more likely to issue FFS. Firms with higher leverage are more likely to violate debt covenants and less likely to gain additional capital (Fan et al., 2008). Therefore, managers have incentives to manipulate accounts by understating liabilities or overstating assets in order to meet certain debt covenants. When liabilities increase, the risk to equity owners and managers can be transferred to debt holders and the likelihood of FFS is increased (Dechow et al., 1996; Spathis et al., 2002).

The above analysis and results concerning financial ratios are generally consistent with managers' incentives to understate expenses or overstate revenues when a firm's profit is low. Beneish (1999a) finds that fraudulent firms have lower return on assets (ROA) and higher sales growth than matched firms before public disclosure. Spathis et al. (2002) employ gross profit/total assets, net profit/total assets, and net profit/sales and find that fraudulent firms have less profit than matched firms. The literature review is summarized in Table 3.1, which displays relevant research on financial variables and fraud investigation.

[Insert Table 3.1 Here]

Based upon the earlier literature, this study posits some of the results could be explained in terms of common accounting practice. It is generally observed that FFS are associated with lower profitability and that managers may have incentives to manipulate accounting records to increase apparent firm profits. In order to inflate apparent profits, either expenses must be understated or income must be overstated. It is also necessary to manipulate another account to satisfy the double entry accounting requirement. The corresponding entry could be either an increase in assets or decrease in liabilities. This may explain earlier reports of higher asset ratios, involving receivables (Stice, 1991), other receivables (Jiang et al., 2010), and inventories (Stice, 1991). It seems that firms have a tendency to choose current asset accounts instead of liability accounts in order to deliberately falsify profits. This may suggest that the use of current assets for account manipulation has less chance of being exposed. [30]

This study proposes another important element in the accounting ratio of a balance sheet when the total of asset-based account ratios is used with a restriction on the sum of equities and liabilities being one. In general, if fraudulent firms experience lower profits, they tend to have lower equity ratios. Because the sum of equity ratios and liability ratios is one, the lower equity ratios will always be accompanied by higher liability ratios. This is consistent with the earlier results that fraudulent firms are associated with higher financial leverage (Roychowdhury, 2006).

[30] It is possible that income statements and cash flow statements are also important indicators of FFS. However, the interest of this study is in the double entry requirement via the balance sheet.

Based upon the previous literature and current understanding, this study proposes that fraudulent manipulation of financial statements could arise in many different accounts with different companies and for different motivations. For example, in 1996 *Qiongminyuan* recorded fictitious profits of 540 million RMB and inflated the capital reserve by 6.57 billion RMB. Also in 1996, *Chengdu Hongguang* recorded a fictitious profit of 157 million RMB by fabricating sales, inflating inventory and manipulating other accounts. Between 1997 and 1999, *Macat Optics and Electronics* forged leasing contracts, and fictitious fixed assets of 90.74 million RMB. Also, *Macat Optics and Electronics* used counterfeit materials and products, forged export documents and applied other means of manipulation to yield 301.18 million RMB of fictitious revenue, 207.98 million RMB of fictitious costs, and 93.2 million RMB of fictitious profits. Most earlier studies focus on specific types of violations and limit their hypotheses to the manipulation of certain accounts. In contrast, this study involves a systematic examination that covers all the accounts in the balance sheet. Using this method, this study seeks to answer two major questions. First, which balance sheet variables are most frequently used to engage in FFS? Second, which particular balance sheet variables are used to perpetuate each type of fraud?

The following hypotheses are built on the premise that there are systematic relationships between the type of fraudulent behaviour and the choice of balance sheet account used. Double entry accounting rules imply that there will be higher asset account balances or lower liability account balances associated with a manipulated profit change. Accordingly, this study proposes the following hypothesis:

Hypothesis 1: Individual balance sheet account values for firms with FFS will be different from those in a matched sample of firms without FFS.

For different types of fraud, firms are motivated by different incentives; some relate to the firm's rights issuing (Chen and Yuan, 2004) and others relate to the managers' personal interests. According to the CSRC (1999), shareholders may 'prop up' a firm that is in danger of being delisted in order to avoid loss of private benefits and control of the firm. Wong and Jian (2003) investigate a sample of 131 listed material industries' firms and find that group-affiliated firms tend to manipulate earnings and tunnel firm value through related-party transactions. Consistent with this, Peng et al. (2010) find controlling shareholders are more likely to prop up firm value through related-party transactions when listed companies are in financial distress and tunnel firm value when firms are financially healthy. Similarly, Jian and Wong (2010) find that subsequent to propping up failing firms, controlling shareholders tunnel cash for their personal benefit. Liu and Lu (2007) find that controlling shareholders usually use related-party loan guarantees to tunnel firm value. However, controlling shareholders in Chinese listed firms also tunnel firm value through related-party corporate loans that represent on average approximately 8.1% of total assets (Jiang et al., 2010).

Nevertheless, the differences in types of fraud should be reflected in the accounts chosen for each particular violation. This study proposes that managers committing fraud will use different accounting transactions to hide their real intention or purposes. This leads to the second hypothesis:

Hypothesis 2: There exists a relationship between the type of fraud undertaken (e.g., violations) and the specific balance sheet accounts associated with that particular fraud.

Because of the possibility of different accounts being used for different types of fraud, this study argues that a comprehensive testing method is necessary. Most earlier studies focus on certain account ratios to find possible indicators of fraud (Chen et al., 2006; Firth, Mo, and Wong, 2005; Jiang et al., 2010). Restricting the analysis in this way may cause a missing variable problem in the regression equation. This study undertakes a more comprehensive approach to distinguish between fraudulent and non-fraudulent financial statements by including all balance sheet accounts as explanatory variables to avoid the missing variable bias.[31] This is particularly important for Chinese firms because of the special features of corporate governance in China. Regulatory pressures create certain financial restrictions for Chinese firms and this may stimulate fraudulent behaviour, such as smoothing earnings to improve financial performance, recover lost reputational capital or gain additional sources of funds (Szwajkowski, 1985). Chinese financial disclosure lacks transparency (Liu, 2006). This provides the opportunity for deception by managing earnings (Aharony et al., 2000). If managers are trying to deceive auditors and investors, they will choose to falsify those accounts that are most easily manipulated and/or have less chance of being detected. Therefore, it is important to investigate all balance sheet variables.

3.3 Sample and methodology

The sample comprises 656 unique cases of FFS by 313 listed Chinese firms (hereafter, fraudulent firms), reported between 1994 to 2011. This study also classifies the sample into two sub-samples. The first sub-sample includes FFS cases of firms with either one violation announcement or multiple violation announcements from non-consecutive

[31] To avoid the collinearity problem, factor analysis will be employed in the model.

years. The second sub-sample consists of FFS cases of firms with multiple violation announcements from consecutive years.[32] This study expects that the likelihood of detection of fraud by the CSRC will be greater for firms found to commit numerous violations over consecutive years. For the purpose of this study, "announcement year" is defined as the first year in which fraudulent reporting is exposed.

This study hand-collects the majority of the violations data by reading the descriptive information in Punishment Bulletins issued by the CSRC and the *Integrity of Files* websites maintained by the SHSE and SZSE. In addition, this study also collects some cases of FFS from the *Law Yearbook of China*, *Securities Times*, *Shanghai Securities Daily* and yearbooks produced by the two stock exchanges. This study also cross-checks the information gathered to the Wind Info Database (WIND) to enhance the integrity of the data. For some firms, fraudulent reporting is disclosed twice or more. For example, three violations are reported for *Hunan Henyang Jinli Technology*, and this study counts this as one firm and three FFS cases.

Prior to exclusions, a total of 734 cases of fraud across 369 firms are identified (see Panel A of Table 3.2). This study then excludes firms whose annual report information is not available and those firms that issue B-shares. In line with other studies, this study also excludes firms in the financial sector because their unique features cause their accounting ratios to be non-comparable with other sectors (Firth, Fung, and Rui, 2007). Following Beasley (1996), this study matches each fraudulent firm with a non-fraudulent firm. Matched firms must be in the same industry and of similar listing age and firm size (within 20 percent of the total assets of the related fraudulent firm) at the date of the fraudulent firm's exposure. This study also requires that the financial

[32] For example, firm 000409 received announcements in 1999 and 2004 respectively; this firm belongs to the non-consecutive sub-sample. Firm 000413 received announcements in 2006 and 2007 and this firm belongs to the consecutive sub-sample.

statement data for matching firms must be available for three years from one year prior to the fraud to one year after. For a firm that commits fraudulent behaviours in consecutive years, only one matched firm is chosen, based on the first fraud exposure. The sample firms' financial data are obtained from the China Stock market and Accounting Research (CSMAR) financial database. The above procedure yields a sample of 626 cases across 313 fraudulent firms.

Table 3.2 presents the sample exclusion procedure (Panel A), the distributions for the year (Panel B), industry (Panel C), punishment type (Panel D) and violation type (Panel E) pertaining to Chinese corporate fraudulent activities exposed for the sample under review. Panel B reveals that the number of fraud cases increased after 2001, peaked in 2005 and then gradually declined towards 2011. The pervasiveness of fraud is particularly evident when reviewed relative to all listed Chinese firms, peaking at 5.34% in 2001. Panel C reveals that the sectors with the highest proportions of firm violations are manufacturing with 55.27% and real estate with 11.82%. Panel D categorizes fraud cases according to the method of punishment over the time period in which the enforcement actions took place. On average, the most frequent method of punishment is public condemnation by the CSRC, which is 40.70%. The percentage of official warnings and internal criticism is also quite high, being 26.22% and 21.65%, respectively.

The violation types that describe the nature of the offences are used to identify the linkages between balance sheet account values and the exposure of fraud. The violation types are listed in Panel E of Table 3.2 and an example of each is provided in the Appendix A.1. The first seven offences in the list relate to related-party transactions (type1), concealment of significant contracts or events (type2), postponements/delays in disclosing information (type3), false statement[33] (type4), external loan guarantees (type5), and embezzlement by major shareholders (type6). Types 7, 8 and 9 all relate to fictitious reporting of profits (fictitious income or assets and fictitious expenses or liabilities). Many fraud announcements report multiple violations, so in total there are 1143 instances of violations among the 656 cases. The most frequent violations involve related-party transactions (type 1), concealment of significant contracts or events (type 2), postponements/delays in disclosure (type 3), false statement (type 4), and external loan guarantees (type 5).

[Insert Table 3.2 Here]

This study hypothesises that fraudulent firms can potentially manipulate any balance sheet account to accomplish their deception. Accordingly, to detect fraudulent firms from information contained in their balance sheets, this study takes the novel approach of including all balance sheet accounts as explanatory variables in the analysis. This is in contrast to previous studies, which use fewer selected variables from balance sheet accounts. This study expects that the balance sheet accounts of fraudulent firms will show some statistical differences relative to those of the matched firms. Variables names are defined according to their name in the balance sheet.

To allow for differences in firm size, each balance sheet variable is scaled by total assets. For example, rate1=receivable/total assets. This study also employs three other analyses: change rate ratios, deviation ratios and absolute deviation. Change rate ratios are calculated by taking account of previous year's account balance. For example, rate2 = {rate1/lag (rate1)} - 1. Roberts (1959) suggests employing both price levels and price

[33] False statement are falsified announcements made to the public, such as incorrect earnings forecast, concealing the real controller of the firm, etc.

changes to study stock-market “patterns” and financial analysis. Roberts (1959) argues that levels of stock prices can give a counterfeit appearance compared changes in stock prices. Brown and Goetzaman (1997) argue that fund-managers are likely to use “window-dressing” to overstate performance at the end of the period. Deviation ratios are calculated by subtracting the mean industry balance from each sample firm’s balance sheet account. For example, rate3= rate1 - mean(rate1). This study proposes that deviations can account for any industry economic structure (Tu and Yu, 2014; Waring, 1996). Statistically, deviation provides a good description of variability of each account that is less sensitive to the extreme account values (Cohen and Lea, 2004). The absolute deviation of account ratio is the absolute value of the deviation. The absolute deviation is a robust measure of dispersion, which deals with excessive sensitivity to the outliers.

To detect fraud using a balance sheet, this study employs two methods commonly adopted in the literature: univariate tests and probit/logit regression. This study has the advantage of having a relatively large sample of violation types, which makes it possible for us to identify specific relationships between balance sheet accounts and violations. The first method used is a T-test comparing the balance sheet accounts for the fraudulent and matched samples. The second method is a probit regression model to identify the relationships between the accounting values and fraudulent behaviours. The identified model is then used in an out-of-sample period to predict firms likely to commit fraud in the future.

In the probit regression, the dependent variable is the probability of fraud for firm i (equal to one if the firm is subject to an enforcement action and zero otherwise) and the main independent variables of interest are balance sheet account values, $\Sigma X_{i,j,\,t}$. There could also be some controlling variables of corporate governance ($\Sigma control_{\,i,k,\,t}$).

Probit Model:

Probability of ($Fraud_{i,\,t}$=1) = $F(\alpha + \sum_{j=1}^{n} \beta_j X_{i,j,t} + \ \sum_{k=1}^{k} \beta_k control_{i,k,t})$ *Equation 1*

F is the standard normal cumulative distribution function (CDF).

Where

Fraud= a dummy variable with a value of one when the firm is subject to an enforcement action and zero if it is a non-fraudulent matched firm;

$\Sigma X_{i,\,t}$= the explanatory variables of balance sheet account ratios;

Prior studies show that corporate governance variables are important elements to explore earnings quality and managerial manipulation (Beasley et al.; 1996; Chen et al., 2006; DeFond, Wong, and Li, 2000; Liu and Lu, 2007; Uzun, Szewczyk, and Varma, 2004). Consistent with previous studies, this study includes three groups of corporate governance variables as control variables in the probit model, pertaining to ownership structure, board of directors and other firm-level attributes.

In particular,

Govt= a dummy variable with a value of one if the government or a government-owned institution is the largest shareholder and a value of zero otherwise;

Tradable= proportion of shares owned by individual shareholders;

Herfindahl= a Herfindahl index that measures the concentration of shares held by the top ten shareholders, other than the controlling one;

Top= the proportion of shares held by the largest stockholder;

INED= the percentage of independent directors on the board;

Board= the number of directors on the board;

Dual= a dummy variable that takes the value of one if the company's CEO is also the chairman of the board and zero otherwise;

SBSIZE= the number of members on the supervisory board;

SBMEET= the number of meetings of the supervisory board in the calendar year;

CPA= a dummy variable coded one if the auditor was one of the 10 biggest auditors by market share and zero otherwise; [34]

ST= a dummy variable coded one if the firm experienced special treatment before the announcement of fraud and zero otherwise;

PT= a dummy variable coded one if the firm experienced particular transfer before the announcement of fraud and zero otherwise;

RET= annual stock return over risk-free rate.

The first group includes four control variables relating to ownership structure. This study obtains stockholding data from the WIND database and firms' annual reports.

[34] Top 10 Chinese CPA firms may vary each year; this study obtains the rank of Chinese CPA firms from the CICPA website (by market share of clients' assets) and code the 10 highest CPA firm as 'one' according to each year's ranking.

The dummy variable ‘Govt’ is equal to one if the government or a government-owned institution is the largest shareholder, and the coefficient is expected to be negative if government ownership reduces the probability of fraud (Xu and Wang, 1999). This study also collects the percentage of individual stock ownership (‘Tradable’), the proportion of shares held by the largest stockholder (‘Top’) and stock ownership concentration (‘Herfindahl’), which controls for the concentration of shares held by the top ten shareholders, except the controlling one. The higher the share ownership held by individuals, the greater the pressure exerted on companies to improve the quality of accounting information (Firth et al., 2007). This study expects that ‘Tradable’ will be negatively associated with the likelihood of fraud. There is a trade-off between the managerial entrenchment effect and the incentive alignment effect for the controlling shareholder. Under the entrenchment perspective, the controlling shareholder has an incentive to engage in self-dealing at the expense of outside shareholders (Claessens et al., 2002; Fan and Wong, 2002; Morck et al., 2000). However, the largest shareholder has no incentive to abuse a firm’s resources for personal gain when that shareholder’s interest highly aligns with the firm (Bai et al., 2004). Because of the mixed motives for accounting quality, this study does not specify expected signs for ‘Top’ and ‘Herfindahl’.

The second group comprises five variables that measure the characteristics and activities of the board of directors and the supervisory board. Data on boardroom characteristics are obtained from the CSMAR financial databases. ‘INED’ is the proportion of outside directors, and its coefficient is expected to be negative if the presence of outside directors provides monitoring roles that reduce the incidence of fraud (Chen et al., 2006; Uzun et al., 2004). Board size (‘Board’) may reduce the likelihood of fraud through better monitoring, in which case the coefficient will be negative (Karamanou and Vafeas, 2005). When the board chairman and CEO is the same person, then there are more opportunities for fraudulent behaviour, hence the coefficient for 'Dual' is expected to be positive. Two variables are used to measure monitoring-related characteristics of the supervisory board, including the number of members on the supervisory board ('SBSIZE'), and the number of meetings held by the supervisory board annually ('SBMEET'). Although prior evidence suggests that more monitoring should reduce the incidence of fraud (Xiao et al., 2004), in the Chinese context, the nature of related-party relationships may impair this oversight role. Hence, this study makes no prediction on the direction of the relationships of these variables with fraud.

For the third group, this study employs four control variables to reflect other firm-level attributes, including auditor quality (CPA), firms' special treatment (ST), particular transfer (PT) and annual stock return over the risk-free rate (RET). This study measures auditor quality using a dummy variable pertaining to the Chinese CPA audit firm's size and, if auditor quality reduces probability of fraud this study expects the coefficient on 'CPA' to be negative (DeFond et al., 2000). Jia et al. (2009) find that firms with special treatment status are more likely to manipulate profits. Therefore, this study expects a positive relation between 'ST' or "PT' status and the occurrence of fraud. If, as shown by Chen et al. (2006), the presence of poor financial performance is associated with fraudulent behaviours, then this study expects the coefficient for 'RET' to be negative.

In order to check the accuracy of the model, this study applies the following two measures using in-sample and out-of-sample data:

1) Fraud prediction ratio (r1): the ratio of the number of correctly predicted fraudulent firms to the total number of fraudulent firms.

2) Non-fraud prediction ratio (r0): the ratio of the number of correctly predicted non-fraudulent firms relative to the total number of non-fraudulent firms.

This study does so first without using controlling variables and secondly, for robustness, this study repeats the procedure including controlling variables. A ratio result of 50% implies a naïve prediction suggesting no predictive power for the model. Only when these ratios are above 50% can this study claim that the resulting model of balance sheet accounting variables is helpful in predicting FFS.

3.4 Empirical results

Table 3.3 compares the mean values of each balance sheet account scaled by total assets for fraudulent firms and matching firms. The statistical significance of differences between groups is tested using t-tests.

[Insert Table 3.3 Here]

Reviewing the full sample results in Panel A of Table 3.3, many significant differences are observed between the fraudulent and matching firm samples. Among the asset accounts and relative to the matching firms, fraudulent firms have higher other receivables (0.103/0.059=175%), other current accounts (83%) and intangible assets (31%), but lower cash and cash equivalents (21%), inventories (26%) and accounts receivable (46%). For the liability and equity accounts, fraudulent firms have higher short-term loans (52%), other short-term liabilities (49%), other non-current liabilities (167%), share capital (24%) and capital reserves (26%), but lower other stockholders' equity (34%). All of the above differences are significant at the 1% level.

Panels B and C of Table 3.3 present the mean balance sheet accounts scaled by total assets for fraudulent and matched firms without consecutive-year announcements and for those with at least two consecutive years' announcements, respectively. The direction of the results, the differences between the fraudulent and matched firms and the levels of significance are similar to the results reported in Panel A. However, it was conjectured that the differences between fraudulent and matched firms would be greater for the sub-sample with consecutive announcements due to their stronger pattern of on-going violations relative to the non-consecutive sub-sample. This pattern of differences is confirmed. For example, for cash and cash equivalents, the difference between fraudulent and matched firms is 6.1% for the consecutive sub-sample (Panel C), and 2.6% for the non-consecutive sub-sample (Panel B), with the latter being less than the half of the former.[35] In fact, for all accounts showing significant differences between fraudulent and matched firms, the differences in the non-consecutive sub-sample are approximately half those of the consecutive sub-sample.

Some of the above results are consistent with previous research. Stice (1991) shows that managers may manipulate accounts receivable upwards to improve a firm's performance. Other studies show different findings. Agrawal et al. (1999) and Roychowdhury (2006) report that fraudulent firms are associated with higher leverage. While results in this study also indicate higher leverage for fraudulent firms, the source is from short-term loans, employee benefits payable and long-term payable, and not

[35] This study finds similar results when this study compares the fraudulent and matching firms using the change rate, deviation and absolute deviation for each balance sheet account.

from notes payable or long-term debt. For some accounts such as inventories, the sign is in the opposite direction, indicating significantly lower inventory levels in fraudulent Chinese firms. Other significant variables in this paper are not well examined in the earlier studies, such as intangible assets, other short-term liabilities, other non-current liabilities, share capital, and capital reserves etc.[36] The above univariate test results have revealed some interesting patterns in the accounting ratios of fraudulent firms; this study next investigates if the same could be observed in multivariate tests.

Before undertaking the multivariate analysis, this study checks for the possible influence of multicollinearity between the account variables. In untabulated analyses, this study calculates the pairwise Pearson correlation coefficients for the variables in the analyses and find that some correlations among the liability variables and equity variables are moderate to high (from 0.5 to 0.8)[37], which indicates a potential mulitcollinearity problem. Next this study computes the variance inflation factors (VIFs) for the complete list of account variables; Panel A of Table 3.4a presents the VIF results. Five variables (receivables, other receivables, inventories, fixed assets and retained earnings) have VIFs close to or exceeding 10, which indicates that multicollinearity might be a problem.

[Insert Tables 3.4a and 3.4b Here]

With the help of factor analysis, for these high VIF variables this study identifies two or three independent factors that may be sufficient to describe the common variances. Through trial and error this study finds two variables are dominant in the multi-correlation conditions: Fixed assets and retained earnings. The remaining variables are

[36] The above observations and statistical results are made with mean values; the same conclusions are produced with median values. To save space this study omits the median values and comparisons in this report.
[37] The details can be requested from the authors.

correlated, mainly with these two variables. The OLS regression results of the two variables are shown in Table 3.4b. The adjusted R-squares for the regressions are 90.47% and 92.32%, respectively, which indicates the existence of a serious identification problem among these variables. To handle this this study replaces the original fixed assets and retained earnings values with the residual components of the two regressions and re-compute the VIFs; this time all VIFs are less than 3 (see Panel B of Table 3.4a), which signals that collinearity has been effectively removed. Nevertheless, collinearity is not necessarily a problem if the coefficients of the variables retain the same characteristics before and after employing the residuals from the fixed assets and retained earnings regressions. If they have the same characteristics, the original variables will be employed to explain fraudulent firms. Therefore one more test is carried out.

This study first runs probit regressions that test the relationships between balance sheet account values and the incidence of FFS. The results are shown in Panels A to D in Table 3.5a. In Panel A, the original fixed assets and retained earnings values are used; in Panel B the residual value is used for fixed assets; for Panel C the residual value is used for retained earnings; and in Panel D the residual values for both fixed assets and retained earnings are used. Comparing the results on the asset side of Panels A and B, it is apparent that the characteristics of five variables are changed after replacing the value of fixed assets with the residual. The cash account has the same sign, but becomes statistically insignificant; prepaid expenses, other current assets and intangible assets have the same signs, and become statistically significant (1%); other non-current assets change sign, but remain insignificant. Therefore, collinearity is a problem in this case.

Next, comparing the results on the liability and equity side of Panels A and C, it is observed that the characteristics of four variables change after replacing the value of retained earnings with the residual. Other short-term liabilities and long-term debt retain the same signs, but become insignificant; notes payable and share capital change signs and remain insignificant; and the statistical significance of other non-current liabilities increases (1%). Hence, collinearity is also a concern in this case.

In summary, to deal with the collinearity problem this study replaces the original values of fixed assets and retained earnings with their residuals before running any regressions. By using the residuals in the following regressions this study has effectively removed the collinearity problem, but not entirely solved the identification problem. This means some of the relationships depicted in the other variables could possibly be due to the correlated fixed assets or retained earnings. Nevertheless, given that this study is interested in developing a model for the purpose of detecting fraudulent firms, there is no difference between using the originals or the residuals, since R-squared is the same.[38]

After the above treatment for the collinearity issue this study runs probit regressions to test for the likelihood of fraud detection, the results of which are shown in Table 3.5. Panel D of Table 3.5a and Panel E and F of Table 3.5b provide in-sample results for the full, non-consecutive and consecutive sub-samples, respectively; Table 3.5c reports out-of-sample results separately. In the in-sample tests this study uses data from all 1994 to 2011 time periods and in the out-of-sample tests this study divides the entire period into two: estimation period (first twelve years) and prediction period (last six years). For both in-sample and out-of-sample regressions, the cash and cash equivalents differences

[38] The employment of residuals is a technique to remove high correlation without reducing any information.

are not statistically significant. This result means that after including other variables, the cash account is not important for distinguishing between fraudulent statements and those that are not fraudulent. This is not very surprising because of the complexity of cash transactions, which are related to all kinds of business activities. The majority of cash balances are banking deposits and deposits from other institutions. Manipulating cash accounts involves fabrication of cash receipts and disbursements, which is easier to identify and detect. As defined by Dechow, Ge, Larson, and Sloan (2011), a cash account is not one of the "soft" asset accounts that provide less flexibility to managers to record transactions. Prior studies find that management employs related-party transactions as a vehicle to siphon money instead of directly transferring it from a cash account (Jiang et al., 2011; Peng et al., 2010). But it is a surprise when this study finds in Panels D, E and F that, after controlling for the other account variables, the coefficients for retained earnings are positive and statistically significant, indicating that fraudulent firms have higher retained earnings than do matched firms. This result is the opposite to the earlier univariate results in Table 3.3, implying that the univariate negative component is absorbed by the other correlated variables and the residual for retained earnings is positively related to the likelihood of exposing fraudulent behaviour. Evidence of this conclusion is shown in Table 3.4b. Retained earnings is negatively related to all other liability and equity ratios, which means some of the other variables' relationships between lower liabilities and FFS may be attributed to lower retained earnings balances of fraudulent firms.

As expected, in Panels D, E and F of Table 3.5 this study observes consistently strong signals in many other variables as well. On the asset side, consistently significant positive coefficients for other receivables, prepaid expenses and intangible assets, and negative coefficients for inventories, indicate that enforcement action for FFS is more likely when firms report higher balances in the above asset accounts, and lower inventory balances. Most of the differences in the coefficients for other receivables, prepaid expenses, intangible assets and inventories in the sub-sample of consecutive firm announcements are more than double those of non-consecutive firms. Even more extreme differences are observed between firms that have and have not experienced enforcement actions for fraud on the liability side in the variables of short-term loans, employee benefits payable and long-term payable. For these variables the coefficients reported in the consecutive sub-sample are more than triple those of the non-consecutive sub-sample. Furthermore, taxes payable and other non-current liabilities have coefficients that are significantly negative for the non-consecutive sub-sample but significantly positive for the consecutive sub-sample. The deferred tax liabilities account is strongly significant and positive for the non-consecutive sub-sample but negative and slightly significant within the consecutive sub-sample. On the equity side, the only variable of note is other stockholders' equity; the consecutive sub-samples' coefficients are strongly significantly positive while the non-consecutive sub-samples' coefficients are strongly significantly negative. These findings suggest that firms that are subject to enforcement actions may falsify particular accounts, or that they share certain problems that are reflected in their financial statements.

Generally the probit model results confirm the conclusions from the univariate test that fraudulent firms show significant differences in many accounting ratios. These ratios could potentially be used as indicators to detect the existence of fraudulent behaviour. Moreover, the signals of the presence of FFS are systematically stronger for firms with consecutive fraud announcements than for those with non-consecutive announcements. The most important signals on the asset side are higher other receivables, higher prepaid expenses, and lower inventories, and on the liability side are higher short-term loans, employee benefits payable, and long-term payables. The finding of higher other receivable balances in firms targeted for enforcement action is consistent with previous findings (Feroz et al., 1991; Jiang et al., 2010; Simunic, 1980; Stice, 1991).[39] However, findings in this study show that lower inventories balances are associated with greater likelihood of fraudulent behaviour is opposite to the findings of research from developed countries (Feroz et al., 1991; Roychowdhury, 2006; Spathis et al., 2002). Reporting the value of inventories involves subjective judgments. For example, a company can choose not to record the true extent of its obsolete inventory. This study argues that Chinese fraudulent firms may manipulate inventories downwards to meet certain demands in Chinese market, such as selling goods to related parties to tunnel money (Cheung et al., 2009; Peng et al., 2011). Findings in this study also suggest that prepaid expenses may be used to misrepresent financial statements. On the liability side, previous research presents evidence of higher leverage associated with fraudulent firms (Chen et al., 2006). This study also finds a similar result; however, this study separates leverage into different accounts and finds lower liabilities in some accounts. This study argues that the different component accounts each have distinguishing features. For example, employee benefits payable and long-term payable are ‘soft’ accounts that allow managers to exercise subjective judgement in determining values relative to long-term debt (Dechow et al., 2011). Therefore, manipulators are more likely to misrepresent those accounts.

Tables 3.5a, 3.5b and 3.5c each provide information on the model’s predictive accuracy. The in-sample correct prediction rates are all greater than 50%; however the accuracy for the stronger cases of consecutive announcements is greater than 80%. A better test

[39] Receivable account includes ‘Other receivables’ and ‘Accounts receivable’. ‘Accounts receivable’ is relatively more difficult to manipulate than ‘other receivables’. ‘Accounts receivable’ needs physical goods. It is easier to identify fake documents. For the service sector enterprise, which sells services not goods, it is hard to manipulate ‘Accounts receivable’.

of predictability is achieved through out-of-sample tests, the results of which are shown in Table 3.5c. The model is based solely on data from the earlier estimation period (first twelve years) and the correct prediction rates are calculated using the balance sheet values from the later prediction period (last six years). Table 3.5c indicates that the prediction accuracy of non-fraudulent firms is well above a naïve 50% benchmark[40], ranging from 82% for the non-consecutive announcement sub-sample to 94% for the consecutive announcement sub-sample. Panels A and B in Table 3.5c also show that the misclassification of fraudulent firms is high.[41] Furthermore, the results from untabulated analyses applying the model to all available Chinese listed firms (2342 firms) indicates an impressive 81.17% correct prediction of no enforcement action for fraud and 57.37% correct prediction for fraudulent firms.[42] These results suggest that though the model can help to identify potential fraudulent firms, it is also associated with some error costs that are likely to be relevant to investors.

[Insert Table 3.5 Here]

Next this study tests whether or not the likelihood of finding different types of fraud has different relationships with balance sheet accounting ratios. As shown in Panel E of Table 3.2, there are many announcements of fraud cases that often involve multiple fraud violations. This study conducts separate cross-sectional probit analyses for each

[40] The model assumes that the cost of errors for fraud prediction (Type I error) and non-fraud prediction (Type II error) are the same. Also, in this study, fraudulent firms are oversampled relative to their true proportion in all Chinese listed companies. This may raise the question that the state-based sample contains more fraudulent firms than would a random sample. However, the probit model is a type of binary classification model, which uses the standard maximum likelihood procedure to estimate and ignore the state-based sample procedures (Beneish, 1999b). As a robustness check, this study also employs a weighted probit model to check the consistency of prediction. Results are reported in Appendix A.2.

[41] If this study uses the first seven years' sample (1994-2000) in the probit regression and use the last 11 years' sample (2001-2011) to calculate the correct prediction rates, the correct prediction rates for fraudulent firms are 65% and 67% in the full sample and the sub-sample with non-consecutive announcements, respectively.

[42] This study uses the sample regression results to predict all available A-share Chinese listed firms and find that correct prediction for fraudulent firms and non-fraudulent firms is 57.37% and 81.17%. The calculation process can be requested from the authors.

of the six most common types of violations. This study also aggregates some of the similar but less common offences from types 7 to 9 (type789) as one type for separate analysis. The empirical results are detailed in Table 3.6. The correct prediction rates range from 69% for violations relating to delays in disclosure and false statement (types 3 and 4) to 88% for non-fraud predictions involving the illegal possession of funds (type6). This indicates that the predictive power of the model improves when separate regressions are performed on separate sub-samples of the most common types of violations.

This study also finds that the likelihood of certain actions are typically associated with specific balance sheet accounts. Firms more likely to undertake frauds involving false statement (type4) or delays in disclosure (type5) tend to report lower cash and cash equivalents, whereas frauds involving illegal possession of funds (type6) report higher cash balances. Firms that are more likely to conduct fraud involving related-party transactions (type1) or false statements (type4) tend to have higher employee benefits payable and lower taxes payable balances. Discovery of violations involving related-party transactions (type1) or external loan guarantees (type5) is associated with higher deferred tax liabilities. Furthermore, firms likely to be exposed for frauds that involve concealing significant contracts/events (type2) or false statements (type4) report lower balances of other stockholders' equity. Across the different types of violations, the most consistent predictor of fraud is other receivables; its coefficient is significantly positive in all seven types. This implies that other receivables may be commonly used in the conduct of various types of fraud.[43] In this test this study finds that some accounting ratios are commonly associated with the exposure of many different types of fraud. But

[43] This finding is confirmed in robustness tests that scale the accounts using sales instead of total assets.

each type has its special indicator(s).[44] It would be interesting to explore the importance of each balance sheet account in a further study to improve the understanding of the relationships between each balance sheet account's attribute and the prediction of future occurrences of various types of fraud.

[Insert Table 3.6 Here]

In summary, this study observes some strong relationships between particular accounting ratios and FFS. The results consistently support Hypothesis 1 that some balance sheet account values are different for fraudulent firms relative to a matched control sample of non-fraudulent firms. As expected, these balance sheet relationships are stronger for firms that have been exposed as committing numerous violations over consecutive years, relative to those firms with either a single violation or multiple non-consecutive violations. These results suggest that the indicators developed in this study are effective and useful techniques to detect fraudulent financial statements in Chinese listed companies. This study also provides evidence that different types of violations are associated with particular balance sheet accounts, with some accounts being specifically associated with only one or two types. Hence, the results support the second hypothesis that there exists a relationship between the type of fraudulent activity and the specific accounts associated with that particular fraud.

[44] This study also examines the relationship between types of fraud and balance sheet accounting ratios by employing clean data. Clean data means this study includes only firms with a single type of fraudulent activity. This study finds similar results that different types of fraud may be associated with the manipulation of different accounts.

3.5 Robustness tests

The main results are from probit regressions to explain the exposure of fraudulent financial statements using balance sheet account values over a three-year period centred on the announcement year of the fraud. To capture how account balances change prior to and post the disclosure of enforcement actions, the first robustness check is carried out. This study runs annual regressions with three sub-samples in a one-year cross-section (year -1, year 0 and year +1 relative to the announcement year). The results are shown in Panel A of Table 3.7. From the table this study observes that the earlier significant relationships (in Table 3.5) are generally confirmed. Additionally, this study detects a clear pattern in the following significant variables: other receivables, prepaid expenses, other currents, short-term loans, deferred tax liabilities, and retained earnings. In these accounts the coefficient values are highest in the year prior to the fraud announcement (year -1), and decline progressively in the announcement year (year 0) and year following (year +1). These patterns are consistent with an interpretation that the announcement of fraud to the markets may influence firms to moderate their fraudulent behaviours and/or engage in some remediation activities that are reflected in a progressive normalisation of the balance sheet accounts.

[Insert Table 3.7 Here]

To test the robustness of the results, this study also performs a probit regression by scaling all account balances by sales instead of total assets, with the results reported in Panel B of Table 3.7.[45] The same significant relationships persist in many asset variables, as with the previous analysis. The likelihood of fraud enforcement

[45] This study also uses the same method to deal with the collinearity issue in the sales-based regressions. After comparison of four models, the original model without employing residuals is selected. In addition, the out-of-sample prediction is provided in Appendix A.3.

announcements is greater for firms that display higher other receivables, higher prepaid expenses and lower inventory balances. The previously identified pattern of asset account coefficients being double for firms with consecutive announcements relative to those with non-consecutive announcements is also confirmed. Similar relationships also persist on the liability side. The balance sheets of firms that are more likely to be exposed for fraud are characterised by higher employee benefits payable, long-term payables and deferred tax liabilities in the non-consecutive sub-sample, and lower deferred tax liabilities in the consecutive sub-sample. However, significant relationships for short-term loans and taxes payable are not observed in the sales-based regressions. Instead, the enforcement action for FFS is more likely when firms report lower share capital.

The differences between the asset-based and sales-based regressions may be explained by the possibility of spurious relationships resulting from scaling by assets. If this study considers two identical firms, H and L, which differ only by their profitability and retained earnings, then by virtue of the accounting identity, and if all else is equal, the firm with lower retained earnings (firm L) will also have lower total assets. In such a case, when the two firms' other liability and equity ratios are scaled by total assets, in percentage terms firm L's ratios will be higher than those of firm H. This study observes that fraudulent firms on average have lower profitability and lower retained earnings balances. For the purpose of the analysis, this means the regression coefficients for asset-based ratios could be positive even when the associated account balance is not related to the status of fraud. This bias exists in asset-based ratios and can be significantly reduced by scaling by sales rather than assets. A simple example to illustrate this point is provided in Appendix A.4. Nevertheless, sales are normally positively associated with total assets and the spurious relationship caused by total assets may indirectly impact on balance sheet accounts scaled by sales. Therefore, such bias may exist but more weakly than would be caused by scaling by total assets.

Using the above reasoning, the earlier finding from the asset-based regressions that firms likely to commit fraud have higher short-loans could be due to this spurious bias. Scaling the balance sheet values by assets has the advantage of enhancing the comparability of results with earlier studies that conclude that fraudulent firms have higher leverage (Chen et al., 2006; Firth et al., 2011). However, the findings from the sales-based regressions indicate that higher leverage in fraudulent firms is concentrated in accounts payable, employee benefits payable, long-term payable and other non-current liabilities. Firms with consecutive enforcement actions are associated with negative coefficients in long-term debt and deferred tax liabilities. Most prior studies use aggregate leverage to study the relationship with fraud. However, this study argues that different components of debt show different relationships, so different components of debt should be analysed separately.

The choice of scaling method also affects the findings with respect to retained earnings. While the asset-based regression results generally indicate positive coefficients for the retained earnings account, in the sales-based regression they are significantly negative. This result indicates that firms most likely to conduct financial fraud have lower retained earnings relative to each unit value of average sales, which is consistent with the earlier indication from the univariate analysis that fraudulent firms are associated with lower profitability (defined as net profit/sales). The first direct univariate comparison also indicates that fraud is associated with lower retained earnings. When many of those observations are correlated with liability accounts and other equity accounts that are removed from retained earnings, the coefficient for the residual of this variable takes a positive relationship (see results in Panels D, E and F of Table 3.5). This study cannot reach an easy conclusion in regard to this variable and more specific analysis is required on this relationship in a future study. The residual process helps to eliminate the high correlation issue; however, it does not solve the identification problem completely.[46]

Another alternative robustness test is employed to find which balance sheet accounts are important predictors in FFS. This study undertakes a thorough examination of every balance account to identify the signals of each variable in each model. For a Probit model, this study has the probability function as mentioned in Equation 1:

$\Pr(Y = 1|X) = F(Zj)$, where F is the standard normal CDF.

A measure of predictive power for a variable (or balance sheet account value in this case) is designed in terms of its contribution to the latent variable ($Z_j = \alpha + \sum_{j=1}^{n} \beta_i X_{i,j}$). This study starts from the calculation of the product of β_i and X_i for each variable i, and rank the products among each observation j. Therefore, each firm has total n variables in each year. The variables shown in the top/bottom two of the ranking are considered as the most important variables in the prediction of fraudulent (Y=1) /non-fraudulent (Y=0) activity. The important variables chosen in the process means that these variables can be used to predict fraudulent and non-fraudulent firms correctly (appearing in the Top-Two/Bottom-Two for the actual fraudulent/non-fraudulent firms). This study counts the number of times the variable is important in predicting correctly and divide

[46] For example, if a study has a regression equation: $Y=\alpha+\beta_1X_1+\beta_2X_2$, X_1 and X_2 are highly correlated but also have a specific relationship with Y. In such a situation, the study cannot just drop any independent variable. This practice causes omitted variable bias. The omitted variable problem will be associated with the bias of the estimated coefficients. Therefore, this study uses the residual of X_1 from X_2 to handle the high correlation problem. Then the regression equation becomes: $Y=\alpha+\beta_1ResidX_1+\beta_2X_2$. Hence, the effect on X_2 includes both its own specific features and characteristics it has in common with X_1.

by the total observations. Hence, the ratio of this important corrected prediction is shown in Table 3.8.

[Insert Table 3.8 Here]

For the full samples of fraudulent and matched firms, the asset-scaled and sales-scaled regressions yield similar results. Other receivables, other current assets, taxes payable, deferred tax liabilities, retained earnings and other stockholders' equity are important indicators for the propensity to engage in fraud, irrespective of the scaling method. For the matched firms, cash, inventories and other stockholder equity are consistently important predictors. For the non-consecutive sub-sample, the common indicators of fraudulent firms in both versions are accounts receivable, other receivables, other current assets, short-term loans, deferred tax liabilities, retained earnings and other stockholders' equity. The common indicators for matching firms are receivable, inventory and other stockholder equity. For the consecutive sub-sample, other receivables, taxes payable, long-term payable, other non-current liabilities and retained earnings are important indicators of fraudulent firms in both asset-scaled and sales-scaled versions. Furthermore, inventories, deferred taxes liabilities and retained earnings are important indicators of non-fraudulent firms in both versions. These patterns are consistent with the regression results in Table 3.5. However, the fixed asset account is an important indicator of fraudulent firms only in the assets-based version. In contrast, the intangible assets account is an indicator of fraudulent firms only in the sales-based version. Nevertheless, the main results remain unchanged, that a firm's propensity to commit fraud can be distinguished from that of non-fraudulent firms through the balance sheet accounts. These results are consistent with Hypothesis 1 that balance sheet values for firms with FFS are different from those in a matched sample of firms without FFS.

Past studies present evidence that the characteristics of corporate governance are associated with the quality of financial reporting (Beasley et al.; 1996; Chen et al., 2006; DeFond et al., 2000; Liu and Lu, 2007; Uzun et al., 2004). The distinct features of corporate governance in China provide opportunities for us to examine whether these characteristics are effective in mitigating FFS. Accordingly, the last robustness check is to incorporate corporate governance and firm-level variables in the probit regression. Several corporate governance variables are identified from past studies (Chen et al., 2006; Fan and Wong, 2005; Firth et al., 2007) and include the following: SOE, Tradable, Herfindahl, Top, INED, Board, Dual, SBSIZE, SBMEET, and CPA. The firm-level variables are ST, PT, and RET (Chen et al., 2006; Firth et al., 2007). The results from these tests are reported in Table 3.9.[47] In Panel A, the results are from a probit regression of all corporate governance variables on the propensity to conduct fraud. The significant variables from the Panel A regression, Board, Top, ST, PT and RET are then added as explanatory variables to the previous probit regression model of balance sheet account values on a corporate fraud indicator (results in Table 3.5). Table 3.9 displays the results when the account variables are scaled by total assets (Panel B), and by total sales (Panel C).

[Insert Table 3.9 Here]

The coefficients of firm's board size (Board) and firm's annual stock return (RET) have the expected negative signs. In Panel B and Panel C, Govt becomes statistically significant (at the 5% level), which is also consistent with some previous findings.

[47] This study computes the VIF for each variable find no VIF is greater than 3.

Claessens and Djankov (1998) and Omran (2002) report evidence that state ownership has a positive effect on firm performance, particularly in developing economies. In addition, state-controlled firms have more financial support and have less motivation for fraudulent activities (Xiao and Wang, 1999). The negative coefficient of Top can be explained by the incentive alignment effect.

The propensity of FFS is positively affected by whether firms suffered special treatment (particular transfer) before the announcement year (ST or PT). Most importantly, the results in Panels B and C are broadly consistent with the major results in Panels D, E and F of Table 3.5 and Panel B of Table 3.7. Hence other receivables, inventories, other current assets and long-term payables are consistently associated with a firms' propensity to commit fraud.

3.6 Conclusion

This study examines the issue of financial fraud in China's emerging market from a balance sheet statements perspective by employing a systematic approach. This study hypothesizes that each individual balance sheet account may be used as a vehicle for fraudulent financial statements. This study systematically investigates the probability of balance sheet accounts being associated with various types of fraud. Other receivables, inventories and total debt have been identified as determinants of fraud in prior research and those identifications are confirmed in this study. However, this study produces evidence in both assets-scaled and sales-scaled regressions that the balance sheet accounts of prepaid expenses, other current assets, employee benefit payable and deferred tax liabilities are also common vehicles for fraud in fraudulent financial statements.

The values of the regression coefficients for balance sheet accounts that show a significant relationship to fraudulent statements are greatest before the announcement year, become smaller in the announcement year and decline to an even smaller level the year after the announcement. The results of this study constitute an explanation that a public announcement of the exposure of a fraud is likely to have an impact on the firm committing the fraud and may trigger a partial reversal effect, visible through the financial statement accounts. This study also presents evidence that the coefficients of significant balance sheet accounts are greater for firms with consecutive announcements than for those with non-consecutive announcements. The pattern shown by these variables is consistent with the interpretation that firms with announcements over two or more consecutive years constitute more serious cases of fraud.

This study also finds that many other accounts are important indicators for different types of fraud; each type has its own important indicators. Generally the correct prediction rates are over 69% in related-party transactions (type1), concealing significant contracts or events (type2), delay in disclosure (type3), false statement (type4), external loan guarantees (type5), illegal possession of funds (type6) and common offences of fictitious accounts (type789), well above the naïve correct prediction of 50%. Importantly, the models may provide a helpful tool to detect fraudulent financial statements in all Chinese firms. The correct prediction rate of non-fraudulence in Chinese listed firms is 81%.

This study results also challenge some earlier studies such as Chen et al. (2006), Jiang et al. (2010), and Stice (1999) that focus on a limited number of accounting ratios.

There may be at least two methodological problems in such studies: the missing variables bias and spurious relationships. The missing variables bias refers to the failure to include other important variables in a regression model that explains the dependent variable. The problem arises when there is a correlation between a missing variable and FFS. It means that any estimated parameters are likely to be biased. Another problem is the possible existence of a spurious relationship when using asset-scaled explanatory variables. In studies with fraud as the dependent variable, the financial statement values used as explanatory variables in the regression analyses are typically scaled by total assets. This study shows that in such cases the findings of higher leverage for fraudulent firms could be misleading and may simply be a result of lower equity. This study shows that scaling balance sheet accounts by sales instead of assets reduces the magnitude of the problem. In addition, some previous studies employ the ratio of total debt to total assets and find evidence of higher leverage in fraudulent firms (Chen et al., 2006; Feroz et al. 1991; Spathis et al., 2002). However, by examining the components of debt separately, this study finds evidence of lower leverage in some liabilities accounts of fraudulent firms. Therefore, a thorough examination of all balance sheet account values and the adoption of two scaled methods (total asset and sales) are good vehicles to explore the relationship between balance sheet accounts and FFS.

The ownership and governance characteristics of firms have some impact on the propensity of FFS in this study. However, this study finds only board size and the percentage of shares held by the largest shareholder are negatively associated with FFS. The efficiency of corporate governance mechanisms in China is still a concern. The research results are of potential importance for both investors and regulators. For investors, the signals in balance sheet account information can assist them with controlling certain risks. The prediction model could be useful for the CSRC to develop an early warning system and improve the quality of financial reporting and curtail misconduct by the management. The CSRC might be interested to know the common fraud types and common malfeasant practices and to promulgate detailed guidelines for auditors and directors to ensure the accuracy of financial reporting.

One limitation of this study is the identification problem relating to the high correlation between independent variables in the prediction model. In addition, this study employs balance sheet information from listed Chinese firms. Therefore, it is not reliable to apply signals from listed companies to private companies. Another limitation is that this study assumes all listed companies are non-fraudulent except for those identified by the CSRC and two stock exchanges. There is a possibility that firms conduct fraudulent activities but have not been detected yet. The third limitation is that this study assumes the cost of errors of classifying fraudulent firms as matching firms (Type I error), and classifying matching firms as fraudulent firms are the same (Type II error). In fact, the classification error costs for the latter are normally smaller than those for the former.

CHAPTER FOUR: ESSAY TWO: CASH TUNNELLING IN CHINESE FIRMS

This chapter examines the factors and process associated with cash tunneling of fraudulent owner in the Chinese market. Section 4.1 provides an overview of the study. Section 4.2 develops the theoretical model used in this study. Review of literature in undertaken and hypotheses are developed in Section 4.3. Section 4.4 presents sample description and discusses the descriptive statistics. Section 4.5 presents the empirical results and discussion, while the final Section 4.6, presents concluding remarks. The chapter's appendices and references are presented in Appendix B and the Reference list sections, respectively.

Cash tunnelling in Chinese firms

Abstract

This study investigates how controlling shareholders extracted firm value from fraudulent Chinese companies during the period of 1998 to 2011, and in which circumstances controlling shareholders were more likely to conduct fraudulent activities, or tunnelling. One form of tunnelling involves the illegal transfer of a company's cash to the top owner's personal account, eventually becoming a loss to the company. The evidence presented in this study suggests that larger tunnelling losses are experienced by less profitable firms and when shareholdings held by controlling shareholders are low. This analysis supports the predictions that to effect a cash transfer, expropriating owners will choose an account that is not directly related to the firm's operating business in order to record a fictitious asset, with the account remaining in the company's books as long as possible. The feature of such an account is that it provides discretionary power for controlling shareholders, which makes it easier to manipulate without detection. Moreover, delays in the recognition of the fictitious asset as a loss in the company financial reports make it more difficult for auditors to detect tunnelling. This paper provides evidence on the factors and process surrounding a form of tunnelling, and sheds light on how these and the differential rights between controlling shareholders and minority shareholders can influence the likelihood of such tunnelling behaviour.

JEL classification: G30; G32; G38; K22

Keywords: Fraudulent Statements; Chinese listed firms

4.1 Introduction

Since 1978, China's political system has shifted from a planned economy to a market, internationally-oriented economy, yet political freedoms and the protection of property rights remain significantly lower when compared to other developed countries (Allen et al., 2005). One result of this situation has been the prevalence of corporate fraud scandals, which are reportedly greater in China than in developed countries and some developing countries (Sun and Zhang, 2006). According to the 2014 Corruption Perception Index of Transparency International, China's corruption among public officials and politicians is perceived as moderately worse, ranking 100 (1 = low corruption) out of 174 countries.[48] In addition, China's corporate governance is relatively weak and provides a limited monitoring role of self-serving behaviours by managers (Bai et al., 2004). Hence, the overall business environment may arguably provide opportunities for top managers to falsify accounting information or report fraudulent financial statements to give the illusion of better firm performance and accountability.

The purpose of accounting is to provide information for sound economic decision making. It should also facilitate the monitoring of managers, but conversely, manager's motivations and intentions can influence the quality of financial statements. To the extent that top managers exert influence over the reporting of accounting numbers, some situations may incentivise them to report deceptive accounting numbers. Examples of potential deceptions include improving firm financial performance, hiding firm risks or losses, and illegally transferring cash out of a business. Management can

[48] Information is available from https://www.transparency.org/cpi2014/results

potentially manipulate financial reports through tunnelling, insider trading, creative accounting and false statements (Rezaee, 2005).

In China, most listed firms are partially privatised, with highly concentrated ownership structures. The concentrated ownership provides discretionary power for controlling shareholders to divert proceeds from minority shareholders. Therefore, the main agency problem in Chinese firms is reported to be between dominant shareholders and minority shareholders (Liu and Lu, 2007). In addition, there are restrictions on the trading of controlling shares; therefore, the controller tends to obtain private benefits at the cost of minority shareholders and, unfortunately, minority shareholders do not have the power to restrict misconduct by controlling shareholders. Some evidence suggests that controlling shareholders fraudulently extract value from Chinese investors through high dividend payments (Chen, Jian, and Xu, 2009). Cheung et al. (2006) document that expropriation by controlling shareholders often leads to the losses suffered by outside investors. Moreover, public enforcement has limited authority over the accounting procedures of companies. As discussed in Chapter 2 (p.37), in 2002, the illegal diversion by controlling shareholders accounts for 96.67 billion RMB. Hence, the reported evidence suggests that the Chinese business environment provides controlling shareholders with opportunities for misappropriation of firm funds.

This research analyses and discusses how Chinese controlling owners extract cash out of companies and funnel these cash flows directly into their personal wealth stocks. In general, tunnelling has been employed to portray the behaviour of the expropriation by controlling shareholders from minority shareholders (La Porta et al., 2000). In a broader definition, tunnelling also includes resource transfers to managers (Atanasov, Black, and Ciccotello, 2011). There are three main types of tunnelling: Cash flow tunnelling;

asset tunnelling; and equity tunnelling. Cash flow tunnelling refers to the expropriation of some of the current year's cash flow, which will not immediately show in their fianncial statement. Asset tunnelling involves related-party transactions between affiliated firms, directly affecting future firm operations and profitability. Equity tunnelling is associated with a change in ownership claims at the expense of minority shareholders.

Regulatory authorities have made some attempts to control and prevent tunnelling behaviours. Atanasov, Black, Ciccotello, and Gyoshev (2010) present evidence that Bulgarian securities law changes in 2002 effectively limited equity tunnelling. Moreover, Atanasov et al. (2011) find that, although there are some anti-tunnelling laws and rules to curb tunnelling in the United States, some offenders still take advantage of gaps in the law to exploit private benefits. Similarly, in China, the CSRC also issues rules and regulations to restrict tunnelling behaviour by controlling shareholders. However, tunnelling substantially persists until the regulation issued on November 7, 2006, indicating that controlling shareholders will face employment termination and civil court prosecution if they fail to resolve outstanding misappropriations.

Asset tunnelling is generally the most frequently occurring form of tunnelling in many countries around the world. Due to the uniqueness of the Chinese market, there is a special case of cash flow tunnelling in China, defined as cash tunnelling in this study. In cash tunnelling, the tunnelled asset is in the form of cash (or equivalent to cash), such as when listed companies 'loan' funds to controlling shareholders via intercorporate loans (Jiang et al., 2010). These loans are essentially fictitious, so the wealth of general investors is eroded while the wealth of controlling owners is enhanced. The incidence of such crimes has rarely been reported in other countries, but it has been very popular in Chinese firms, especially over the study period from 1999-2006.

This study focuses on the process by which firms fraudulently tunnel firm value. This study investigates three questions: (1) Do firms fraudulently tunnel firm value by employing accounts that are not directly related to operating activities? (2) If firms do fraudulently tunnel firm value, what kind of process is employed to conduct tunnelling activities to avoid detection? (3) How are firms' corporate governance characteristics and financial performance associated with controlling shareholders' tunnelling behaviours? Jiang et al. (2010) study tunnelling by controlling shareholders who employ 'Other receivables' (OREC).[49] They find that controlling shareholders tunnel firm value through intercorporate loans reported as part of OREC, and that most of these intercorporate loans are directly traced to controlling shareholders or their affiliates. Most commonly there is no interest charged on these loans to controlling shareholders. However, even when firms do charge interest, controlling shareholders are unlikely to pay back either interest or principal (Jiang et al., 2010). The process of tunnelling behaviours is of interest when firms record fictitious assets to divert resources for financial reporting purposes, as the fabricated amount must be treated in later years in the form of other accounts. Understanding the nature of the process of tunnelling can help investors to identify some obvious tunnelling activities. Similarly, if controlling shareholders fraudulently tunnel firm value in the form of OREC, firms will report a loss equal to the tunnelled amount in the income statement in later years. This study expects these cost accounts to be relatively 'soft', as they are not directly associated with a firm's operating activities and have more connection with the 'other

[49] The CSRC issued a series of general requirements about reducing OREC balances from 2001 to 2006. However, due to its limited jurisdictional power, most of the regulations are ignored by controlling shareholders.

operating' part of the business.[50] Sometimes firms delay the reporting of tunnelling losses in some cost accounts, and one possible reason is that it reduces the likelihood of detection.

This study contributes to the literature in several important ways. First, this study groups asset accounts, cash flow accounts and cost accounts into solid and soft categories, according to whether these accounts are directly related to a firm's operating activities and whether these accounts provide more discretionary power for managers to manipulate. This study builds on work by Jiang et al. (2010) by providing evidence that controlling shareholders are more likely to tunnel firm value in the form of soft accounts, such as OREC and impairment losses. Second, this study distinguishes a two step process of manipulation or tunnelling, beginning with the initiation of an OREC loan and following up with the subsequent recognition of an impairment loss. Third, this study identifies the circumstances under which a firm is more likely to conduct tunnelling. This study finds that controlling shareholders are more likely to commit tunnelling acitivties when a firm's financial performance is poor. This result continues to hold when endogeneity issues between tunnelling and profitability are addressed. Fourth, this study provides evidence that the model to explain tunnelling behaviour remains valid when this study controls for earnings management behaviour. Finally, this study bases on the provision and reversal of OREC and finds that the maximum tunnelling loss in the sample of firms that have been found to egngage in fraud is 30,535.58 million RMB, which is 5.54 times their aggregate net income.

[50] The Chinese income statement categorises records into three parts: Operating; other operating; and non-operating. 'Solid' accounts are accounts that are directly related to a firm's operating activities, such as inventories. In contrast, 'soft' accounts, such as 'other receivables' are not directly relating to operating activities.

The remainder of the paper proceeds as follows. Section 4.2 develops the theoretical model. Section 4.3 reviews the literature and discusses related hypotheses. Section 4.4 describes the sample and data used in the study. Section 4.5 presents the empirical results and robustness results. Section 4.6 concludes the paper with the implications of these results.

4.2 Theoretical model

This section discusses the factors involved with fraudulent tunnelling, explains the intuition about the tunnelling process and suggests some expectations for further empirical tests. To construct a model concerning the influence of tunnelling activities, this study uses the tunnelling balances as a proxy of the severity of tunnelling by controlling shareholders.

In the first instance, this study develops a model to describe the relationship between top shareholders' financial incentives and tunnelling balances. This model assumes that the benefit to the tunnelling controlling shareholder is an immediate large amount of cash that is transferred from the publicly owned company to the tunneller's personal wealth portfolio. At the same time, the controlling shareholder will face a loss. The main consequence of the fraudulence is the damage to the tunneller's reputation and the firm's operational business. Therefore, controlling shareholders enjoy less cash flow benefits from the deteriorating financial performance. Hence, this study expects that potential cost from fraudulent tunnelling when detected is much higher than the private benefit from tunnelling. Otherwise, all controlling shareholders would choose to commit tunnelling activities if private benefits exceed potential costs.

In addition, Karpoff, Lee, and Martin (2008b) study the cost to firms of making fraudulent statements. They find that for each dollar the firm inflates the market value by, it will suffer this dollar as a loss plus an additional loss of \$3.08 after enforcement actions. The additional loss comprises of \$0.36 of legal penalties and \$2.71 of reputational costs. This means that firms suffer more when they get caught than the manipulation in the financial statements. In another propping and tunnelling study by Friedman, Johnson, and Mitton (2003), they assume that the cost of stealing is proportional to the square of the amount of stealing by the entrepreneur from retained earnings.[51] Therefore, this study assumes that potential costs when detected are much greater than the private benefits from fraudulent activities. In this following model, this study uses T to denote firm-i's tunnelling balance, α to denote the percentage of shareholdings by the top shareholder, Ω to denote the profitability (long-term growth opportunities) of the firm, A_0 to denote the firm's initial assets and k to denote the strength of financial and reputational punishment, which is the coefficient of tunnelling cost.

Then, this study follows Friedman et al. (2003) and assume that, if government agencies such as the CSRC find false accounting reports, the degree of financial and reputational punishment for the firm is proportional to the square of the tunnelling amount ($k\,T^2$).[52] This study focuses on the interests of the top owner or group of controlling owners, and analyse tunnelling behaviour. The top owner's equity value in the company is proportional to the company's profitability, which is $V_0=\alpha\ \Omega\ (A_0)$; he/she may further

[51] Specifically, Friedman et al. (2003) use I to denote retained earnings, S_t to denote the amount stolen from retained earnings by the entrepreneur and k to denote the strength of the legal system, which is less than I. The cost of stealing is ($S_t^2/2$k).
[52] The same conclusions could be made with the form of cost function with the property of increasing marginal cost; for simplification purposes, this study uses the quadratic form.

increase the value by tunnelling (or value expropriation from other smaller equity investors) T with a potential cost of being discovered and getting punished.

Therefore, the top owner's value is expressed as:

$V= \alpha\, \Omega\, (A_0\text{-}T) + T - k\, T^2$ *Equation 1*

So, the top owner's value V is equal to their proportionate equity interest net of the tunnelled amount, plus the amount tunnelled, less the financial and reputational penalty incurred for tunnelling.

Using Equation 1 this study gets the value maximising condition in terms of the extent of tunnelling,

$dV/dT= (1- \alpha\, \Omega) – 2kT = 0$. Therefore:

$T^* = (1- \alpha\, \Omega) /2k$ *Equation 2*

From the point of view of the top owner, the optimal tunnelled amount will be a function of the percentage of shareholdings by the top shareholder, the profitability of the firm and the coefficient of tunnelling cost. Hence, from Equation 2 this study can summarise the following predictions: (1) The higher the cost of tunnelling, the lower the optimal tunnelling balance; (2) the higher the profitability of the firm, the lower the optimal tunnelling balance; and (3) the higher the ownership of the top shareholders, the lower the optimal tunnelling balance.

Prior to testing predictions in the above model, an exploratory investigation of the tunnelling process is undertaken below following the double entry requirement of balance sheets.

Next, this study presents the conventional balance sheet accounting identity as follows:

Total assets = Total liabilities + Shareholders' Equity *Equation 3*

According to Dechow, Richardson, and Sloan (2008), this study can distinguish operating assets and liabilities from financial assets and liabilities. The most common financial assets are cash and short-term investments (Investments), and the most common financial liability is debt (Debt). Hence, if total assets are comprised of investments and operating assets, and if this study distinguishes debt from other operating liabilities, then the accounting identity can be re-expressed as:

Investments + Operating assets = Debt + Operating Liabilities + Shareholders' Equity

Equation 4

This study can summarise the difference between operating assets and operating liabilities as net operating assets (NOA), therefore the equation can be rearranged as:

Investments + NOA = Debt + Equity *Equation 5*

This study can describe the tunnelling behaviour as follows: Assets (or cash) of value T are expropriated (for example, as a related transaction) and may (or may not) be collected later by the firm as a lower value asset (T-L) (or cash), where L is the loss suffered by the firm. The net effect is that total equity value across the firm will fall by L. Revising Equation 5 above, the net effect should also reflect the decreased value of the available assets for reinvestment.

Investments + NOA - L = Debt + (Equity - L) *Equation 6*

Accordingly, this study can observe from the firm's financial accounts that tunnelling transactions can be processed as two separate steps: (1) Firms transfer out an asset T to the controlling owner; and (2) at a later date, collect another asset or return the same asset at a reduced value. There is no recognition of the accounting loss in the first step;

it is simply an asset transfer. For example, as depicted in the tables below, in the first step a firm transfers some cash with a value of T to a related company and records it as a related party loan involving a debit entry to OREC and a credit entry to the cash account. In the second step, the lending firm will recognise a loss L, such as an impairment loss, by debiting a cost account and will extinguish the loan by making an offsetting credit entry for the value of the loan T, in OREC. If there is any cash recovered from the loan, then that will also be reflected in the accounts by debiting the cash account by the amount recovered T-L, resulting in a reduced cash balance equal to the loss, L. If there is no value recovered from the loan, then L=T. The amount of the cash loss will be recognised in the income statement.

	Cash		Balance
	Debit	Credit	
Step 1:		T	-T
Step 2:	T-L		- L

	Non-operational Asset (e.g.,OREC)		Balance
	Debit	Credit	
Step 1:	T		T
Step 2:		T	0

	Impairment Loss		Balance
	Debit	Credit	
Step 2:	L		L

Although related party transactions are disclosed in the footnotes to the financial statements, evidence of tunnelling cannot be directly observed in the first step. It only becomes evident in the second step, when the failure to repay is obvious. These two steps could last more than one or two years, but will eventually result in the recognition of a loss in the income statement, which in turn reduces the value of equity. Based upon the above description, this study considers that the best way to measure tunnelling is to identify any exceptionally high losses over a long period. Accordingly, this study identifies any persistently high losses in income statements and uses these as an indication of the total tunnelled value over the period.

To recognise losses from tunnelling, firms conducting accounting fraud have a choice of which accounts to use. When considering this choice, the fraud cost is likely to be an important element. Firms may consider the degree of difficulty that regulators or auditors will experience in uncovering the fraud and the amount of the financial penalty and substantial reputational losses if detected. This study proposes that there are two ways to reduce such costs: One is to choose a soft account to record the transaction; and the second is to make two related accounting entries over a long period (greater than a year). This study also considers that some accounts are solid because their entries are closely tied to operational business activities that can be measured in quantitative units, such as inventories and account receivables. In contrast, some non-operational accounts, such as OREC and other payables, can be described as soft accounts because they are generally not closely aligned with operational business.

This study describes tunnelling as the transfer of a company's cash to the controlling shareholder's personal (or related business) account. At the time of the cash transfer, a firm participating in fraud must choose an account to create a fictitious asset to satisfy the double entry accounting requirement. At this stage, it is difficult for outsiders or auditors to ascertain whether or not the related party transaction is bona-fide or fraudulent. To reduce the chance that the fraud is detected, it is logical for the firm to recognise the loss at a date much later than the time of the cash transfer. However, the fictitious asset cannot remain there for too long, because it will eventually be clear that the whole, or part, of the value will never be returned. So, it will then become a loss in the financial report accompanied by an explanatory note of excuse.

In summary, the tunnelling process involves an expropriating owner who chooses some soft accounts to record a fictitious asset at the time of the cash transfer; the record will be maintained there for as long as possible. The soft feature of an account makes it easier to manipulate, and the early identification of fraud through the annual auditing process is made more difficult by the late recognition of a loss in the financial report.

Pursuant to the above analysis, this study next considers potentially appropriate variables to indicate the extent of tunnelling. The previous literature use the balance or ratio of OREC (or related-party transactions) as a proxy (Liu and Lu, 2007; Wong and Jian, 2003; Jiang et al., 2010). The theory in this study is consistent with using this measure as an appropriate indicator variable. However, the use of this variable alone as a proxy for the tunnelling balance has some limitations. The existing duration of the fictitious asset account could vary. If, for the same amount of tunnelling the duration of the fictitious account is two years instead of one, then a good proxy measure should provide a stronger signal. To allow for the potential for time differences in the duration of the fictitious asset, this study proposes to examine the accumulated cost over a longer period (at least three or more years) in each expense account in the income statement to identify possible tunnelling vehicles.

4.3 Hypothesis development

In this section, the study discusses the theories that models how controlling shareholders tunnel firm value, and how a firm's financial performance and corporate governance affect controlling shareholders in conducting tunnelling. As illustrated by Jiang et al. (2010), highly concentrated ownership structures, limited ownership benefits and weak enforcement mechanisms in China provide incentives for controlling shareholders to tunnel. While previous research has highlighted the role of the institutional background in motivating tunnelling behaviour, this study investigates the process and economic conditions that influence controlling shareholders' tunnelling behaviour. From this research aim, three testable hypotheses are derived, as described below.

4.3.1 Cost of fraudulent financial statements and propensity for fraud

The main consequence of the exposure of fraud in firms is the damage to their reputation. As revealed by Karpoff, Lee, and Martin (2008a), companies incur dramatic decreases in stock prices at all stages of the enforcement process. Alexander (1999) concludes that it is larger shareholders who experience huge losses when firm misconduct is detected and disclosed. Some researchers report that most managers lose their jobs when their firms are caught for misconduct (Arthaud-Day, Certo, Dalton, and Dalton, 2006; Desai, Hogan, and Wilkins, 2006; Feroz, Park, and Pastena, 1991), while Fich and Shivdasani (2007) find outside directors face a significant decline in their other board directorships.

When fraudulent activities are discovered, firms will suffer legal costs from punishment, reputation costs from decreases in stock price and/or the loss of customers. Firms need to take action to remedy the problems or recover their reputation after enforcement actions. Therefore, managers of firms that engage in fraudulent activities would choose an account and a method that minimises the potential tunnelling cost. This gives rise to the first hypothesis.

Hypothesis 1: The higher the cost of engaging in financial fraud, the lower the probability that the firm will be exposed for engaging in financial fraud.

Some accounts require subjective judgement, which increases the risk of financial statement manipulation. Specifically, accounts subject to assumptions and forecasts give more flexibility to managers to manipulate earnings (Summers and Sweeney, 1998). For example, receivables and inventory accounts involve estimates and assumptions. Moreover, these two accounts have direct links to revenue calculation and costs of goods sold, have an impact on gross profit, and are regarded as important performance indicators (Summers and Sweeney, 1998; Dechow et al., 2011). In addition to changes in receivables and inventory, Dechow et al. (2011) use the percentage of soft assets in the balance sheet to measure accrual quality, and they define soft assets as the percentage of assets that are neither cash nor property, plant and equipment (PP&E). They find that of all the variables, change in receivables and the percentage of soft assets have the greatest impact in explaining accrual quality. After controlling for industry effects, the regression coefficient on the percentage of soft assets remains significantly positive. Therefore, they conclude that soft assets are associated with lower accrual quality in the U.S. market.

For the Chinese market, this study hypothesises that firms found to engage in fraud are more likely to perpetuate the fraud by using more soft accounts and fewer solid accounts. Soft accounts increase the degree of difficulty for fraud detection by auditors and all soft accounts are equally possible vehicles for fraud. In contrast, this study argues cash and inventory accounts are solid accounts that cannot be conveniently used because they can be independently verified. The typical soft account in the Chinese market is OREC. While trade receivables are ordinary business transactions recorded as 'accounts receivable', related party loans outside of the normal course of business are recorded as OREC (Jiang et al., 2010).

Non-operating income is also a popular soft account employed by listed firms. Some studies find that Chinese firms inflate non-operating income to increase ROE to satisfy regulatory hurdles, such as rights offerings (Chen and Yuan, 2004; Haw et al., 2005). Similarly, Bertrand et al. (2002) present evidence that owners of Indian firms expropriate resources mainly via non-operating components of profit. From an accounting perspective, non-operating income is arguably easier to manipulate than operating income. In the income statement, the details of sources of operating income are more specific than those for non-operating income. In addition, operating income is related to firms' main business and involves more routine checking by auditors.[53] Therefore, if managers manipulate accounts in operating income, the probability of discovery is larger. Especially for industrial companies, manipulating operating income has been arguably associated with forged inventory receipts (that is, forged accounts receivable). Hence, accounts that are associated with operating income, such as inventory and accounts receivable are regarded as solid accounts in the Chinese market. Furthermore, managers are more likely to choose those soft accounts to tunnel and also use soft accounts as fictitious assets to transfer money and record losses. For example, if firms choose to record losses through operating expenses (solid accounts), it is more easily found out because operating expenses are related to main business costs and more easily detected by auditors. Taken together, the expectation is as in Hypothesis 1A.

Hypothesis 1A: Firms that have been reported to have engaged in fraud are more likely to employ soft accounts than solid accounts to conduct tunnelling fraud.

Controlling shareholders may be able to prevent detection of their fraudulent activities by using different accounts over several periods. For example, Torch Aut**o**mobile (Group) Co., Ltd committed fraudulent activities via fictitious sales and profit accounts over six years before being exposed.[54] Conducting fraudulent activities over a long time span may have several advantages. First, if controlling shareholders directly transfer the cash out of firms, there may be an immediate loss shown in the income statement. This would send a negative signal to both investors and auditors. If controlling shareholders borrow money from the firm through the OREC account, then they can tunnel funds from the firm, and the firm can recognise a loss later in the second stage. While it is

[53] As can be seen in any one listed company's income statement from the CSMAR, operating income involves 16 accounts; however, non-operating income involves only 1 record.
[54] For details see Appendix B.1.

reasonable for firms to record losses on bona fide loans in later periods, this practice also decreases the chance of detection of fictitious related party loans. In terms of the timing of losses, this study conjectures that the longer the period over which they are hidden, the lower the probability the auditors will detect the fraudulent activities. Accordingly, this study draws the following hypothesis.

Hypothesis 1B: Firms that have been reported to have engaged in fraud are more likely to conduct tunnelling activities and recognise the ensuing losses over a period of several years.

4.3.2 Profitability condition and propensity for fraud

Other research has considered how a firm's financial performance may influence its propensity to engage in fraudulent activities. Fan, Rui, and Zhao (2008) find that in countries with poor corporate governance, controlling shareholders are more likely to expropriate wealth from investors when firms are faced with low profitability. Furthermore, investor protection in China is very weak, leading firms to regard share capital as a 'free' source of finance (Chen, 2004). However, Chinese listed firms are temporarily delisted by the CSRC if they experience losses in three consecutive years. This can not only impose constraints on operations and trading, but can hamper efforts to raise capital. In China, rights offerings are the primary post-IPO source of additional financing (Chen, Lee, and Li, 2008). Accordingly, to meet CSRC criteria and avoid special treatment (ST) status some firms manipulate their profits (Jia, et al., 2009).[55]

[55] If a listed company experiences losses consecutively over two years, it will have a special treatment 'cap' imposed on it by the CSRC.

Consequently, the CSRC delisting regulations and the prospect of gaining needed capital from rights offerings give Chinese listed firms considerable motivation to withhold reports of negative earnings. In a similar vein, Dechow et al. (2011) study the earnings management misstatements of firms during the period of 1982 to 2005 and find that misstated firms issued securities before and during the manipulation years. Alternatively, to avoid the loss of private benefits and control, controlling shareholders may prop up earnings through related sales to meet earnings targets when they are in danger of being delisted or of losing the right to issue new shares (Jian and Wong, 2010).

Peng et al. (2011) find propping up and tunnelling are related. Propping up is used to prevent delisting, and so the market reacts favourably to an announcement of related-party transactions if firms face the risk of delisting. However, the reason for propping by dominant shareholders is so that they can continue to enjoy private benefits in the long run (Jian and Wong, 2010). In contrast, the market reacts unfavourably to the announcement of connected transactions if firms have obtained the right to issue shares (Peng et al., 2011). Presumably the market recognises the potential for dominant shareholders to extract personal benefits in such a circumstance.

Other research has shed further light on the circumstances that induce firms to commit fraud. Berkman et al. (2009) use ‘related-party loan guarantees’ to directly measure tunnelling; they find that firms that issue loan guarantees to related parties are more likely to have higher leverage and less profitability. Similarly, Denis et al. (2006) present evidence that the likelihood of managers conducting fraudulent activities is high when firm financial performance is poor. In addition, firms with poor financial performance are more motivated to conduct fraudulent activities, such as fraudulently increasing earnings and profitability to reduce the threat of job losses (Summers and Sweeney, 1998). Overall, it appears that when faced with low firm profitability, controlling shareholders and their firms can be motivated to engage in financial manipulation. The expectation is:

Hypothesis 2: The likelihood that a firm commits financial fraud is negatively related to its profitability.

Some empirical studies have considered how the quality of corporate governance and concentrated ownership are associated with fraud. Based on Becker's (1968) crime theory, the strength of the incentives to commit fraud is positively associated with personal financial incentives (Johnson, Ryan, and Tian, 2003). According to Summers and Sweeney (1998), firms facing financial difficulties are more likely to have a weak governance mechanism, which increases the probability of fraudulent activities. Poor governance is associated with poorer monitoring of fraudulent behaviour. Chinese markets have the unique characteristics of high ownership concentration and weak legal minority shareholder protection. Controlling shareholders in companies with concentrated ownership can have large amounts of power and incentives to tunnel. Bertrand et al. (2002) provide evidence that owners expropriate resources from firms in which their cash flow ownership is lower, to firms in which their cash flow ownership is higher. Therefore, controlling shareholders have stronger motivations to defraud when they believe the private benefits are high, which leads to the next hypothesis:

Hypothesis 3: Firms are more likely to engage in financial fraud when top shareholders have a lower percentage of ownership and when firms have weak corporate governance.

4.4 Research design

4.4.1 Sample description

This study undertakes a thorough examination of the CSRC and stock exchange announcements from 1994 to 2011 to identify firms that have been reported to have engaged in fraud (i.e., fraudulent firms).[56] From this, this study identifies a total of 733 cases of fraud involving 369 firms[57]. This study excludes firms in the finance and financial services industries and firms issuing B-shares because they are subject to different regulatory environments. To be included in the sample, a company must also have publicly available annual financial data. After the above exclusions, this study is left with a sample of 656 unique cases of fraud committed by 313 Chinese public companies listed on the Shanghai and Shenzhen stock exchanges during the period of 1994-2011. The characteristics and analyses of these cases are summarised in Table 4.1.

Panel A shows the number of fraudulent cases and fraudulent firms in each year. For example, in 2005 there are disclosures of 95 cases, involving 64 firms; these 95 cases represent 14.48% of all fraudulent cases, and these 64 firms represent 11.81% of all fraudulent firms and 4.63% of all listed firms in 2005. On average, about 2.27% of listed firms are reported to have committed fraud each year. A fraud index[58] is calculated to measure the tendency of fraud disclosure in each year, and results from this show that fraud cases are over-represented in the study period from 2001 to 2006. This result coincides with weaker monitoring and enforcement before 2007. According

[56] The punishment bulletins issued by the CSRC and the Integrity of Files websites maintained by the SHSE and SZSE are available from
http://www.csrc.gov.cn/pub/zjhpublic/index.htm?channel=3300/3313 ;
http://www.sse.com.cn/disclosure/listedinfo/credibility/condemn/ and
http://www.szse.cn/main/disclosure/bulliten/cxda/cfcfjl/, respectively.
[57] This study provides the enforcement action process followed by the CSRC in Appendix B.2.
[58] The explanation and calculation of fraud index is provided in Table 4.1.

to Jia et al. (2009), “on January 30, 2007, the CSRC issued its Rules of Listed Firm Information Disclosure to delineate the detailed Fraud and Corporate Governance in China 563 requirements for company prospectuses, regular reports, and temporary reports, among other types of documents” (pp.4-5). In addition, this study uses Pearson’s chi-square test and finds that fraudulent firms’ yearly distribution is different from listed firms’ yearly distribution.[59]

Panel B provides the number of fraudulent cases and fraudulent firms in each industry. There are 333 cases in the manufacturing sector, constituting approximately 50.76% of the fraud cases. These involve 282 firms, or about 52.03% of the sample firms in the manufacturing industry. This study uses a fraud index to measure the tendency of fraud disclosure within each industry. For example, the fraud index in real estate is 122.41%. If the percentage of fraudulent firms in an industry is higher than the percentage of listed firms in this industry, then the listed firms in this industry have a higher incidence of fraud disclosure and a higher fraud index value. From Panel B, this study finds that fraudulent firms are over-represented in the five industries of farming, information technology, real estate, social service and conglomerates. Also, this study employs Pearson’s chi-square test to examine the consistency between the industry distributions of fraudulent firms and listed firms. This study finds these two distributions are significantly different.[60]

Panel C shows the frequency distribution for punishment of fraudulent firms. Sixty-four firms received some form of punishment twice, representing 20.45% of all fraudulent firms. On average, more than 50% of fraudulent firms received punishments on more than one occasion. Panel D presents information on the size of fraudulent firms. To

[59] χ^2=225.55, df =17, P<0.0001.
[60] χ^2=151.26, df =11, P<0.0001.

calculate size deciles, this study sorts firms into ten deciles based on their equity capitalisation in each fiscal year. This study then determines the decile rankings of fraudulent firms in the first year that fraud is detected. The results indicate that only 2.02% of the firms that manipulate their earnings are from the largest size decile (decile 10), while 27.8% of fraudulent firms are small (decile 1). The results in bold identify that the smaller size deciles are over represented in the fraudulent-firm population.

Panel E of Table 4.1 reports the provincial distribution of both fraudulent cases and fraudulent firms. For example, during the period of this study, 68 enforcement actions (34 firms) were made against firms located in Guangdong and this represents about 10.37% (10.83%) of the fraud cases (all fraudulent firms) in that province. This study includes a market development score (MINDEX)[61] to denote the degree of regional development. The province with the greatest incidence of fraud announcements is Guangdong, at a ratio of 9.97% of fraud firms in this province. It is considered to be a relatively well-developed province, as its MINDEX is the second highest. However, there are no other obvious patterns in panel E. For example, Zhejiang is a well-developed province and has a ratio of fraud firms, at 7.17%. Gansu has a development score of 3.95, but a high ratio of fraud firms of 36%. Yuannan, a less developed province, which has a lower ratio of fraud firms at 3.45%. In addition, this study employs Pearson's chi-square test and finds that the provincial distributions of fraudulent firms are different from the provincial distributions of listed firms.

[Insert Panels A, B, C, D and E of Table 4.1 Here]

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[61] According to Fan and Wang (2003), MINDEX is a comprehensive index to capture the regional market development using the following aspects: (1) The relationship between government and markets, such as the role of markets in allocating resources and enterprises' burdens in addition to normal taxes; (2) the development of non-state business, such as the ratio of industrial output by the private sector to total industrial outputs; (3) the development of product markets, such as regional trade barriers; (4) the development of factor markets such as FDI and mobility of labour; and (5) the development of market intermediaries and the legal environment, such as the protection of property rights.

4.4.2 Control firms

This study follows previous research and use control firms as a benchmark when evaluating the key factors associated with tunnelling behaviours in fraudulent firms (Agrawal and Chadha, 2005, Chen et al., 2006 and Firth et al., 2011). Following Beasley (1996), matching firms are selected by the similarity of total assets, the same industry[62] and the same available study period.

4.4.3 Identification of accounts related to tunnelling

Following on from Hypothesis 1, this study expects that firms engaged in tunnelling are more likely to use soft accounts in order to avoid detection by auditors and other monitoring bodies. Accordingly, this study examines other receivables, short-term loans and employee benefits payable, firstly, from a calendar year perspective, and secondly, using event years. It may be that the announcement of fraudulent activities has some special effects on tunnelling; hence this study redrafts the graphs using event years in Appendix B.3.

4.4.3.1 Soft accounts

If Hypothesis 1 is true, then this study expects to find that firms engaging in fraudulent activities have more soft account balances than matching firms. Accordingly, in Figure 4.1 this study graphs the annual soft account balances of OREC, short-term loans and

[62] According to the CSMAR database, this study categorises firms into 12 industries, which are manufacturing, real estate, information technology, wholesale and retail trade, farming, forestry and animal husbandry and fishery, social services, utilities, construction, transportation and warehousing, mining, communication and cultural industry, and conglomerates.

employee benefits payable for the samples of fraudulent and matching firms. As can be seen from Figure 4.1(a), in 1994 75% of fraudulent firms had higher OREC than matching firms; with the percentage increasing from 58.33% in 1997 to 78.01% in 2005. Following the 2006 introduction of CSRC regulations on OREC, the ratio starts to decrease. However, the percentage remains higher than the matching firms until 2009. Next, Figure 4.1(b) shows the amount of OREC in million RMB for each sample. It is clear that fraudulent firms have higher balances of OREC than matching firms between 1993 and 2008. At its peak in 2006, the amount of OREC for the fraudulent sample was 2.4 times more than the matching sample. After the 2006 introduction of the CSRC regulation, the balances in the fraudulent sample decrease dramatically, declining to the same level as the matching sample by 2008.

From Figure 4.1(d), it is evident that greater than 50% of fraudulent firms have higher short-term loan balances than matching firms. According to Figure 4.1(e), on average, fraudulent firms extended a greater value of short-term loans relative to matching firms during the period of 1998 to 2006. After 2006, the value of short-term loans is similar in both samples. Figure 4.1(g) shows that more than 50% of fraudulent firms had higher employee benefits payable between 1996 and 2009, except in 2001. Moreover, from Figure 4.1(h), fraudulent firms had higher balances of employee benefits payable from 1996 to 2004. Additionally, Figure 4.1(c), Figure 4.1(f) and Figure 4.1(i) depict the patterns of median value of above three accounts (other receivables, short-term loans and employee benefits payable), which are similar to those in mean values.

[Insert Figure 4.1 Here]

4.4.3.2 Solid accounts

If Hypothesis 1 is true, then this study expects to find that firms involved with fraud are indifferent from or less than matching firms in solid account balances. Accordingly, in Figure 4.2 this study graphs the annual solid account balances of prepaid expenses, cash, receivables, inventories, taxes payable and operating revenue for the samples of fraudulent and matching firms. From figures below, there are no consistent patterns in the solid accounts of prepaid expenses, cash, receivables, and inventories prior to 2004. Next, there is some evidence of lower balances in the fraudulent firms after 2004 in prepaid expenses, cash, receivables and inventories, and higher balances in taxes payable after 2008.

[Insert Figure 4.2 Here]

4.4.3.3 Cost accounts

In the following figures, I have graphed operating revenue, cost accounts, and non-operating accounts for the samples of fraudulent and matching firms. If Hypothesis 1A is valid, this study expects to find that fraudulent firms have higher soft cost accounts and higher non-operating expenses than matching firms. From Figure 4.3, it is clear that fraudulent firms have lower sales balances than matching firms. According to Figure 4.4, there is no consistent pattern in G&A expenses. In addition, fraudulent firms have lower balances in TaxFees (between 1994 and 2009) and selling expenses (from 1997 to 2009), and higher balances in G&A expenses (from 1998 to 2006), finance expenses (between 1997 and 2008), and impairment losses (between 1997 to 2000 and 2006 to 2011).

In particular, after 2006, fraudulent firms mainly report losses in the cost account of impairment losses. Moreover, the increasing balances of OREC and short-term loans (Figure 4.1) in fraudulent firms before 2006 also suggests that fraudulent firms transfer firm value out in one period and record losses in a different one. This is consistent with Hypothesis 1B. Furthermore, previous studies show that impairment losses can be used as an earnings management tool to manipulate earnings (Chen et al., 2009; Duh et al., 2009). Detailed discussion of earnings management and tunnelling will be provided in Section 4.5.3.

From Figures 4.4(f) and 4.4(g), this study observes that a higher percentage of fraudulent firms had impairment losses between 1998 to 2000 and 2007 to 2011. During these two study periods, more fraudulent firms had higher impairment losses than matching firms. In terms of the average loss in each sample, fraudulent firms had a significantly higher value of impairment losses than matching firms. Figures 4.5(a) and 4.5(b) show that fraudulent firms had a higher balance of non-operating income after 1999. The difference between fraudulent non-operating income and fraudulent non-operating expenses was the largest in 2007. Also, fraudulent firms' non-operating expenses were higher than matching firms across the whole study period.

[Insert Figure 4.3 Here]

[Insert Figure 4.4 Here]

[Insert Figure 4.5 Here]

Finally, in Appendix B.3, Figures B.3.1.1 to B.3.2.2 are redrawn to reflect event years rather than calendar years. This study does this in an attempt to confirm whether previous patterns still hold when announcement effects are taken into account. This study finds no material differences relative to the earlier analyses.

To summarise, this study finds evidence of higher OREC and short term loans in the fraudulent sample relative to the matching sample. This is consistent with Hypothesis 1 and Hypothesis 1A, that soft accounts are used by fraudulent firms to siphon funds. However, the finding in employee benefits payable is not consistent with the expectation. There is no consistent pattern in this account. In addition, fraudulent firms tend to record abnormal costs mainly through G&A expenses, finance expenses, impairment losses and non-operating expenses. This evidence is consistent with expectations that fraudulent firms employ soft cost accounts to record losses. The overall insights from the analysis of asset accounts, liability accounts, cost accounts, operating accounts and non-operating accounts suggests that fraudulent firms tend to use these accounts, which are not directly related to operating business, to conduct tunnelling activities.

4.4.4 Univariate tests

The experimental variables are soft asset accounts, soft cash flow accounts and soft cost accounts. According to Hypothesis 1A, to disguise their tunnelling activities and write off the ensuing losses, fraudulent firms are more likely to choose those cost accounts which are not directly related to operating costs. These are tax and additional fees of operations (*TaxFees*), selling expenses (*SellingExp*), general and administrative expenses (*G&A*), finance expenses (*FinExp*) and impairment losses (*Impairment*). In contrast, operating costs tend to be solid accounts and easily verified, can be measured in quantitative units, and have more routine checks by auditors. Net other cash paid for operating activities (*NOCPOper*), net other cash paid for investment activities (*NOCPInv*) and net other cash payments for financing activities (*NOCPFin*) are also considered to be soft accounts. This study also includes in the analysis the following control variables: Return on assets (*ROA*); change in short-term debt (Δ*STDebt*); change in employee benefits payable (Δ*employee*); change in retained earnings (Δ*earnings*); and percentage of shares held by the largest shareholder (*TopRatio*).

Dechow et al. (1996) present evidence that misstated firms are associated with poor financial performance. This study then expects that firms alleged to have committed fraud have lower net profit and retained earnings. Furthermore, firms can borrow short-term bank loans to finance working capital (Chen, 2004). Compared with long-term debt, short-term debt has less default risk and enables investors to better monitor firms. Also, Chen (2004) finds that there is a negative relationship between profitability and debt in Chinese-listed companies. Hence, this study expects to find higher short-term debt in fraudulent firms.

Panel A of Table 4.2 provides the basic statistics of the accounting variables and the other characteristics of the sample firms, while Appendix B.4 gives details of the variable definitions. For the purpose of this analysis, this study defines the first year in which a fraud is announced as an event year. Data from three years before the event year and three years after the event year are included in the dataset. [63] All variables are winsorized at 1% and 99% to exclude the effect of extreme outliers. In an attempt to

[63] This study retains in the dataset those firms with less than three years of data either before or after the fraudulent event only if they have at least one year before and one year after the event (at least three years financial data). However, further untabulated analysis indicates that the overall results would not change if this study includes only those firms with a complete set of seven years of financial data. In addition, this study also tests the sample with available financial data, which means the sample period may be larger than seven years. The overall results remain the same.

address accounts' balances, and allow for size and sales differences in fraudulent firms, three versions of the descriptive statistics are presented: Before standardisation (Model 1); scaling by total assets (Model 2); and scaling by sales (Model 3). Model 1 of Panel A reports that the average impairment losses (*Impairment*) are 9.01 million RMB. The mean value of *NOCPInv* is 0.31 million RMB in Model 1 and 0.2% in Model 3. The mean value of *OREC* is 13.8% in Model 2 and 121% in Model 3. As expected, the largest shareholder controls a substantial portion of these fraudulent firms; the average shareholding is 34.5%.

In Table 4.2 this study compares the experimental and control variables to test whether there are significant operational and non-operational differences between the fraudulent firms and the matching firms. The results of before standardisation are reported in Panel B; the results deflated by total assets are reported in Panel C; and the results deflated by sales are reported in Panel D. This study uses t-tests and Wilcoxon-tests (Z-tests) to check for significant differences in means and medians, respectively. The data in Panel B indicates that fraudulent firms are smaller than matching firms in terms of both size (*Assets*) and *Sales*. In terms of other operational costs, as expected, fraudulent firms have higher reported costs of *G&A*, *FinExp*, and *Impairment* than matching firms. There is also some evidence that fraud sample firms have lower *retained earnings* and *net profit*. The differences are statistically significant at the 0.01 level on both mean and median values. One interpretation of this finding is that, for the fraudulent firms, poor profitability motivates the largest shareholder to extract value by engaging in fraudulent activities. In addition, fraudulent firms have higher leverage (*STDebt*) than matching firms, suggesting that firms with high debt levels are more likely to conduct fraudulent activities. All these findings also hold when the variables are scaled by total assets (Panel C) and by sales (Panel D).

[Insert Panels A, B, C, D of Table 4.2 Here]

Panel E, Panel F, and Panel G present year-by-year statistics for OREC in million RMB, deflated by total assets and deflated by sales, respectively, for the fraudulent sample. Both Panels E and F show that OREC increases from 1998 to 2005, but then subsequently declines. When OREC is deflated by sales as shown in Panel G, similar trends emerge, but with more fluctuations.

[Insert Panels E, F, G of Table 4.2 Here]

Overall, these basic statistics suggest that fraudulent firms have lower profitability and higher other-operating costs. The theoretical model predicts that the top owner has an incentive to tunnel more from less profitable firms. Since the fraudulent firms are generally lower in profitability than the matching firms, the implication from Hypothesis 2 is that tunnelling and wealth loss from tunnelling will be more problematic for the sample firms. In the subsequent regression analysis, this study examines these variables deflated by total assets and deflated by sales.

4.5 Multivariate tests

4.5.1 Determinants of the change of other receivables (∆*OREC*)

The first test involves the personal benefit that induces controlling shareholders to employ soft accounts to illegally transfer money and use soft accounts to write off the subsequent losses. Table 4.3 presents the Pearson correlation coefficients between the dependent variable and the key testing variables. There are no high correlations among the key testing variables. The highest correlation is 0.479, which is between *FinExp* and *Impairment*, and is reasonable.[64]

[Insert Table 4.3 Here]

The next set of tests use OLS regression to test the predictions presented in Hypotheses 1, 1A and 1B, respectively. This study expects to find that tunnelling assets are positively associated with cash payments and negatively related to cost accounts. To test these hypotheses, first of all this study pays attention to one particular soft asset account, OREC. The following regression models are employed:

$$\Delta OREC_{it} = \alpha_{0i} + \alpha_1 TaxFees_{it} + \alpha_2 SellingExp_{it} + \alpha_3 G\&A_{it} + \alpha_4 FinExp_{it} + \alpha_5 Impairment_{it} + \alpha_6 NOCPOper_{it} + \alpha_7 CPInv_{it} + \alpha_8 NCAcq_{it} + \alpha_9 NOCPInv_{it} + \alpha_{10} NOCPFin_{it} + \text{(industry dummies)} + \varepsilon_{it} \qquad \textit{Equation 7}$$

where Δ*OREC* is the change in other receivables, defined as OREC in year t minus OREC in year t-1. The independent variables are: *TaxFees* (tax and additional fees of operations); *SellingExp* (selling expenses); *G&A* (general and administrative expenses); *FinExp* (finance expenses); *Impairment* (impairment losses); *NOCPOper* (defined as other cash paid relating to operating activities [OCPOper] minus other cash received relating to operating activities [OCROper]); *NOCPInv* (defined as other cash paid relating to investing activities [OCPInv] minus other cash received relating to investing activities [OCRInv]); *CPInv* (cash paid for investments); *NCAcq* (net cash paid for acquisition of subsidiaries and other businesses); and *NOCPFin* (defined as other cash payment relating to financing activities [OCPFin] minus other proceeds relating to financing activities [OCRFin]). All of the variables above are deflated by total assets.

[64] None of the VIFs exceed 4 in the following regressions and this confirms that multicollinearity is not a problem in interpreting the regression results.

This study also includes industry dummy variables in each of the regressions to control for industry effects. The results of the OLS regression analyses are presented in Table 4.4.

[Insert Table 4.4 Here]

Results for the full fraud sample period from 1998 to 2011 are reported in Model 1 of Table 4.4. In Model 1, this study finds that Δ*OREC* is positively associated with net cash payments (*NOCPOper*, *NOCPInv* and *NOCPFin*). These three cash flow accounts are generally not proportional to the product units. In addition, these three accounts are other cash accounts and are regarded as soft cash payment accounts. Also, this study finds that Δ*OREC* is negatively related to tax fees (*TaxFees*), selling expenses (*SellingExp*), finance expenses (*FinExp*) and impairment losses (*Impairment*). These expenses are also soft cost accounts reported as other-operating components in the income statement. Therefore, these findings are consistent with Hypothesis 1A that controlling shareholders are more likely to employ soft accounts in an attempt to avoid detection and, thereby, reduce the costs of conducting fraudulent tunnelling activities.

Between 2001 and 2006, the CSRC issues a series of regulations regarding the management and penalties relating to OREC balances.[65] Yet, as shown earlier in Panel E of Table 4.2, OREC only starts to decrease late in the period, from 2005. In order to test Hypothesis 1B with respect to controlling shareholders recording losses over a prolonged number of years, this study categorises the study period into two sub-periods; pre-2005 when OREC is increasing, and post-2005 when OREC is decreasing. The year 2005 also corresponds to the strict regulation by the CSRC announcement in this year, in which the CSRC requires all listed companies to resolve the problem of

[65] See details in Appendix B.5.

expropriation. The pre-2005 results are reported in Model 2 of Table 4.4 and the post-2005 results are presented in Model 3 of Table 4.4. This study expects to find evidence of greater tunnelling behaviour (positive change in OREC) when the firm's net cash payments are positive, and expect to observe that firms disguise the earlier tunnelling activities by writing off associated OREC losses using various cost accounts. In addition, in Hypothesis 1B this study predicts that firms recognise losses in different stages to avoid detection by auditors and regulatory departments. Therefore, when firms start to realise losses, this study expects to find that a change in the soft asset account (Δ*OREC*) is negatively related to some cost accounts in the income statement, and this study expects this to be stronger in periods when the soft asset accounts are decreasing in value. In the period when OREC is increasing (Model 2 of Table 4.4), this study finds that the Δ*OREC* is positively related to *NOCPOper* and is consistent with expectations. The net other cash operating account is a soft cash account, and the lack of a direct relationship between theses soft cash accounts and operating activities provides controlling shareholders with more discretionary power to illegally transfer resources. However, in Model 3 when OREC is decreasing, consistent with the predictions, this study finds that Δ*OREC* is negatively related to selling expenses (*SellingExp*), finance expenses (*FinExp*) and impairment losses (*Impairment*). Hence, this study confirms the posited negative relationship between decreasing values in OREC and the cost accounts. This is further consistent with Hypothesis 1B in regards to the two-step process of tunnelling.

To provide further evidence on the two-step process of tunnelling, this study repeats the regressions using event years based on enforcement actions instead of calendar years. Based on the previous two step tunnelling process, the first step of tunnelling is before the announcement, and the second step of tunnelling is after the announcement of fraudulent activities. If controlling shareholders expropriate money in the first step without market notice, then tunnelling losses should be recognised in the second step when fraudulent activities are exposed. Under this assumption, this study investigates tunnelling patterns according to the announcement of fraudulent activities. The results are reported based on the fraudulent sample before the event year in Model 4, and after the event year in Model 5. This study finds that the previously documented effects of the Δ*OREC* on net cash payment and cost accounts are robust. In the presence of increasing OREC (Model 4), net cash payments increase (*NOCPOpe*r and *NOCPfin*); in the presence of decreasing OREC (Model 5), other operating costs increase (*SellingExp*, *FinExp*, and *Impairment*).

In general, the above results are consistent with the expectations. This study finds evidence of tunnelling activities across two different steps. In the first step during the earlier period, this study observes higher net other cash paid (*NOCPOper* and *NOCPfin*). In the second step, this study finds that a decrease in OREC is associated with a concurrent increase in costs (*SellingExp, FinExp, and Impairment*). The pair of double entries (decrease of OREC and increase in the costs) is consistent with the prediction of two-step tunnelling. As posited, both the cash account used for payment in the first step and other operating costs realised in the second step are soft accounts, which are used in order to avoid detection and reduce tunnelling costs.

Next, this study modifies the above model by including a set of six additional control variables to test the robustness of the tunnelling findings. This study does this because it is possible that the regression may suffer from possible missing variables. These results are presented in three panels of Table 4.5. In each panel, this study has three groups of control variables; ROA, four flow variables from the balance sheet (Δ*prepaidExp*, Δ*STDebt*, Δ*employee*, Δ*earnings*), and the percentage of shares held by the largest shareholder (*TopRatio*). Results for the full fraud sample period from 1998 to 2011 are shown in Panel A, the results for the study period before 2005 are shown in Panel B and the results for the study period after 2005 are shown in Panel C.

In Model 1 of Panel A (Table 4.5), this study adds one more controlling variable, *sales*, into the regression shown in Table 4.4. The results of the previous findings remain qualitatively the same. Model 2 of Panel A (Table 4.5) incorporates *ROA*; the pattern is also similar to the findings in Table 4.4. The results in Model 3 and Model 4 are also robust. Then, in Model 5, this study adds *TopRatio* to examine the impact of ownership structure on the firm's tunnelling behaviours. The weakly positive coefficient for *TopRatio* suggests that tunnelling activities are stronger when the top shareholder has greater control, as proxied by the percentage of shares held.

[Insert Panel A of Table 4.5 Here]

In Panel B of Table 4.5, this study focuses on the period when OREC balances are increasing. This study finds consistent results that an increase of OREC is associated with an increase of net cash payments (*NOCPOpe*r). Also, positive changes in OREC are also associated with higher short-term loans (Δ*STDebt*) and higher employee benefits payable (Δ*employee*) in the calendar year study.

[Insert Panel B of Table 4.5 Here]

The results for the post-2005 period are presented in Panel C of Table 4.5. Similar to the results in Model 3 of Table 4.4, impairment losses (*Impairment*), selling expenses (*SellingExp*) and financing expenses (*FinExp*) increase during the second step of tunnelling. The coefficients of *Impairment* are all negative and significant, except in

Model 3.[66] Moreover, this study finds the coefficient for *G&A* is insignificant in the first sub-period (Panel B) and significantly positive in the second sub-period (Panel C); *TaxFees* is significantly negative in the first sub-period (Panel B) and insignificant in the second sub-period (Panel C). This is not consistent with the second step tunnelling of a negative relationship between costs accounts and tunnelled assets. This suggests that the cost accounts *G&A* and *TaxFees* are less likely to be associated with tunnelling losses.

The results are materially unchanged in both the pre-event and post-event sub-periods when event years are used, except for Δ*employee* which declines with a positive change in OREC in the pre-event year study. This study also finds a similar pattern of tunnelling process that the presence of tunnelling activities in the first step and the recognition of tunnelling loss when fraud exposed.

[Insert Panel C of Table 4.5 Here]

In summary, this study finds that firms are more likely to set up soft accounts such as OREC to illegally transfer assets, and use soft cash payments such as *NOCPInv* to execute the transfer of funds. Subsequently, firms employ soft cost accounts such as impairment losses to record losses. Hence, this study can describe tunnelling behaviour through two steps. In the first step, there is no recognition of an accounting loss, and it is simply an asset transfer, such as the payment of cash and the creation of a fictitious OREC asset. The second step is to reduce (or remove) the OREC from the balance sheet and record the expropriated resources as a cost/loss (of some non-operating type) in the income statement. This effectively reduces the value of the equity account.

[66] When the change in short-term loans (Δ*STDebt*) is excluded from Model 3 (Panel C of Table 4.5), this study obtains similar results to those from Table 4.4, and also finds a significant negative coefficient for *impairment*.

4.5.2 Robustness checks when variables are deflated by sales

In the earlier tests, this study follows previous research that scales accounting variables by assets. However, there is a potential problem of a spurious relationship due to the restriction of sum of equity ratios and liability ratios being equal to one under asset-based account ratios. Consequently, in this section, this study tests whether the relationships between the change of other receivables ($\Delta OREC$) and net cash payments and tunnelling costs still hold when all variables are deflated by sales. Table 4.6 presents the estimation results from the OLS regression when variables are scaled by sales. Models 1 to 3 of Table 4.6 report the results based on the full fraud sample period. [67] The effects of the key factors are similar to those shown in Table 4.4. In Model 4 this study examines tunnelling behaviour when OREC increases. This study finds that two net cash payment accounts, *NOCPOper* and *NOCPInv*, are positively related to the $\Delta OREC$. In Model 5 when OREC decreases, this study finds *G&A*, *SellingExp* and *Impairment* are negatively associated with the $\Delta OREC$. This suggests that the robustness results are consistent with two-step tunnelling behaviour.

[Insert Table 4.6 Here]

To check the persistence of the results, further tests follow Section 4.5.1 to test the standardised results by including other control variables. Table 4.7 is divided into three panels, based on the full fraud sample period from 1998 to 2011 (Panel A), the study period before 2005 (Panel B), and the study period after 2005 (Panel C). The results in Panel A are similar to those in Table 4.5 (Panel A) and Table 4.6. This study finds

[67] In Table 4.6, the correlation between *G&A* and *FinExp* is 0.75; this study therefore tests the results by including both *G&A* and *FinExp* (Model 1), *G&A* only (Model 2) and *FinExp* only (Model 3), respectively. The significant levels on the other coefficients are qualitatively the same. This study includes *G&A* only for the later sub-period analyses and other analysis when controlling variables are included. This study does not report the results when *FinExp* is included only (instead of *G&A*), in order to save space. The tables are available from the authors upon request.

changes in other net cash payment accounts (*NOCPOper* and *NOCPInv*) are consistent with these soft cash payments being employed as vehicles for tunnelling to divert resources. The results in Panel B and Panel C are aligned with the findings in Table 4.5 (Panel B and Panel C). In addition, robust results are found concerning the key variables of *NOCPoper*, *SellingExp* and *Impairment*, which were discussed in Section 4.5.1. From the above observations, there appears to be sufficient evidence to support the two-step process tunnelling model. In addition, both cash payments in the first step and costs vehicles in the second step are soft accounts.

[Insert Table 4.7 Here]

4.5.3 Robustness tests when earnings management is controlled

This section examines the effect of asset impairment reversals on tunnelling behaviour. Previous studies present evidence that Chinese listed companies record the impairment of assets and reversal of asset impairments in order to manage earnings (Chen et al., 2009; Duh et al., 2009; Yang, et al., 2005; Zhang et al., 2010). One motive for doing so is to smooth earnings in order to avoid the negative consequences of ST status. To discourage this practice, in 2006 Chinese accounting standards (*CAS No. 8*) forbade listed companies from reversing previous long-lived asset impairment write-downs. In this section, this study aims to determine whether the findings still hold when the provision for, and reversal of, asset impairments is controlled. Table 4.8 presents the regression results.

[Insert Panel A of Table 4.8 Here]

As shown in Table 4.8, the coefficient of *NOCPOper* and the coefficients of *SellingExp*, *G&A*, *FinExp*, and *Impairment* (*New Impairment*[68]) that appear in both Model 1 and Model 2 are qualitatively similar. The relationships between tunnelling measures and cash payment accounts and cost accounts remain significant. In general, the results support the Hypothesis 1.

Nevertheless, there is some concern that the impairment loss findings are not unique to firms that engage in tunnelling. Accordingly, in Appendix B.6 this study presents the approximate total losses attributable to the provision and reversal of OREC for fraudulent firms and matching firms. Furthermore, this study provides the approximate total loss for fraudulent firms and matching firms according to the provision and reversal of OREC, which is reported in Appendix B.6. The total loss from tunnelling is about 5.54 times that of net income in the fraudulent sample, and 0.27 times net income in the matching sample. This suggests that tunnelling is much more severe in the fraudulent sample, and that it is extremely unlikely that the findings represent earnings management behaviour.

The previous results report evidence of two-step tunnelling behaviour across seven different violation types. To determine whether the results apply in the case of each of the three typical violation types, in Appendix B.7, this study repeats the regression of the change of OREC on net cash flows and other operating costs separately for related party transactions (type1), external loan guarantees (type5) and illegal possession of funds (type6). The results are consistent with the previous findings of a two-step tunnelling process.

[68] New Impairment is equal to impairment loss plus non-operating expenses.

4.5.4 The proxy of tunnelling in the form of impairment losses

In this section, this study provides more evidence of possible asset vehicles used by controlling shareholders to divert company resources. There is an interesting discovery regarding impairment losses in Figure 4.4(g) and Figure 4.4(h). This study can observe from Figures 4.1(b) and 4.1(c) that the years during which OREC is declining roughly correspond to the 2003 to 2006 period, during which the CSRC imposes regulations concerning expropriation by controlling shareholders. Notably, as depicted in Figures 4.4(g) and 4.4(h), impairment losses are widely used in the later periods (post-2005 and post-event). This study examines one soft asset account, OREC, in the previous sections. Some other asset accounts, for example *prepaidExp*, are not completely soft, but it is possible that these accounts could be used for tunnelling. The intuition is that a controlling shareholder can transfer the money from the listed firm's bank deposit to her personal account by establishing a 'prepaid expense'. For example, in 2012 *Wanfu Biotechnology (Hunan)* was found to have more than 300 million RMB in prepaid expenses. In particular, the CSRC found *Wanfu Biotechnology* paid 80.36 million RMB for equipment purchases to an individual instead of to suppliers. Moreover, the CFO of this company manipulated 56 personal bank cards to forge bank receipts and fabricate revenues.[69] To detect the misuse of prepaid expenses, this study employs *Impairment* as a dependent variable and examines which accounts contribute to the impairment losses. The baseline model is as follows:

$$\text{Impairment}_{it}{}^{70} = \alpha_{0i} + \alpha_1 \Delta \text{OREC}_{it} + \alpha_2 \Delta \text{prepaidExp}_{it} + \text{main effects} + \text{(industry dummies)} + \varepsilon_{it} \qquad \textit{Equation 8}$$

[69] Information is available from http://chuansong.me/n/1256770

[70] This study also adopts an alternative measure of Impairment plus non-operating expenses to replace Impairment; the results are similar.

where the independent variables are; Δ*OREC*; Δ*prepaidExp*, defined as prepaid expenses in year t minus prepaid expenses in year t-1; the main effects of sales (operating revenue); *ROA* (return on assets); Δ*STDebt* (defined as short-term loans in year t minus short-term loans in year t-1); Δ*employee* (defined as employee benefits payable in year t minus employee benefits payable in year t-1); and Δ*earnings* (defined as retained earnings in year t minus retained earnings in year t-1) are added as controls. Industry dummy variables are included in each of the regressions to control for industry effects. The regression results are reported in Table 4.9.

Table 4.9 is divided into three panels, the full fraud sample period from 1998 to 2011 (Panel A), the study period before 2005 (Panel B), and the study period after 2005 (Panel C). First, this study focuses on the results in Panel A. This study is particularly interested in the coefficients of Δ*OREC* and Δ*prepaidExp*, which are negative and significant in each of the regressions. This suggests that these two accounts are possibly used as vehicles to transfer assets to shareholders. Models 3 and 5 also indicate that the impairment losses are negatively related to firm profitability (*ROA* and Δ*earnings*). The coefficient of *NOCPFin* is weakly significant in Model 4, but insignificant in Model 5 when Δ*STDebt* is controlled. This is also consistent with the finding in Section 4.5.2 that *NOCPFin* is unlikely to be used as a tunnelling vehicle. To further confirm the accounting process for recognising cash tunnelling losses, the sample is partitioned into two groups in 2005.

[Insert Panel A of Table 4.9 Here]

In Panel B for the pre-2005 and pre-event regressions, the coefficient for Δ*OREC* shows little evidence of statistical significance. However in Panel C's post-2005 and post-event analyses, the coefficient for Δ*OREC* is consistently significantly negative. These suggest that $\Delta OREC$ is used as a transferring vehicle across the two steps; the significance of the coefficients for $\Delta OREC$ in the later sub-period implies that impairment loss is used as a special vehicle during the period of declining OREC. In both Panels B and C, $\Delta prepaidExp$ has a negative effect on *Impairment*, so $\Delta prepaidExp$ may also contribute part of the impairment losses. Recall that from Figures 4.2(a) to (c), relative to the matching firms, fraudulent firms have lower levels of prepaid expenses in most years, especially after 2005 and, therefore, prepaid expenses are probably not the most frequently used vehicle for tunnelling. Hence, this study cannot draw a strong conclusion that prepaid expenses are used for tunnelling. The sharp decline of OREC from 2005 to 2010 (Figures 4.1(b) and (c)) and the exceptionally high level of impairment losses (Figures 4.4(g) and (h)) in the same period are good indications of the accounting process for cash tunnelling losses.

[Insert Panel B of Table 4.9 Here]

[Insert Panel C of Table 4.9 Here]

This study also finds some other factors which affect firm tunnelling behaviour. Firm profitability has a negative effect on *Impairment*. This indicates that firms with higher impairment losses have lower profits. In addition, $\Delta STDebt$ is negatively associated with *Impairment*. In Section 4.5.1 this study finds that short-term debt is positively associated with the change of OREC. Overall, the results in Table 4.9 demonstrate that firms can employ different asset accounts to transfer money in order to hide their fraudulent activities. As a robustness check, this study repeats the Table 4.9 analyses in Table 4.10 using all variables standardised by sales rather than by assets, and find similar results. The evidence from Tables 4.9 and 4.10 suggests that the soft asset accounts, soft cash flow accounts and soft cost accounts throw light upon many possible ways of tunnelling transactions.

[Insert Table 4.10 Here]

4.5.5 Comparison between fraudulent firms and matching firms

In order to assess whether tunnelling is popular in matching firms, it would be useful to know how the key variables behave in matching firms. This study therefore repeats the regression analyses of the change in OREC on soft cash flow accounts and soft cost accounts using matching firms only. This study then performs another regression by including all both fraudulent and matching firms, and using dummies (coded 1 if it is a fraudulent firm, 0 otherwise) and interactions to investigate whether the key accounts that influence changes in OREC in fraudulent firms are also observed in the matched sample. Table 4.11 presents these results.

[Insert Table 4.11 Here]

As shown in Model 3 of Panel A (Table 4.11)[71], the estimated coefficients of the cash payment account (*NOCPOper*) and other operating cost accounts (TaxFees, *SellingExp*, *G&A*, and *FinExp*), and their significance, are different between firms that have been found to engage in fraud and matching firms. These differences also persist in the results of the sub-period samples (Panels B and C). Hence, fraudulent firms are associated with different accounts than is the case for the matched sample.

[71] To save space, only the coefficients of the interaction terms are reported in Model 3.

Specifically, Model 2 in Panel A of Table 4.11 for the matching firms indicates that Δ*OREC* is positively related to *NOCPOper* and *CPInv*, and negatively associated with *G&A.* If tunnelling is popular in matching firms, then it would expect to find a more negative relationship relative to the earlier period between the tunnelling asset and cost accounts in the later period. From the Panel C post-2005 results, this study finds Δ*OREC* is negatively associated with *G&A* for the Model 2 matched sample, yet the magnitude is smaller than in Panel B. Hence, the evidence suggests that tunnelling behaviour is not popular in the matching firms. In summary, this study finds a significantly positive relationship between *NOCPOper* and Δ*OREC* among firms involved in fraudulent activities, which is consistent with the first step of the tunnelling prediction. Moreover, there is a significantly negative relationship between Δ*OREC* and costs (impairment losses, selling expenses and financial expenses), which aligns with the second step of the tunnelling prediction. Therefore, the findings support the first hypothesis, which posits that firms are more likely to employ soft accounts to reduce tunnelling costs.

4.5.6 Characteristics of tunnelling firms

In this section, this study tests Hypotheses 2 and 3. Hypothesis 2 predicts that controlling shareholders are more likely to conduct tunnelling in firms that display poor financial performance. Hypothesis 3 predicts that financial fraud is more likely in firms when top shareholders have lower ownership, and when firms have weak corporate governance. The ownership structure test is motivated by substantial evidence that tunnelling is more severe when the controlling shareholder's controlling right is much larger than his ownership right. Claessens, Djankov, Fan, and Lang (2002) employ data from eight East Asian economies and find that when the largest shareholders' controlling rights are larger than cash-flow rights, firm value decreases.[72] This is more aligned with an 'entrenchment effect' whereby controlling shareholders conduct self-dealing activities at the expense of minority shareholders. Also, firm value increases if cash-flow rights of the largest shareholders exceed their controlling rights. Moreover, Lian (2006) uses Chinese data and finds that Tobin's Q (a proxy for firm value) is positively related to large shareholders' cash-flow rights and is negatively related to large shareholders' controlling rights. Similar to Claessens et al. (1999) and Jiang et al. (2010), this study expects to find that tunnelling behaviour is more severe when the percentages of the largest shareholders' shareholdings are lower.[73] The intuition is that lower shareholdings held by controlling shareholders motivate controlling shareholders to engage in private benefits, due to lower interests being aligned with firm value. To better understand the relationship between ownership structure and the extent of tunnelling, this study ranks firms based on the percentage of shares held by the largest shareholder (*TopRatio*) in each fiscal year. This study then determines the mean of *TopRatio* and *OREC* in each decile, which is reported in Figure 4.6. The x-axis is the decile ranking based on *TopRatio,* the left y-axis presents numerical values for *TopRatio,* and the right y-axis reports numerical values for *OREC*.

Figure 4.6 shows that in the full fraud sample, OREC is around 4% for firms that fall within the largest decile (decile 10) for *TopRatio,* and around 8% for firms within the lowest decile (decile 1). OREC is highest when the largest shareholder holds less than 30% of the shares (decile 5). However, in general, firms tend to have greater OREC

[72] The eight East Asian economies are Hong Kong, Indonesia, South Korea, Malaysia, the Philippines, Singapore, Taiwan, and Thailand.
[73] This study does not have direct data on controlling shareholders' cash flow rights and controlling rights; therefore, this study follows Jiang et al. (2010) by examining the percentage of the top shareholders' ownership.

balances when the controlling shareholder's ownership rights are lower. As can be seen from the sub-period figures, in the pre-2005 period, the OREC balances are roughly positively correlated with the holding of lower levels of shares by controlling shareholders. This suggests that OREC balances are negatively correlated with controlling shareholder ownership. In the post period, OREC balances are relatively large when the shares held by the largest shareholder are small, but highest when shares held by the largest shareholder are in decile 5. The OREC balances are relatively low when the shares held by the largest shareholder are large.

[Insert Figure 4.6 Here]

Jiang et al. (2010) find that the extent of tunnelling through using OREC is greater in smaller firms. In this study, *TopRatio* is also expected to be positively related to firm size. This study ranks firms based on the log of total assets in each fiscal year, and then calculate the mean value of *TopRatio* and the log of total assets (*Size*) within each decile. The results are depicted in Figure 4.7. The x-axis is the decile ranking based on *TopRatio*. The numerical values for *TopRatio* are reported on the left side of the graphs; the numerical values for *Size* are reported on the right side. Figure 4.7(a) indicates that firm size is largest for the top decile (decile 10) of *TopRatio* and is smallest for the middle decile (decile 5) of *TopRatio*. The overall evidence from Figure 4.7(a) suggests that *Size* is positively correlated with *TopRatio*.

[Insert Figure 4.7 Here]

Hypothesis 3 suggests that firms are more likely to engage in financial fraud when top shareholders have lower ownership. Accordingly, a lower percentage of shares held by the largest shareholder would be expected to be associated with higher impairment losses. This study constructs Figure 4.8 by ranking the *TopRatio* values in 10 deciles, and then calculates the mean values of *TopRatio* and *Impairment* for each decile. The x-axis is decile rankings based on *TopRatio*, with *TopRatio* values on the left y-axis, and *Impairment* values on the right y-axis. In general, Figure 4.8 illustrates that firms report the highest impairment losses when controlling shareholders have the lowest percentage of shares (decile 1). Firms' impairment losses are lowest in decile 10, where the percentage of shares held by the largest shareholder is largest.

[Insert Figure 4.8 Here]

Hypothesis 3 further suggests that firms are more likely to engage in financial fraud when firms have weak corporate governance. Accordingly, in order to gather further evidence regarding Hypotheses 2 and 3, this study considers other possible corporate governance variables that may influence the results. This study uses the following regression model to examine the determinants of OREC, and these regression analyses are reported in Table 4.12.

$$OREC_{it} = \alpha_{0i} + \alpha_1 TopRatio_{it} + \alpha_2 newROA_{it} + \alpha_3 Govt_{it} + \alpha_4 Size_{it} + \alpha_5 MINDEX_{it} + \alpha_6 State_{it} + \alpha_7 DUAL_{it} + \alpha_8 Board_{it} + \alpha_9 SBSIZE_{it} + \alpha_{10} INDE_{it} + \alpha_{11} MEET_{it} + \alpha_{12} SBMEET_{it} + \alpha_{13} CPAs_{it} + \alpha_{14} ST_{it} + \alpha_{15} PT_{it} + \alpha_{16} RET_{it} + \text{(industry dummies)} + \varepsilon_{it} \quad \textit{Equation 9}$$

OREC is the dependent variable, and most of the independent variables have been defined previously. Variables new to this regression analysis are: *TopRatio*; *newROA* (operating profit deflated by total assets); *Govt* (a dummy variable with a value of 1 if the government or a government-owned institution is the largest shareholder and a value of 0 otherwise); *Size*; *MINDEX* (a comprehensive index to capture the regional market development)*; State* (proportion of shares owned by state stockholders); *Dual* (a dummy variable that takes the value of 1 if the company's CEO is also the chairperson of the board and 0 otherwise); *Board* (board size, being the number of directors on the board); *SBSIZE* (the number of members on the supervisory board); *INDE* (the percentage of independent directors on the board); *MEET* (the number of meetings of the board of directors in the calendar year); *SBMEET* (the number of meetings of the supervisory board in the calendar year); *CPAs* (a dummy variable coded 1 if the auditor was one of the 10 biggest auditors by market share); *ST* (a dummy variable coded 1 if the firm has a special treatment, 0 otherwise); *PT* (a dummy variable coded 1 if the firm has a particular transfer); and *RET* (the annual stock return minus the risk free rate). This study also includes industry and year fixed effect dummies. The regression results are reported in Table 4.12.

[Insert Table 4.12 Here]

This study first focuses on the fraudulent sample (Model 1 to Model 3). The coefficient of *TopRatio* is significantly negative in Model 1 of Table 4.12, which is consistent with the expectation that firms suffer larger tunnelling amounts when the percentage of largest shareholders' shareholdings is lower (Hypothesis 3). In particular, in order to address a potential endogeneity issue between tunnelling balances and firm profitability, this study employs net profit minus other operating profit and non-operating profit to proxy the profitability condition. In this study, tunnelling is correlated with non-operating components in the financial statements; therefore, this study excludes other operating and non-operating profit from net profit to isolate the operating effects. This study finds that the estimated coefficient of *newROA* is significantly negatively associated with *OREC* in Model 1. This is consistent with the Hypothesis 2; that the extent of tunnelling is more severe when a firm's performance is worse.[74] Table 4.12 also shows that *MINDEX* is unrelated to the extent of *OREC*. This indicates that the balance of tunnelling is not related to the firm's geographical region in China. In addition, the tunnelling balance is higher if firms have higher state ownership, the supervisory board size (*SBSIZE*) is larger, board meetings are more frequent, and firms suffer from special treatment and particular transfer statuses. However, the tunnelling balance is lower when firms are controlled by government or government-owned institutions, which is aligned with a government reputation effect. Furthermore, the tunnelling balance is negatively associated with more meetings of the supervisory board (*SBMEET*). This suggests that the supervisory board plays an effective role in monitoring firms. Only in the later period (Model 3) are top CPA-firms negatively associated with tunnelling. In the pre-2005 period, there is even weak evidence that firms with higher ranking auditors have higher balances related to tunnelling (Model 2). Hence, top auditors in China do not fill an effective role for curtailing the tunnelling behaviours before 2005.

This study next conducts the same OLS regression for matching firms, the results of which are reported in Models 4 to 6 of Table 4.12. The consistently insignificant coefficients of *TopRatio* and the negative coefficients of *newROA* in the matching sample firms further reinforce the earlier findings concerning the characteristics of tunnelling in firms involved with tunnelling activities. The results imply that a controlling shareholder is more likely to conduct tunnelling in fraudulent firms when profitability and the controlling shareholder's percentage of shareholdings are lower. In

[74] This study also reports the regression results in Appendix B.8, based on ROA instead of newROA. The results are similar for most variables.

addition, poor financial performance is also associated with more tunnelling in matching firms, but to a smaller extent than in fraudulent firms.

The overall evidence in Table 4.12 suggests that the balance of *OREC* is related to the profitability and *Size* of the firm. This study has produced evidence that *TopRatio* also contributes to the explanation of *OREC*, though it is not significant in the Model 2 pre-2005 period. One potential explanation for the lack of evidence of *TopRatio* on *OREC* during the pre-2005 period is the clumsy proxy for the top shareholder's cash flow rights. In addition, due to the data limitation, this study is not able to isolate the controlling shareholder's cash flow rights from controlling rights. This study also provides another alternative measure of the impairment losses (*Impairment*) account to proxy the severity of tunnelling.

As a robustness check, this study repeats the analyses in Table 4.12 using *Impairment* as the dependent variable.[75] The results, complete with industry fixed effects dummies, are presented in Table 4.13. The full fraudulent firm sample in Model 1 of Table 4.13 indicates that both *TopRatio* and *newROA* have a negative effect on *Impairment*. This study also finds some evidence of a negative relation between *TopRatio* and *Impairment* in the matching sample (Model 3). Nevertheless, the coefficient values are smaller in the matching sample. Overall, the evidence suggests that the tunnelling problem is affected by the percentage of shares held by the largest shareholder (*TopRatio*) and the financial performance (*newROA*) of the fraudulent firm. This is consistent with the Hypotheses 2 and 3, which further suggests that less profitable firms and firms whose top owner has a lower percentage of ownership are more likely to conduct tunnelling activities in the fraudulent sample. In addition, this study also provides some evidence

[75] This study also reports the regression results in Appendix B.9, based on ROA instead of newROA. The results are similar for most variables.

that tunnelling is also negatively associated with *TopRatio* in the matched sample, but to a smaller extent when compared with the fraud sample.

[Insert Table 4.13 Here]

4.6 Conclusion

This paper chooses a Chinese dataset of listed firms that have committed fraudulent crime. China is not only the largest emerging market in the world, but it is also associated with substantial fraudulent activities (Chen et al., 2006). The costs of committing fraud are legal penalties and substantial reputation losses when fraud is detected. The benefit of carrying out fraud is the private benefit to the controlling shareholder. The relatively lower profitability of fraudulent firms and lower tunnelling costs in China explain the popularity, and the large scale, of cash tunnelling behaviour observed in the sample. This enables us to examine the factors relating to the tunnelling behaviour that underlie fraudulent activities. This includes consideration of the motivations behind tunnelling, its consequences and the means by which tunnelling can be achieved and concealed over a number of years using accounting procedures.

This study develops a model to explain the conditions under which people have a higher motivation to tunnel money. This study produces evidence that the lower the cost of tunnelling, the lower the profitability of the firm and the lower the ownership of the top shareholders; the greater the economic motivation for the top owner to engage in tunnelling. This study explains how tunnelled money is hidden in some soft accounts, and how it will fundamentally be accounted for as a cost in the future. The evidence reveals that the tunnelling behaviour by controlling shareholders is consistent with the predicted motivation to reduce the tunnelling cost. This study also presents evidence that some soft accounts are highly correlated with future costs. By analysing the datasets over time this study is able to show that this occurs consistently within firms where tunnelling has been detected. From the analysis, this study also finds that firms modify this manipulation of accounts after detection. To the best of this author's knowledge, this paper is unique in the development of a novel model of cash tunnelling in Chinese firms and in demonstrating the multi-period cycle of tunnelling in Chinese market.

This study finds evidence that an increase in other receivables is significantly positively related to cash payments in the form of other cash paid relating to operating activities, and other cash paid relating to investing activities. Moreover, a decrease of other receivables is significantly related to the costs of selling expenses and impairment loss in the same year. Of particular interest is the widespread use of the impairment loss account in the later periods when firms engaged in fraudulent activities are scrutinised by the market regulator and more serious punishments are applied. The results indicate that the impairment loss account is another alternative proxy to other receivables used to measure tunnelling in Chinese firms.

Over one hundred million people (one out of ten people in China) have opened stock market trading accounts in China. Many individuals or minority shareholders do not have enough expertise to identify fraudulent firms and protect themselves. Furthermore, information is asymmetric, such that insiders have more information than investors, and top managers in China are able to conceal significant events which may affect a firm's value. The findings in this research should caution investors that they should not rely on enticing numbers in Chinese financial statements. In some circumstances, these numbers may be manipulated by management. The research has important implications for Chinese regulators. Firstly, further steps are needed to enhance the quality and integrity of Chinese financial statements. Secondly, more regulatory mechanisms are needed to protect minority shareholders from expropriation by controlling shareholders.

CHAPTER FIVE: ESSAY THREE: LONG-TERM STOCK PRICE AND ACCOUNTING PERFORMANCE OF FRAUDULENT FIRMS IN CHINA

This chapter examines long-term stock performance surrounding the fraudulent announcement in the Chinese market. A brief overview of the study is presented in Section 5.1. Section 5.2 provides the literature review and hypotheses development. Section 5.3 presents the data sample, research methods and empirical results. Section 5.4 concludes the study. The chapter's references are presented in the Reference list section of this thesis.

Long-term stock price and accounting performance of fraudulent firms in China

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Abstract

This study investigates the long-term stock price and accounting performance of Chinese listed companies after the public exposure of their fraudulent activities. It documents that fraudulent firms have worse operating performance, lower dividend payments and higher other equity distributions compared with matching firms. Results in this study also reveal significantly negative short-term abnormal returns surrounding the announcement of fraud, which suggests that the news of fraudulent activities is a surprise that is not anticipated by investors. Yet, using a variety of estimation approaches, findings in this study show that long-term stock price performance is insignificant both before and after the fraud exposure. This lack of a long-term stock market reaction demonstrates a degree of inefficiency in the Chinese stock market.

JEL classification: G30; G32; G38

Keywords: Regulatory enforcement; Abnormal returns; Economic consequences; China

5.1 Introduction

Many US companies recently affected by accounting scandals, such as Enron, HealthSouth, Tyco and WorldCom, have experienced a marked decrease in equity value and have witnessed a significant fall in the credit ratings of their debt issues (Uzun, Szewczyk, and Varma, 2004). Dechow et al. (1996) state that the main motivation for firms to engage in earnings manipulation is to attract external financing at a lower cost; however, when manipulation is exposed these firms are penalised with higher investor required rates of return. This study adds to the literature by investigating the stock price and accounting performance of Chinese listed firms that have been reported to have engaged in fraud (hereafter, fraudulent firms) in China in order to shed light on the economic forces and individual firm characteristics that distinguish these firms and their fraudulent events.

Much of the existing research on firms subject to fraud violations examines the characteristics and causes of such fraud with respect to corporate governance (Agrawal and Chadha, 2005; Beasley, 1996; Chen et al., 2006; Dechow et al., 1996; Firth et al., 2011). Other studies of announcements of fraud have highlighted the consequences and implications, such as an increase in the affected firms' cost of equity (Anderson and Yohn, 2002; Cheung et al. 2006; Hribar and Jenkins, 2004; Palmrose, Richardson, and Scholz, 2004). A few studies have investigated the specific actions that firms take after the announcement of fraudulent activities. For example, in the US market, Karpoff et al. (2008) find that 93.4% of managers lose their jobs by the end of the enforcement period. Farber (2005) finds that, before the detection of the fraud, fraudulent firms have poor corporate governance compared with matching firms, but after the announcement these fraudulent firms take actions to improve their governance. In addition, Cheng and

Farber (2008) report that firms with earnings restatements subsequently reduce the CEO's option-based compensation, which in turn improves firm operating performance in future periods. Furthermore, a few papers have examined the long-term stock price performance of US firms found to have engaged in irregular behaviour (Bauer and Braun, 2010; Marciukaityte, Szewczyk, Uzun, and Varma, 2006). Yet there remains a paucity of research on long-term stock performance and accounting performance after Chinese announcements of fraud. Due to the uniqueness of the Chinese institutional environment, and the internal and external corporate governance structures, this study seeks to establish whether the long-term performance documented in developed markets also applies to an emerging market such as China.

To do this, this paper adopts an event study approach and focuses on the impact of fraudulent activities on performance in China. While prior Chinese studies provide insights into long-term stock performance for specific areas such as IPOs (Chan, Wang, and Wei, 2004; Fan, Wong, and Zhang, 2007), this study examines the reaction of long-term performance to the shock of fraudulent activities. Key findings in this study are as follows. First, this study finds evidence of negative short-term cumulative abnormal stock returns (CARs) for the affected firms around the fraud announcements. This finding is consistent with the previous literature (Beneish, 1999, Chen et al., 2005; Cheung et al., 2006).

Second, this study finds that operating performance in fraudulent firms increases significantly starting one year after the announcement of fraud. In addition, it presents evidence that compared with matching firms, fraudulent firms have worse accounting performance both before and after event years.

Third, using both buy-and-hold and calendar time methods to estimate long-term stock performance surrounding announcements of fraud, this study finds that abnormal stock returns are insignificantly positive in both the prior- and post-announcement periods. This is consistent with Marciukaityte et al. (2006), who also find insignificant abnormal returns after US fraudulent events.

Fourth, this study investigates whether the unexpected long-term stock performance of event firms is aligned with the change in operating performance. It finds that long-term stock price performance is positively associated with the operating return on assets. Furthermore, this study investigates changes in post-announcement performance by employing seven different performance measures. This study also uses the balance of other receivables to examine whether greater tunnelling amounts are diverted by controlling shareholders, thereby leading to worse operating performance. It finds that post-announcement performance is negatively associated with the financial statement balance of other receivables (tunnelling vehicles) by controlling shareholders.

Fifth, this study presents evidence that the news of fraudulent activities is not anticipated by investors. In addition, compared with matching firms, fraudulent firms have significantly lower operating income and dividend payments, and higher other equity distributions. Hence, the losses suffered by the firm are not reflected in stock prices, suggesting that the stock market is not informationally efficient.

This paper contributes to the literature in the following ways. First, though short-term stock price performance has been frequently examined, this study also distinguishes between the various types of punishment and the first source of the fraud announcement. Firms that receive the most serious punishments, such as official warnings, experience the greatest decrease in stock returns. In addition, this study presents evidence that firms exposed by CSRC disclosures suffer the most negative abnormal returns. This result contrasts with Chen et al. (2005), who report that more negative abnormal returns are incurred when event firms make the initial announcement. Second, this study sheds light on prior evidence regarding post-event stock price behaviour (Leng, Feroz, Cao, and Davalos, 2011; Marciukaityte et al., 2006). Moreover, by examining stock price reactions both before and after the event years, this study fills a gap in the literature regarding the degree to which fraudulent events are anticipated by investors. Third, this research contributes to the research on the explanations of long-term stock performance. This study provides evidence of higher other equity distributions directly through retained earnings in fraudulent firms and finds that the amount of other distributions is twice the value of net income. The overall message gained from the observation of insignificant long-term stock price performance given the presence of significant book-value losses, significantly lower dividend payments and higher other equity distributions, is that Chinese stock price reactions are not responding in a manner consistent with market efficiency.

The remainder of this paper is organised as follows. Section 5.2 discusses the literature review and hypotheses. Section 5.3 describes the sample, presents the methodology and reports the results. Section 5.4 concludes the paper.

5.2 Literature review and hypotheses development

In this study, the announcement of a fraud violation is considered to be an indicator of expected costs to firms that are subject to a fraud investigation. Hence, the first key research aim of this study is to examine the impact of fraud violations on Chinese listed company stock prices. From this first research aim, two testable hypotheses are derived, as described below.

The first hypothesis involves testing the stock market reaction to fraud violation announcements. Hribar and Jenkins (2004) estimate that in the month following an accounting restatement[76], US firms experience an increase in the cost of capital of approximately 7 to 19%. Similarly, Palmrose, Richardson, and Scholz (2004) find that US firms experience significantly negative stock market reactions to accounting restatements, represented by a 9% decline in abnormal returns over a two-day event window. According to Karpoff, Lee, and Martin (2008), in the US, financial misrepresentation results in a dramatic decrease in affected firms' stock prices at all stages of the enforcement process. In the Chinese market, Chen et al. (2005) investigate the effectiveness of the CSRC in identifying fraudulent firms and the economic consequences pursuant to enforcement actions. After experiencing internal criticism, public criticism, or criminal prosecution, listed firms suffer a negative market reaction of approximately 1 to 2% in the five-day window surrounding the event. Similarly, Anderson and Yohn (2002) witness an average 3.8% negative abnormal return over a (-3, +3) window upon the restatement announcements of 161 US firms. Also in the US market, Marciukaityte et al. (2006) find even greater negative two-day cumulative abnormal returns of 5.01%. In contrast, Kinney and McDaniel (1989) report that US firms' abnormal market returns over a five-day window are not significantly different from zero after public disclosure of corrected earnings.

Most of the literature finds that announcements of fraud violations are typically accompanied by a decline in affected firms' stock prices. Therefore, as postulated in

[76] The release of a previously issued financial statement amended with new information.

Hypothesis 1, it is expected that the announcement of firm fraud violations will be associated with negative short-term stock price performance for the affected firms.

Hypothesis 1: The stocks of firms that have been reported to have engaged in fraud are expected to experience negative abnormal returns immediately upon the announcement of fraud.

Investor reactions to the announcement of fraudulent financial statements are arguably more negative for more serious cases of fraud. In the US market, Anderson and Yohn (2002) find evidence of negative market returns and wider bid-ask spreads after the announcement of accounting problems. They find a more pronounced reduction in firms' value when the problems involve revenue recognition. This study conjectures that firms that are the subject of consecutive fraud announcements in adjacent years are viewed more negatively compared with firms that are the subject of fraud announcements in non-consecutive years[77]. Moreover, Fich and Shivdasani (2007) show that firms that have undergone a formal Securities and Exchange Commission (SEC) inquiry have more negative excess returns than firms that have been the subject of an informal SEC inquiry. In China, the CSRC is the main regulator that enforces securities law with respect to Chinese listed firms; it has a similar function to the SEC in the US. As with the New York Stock Exchange (NYSE), the Shanghai (SHSE) and Shenzhen Stock Exchanges (SZSE) are self-regulatory organisations, but their enforcement actions are less severe compared with the CSRC. This study expects that the stock of firms will suffer a more negative market reaction when they are subjected to enforcement actions

[77] The details of consecutive announcements and non-consecutive announcements are explained in the sample section.

by the CSRC than by the Shanghai and Shenzhen Stock Exchanges. The CSRC sanctions imposed upon listed companies can be categorised as; internal criticism, public criticism, public condemnation, official warning, and monetary fines (Mao, 2002).[78] This study proposes that firms receiving official warnings and monetary fines will suffer more negative returns than firms that receive other punishments. Accordingly, this essay hypothesises that:

Hypothesis 1A: Firms that are alleged to have committed fraud are more likely to suffer greater losses in equity returns as a result of first disclosures of impropriety by the CSRC than first disclosures of impropriety by the stock exchanges.

Hypothesis 1B: Those firms that are alleged to have committed fraud and that have received a greater penalty are more likely to suffer greater losses in equity returns.

The second key research aim of this study is to investigate the long-term impact of fraud violations pertinent to accounting performance. Several researchers present evidence that accounting performance deteriorates after the announcement of irregular activities. Agrawal and Chadha (2005) find that, compared with control firms, restating firms have worse median operating performance to assets ratios in the study period of two years prior to the announcement. Hou and Moore (2010) present evidence that Chinese firms with poor past operating performance are more likely to conduct fraudulent activities. In addition, Leng et al. (2011) employ both cash flow-based and earnings-based operating performance measures and present evidence that firms subject to US SEC's Accounting and Auditing Enforcement Releases (AAERs) suffer

[78] http://www.szse.cn/UpFiles/Attach/1088/2003/11/05/report0057.pdf

significantly negative abnormal operating performance in the second and third years after the disclosure of AAERs. Bhuiyan and Zhou (2015) indicate that the presence of problem directors on the board is associated with deteriorating performance in firms. Moreover, Tu and Yu (2014) find that one effect of anti-tunnelling legislation is the improvement of post-privatisation performance in Chinese SOEs.

In contrast to the above, other studies present evidence that fraud announcements do not influence accounting performance. Agrawal, Jaffe, and Karpoff (1999) proxy operating performance using operating income deflated by sales, and operating income deflated by total assets. They find that the operating performance of fraudulent firms is not statistically different from control firms from three years before to three years after the fraud event. Similarly, Marciukaityte et al. (2006) use six operating measures to evaluate the change in operating characteristics of firms subject to fraud from three years before to five years after the event. They find that most operating characteristics are almost identical between event firms and matching firms across different study periods. The exception is that the return on assets (ROA) is slightly significantly negative (10%) one year before the event and significantly negative (1%) in the event year. Overall, there is mixed evidence with respect to operating performance in the existing literature. In the current study, some exploratory consideration of operating performance will be undertaken in an attempt to shed light on the impact of the announcement of fraud in connection with stock price performance. The predictions concerning operating performance in this study will be made following the proposition on long-run stock performance.

Hypothesis 2: Firms subject to fraud investigations in the Chinese market experience declining operating performance following the fraud announcement.

Hypothesis 2A: The stock returns of firms subject to fraudulent investigations in the Chinese market underperform the stock returns of a portfolio of matching firms.

The third hypothesis involves testing long-term stock price performance after the announcement of fraud. Long-run abnormal stock returns have been examined by Marciukaityte et al. (2006) in the US market. They represent that one- to five-year buy-and-hold abnormal returns are statistically insignificant, indicating no negative abnormal performance following a corporate fraud event (Marciukaityte et al., 2006). In addition, they present evidence of no difference in operating performance between fraudulent firms and matching firms and find that these event firms improve their corporate governance after a fraud announcement. This may imply that the negative news of fraud may be offset by a positive prospect of strengthened internal governance after fraud sanctions. Similarly, Farber (2005) finds that fraudulent firms that take actions to improve corporate governance have higher stock price performance than those which do not. Yet, Bauer and Braun (2010) present evidence that firms that are prosecuted in class-action lawsuits generally underperform in the class-action event period of (0, +6) months. However, the negative abnormal returns reduce in significance after longer time periods following the announcement. The recovery of stock prices in Bauer and Braun's (2010) study depends on the type of allegation, the time horizon and the estimation approach. Leng et al. (2011) find that suspect firms named in US SEC accounting and auditing enforcement releases (AAER) significantly underperform comparable firms in the one-year, two-years, and three-years post-AAERs. The above results suggest that long-term stock price performance may be helpful in explaining the impact of bad events of financial reporting credibility. Based upon existing findings on earnings announcements and the disclosure of audit reports, Taffler, Lu, and Kausar (2004) and Willenborg and Mckeown (2000) show that the stock market does not fully incorporate the new information in a matter of days. This study proposes that it takes time for the stock markets to fully impound an unexpected announcement.

Hypothesis 3: Firms subject to fraud investigations in the Chinese market have negative long-run abnormal stock returns following the fraud announcement.

5.3 Sample, methodology and empirical results

To test the hypotheses relating to the impact of fraud violations on stock market returns, announcements reporting firms that have engaged in fraud (i.e., fraudulent firms) are collected from the CSRC and stock exchange websites between 1994 and 2011. To be included in the sample, each sample firm is required to meet the following restrictions. First, it must have available financial data and stock price data, from at least one year before the announcement/event to one year after. Second, due to their unique characteristics, firms in the financial and financial services industries are excluded. Third, because they are subject to a different regulatory environment, firms issuing B-shares are also excluded. The application of these screening criteria results in a sample of 656 unique cases of fraud committed by 313 Chinese listed companies. It may be that the performance of firms with more than one violation announcements arising in consecutive years are worse when compared with firms with announcements of fraud in non-consecutive years. Accordingly, this study defines the ‘consecutive sample’ as firms that have been the subject of multiple violation announcements over consecutive years, and the ‘non-consecutive sample’ as firms with either one violation announcement or multiple violation announcements from non-consecutive years.

5.3.1 Short-term abnormal stock returns

The first set of tests use event study methodology to examine the immediate market response to the fraud violations presented in Hypotheses 1, 1A and 1B. To test these hypotheses, the impact of announcements of fraud on short-run stock returns is measured. This study uses two different event windows, five days (-2, +2) and three days (-1, +1), to capture the cumulative announcement effects. To conduct the event study, a measure of abnormal returns is needed. Following Beneish (1999) and Chen et al. (2005), both cumulative market returns and risk adjusted abnormal returns are evaluated using the following equations.

Cumulative market adjusted abnormal returns$_{it}$ (CMAAR)

$$=R_{it} - R_{mt} \qquad \textit{Equation 1}$$

Cumulative risk adjusted abnormal returns$_{it}$ (CRAAR)

$$=R_{it} - (\alpha_i + \beta_i R_{mt}) \qquad \textit{Equation 2}$$

where R_{it} is the daily return of firm *i*, and R_{mt} is the value-weighted market return (Shanghai and Shenzhen markets are calculated separately). CMAAR and CRAAR denote the cumulative abnormal return (CAR) for firm *i* in period *t*. Abnormal returns are calculated as the difference between event firms’ returns and expected market model returns, or expected risk model returns, over the event window. The parameters of α_i and β_i in the risk model are estimated for firm i from market model regressions estimated using 250 trading days of data from day -280 to day -31 (Chen et al., 2005). The event date (day 0) is the first announcement of a firm's violation, or alleged violation.

This study employs cross-sectional t-statistics to evaluate the statistical significance of the mean CARs and use the Wilcoxon signed-rank test p-values to evaluate the statistical significance of the median CARs. Hereafter this study denotes cumulative market adjusted abnormal returns (-1, +1) as CMAAR3, cumulative market adjusted abnormal returns (-2, +2) as CMAAR5, cumulative risk adjusted abnormal returns (-1, +1) as CRAAR3, and cumulative risk adjusted abnormal returns (-2, +2) as CRAAR5.

Table 5.1 shows the mean CARs for the full sample and various partitions of the sample, being CRAAR 5 day, CRAAR 3 day, CMAAR 5 day and CMAAR 3 day, respectively. Panel A presents the results for the full sample and subsamples classified by whether or not the occurrence of fraud event is consecutive. As expected, all CARs are negative in both the subsamples and full sample. In addition, the results are very similar across the CRAAR and CMAAR models. The range for the significant abnormal returns is from -0.7% to -1.6% in the total sample.

This study also divides the sample according to different punishment categories (Panel B) and the source of the initial enforcement announcement (Panel C) There is a clear pattern within the punishment categories subsample. Official warnings generate the greatest losses in both models. With respect to the different sources of first disclosures, the CSRC has the greatest negative impact on stock prices. Hypothesis 1A posits that more negative market reactions will be suffered by firms that receive enforcement actions from the CSRC than from the Shanghai and Shenzhen Stock exchanges. No significant differences are found when distinguishing between initial enforcement actions by the Shanghai and Shenzhen Stock exchanges.

[Insert Table 5.1 Here]

Figures 5.1 and 5.2 show the longer-term CARs. There is some evidence of information leakage prior to the release of the enforcement action. Both CRAAR and CMAAR are negative from 60 days before the announcement date and deteriorate further after the release of the enforcement action. In contrast with the non-consecutive sample, the consecutive sample deteriorates further and gradually trends downwards until 110 days after the announcement.

[Insert Figure 5.1 Here]

[Insert Figure 5.2 Here]

Hypotheses 1, 1A and 1B make different predictions with respect to the impact of announcements of fraud, depending upon whether the event is consecutive, has different punishment types, and has different sources of first disclosure. In order to gather further evidence regarding these hypotheses and to consider other possible firm and market development variables that may influence the results, cross-sectional regression tests are conducted. The model is:

$CAR_i = \alpha_{0i} + \alpha_1 \text{Internal criticism}_{it} + \alpha_2 \text{Public condemnation}_{it} + \alpha_3 \text{Official warning}_{it} + \alpha_4 CSRC_{it} + \alpha_5 SHSE_{it} + \alpha_6 MINDEX_{it} + \alpha_7 TopRatio_{it} + \alpha_8 Size_{it} + \alpha_9 CPAs_{it} + \varepsilon_{it}$,[79]

Equation 3

[79]The VIFs in this regression are lower than the critical value of 10.

where CAR is the cumulative abnormal return over two different event windows, (-1, +1) and (-2, +2), using CMAAR and CRAAR as measures of CAR. Three dummy variables are employed according to whether enforcement action is internal criticism, public condemnation, or official warning. To represent first disclosures of enforcement by source, two dummy variables (CSRC and SHSE) denote first disclosures by the CSRC and the SHSE, respectively. MINDEX is a comprehensive index to capture the level of development of regional markets. TopRatio is the percentage of shares held by the largest shareholder. Size is the natural logarithm of total assets. Finally, CPAs is a dummy variable coded one (1) if the auditor is one of the ten biggest auditors by market share and zero otherwise.

This study runs a series of regression equations to test whether the model can explain the variation in stock returns. Several variants of the above cross-sectional regression results are reported in Table 5.2. Model 1 examines the relationship between market reaction and types of enforcement actions. Consistent with the results reported in Table 5.1, official warnings prompt greater firm losses than other punishment types. Model 2 investigates the relationship between the market reaction and different initial enforcement sources. This study finds that more negative CARs are associated with CSRC first disclosures rather than stock exchange first disclosures. Model 3 presents the results for the full model. Only the coefficient for official warning is significant in both the CRAAR and CMAAR models over the two event windows. In addition, the coefficient of Size is slightly significant over the (-1, +1) window, while the other coefficients are not significant. In general, the regression results suggest that the market does not clearly distinguish companies based on different characteristics.

[Insert Table 5.2 Here]

5.3.2 The change in firm operating performance surrounding fraud events

This section tests whether operating performance in fraudulent firms is improved or impaired after announcements of fraud. To provide further evidence on the insignificant long-term stock price performance, following Chan et al. (2004), Fan et al. (2007) and Marciukaityte et al. (2006), this study examines changes in the operating performance of event firms surrounding the event year. This study estimates return on assets (ROA1), operating return on assets (ROA2), asset turnover (net sales over total assets, ATO), operating cash flow to total assets (CFOA), and sales growth rate (Sale_G). Table 5.3 presents the mean change in operating performance of fraudulent firms surrounding the announcement of fraud from one year before the corporate fraud year to three years after the corporate fraud year. This study also reports the industry-adjusted mean change for the same operating variables, which is defined as the deviation of the mean change of a variable from the industry median.

[Insert Table 5.3 Here]

As reported in Panel A of Table 5.3, there are clear trends observable for all of the examined variables in the last three event window-years; (-1, +1), (-1, +2), and (-1, +3). Table 5.3 reveals that operating performance increases after announcements of fraud regardless of the event window used, demonstrating that fraudulent firms exhibit an improvement in their post-fraud operating performance.

Overall, this study does not find evidence that fraud sample firms have deteriorating performance after the announcement, which is counter to Hypothesis 2. Consistent with findings in Marciukaityte et al. (2006), accusations of fraud fail to have a significant long-term impact on the event firms' operating performance, especially after the announcement of fraud. These results are counter to Leng et al. (2011), who find that firms subject to AAERs need a longer time to recover their reputation, and experience deteriorating performance in the post-announcement period.

5.3.3 Long-term accounting performance of fraudulent and matching firms around fraud events

The last section focused on the changes in fraudulent firms' operating performance surrounding fraud events. This section examines the difference of accounting performance between fraudulent firms and matching firms. This study employs several accounting-based measures to evaluate the long-term change in firm performance after fraud events. Specifically, six variables are used to measure long-term firm performance; return on assets (ROA1), operating profit deflated by total assets (ROA2), non-operating profit deflated by total assets (ROA3), return on sales (ROS1), operating profit deflated by sales (ROS2), and non-operating profit deflated by sales (ROS3).

Table 5.4 provides the summary statistics for these six accounting performance variables. In Panels A and B this study reports the results for each of the fraud samples and matched samples, and the pooled firm-year mean (Panel A) and median (Panel B) values of each of the variables during the three pre-event years (pre-event) and the three post-event years (post-event), as well as the change in each variable before and after the event. In the last two columns, for each variable this study also presents the mean (Panel A) and median (Panel B) differences between the event sample and matched sample in both pre-event and post-event years. The event year observations are excluded from the analysis, but the results are essentially the same even when they are included. For firms with less than three years of data either before or after the event, this study uses the available years to calculate the mean (median) value before measuring the change in variables.[80] However, the overall results are similar if this study only includes those firms with seven complete years of accounting performance data.

[Insert Table 5.4 Here]

As reported in Panel A of Table 5.4, after the event, accounting performance changes significantly in firms alleged to have committed fraud. Specifically, return on sales (ROS1), operating profit on sales (ROS2), non-operating profit on assets (ROA3) and non-operating profit on sales (ROS3) all decrease significantly after the event. In addition, in the post-event period for the matched sample, operating profit on assets (ROA2) increases significantly and non-operating profit on assets (ROA3) decreases significantly. The median values in Panel B reveal a similar pattern to Panel A. Moreover, event firms display significantly poorer accounting performance than matching firms in both pre-event and post-event years. This significant difference between event firms and matching firms in the post-event years is consistent with the findings in Leng et al. (2011), but are counter to the evidence in Marciukaityte et al. (2006). Furthermore, the underperformance displayed by the fraud sample in the pre-event years is consistent with evidence presented by Agrawal and Chadha (2005). Overall, these results allow the acceptance of Hypothesis 2A, which predicts that event firms experience inferior operating performance following the announcement of fraud.

[80] For firms with less than three years of data either before or after the event, this study makes sure that both event firms and matching firms have at least one year of data before the event and one year of data after the event.

Panel C reports the results of a "difference-in-differences" analysis, reflecting differences in changes in the accounting performance of event firms following fraud violation events net of the corresponding changes in the matching firms. This study defines the net change in an accounting performance variable as the difference in the change of an accounting performance variable between the event firms and the matching firms.

Panel C of Table 5.4 shows that net changes in operating performance between event firms and matching firms are all negative, but are only statistically significant for return on sales (ROS1) and non-operating profit on sales (ROS3). This suggests that the long-term accounting performance of the event firms declines relative to that of the matching firms.

From the above observations, this study concludes that fraudulent firms improved their operating performance after the fraud events (shown in Table 5.3); however, relative to matching firms, fraudulent firms have worse accounting performance in the periods both before and after the event (shown in Table 5.4). These findings lead us to investigate another question in the following sections: What is the long-term stock price reaction after an announcement of fraud?

5.3.4 Long-term abnormal stock returns

5.3.4.1 Consequences of fraudulent activities

In this section, this study investigates the long-term stock price performance of firms that have been reported to have engaged in fraud. It examines the market's reaction to the announcement of enforcement action over various event windows in terms of both pre-fraud and post-fraud stock price performance. Following Mitchell and Stafford (2000) and Hertzel, Lemmon, Linck, and Rees (2002), this study uses both buy-and-hold abnormal returns (BHAR) and calendar time abnormal returns (CTAR) to measure long-run abnormal stock price performance from 36 months before the event-month to 36 months after the event-month in order to provide a comprehensive economic picture of Chinese firms alleged to have committed fraud. First, this study follows Barber and Lyon (1997) and Hertzel et al. (2002) and uses the difference between the buy-and-hold return to an event firm less the buy-and-hold return of a control firm matched by certain benchmarks. However, Barber and Lyon (1997), Jegadeesh (2000), and Mitchell and Stafford (2000) all point out that the major drawback to the BHAR method arises from potential cross-sectional dependence on sample returns. To address this issue, this study uses the CTAR approach to estimate abnormal returns. The CTAR approach focuses on mean abnormal time series return portfolios consisting of event firms and assumes the independence of individual sample firm returns. Yet, this measure is subject to some criticisms. Lyon, Barber, and Tsai (1999) argue that the calendar time portfolio method is less precise in measuring abnormal returns than the BHAR approach. In addition, Loughran and Ritter (2000) show that the CTAR technique cannot provide high accuracy when measuring abnormal returns because all event firms are equally weighted within the portfolio. Though neither of these two methods are perfect, this study adopts both the BHAR and CTAR approaches to measure long-term abnormal returns and assess the consistency of the results across the two methods.

5.3.4.1.1 Buy-and-hold abnormal returns

The buy-and-hold return method assumes that investors buy firms' shares and hold them over a period of time (e.g., 36 months). Barber and Lyon (1997) suggest that BHAR approaches using a reference portfolio yield negatively biased test statistics. In addition, Barber and Lyon (1997), Lyon et al. (1999) and Mitchell and Stafford (2000) demonstrate that the use of a reference portfolio to calculate buy-and-hold abnormal returns is subject to biases due to new listings or survivorship, rebalancing and skewness, all of which have an impact on the reliability of the BHAR approach. However, if the BHAR approach is calculated as the abnormal return of the event firm minus a single control firm selected from a designed benchmark, then biases are eliminated and test statistics are well-specified (Barber and Lyon, 1997; Chan et al., 2004).

To deal with new listing bias, this study makes sure that both event firms and control firms have been listed for at least two years. In addition, both event firms and control firms are calculated without rebalancing, which alleviates rebalancing bias. Furthermore, since both event firms and control firms are equally subject to potential positive long-run abnormal returns, skewness bias can be largely reduced (Barber and Lyon, 1997). As a result, this study follows Chan et al. (2004), Hertzel et al. (2002) and Ritter (1991) to construct four benchmarks to measure the adjusted performance of firms that have been reported to have engaged in fraud; size-matched, size-and-industry-matched, book-to-market-matched, and size-and-book-to-market-matched. The following section provides the benchmark building process, the procedure for identifying control firms and the calculation of long-term abnormal stock price performance over the 36 months before the event to 36 months following the event.

For the size-matched portfolio, each fraudulent firm is matched with a firm that has been listed for at least two years and has the closest market value at the year-end prior to the announcement month. For the size-and-industry-matched benchmark, the procedure is similar to the size-matched benchmark except that the control firm is also in the same industry as the event firm. For the book-to-market-matched portfolio, this study selects the firm with the book-to-market ratio closest to the event firm. For the size-and-book-to-market-matched benchmark, a control firm is selected to minimize the sum of the absolute percentage difference between the size and book-to-market ratio of each event firm and control firm.

In the Chinese market, outstanding shares can be categorized into tradable shares and non-tradable shares. This study uses both tradable shares and total outstanding shares to measure market value. Specifically, the tradable market value of a listed firm is defined as the end-of-month market price multiplied by the number of tradable shares. Similarly, the total market value of a listed firm is the end-of-month market price times the number of total outstanding shares. This study finds that the results are quantitatively similar for both measures of market value. In the following sections, this study only reports results based on tradable shares. To measure the book-to-market ratio (B/M), Chan et al. (2004) and Wang (2004) use the book value of equity from the balance sheet divided by the tradable (or total) market value of A-shares. This measure is arguably inappropriate to measure the B/M ratio per A-share of a firm with multiple class shares. Therefore, this study follows Chen, Kim, Yao, and Yu (2010) and defines the B/M ratio as the book value of equity per share divided by the A-share price.

The buy-and-hold returns (BHR) for the event (fraud) firm i and control firm m are as follows:

$\mathrm{BHR}_{i,a;b} = [\Pi_b^a(1 + \mathrm{R}_{i,t})] - 1$ *Equation 4*

$\mathrm{BHR}_{m,a:b} = [\Pi_b^a(1 + \mathrm{R}_{m,t})] - 1$ *Equation 5*

where $\mathrm{R}_{i,t}$ is the monthly return of fraud company *i* in month *t* during the period from *a* to *b*; and $\mathrm{BHR}_{m,a,b}$ is the monthly return of matching company *m* in month *t* during the period from *a* to *b*. The BHAR for fraud firm i during the period from *a* to *b* is then calculated as:

$\mathrm{BHAR}_{i,a:b} = \mathrm{BHR}_{i,a:b} - \mathrm{BHR}_{m,a:b}$ *Equation 6*

The average BHAR is:

$\mathrm{BHAR}_{a:b} = (\frac{1}{n})\sum_{i=1}^{n} BHAR_{i,a:b}$ *Equation 7*

where n is the number of firms in the sample.

This study also follows Chan et al. (2004), Mitchell and Stafford (2000) and Ritter (1991) by employing the wealth relative as an alternative performance measure:

$\text{Wealth relative}=\frac{\text{1+average n−year holding period returns on sample firms}}{\text{1+average n−year holding period returns on control firms}}$ *Equation 8*

A wealth relative of greater than 1.00 indicates that fraud firms outperform a portfolio of matching firms; a wealth relative of less than 1.00 shows that fraud firms underperform a portfolio of matching firms.

Hypothesis 3 predicts that event firms have negative long-term abnormal returns after the announcement of fraud. To consider the persistence and pattern of both prior-announcement and post-announcement periods of interest, the test results are presented in Table 5.5. In terms of the post-announcement period, Panel A of Table 5.5 reports no evidence of significantly negative buy-and-hold adjusted returns (mean AD-BHR) over the non-consecutive sample (Model 1). For the consecutive sample (Model 2), this study finds only a slightly significantly negative mean AD-BHR in the periods of (0, +12) and (+12, +24). Model 3 (full sample) further reveals that the mean AD-BHR is slightly significantly negative in the window (+24, +36) for the full sample. No other months show statistically significant negative results.

[Insert Table 5.5 Here]

Although no hypothesis is proposed concerning possible stock price performance before the announcement, to better understanding the impact of announcements of fraud, the results of prior-announcement periods are also presented in order to examine whether this fraudulent news is anticipated by investors. Bhattacharya, Daouk, Jorgenson, and Kehr (2000) find that if a news announcement is anticipated by investors, then the stock price does not react to specific news. This study does find significantly negative short-term abnormal returns surrounding the announcement of fraud, suggesting that this news is a surprise that has not been anticipated by investors. The test results for the prior periods confirm this suggestion, indicating that there is no evidence of statistically significant mean AD-BHR adjusted returns (Panel A), with the exceptions of weakly positive results in the (-24, 0) window for the non-consecutive sample (Model 1), and slightly negative results in the (-12, 0) window for the consecutive sample (Model 2).

Both prior and post periods results are materially unchanged when AD-BHR is calculated using the alternative benchmarks; size-and-industry-matched (Panel B), book-to-market-matched (Panel C), and size-and-book-to-market-matched (Panel D). The above analyses do not support the proposition in Hypothesis 3 that BHR abnormal returns are negative in the period after the announcement of fraud. Similarly, some weak evidence suggests that prior-event BHR abnormal returns are negative and event firms underperform matching firms (wealth relative<1) before the release of fraud news in the window (-12, 0) across four benchmarks. These results show that the above observations are robust to the choice of benchmark, and that investors do not fully anticipate the news of fraudulent activities.

Figure 5.3 plots the long-term monthly cumulative returns from 3-years before the announcement to 3-years after the announcement across four different benchmarks in the consecutive, non-consecutive and full samples. In Panel A, the size-matched benchmark depicts that BHAR is negative in all samples, but recovers and becomes positive around 1-year after the announcement in the non-consecutive and full samples. However, in the consecutive sample, the BHAR is negative starting around 1-year before the announcement and then gradually trends downward after the announcement, taking a longer time to recover. In terms of the other three benchmarks (Panels B to D), all figures demonstrate a similar pattern to Panel A, wherein the BHAR tends to be more negative, and takes more time to recover, in the consecutive sample compared with the non-consecutive sample[81]. These results suggest that investors expect firms that are subject to consecutive fraud violations to be more likely to perform poorly.

[Insert Figure 5.3 Here]

[81] This study finds that fraudulent firms generally underperform matching firms in the event period of (0, +3) months; however, the significance level depends on the different estimation approaches and different sub-samples used. These untabulated results are available from the authors.

5.3.4.1.2 Calendar time abnormal returns approach

In this study, a monthly calendar time portfolio is formed for both the post, and prior to, event study periods. For the post-event 3-year abnormal return calculation, for each calendar month in the sample period, either equal weighted (EW) or value weighted (VW) portfolios are formed including all sample firms that experience fraudulent activities in the previous 36 months. Portfolios are rebalanced every month to drop all companies that reach the end of the specified time period (3-year period) and add any companies that now meet the above requirements.

Similarly, for the pre-event 3-year abnormal return calculation, this study forms EW and VW portfolios of all sample firms in the next 36 months following the event announcement date. The portfolio excess returns are regressed against the three Fama and French (1993) factors. The Fama-French three-factor model is specified by the following equation:

$$R_{p,t} - R_{f,t} = \alpha_p + \beta_p(R_{m,t} - R_{f,t}) + s_p SMB_t + h_p HML_t + \varepsilon_{p,t} \qquad \textit{Equation 9}$$

where $R_{p,t}$ is the calendar time portfolio return for month t and $R_{f,t}$ is the risk-free interest rate. This study follows Chen et al. (2010) and Wang (2004), and uses the 3-month household deposit interest rate as the risk-free rate in China. $R_{p,t} - R_{f,t}$ is the monthly return of portfolio *i* in excess of the monthly risk-free rate, $(R_{m,t} - R_{f,t})$ is the market return in excess of the risk-free rate, SMB_t is the difference in returns between a portfolio of “small” and “big” stocks, and HML_t is the difference in returns between a portfolio of “high” book-to-market and “low” book-to-market stocks. The intercept α_p measures the average monthly abnormal return on the portfolio of event firms after controlling for the market, size and book-to-market factors. An α_p of zero suggests no abnormal performance under the null hypothesis.

In order to gain a perspective on whether intercepts are different between the fraud sample and the matched sample, this study estimates equation intercepts in; a) the matched sample alone, and b) the full sample incorporating both the fraud sample and the matched sample. Finally, to differentiate event firms and matching firms, in the full sample this study includes a dummy variable FL, which is equal to one if it is an event firm and 0 if it is a matching firm. Then, the three-factor regression model takes the following form:

$$R_{p,t} - R_{f,t} = \alpha_p + Adj\alpha FL + \beta_p(R_{m,t} - R_{f,t}) + s_p SMB_t + h_p HML_t + \varepsilon_{p,t} \qquad \textit{Equation 10}$$

The intercept Adjα measures the difference between the average monthly abnormal return on the portfolio of event firms and the average monthly abnormal return on the portfolio of matching firms.

As the components for the Fama-French three-factor model are not publicly available in China, this study follows Fama and French (1993) to compute the factors SMB, HML and market using Chinese listed companies. First, though Chinese listed companies issue multiple shares, this study focuses on A-shares only due to the different regulatory environment between A-shares and B-shares. The total market value is then equal to the sum of each A-share’s closing price multiplied by the total number of outstanding shares. Also, the tradable market value is equal to the sum of each A-share’s closing price multiplied by the number of tradable shares. This study finds that the results are essentially the same for both measures of market value. It tabulates the results based on tradable shares only in the following sections. In addition, the book-to-market (B/M) ratio is defined as the book value of equity per share divided by the closing stock price at the end of the year. Second, at the end of June in each year *t*, this study sorts all stocks into small (S) and big (B) size groups according to the median tradable market value. To form the HML factor, this study independently sorts all stocks at the end of December of year *t-1* into low (L), median (M), and high (H) B/M groups based on the 30th and 70th percentiles of the book-to-market ratio of all Chinese listed companies. After the above steps, at the end of June of year *t*, this study has two size groups and three B/M groups. The intersection of size and B/M forms six non-overlapping portfolios, denoted as (S, L), (S, M), (S, H), (B, L), (B, M) and (B, H). The portfolios from July of year *t* to June of year *t+1* remain the same and the Fama-French benchmark portfolios are rebalanced at the end of June in each year *t*. Third, in each month, the SMB factor is computed as the difference between a simple average of the value-weighted returns of the three small-stock portfolios (S/L, S/M and S/H) and a simple average of the value-weighted returns of the three big-stock portfolios (B/L, B/M and B/H). Similarly, in each month, the HML factor is the difference between a simple average of the value-weighted returns of the two high-B/M portfolios (S/H and B/H) and a simple average of the value-weighted returns of the two low-B/M portfolios (S/L and B/L). The monthly market returns are equal to the value-weighted average monthly returns of all A-shares. Table 5.6 reports the risk-adjusted results after the formation of the SMB, HML and market factors.

[Insert Table 5.6 Here]

Table 5.6 shows the regression results from using a firm's tradable market value to determine the portfolio breakpoints and value-weighted returns to calculate the SMB and HML factors. The results are very similar in the non-consecutive sample (Panel A), consecutive sample (Panel B) and full sample (Panel C). There is some evidence that both event firms and matching firms exhibit negative average abnormal returns prior to and after the announcement. However, the adjusted intercept (Adj α) is only weakly significant in the consecutive sample (Panel B) and the full sample (Panel C) over the window (-1, 0). This translates to a one-year return of approximately -25.5% $[(1-0.024)^{12}-1]$ in Panel B and -13.1% $[(1-0.012)^{12}-1]$ in Panel C. These findings are similar to the underperformance reported using BHAR based on the control-firm approach.

5.3.4.2 Consequences of fraudulent activities—robustness check

So far, this study fails to observe statistically significant negative long-term abnormal returns after the announcement of fraud in the Chinese market. In this section, this study employs additional tests to check the robustness of the results. First, the robustness of the event study monthly results are tested using cumulative control-firm adjusted stock returns (CARs). The CAR measure is employed by some studies to proxy long-term firm performance in the Chinese market (e.g., Fan et al., 2007; Kao, Wu, and Yang, 2009). Furthermore, this study explores whether BHAR are sensitive to the use of control firms, as in Essay One and Essay Two[82].

To do this, this study measures buy-and-hold returns according to Equations 4 to 7, and evaluate cumulative control-firm adjusted abnormal returns (CARs) as follows:

$$CAR_{i,t} = \sum R_{s,t} - \sum R_{c,t} \qquad \textit{Equation 11}$$

[82] The control firms have similar total assets, the same industry and similar studying periods to the event firms.

where $R_{s,t}$ is the monthly return of a sample firm, and $R_{c,t}$ is the monthly return of each corresponding matching company.

This study performs this event study using both CAR and BHAR over seven event windows that range from three years before to three years after the event month. The event month of a fraudulent firm is identified as the month the enforcement action information is released to the public. Panel A of Table 5.7 shows the mean and median CARs and BHARs for the total available sample. CAR and BHAR results are shown over windows of: (-3, 0) 3 years; (-2, 0) 2 years; (-1, 0) 1 year; (-2, -1) 1 year; (0, +3) 3 years; (0, +2) 2 years; and (0, +1) 1 year. [83]

[Insert Table 5.7 Here]

In Panel A of Table 5.7, this study employs cross-sectional t-statistics to assess the significance of the means and compute the Z-statistics (Wilcoxon signed test) to examine the level of significance of the median CARs and BHARs. In addition, a χ^2-test is employed to determine the significance of the percent of negative CAR and BHAR.

The Panel A results from Model 1 and Model 2 are very similar. All means are negative but insignificant prior to the announcement of the event. This suggests that event firms do not underperform the matching firms prior to the release of fraudulent news. In addition, the CAR model reveals insignificant positive results in the period of (0, +12) and (0, +24), and significantly (10%) positive abnormal returns across the accumulation period (0, +36). In the BHAR model, the means are significantly positive at the 10% level in the periods (0, +24) and (0, +36). This suggests that in the long-run, the stock

[83] All of the accumulation periods above exclude time 0.

market has no negative perceptions surrounding enforcement actions for firms alleged to have committed fraud.

To evaluate the mean statistical significance of buy-and-hold abnormal returns, in addition to conventional t-statistics, this study also uses bootstrapped p-values following Marciukaityte et al.'s (2006) method. It finds that none of the seven estimated bootstrapped p-values are statistically significant at either the 5% or 10% levels. Therefore, the results suggest no abnormal long-term prior-event and/or abnormal post-event stock price performance across all seven event windows. These findings are consistent with Marciukaityte et al. (2006), who report no abnormal performance in one- to five-year BHARs following corporate fraud events.

The previous section found no statistical evidence of significant, negative long-term stock price performance in sample firms around fraud violation announcements. The overall lack of a negative reaction may potentially be explained by the possibility that the stock market may be differentially reacting to other receivables (OREC) disclosures through the financial statements, rather than, or in addition to, the fraud violation announcement. *OREC* are tunnelling vehicles that the market could consider to be indicative of corporate fraud (Jiang et al., 2010). Accordingly, this study next addresses whether the financial statement balance of *OREC* (tunnelling vehicles) affects the stock market reactions. To measure whether the balance of *OREC* affects long-term stock price performance, this study performs the above event study using three terciles of *OREC* (bottom, middle and top). In Table 5.8, this study stratifies the sample into three terciles based on the three-year average of *OREC* before the fraud event. The results show no obvious pattern on BHARs in the pre-fraud event time for the three levels of *OREC*.

However, as shown in post-fraud event windows, higher balances of *OREC* are associated with more negative BHARs. When this study compares the mean and median differences in post-event BHARs between the top and bottom terciles of OREC, this study consistently finds that the mean and median BHARs are lowest for the top terciles of OREC. Also, the differences between the top and bottom terciles are negatively significant across the study periods (0, +12) and (0, +24). These findings suggest that it is the level of *OREC*, and not the incidence of fraud detection, that has a negative impact on firm value after fraud events.

[Insert Table 5.8 Here]

5.3.5 The relationship between operating performance and stock price performance

From the above observations, there appears to be insufficient evidence to support the proposition that overall, long-term abnormal stock returns decrease in the post-event period, but not in response to the fraud announcement alone. Recall from Section 5.3.3 that operating performance is improved in fraudulent firms after fraud events. This study expects to find that long-term stock price performance is positively associated with post-fraud operating performance. Hence, this study expects that fraudulent firms with poor operating performance suffer poor long-term stock price performance, while fraudulent firms that have sustained good operating performance do not suffer from negative stock price performance. Given the Section 5.3.4 finding of insignificant long-term stock price performance after fraud events, this section investigates whether the insignificant stock price performance is affected by fraudulent firms' operating performance after the event. In order to investigate the relationship between operating performance and post-event stock price performance, this study constructs two cross-sectional regression models, as follows:

$$BHAR_i = \alpha_{0i} + \alpha_1 \Delta ROA1_{it} + \alpha_2 \Delta ATO_{it} + \alpha_3 \Delta CFOA_{it} + \alpha_4\ \Delta Sale\_G_{it} + (\text{industry dummies}) + \varepsilon_{it},$$ [84] *Equation 12*

$$BHAR_i = \alpha_{0i} + \alpha_1 \Delta ROA2_{it} + \alpha_2 \Delta ATO_{it} + \alpha_3 \Delta CFOA_{it} + \alpha_4\ \Delta Sale\_G_{it} + (\text{industry dummies}) + \varepsilon_{it},$$ [85] *Equation 13*

where $BHAR_i$ is the 1-year and 3-year buy-and-hold abnormal returns following the fraud event. The independent variables are contemporaneous changes in industry-adjusted operating performance measures after the announcement of fraud. ROA1 is net profit deflated by total assets (return on assets); ROA2 is operating profit deflated by total assets; ATO is the asset turnover measured as net sales over total assets; CFOA is the operating cash flow deflated by total assets; and Sale_G is the growth rate of net sales. The industry-adjusted change or growth rate for a given firm is the deviation from the industry median. Year 0 is the fiscal year when the fraud is announced. Table 5.9 reports these regression results.

[Insert Table 5.9 Here]

Table 5.9 shows that the 1-year and 3-year abnormal returns are positively related to ΔROA1 and ΔROA2, indicating that the information on the changes in operating performance are important factors in explaining the reaction of stock price performance.

[84] The VIFs in this regression are lower than the critical value of 10.
[85] The VIFs in this regression are lower than the critical value of 10.

In summary, the post event stock price performance is associated with the changes in operating performance.

Furthermore, this study also adds the dividend payment or dividend pay-out ratio to the above regressions to examine whether the lack of negative long-term stock price performance is also attributed to dividend payments. The conjecture in this study is that, if investors receive the same dividend payment before and after the announcement of fraud, then investors are less likely to respond negatively via the stock price. In untabulated results, this study finds that the coefficient for dividend payment (or dividend pay-out ratio) is insignificant in the regressions. Therefore, this study concludes that the insignificant long-term stock returns after the event are unlikely to be associated with dividend payments and more likely reflect investors' expectations of concurrent improvements in operating performance.

5.3.6 Effect of enforcement actions and firm performance

The findings in Section 5.3.4.2 show that the stock market reacts to the disclosure of other receivables, rather than to the announcement of fraud. In the subsequent analysis, this study uses another approach to examine the performance of event firms surrounding the fraud events in terms of tunnelling vehicles. In this section, this study analyses the relation of other receivables (*OREC*) and impairment losses (*Impairment*) to changes in firm performance over the three-year period following fraud detection by estimating the following regressions:

$$\text{Performance}_i = \alpha_{0i} + \alpha_1 \Delta \text{newOREC}_{it} + \alpha_2 \text{PreROA1}_{it} + \alpha_3 \text{PreSize}_{it} + \alpha_4 \text{PreSTDebt}_{it} + (\text{industry dummies}) + \varepsilon_{it}, \qquad \textit{Equation 14}$$

$\text{Performance}_i = \alpha_{0i} + \alpha_1\Delta\text{Impairment}_{it} + \alpha_2\text{PreROA1}_{it} + \alpha_3\text{PreSize}_{it} + \alpha_4\text{PreSTDebt}_{it} + (\text{industry dummies}) + \varepsilon_{it}$, *Equation 15*

$\text{Performance}_i = \alpha_{0i} + \alpha_1\Delta\text{newOREC}_{it} + \alpha_2\Delta\text{Impairment}_{it} + \alpha_3\text{PreROA1}_{it} + \alpha_4\text{PreSize}_{it} + \alpha_5\text{PreSTDebt}_{it} + (\text{industry dummies}) + \varepsilon_{it}$,[86] *Equation 16*

The dependent variable is a set of long-term performance proxies, including both stock price performance and accounting performance measures. Prior literature employs stock price performance, return on assets and return on sales to capture long-term performance (Farber, 2005; Fan et al., 2007; Tu and Yu, 2014). This essay follows these studies and also employs non-operating profit as a performance measure. Specifically, the dependent variables are BHAR, ΔROA1, ΔROA2, ΔROA3, ΔROS1, ΔROS2 and ΔROS3. BHAR is the buy-and-hold abnormal return in the three years after the event, using fraudulent firms' buy-and-hold returns minus matching firms' buy-and-hold returns. For each accounting return measure, this study computes the change as the three-year average of accounting returns after the fraud announcement, minus the three-year average of accounting returns before the announcement, adjusted for the change of industry median. By subtracting the median industry accounting return from the pre- and post-announcement three-year average of accounting returns, this study adjusts for any macro-economic impact (Tu and Yu, 2014). So, for example, ΔROA1 is the three-year average of ROA (return on assets) after the fraud announcement minus the three-year average of ROA before the announcement, adjusted for the change of industry median. This study follows the same procedure for ΔROA2, ΔROA3, ΔROS1, ΔROS2 and ΔROS3.

[86] The VIFs in the above regressions are lower than the critical value of 10.

This study controls for a possible change of tunnelling behaviour as well as for prior performance, size, and leverage. The independent variables are: ΔnewOREC, computed as the three-year average of other receivables after the event minus the three-year average of other receivables before the event, adjusted for the change of industry median and scaled by total assets; ΔImpairment, calculated as the three-year average of impairment losses after the event minus the three-year average of impairment losses before the event, adjusted for the change of industry median and scaled by total assets; PreROA1, being the three-year average ROA before the event; PreSize, which is the average value of the natural logarithm of total assets in the three years before the event; and PreSTDebt, being the three-year average of short-term loans before the event.

This study runs the regression with each dependent variable three times and reports the results in Table 5.10. The first regression tests the relationship between the effect of fraud violations on firm performance and the change of OREC over the seven year study period (Model 1). The second regression examines the relationship between the effect of fraud violations on firm performance and the change in impairment losses (Model 2). The third regression involves both the change of OREC and the change in impairment losses (Model 3). Panel A shows the OLS regression results of BHAR (0, +3), ΔROA1, ΔROA2 and ΔROA3 on the independent variables. Panel B reports the OLS regression results of ΔROS1, ΔROS2 and ΔROS3 on the independent variables.

[Insert Table 5.10 Here]

The overall results in Panels A and B of Table 5.10 suggest that long-term firm performance after announcements of fraud is negatively associated with tunnelling proxies (Δ*newOREC* and Δ*Impairment*), with the majority of performance measures being statistically significant. This finding provides evidence that higher tunnelling balances are associated with both poorer stock price performance and diminished accounting operating performance. In addition, the coefficient on past profitability (*PreROA1*) is negative and statistically significant in most models, indicating that good performance prior to a fraud announcement is associated with deteriorating performance after the announcement. This study cannot find evidence of a relationship between long-term firm performance and prior firm size (*PreSize*). The coefficient on prior leverage (*PreSTDebt*) is only significant in the models of ΔROA1 and ΔROA3.

5.3.7 Other potential explanations for stock performance

In this section, this study attempts to address some other potential explanations for the insignificant long-term stock price performance of fraudulent firms after the event. Recall from Section 5.3.3 that operating performance of fraudulent firms improves after the fraud events; however, relative to matching firms, fraudulent firms display worse accounting performance in the periods both before and after the event. Specifically, compared with matching firms, fraudulent firms are associated with lower net profits (shown in ROA1 and ROS1 of Table 5.4)[87]. Furthermore, previous sections show that market prices of fraudulent firms decrease for a short time after the announcement then tend to increase gradually afterwards. Nevertheless, none of the long-term cumulative abnormal returns are significantly negative in any of the post-announcement study windows, which means that market prices do not show significant, sustained losses.

The above long-term stock price performance pertaining to announcements of fraud could arise for three possible reasons. First, if this fraud news is anticipated by investors,

[87] Also, in Essay Two, fraudulent firms are found to have significant lower net profits compared with matching firms (-0.038 vs 0.023 when net profit is standardised by total assets).

this study should observe significant negative abnormal returns before the event. Yet, in Section 5.3.4, this study presents evidence of insignificant long-term abnormal returns before the announcement. In addition, this study observes significantly negative short-term abnormal returns around the fraud announcements. Hence, this explanation appears unlikely.

Second, if fraudulent firms pay significantly higher dividends, then this leads us to a possible explanation for insignificant long-term stock prices after fraud events. If investors in fraudulent firms receive higher dividend payments, then investors may not be concerned about any loss in operating performance. In contrast, if fraudulent firms pay significantly lower dividends, the lack of a long-term stock price reaction may indicate a lack of market efficiency.

Third, if there are other changes in retained earnings, such as the savings on other equity outflows, then this can help to explain previous findings on why long-term stock price does not respond to the inferior operating performance in fraudulent firms. Saving on other equity outflows via retained earnings could potentially compensate for the operating loss. Accordingly, this study next investigates dividend payments and other changes in retained earnings of fraudulent firms, and compares the findings with matching firms.

This essay begins with the conventional statement of retained earnings. Retained earnings is the portion of the profits of a business that has not been distributed to shareholders. The general equation depicting the relationship between retained earnings, net income, dividends paid and other changes in retained earning can be expressed as:

Ending retained earnings = Beginning retained earnings + Net income – Dividends paid +/– other changes in retained earnings *Equation 17*

This study can summarise the difference between ending retained earnings and beginning retained earnings as the change in retained earnings (Δretained earnings); therefore, the equation can be rearranged as:

ΔRetained earnings = Net income – Dividends paid +/– other changes in retained earnings *Equation 18*

In the subsequent sections, this study follows Chen et al. (2015) and denotes the other changes in retained earnings as a "grey" balance. Hence the equation is:

ΔRetained earnings = Net income – Dividends paid – Grey value *Equation 19*

The value of the grey value is given as:

Grey value = (Net income – Dividends paid) – ΔRetained earnings *Equation 20*

If fraudulent firms have higher dividend payments or lower grey values, then this could offset the impaired operating performance and explain the insignificant long-term stock reaction of fraudulent firms. Accordingly, this study examines and graphs the components of Equation 20 from an event year perspective.

In Figure 5.4 this study graph the annual balances of net income, dividends, retained earnings, ΔRetained earnings, the difference between net income and dividends (net income – dividends paid), and the grey value for the samples of fraudulent and matching firms.

As can be seen from Figures 5.4(a) and 5.4(d), fraudulent firms have lower values for net income and retained earnings during the period (-3, +3), which is consistent with the previous results indicating that fraudulent firms have a lower return on assets. Next, Figure 5.4(b) reveals that fraudulent firms have lower dividend payments compared with matching firms from three years before the event to three years after the event. This observation is counter to the second expectation of higher dividend payments. The finding of insignificant long-term stock market reactions, despite poor operating performance and lower dividend payments in fraudulent firms, is inconsistent with accepted concepts of market efficiency.

Next this essay examines the level of grey value. It finds that the grey values are negative, representing a reduction of retained earnings. This is consistent with an equity outflow or distribution that has bypassed the income statement. In addition, according to Figure 5.4(f), fraudulent firms have relatively more grey distributions than matching firms. This is not consistent with a view that fraudulent firms have compensated for poorer performance through saving on other equity outflows. Additionally, fraudulent firms are suffering further deteriorations in retained earnings (shown in Figure 5.4(c)). This finding is consistent with Chen et al. (2015), who investigate the possibility of another type of tunnelling through other equity distributions, and present evidence that politically connected firms experience a significant distribution loss directly through retained earnings. Hence, the evidence of extra capital outflows in fraudulent firms suggests that market prices of fraudulent firms do not reflect the sustained operating losses.

[Insert Figure 5.4 Here]

A summary of net income, dividend payments and grey value in both the fraud sample and matched sample is presented in Panels A and B of Table 5.11. All the accounts in Table 5.11 are deflated by total assets. Panel A reports the cumulative value and Panel B reports the mean value of these accounts during the period (-3, +3). Panel A indicates that fraudulent firms have significantly higher losses (net income; -35.08%), lower dividend payments (-4.16%) and significantly lower grey values (i.e., higher distributions, 31.40%). Panel B shows a similar pattern in mean values over the same period and, although the values are less extreme, they remain strongly statistically significant. Of particular note this study finds that, on average, the value of the grey distributions is more than twice that of the loss (net income) in fraudulent firms.

[Insert Table 5.11 Here]

To summarise, this study finds evidence of lower net income, lower dividend payments and higher grey distributions in the fraud sample. These negative signals should translate into negative market price reactions. Surprisingly, this is not the case, with the evidence suggesting that market prices do not properly reflect the actual loss. Such a result suggests some degree of stock market inefficiency in China. Furthermore, this study provides evidence of the presence of greater other equity distributions in fraudulent firms. There is a leakage from the firm in the form of grey distributions (direct reductions of equity), so net income losses plus grey distributions are associated with reduced retained earnings and dividends. This study cannot dismiss the possibility that there are legitimate reasons for the other equity distributions; however, there also remains a possibility that these grey distributions from equity represent another form of tunnelling in fraudulent firms. This study leaves this as a potentially fruitful area for future research.

5.4 Conclusion

This paper studies the long-term stock price and long-term accounting performance of firms subject to fraud investigations in the Chinese market. This study presents evidence that operating performance proxies in fraudulent firms start to increase from one year after the announcement of fraud. Moreover, compared with matching firms, fraudulent firms have worse accounting performance in the periods both before and after the fraud event.

To the best of this author’s knowledge, this is the first study to examine a comprehensive set of abnormal returns analyses for Chinese listed firms accused of financial fraud. This study finds that long-term stock price performance is positive, but insignificant, during the post-event period across different approaches. This result is inconsistent with the expectation that fraudulent firms experience negative abnormal returns from damage to their reputation. The cross-sectional regression results indicate that long-term performance is negatively associated with OREC tunnelling balances. Furthermore, this study examines whether the insignificant long-term abnormal returns are aligned with operating performance. This study finds that long-term stock prices are positively associated with changes in operating performance.

Nevertheless, this study presents evidence of insignificant long-term stock price performance before the event and significantly negative short-term stock price performance surrounding the events, which implies that fraudulent news is not anticipated by investors. In addition, fraudulent firms have worse operating performance and lower dividend payments compared with matching firms. This suggests that investors in fraudulent firms experience deteriorating net income, but do not receive any compensation in terms of higher dividend payments. The findings are consistent with the view that stock market prices do not appropriately reflect fraudulent firms' diminished capacity to sustain their operating performance and distribution policies.

Furthermore, to provide a further explanation of long-term stock performance, this study finds that net income, dividend payments and the change in retained earnings for the fraud sample are well below that of the matched sample. The significantly higher grey values further indicate the presence of capital outflows. From the above observations, there appears to be sufficient evidence to support the proposition that stock prices do not react rationally to fraud announcements. Fraudulent firms suffer book-value losses after the announcement of fraudulent activities, and yet the actual stock prices do not respond to such losses. Taken together, these observations highlight an important source of inefficiency in the Chinese capital markets.

This study expands the limited research that has examined immediate stock price reactions to fraudulent activities. Instead, it considers long-term stock price and accounting performance based on the conjecture that event firms need some time to recover their reputation. This study also provides a better understanding of how market prices respond to fraud events in China. The documentation of insignificant market reactions and significant book-value losses emanating from fraud events depicts a lack of rational behaviour in the Chinese capital market. As such, the findings provide valuable insights into the economic effects of fraud events in the Chinese market.

CHAPTER SIX: CONCLUSION

This chapter concludes the thesis by reviewing of hypotheses and providing a summary of the major findings and implications for each of the three essays, as presented in Section 6.1. Section 6.2 presents limitations of the thesis and suggests potential areas for future research.

6.1 Review of hypotheses, major findings and implications

The hypotheses and conclusions in connection with the three key research aims are summarised in Table 6.1, and discussed further below.

Table 6.1 Hypotheses and conclusions for three key research aims

Research aim 1: To investigate which balance sheet accounts are more likely to be employed by managers to manipulate FFS among Chinese listed companies		
Hypothesis 1	*Individual balance sheet account values for firms with FFS will be different from those in a matched sample of firms without FFS.*	Supported
Hypothesis 2	*There exists a relationship between the type of fraud undertaken (e.g,. violations) and the specific balance sheet accounts associated with that particular fraud.*	Supported

Research aim 2: To examine the process by which controlling shareholders illegally extract money from minority shareholders		
Hypothesis 1	*The higher the cost of engaging in financial fraud, the lower the probability that the firm will be exposed for engaging in financial fraud.*	Supported
Hypothesis 1A	*Firms that have been reported to have engaged in fraud are more likely to employ soft accounts than solid accounts to conduct tunnelling fraud.*	Supported
Hypothesis 1B	*Firms that have been reported to have engaged in fraud are more likely to conduct tunnelling activities and recognise the ensuing losses over a period of several years.*	Supported
Hypothesis 2	*The likelihood that a firm commits financial fraud is negatively related to its profitability.*	Supported
Hypothesis 3	*Firms are more likely to engage in financial fraud when top shareholders have a lower percentage of ownership and when firms have weak corporate governance.*	Supported

Research aim 3: To examine the long-term market and accounting performance following announcements exposing financial fraud in China		
Hypothesis 1	*The stocks of firms that have been reported to have engaged in fraud are expected to experience negative abnormal returns immediately upon the announcement of fraud.*	Supported
Hypothesis 1A	*Firms that are alleged to have committed fraud are more likely to suffer greater losses in equity returns as a result of first disclosures of impropriety by the CSRC than first disclosures of impropriety by the stock exchanges.*	Supported
Hypothesis 1B	*Those firms that are alleged to have committed fraud and that have received a greater penalty are more likely to suffer greater losses in equity returns.*	Supported
Hypothesis 2	*Firms subject to fraud investigations in the Chinese market experience declining operating performance following the fraud announcement.*	Not supported
Hypothesis 2A	*The stock returns of firms subject to fraudulent investigations in the Chinese market underperform the stock returns of a portfolio of matching firms.*	Supported
Hypothesis 3	*Firms subject to fraud investigations in the Chinese market have negative long-run abnormal stock returns following the fraud announcement.*	Not supported

6.1.1 Essay One: Detecting fraud in Chinese listed companies using balance sheet accounting values

This essay examines the balance sheet accounting values for Chinese listed companies from 1994 to 2011 to explore potential indicators of fraudulent financial statements. The methodological problem of missing variable bias is effectively resolved by using a complete set of variables from the balance sheet. This study confirms previous findings that balance sheet indicators of fraud include other receivables (Jiang et al., 2010), inventories (Stice, 1999) and total debt (Chen et al., 2006). In addition, by employing both assets-scaled and sales-scaled probit regressions, this study introduces new evidence of different indicators for fraud in the form of prepaid expenses, other current assets, employee benefit payable and deferred tax liabilities Moreover, previous research finds that FFS are associated with higher leverage (Dechow et al., 1996; Spathis et al., 2002). However, by examining the components of debt separately, this study finds evidence of lower leverage in some liability accounts.

In addition to resolving the potential problem of missing variable bias that besets previous research, this study also addresses a potential spurious relationship which may arise when explanatory variables are scaled by total assets. A typical example provided in the Appendix A.4 demonstrates that by using balance sheet values scaled by total assets, previous findings of higher leverage for firms subject to fraud investigations could be the result of their lower equity balances. The magnitude of this spurious relationship problem can be significantly reduced if balance sheet accounts are instead scaled by sales.

This study offers additional information on the impact of the exposure of fraudulent activities. Results show that the relationship between regression coefficients for balance sheet accounts and fraudulent financial statements are greatest before the announcement year, decline to a lower level in the announcement year and drop further after the announcement. This study also reveals that the balance sheet indicators are better indicators of FFS when accusations of fraud are more persistent. This is supported by evidence that firms with consecutive announcements of fraud display greater significant balance sheet coefficients in the regression equations than those with non-consecutive announcements.

This study also shows that when fraudulent financial statements are categorised more precisely by the type of fraud case, the set of important indicators for each type are unique with improved predictive power (i.e., greater than 50% in the probit regressions).

When applied to the entire sample of all Chinese listed companies, the indicators correctly predict the absence of fraud in about 81% of cases.

6.1.2 Essay Two: Cash tunnelling in Chinese firms

This essay examines the factors and processes associated with controlling shareholders who illegally divert resources from fraudulent Chinese companies during the period from 1998 to 2011. This study focuses particularly on cash tunnelling in the Chinese market, which involves the direct transfer of a company's cash to an expropriating owner. The development of the theoretical model in this study is based on the potential costs and benefits to the owner of committing fraud. This enables a clarification of the motivations and means behind tunnelling in Chinese listed companies.

The main findings are summarised as follows. Controlling shareholders are more likely to conduct tunnelling when the cost of tunnelling is lower, the profitability of the firm is lower and the shareholding of the top shareholders is lower. The costs of tunnelling arise when accounts are first employed to misrepresent the transfer of money and later when accounts are used to realise losses for the previously recorded fictitious assets. Accordingly, the study categorises the financial accounts into 'soft' and 'solid' based on two characteristics: the ease with which auditors can detect fraud and the degree of discretionary power exercised by controlling shareholders.

This essay is the first research to develop a cash tunnelling model and explain the multi-period tunnelling process in the Chinese market. It presents evidence that some soft asset accounts are highly correlated with cash payment accounts and cost accounts. In particular, the increase in other receivables is positively associated with cash payments, both in the form of other cash paid relating to operating activities, and other cash paid relating to investing activities. In addition, a decrease of other receivables is negatively associated with the recognition of selling expenses and impairment losses in the same period. These findings suggest that expropriating owners tend to transfer the money using some soft asset accounts which are not directly related to the firm's operating business and then maintain these fictitious assets for a prolonged period of time to reduce the probability of detection. Then in later periods, expropriating owners record the associated losses through some soft cost accounts in an attempt to decrease the chances of detection. According to this study, approximate cash tunnelling losses to non-expropriating investors represent an estimated 5.54 times that of net income.

6.1.3 Essay Three: Long-term stock price and accounting performance of fraudulent firms in China

The final essay of this thesis studies long-term stock price reactions when fraudulent activities of listed Chinese firms are publicly revealed. Much of the previous research focuses on the short-term market response after fraud announcements. However, there is a possibility that investors partially anticipate the impact before the announcement. This study investigates long-term stock price reactions by using different estimation approaches across different study periods in years surrounding the announcement.

The study finding of insignificant long-term stock price performance contradicts the proposition of negative market responses after the release of fraud information. In addition, this essay presents evidence that the operating performance in fraudulent firms improved in years following the event. A positive relationship between operating performance and abnormal returns is revealed, and implies that the long-term stock price is a partial reflection of the company's fundamental operational performance in China.

This study also reveals that fraudulent firms have worse operating performance, lower dividend payments and higher other equity distributions from retained earnings compared with matching firms. The higher other equity distributions represent a large unexplained reduction of retained earnings that are approximately twice the value of net income. This study conjectures this leakage could potentially be indicative of yet another channel for tunnelling. This study would normally expect these signals to be viewed negatively by investors. Accordingly, the absence of a negative long-term stock price reaction is consistent with a view that stock market prices in China do not fully reflect the losses incurred by fraudulent firms and that in this regard, the stock market in China is not fully efficient.

6.2 Limitations of the thesis and future areas of research

As with all research, there are some limitations in this thesis. One key limitation of the first essay is the identification problem arising from the high correlation among the independent variables. However, in order to mitigate the missing variable bias, this study employs a complete set of accounting values from the balance sheet to identify important indicators of fraudulent financial statements. The second limitation in the first essay is that the matching sample may contain fraudulent cases which have not yet been detected. Third, there could be potential for model error that is attributed to the assumption of the same classification error costs between classifying fraudulent firms as matching firms (Type I error) and classifying matching firms as fraudulent firms (Type II error). In general, the Type I classification costs are smaller than Type II classification costs.

There are two main limitations in the second essay. First, as with other research of this ilk, this study cannot identify the wedge between top owner's control rights and cash flow rights; therefore, the conclusion made between the shareholding held by controlling shareholders and the balance of tunnelling is limited to a certain extent. Due to a lack of data for control rights and cash flow rights, this study follows Jiang et al. (2010) and uses the shareholdings of the top shareholders to examine tunnelling incentives. Second, this essay recognises impairment losses as the major cost account employed to recognise fictitious assets as losses. However, previous research presents evidence of earnings management through asset impairments (Chen et al., 2009; Duh et al., 2009; Zhang et al., 2010). Due to data limitations, this study uses available data of the provision and reversal of other receivables to partially address the possibility of earnings management behaviour. The results indicate that the relationship between other receivables and impairment losses still holds after partially excluding the possibility of earnings management.

Finally, there could be potential for model error in the third essay that is attributed to the assumptions and the specification of the applied event methodology models. In addition, an estimation bias may arise from the use of the matching sample criteria.

The third essay reveals insignificant long-term stock market performance using several different estimation approaches. Future studies could examine whether long-term stock price performance still holds when the Fama-French five-factor model (Fama and French, 2015) is employed. The final essay also detects that fraudulent firms pay lower dividends and make higher other equity reductions via retained earnings. However, previous research presents evidence of dividend tunnelling in the Chinese market (Chen et al., 2009). Future research could investigate whether dividend and other equity tunnelling is conducted by fraudulent firms. Total tunnelling losses from all tunnelling channels may be greater than has previously been exposed.

LIST OF TABLES: CHAPTER THREE: ESSAY ONE: DETECTING FRAUD IN CHINESE LISTED COMPANIES USING BALANCE SHEET ACCOUNTING VALUES

Table 3.1 Empirical studies

Research on financial ratios and fraud detection.

Authors	Scope of study	Objectives of study	Financial ratios and Variables used
Beneish (1999a)	64 GAAP violated firms and two matched sample, one sample matched by industry, year, and total assets, other sample matched by industry, year and time-listed in the US market	Examine incentives and penalties related to earnings overstatements	Total assets, working capital to total assets, total debt to total assets, profit margin, ROA, cash flow to total assets, sales growth, cash sales growth
Bonner et al.(1998)	261 companies with SEC enforcement actions between 1982 and 1995	Examine the relationship between fraud type and auditor litigation	Revenues, receivables, inventory
Fanning and Cogger (1998)	102 fraudulent firms and 102 matched firms by firm, size and year	Examine publicly available predictors of fraudulent financial statements by using Artificial Neural Network and AutoNet	Accounts receivable/sales, accounts receivable/ total assets, inventory/sales, net property, plant and equipment/total assets, debt/equity, retained earnings/total assets, working capital/total assets, and sales/total assets
Feroz et al. (1991)	188 firms in the SEC enforcement release from 1982 to 1989	Examine financial and market effects of the SEC enforcement actions	Receivable, inventory, long-term assets, liabilities
Jiang et al.(2010)	1377 public companies during 1996 to 2004 in the Chinese market	Examine controlling shareholders tunnel firm value through inter-corporate loans	Other receivable, other receivable/ market capitalization, other receivable/tradable market value, other receivable/ total assets, total liabilities/ total assets, ROA
Roychowdhury (2006)	3672 firms in COMPUSTAT between 1987 and 2007	Examine real activities manipulation by managers	Inventory turnover ratio, receivable turnover ratio, discretionary expenditures, cost of goods sold, sales, total assets, research and development expenditures, maintenance expenditures

Table 3.1 (continued)

Authors	Scope of study	Objectives of study	Financial ratios and Variables used
Simunic (1980)	397 observations on audit fees and related variables obtained from a sample of survey in US firms during 1977	Examine cross-sectional audit fees in terms of auditors' competition	Foreign assets/total assets, accounts, loans, and notes receivable/total assets, inventories/total assets, net income/total assets
Stice (1991)	49 fraudulent firms during 1960-1972 and 1973-1985	Examine the relationship between firms' likelihood of litigation and firms' asset structure, financial condition, market value and variability of returns	Accounts receivables/total assets, inventory/total assets
Spathis et al. (2002)	38 fraudulent firms and 38 matched firms in the Greek market	Examine financial variables for detecting fraudulent firms	Debt/equity, sales/ total assets, net profit/ sales, receivable/sales, net profit/total assets, working capital/total assets, gross profit/total assets, inventories/sales, total debt/total assets

Table 3.2 Sample description of fraud

This table presents the sample collection procedure (Panel A), the distributions across years (Panel A), industry (Panel B), punishment type (Panel C) and type of violation (Panel D) for the corporate fraud sample. Fraud cases are the number of fraudulent activities committed by listed firms that are exposed by the CSRC. Fraud firms are the number of listed firms that committed at least one fraud.

Panel A: Sample exclusions		
	firms	cases
Number of announcements by the CSRC and two stock exchanges (1994-2011)	**369**	**734**
Reasons for deletions		
B-share	1	1
no matching firms	51	66
finance industry	4	11
multiple announcement in the same year	0	0
Fraudulent firms deleted	56	78
Final sample size	**313**	**656**
Number of matched control firms	313	
Total number of firms in the study	626	

Panel B: Distribution of fraud cases and fraud firms by year

Years	Fraud cases		Fraud firms		Listed firms	Fraud firms/Listed firms
	Number	percent	Number	percent	Number	percent
1994	2	0.30	2	0.37	291	0.69
1995	0	0.00	0	0.00	323	0.00
1996	4	0.61	4	0.74	530	0.75
1997	10	1.52	10	1.85	745	1.34
1998	5	0.76	5	0.92	851	0.59
1999	13	1.98	13	2.40	949	1.37
2000	14	2.13	14	2.58	1088	1.29
2001	68	10.37	62	11.44	1160	5.34
2002	55	8.38	47	8.67	1224	3.84
2003	55	8.38	44	8.12	1287	3.42
2004	61	9.30	53	9.78	1377	3.85
2005	95	14.48	64	11.81	1381	4.63
2006	92	14.02	66	12.18	1434	4.60
2007	75	11.43	58	10.70	1550	3.74
2008	37	5.64	33	6.09	1625	2.03
2009	36	5.49	33	6.09	1718	1.92
2010	15	2.29	15	2.77	2063	0.73
2011	19	2.90	19	3.51	2342	0.81
total	**656**	100	542	100		
					Average	2.27

Panel C: Distribution of fraud cases and fraud firms by industry				
Industries	Fraud cases		Fraud firms	
	Number	Percent	Number	Percent
Manufacturing	333	50.76	173	55.27
Real Estate	82	12.50	37	11.82
Information Technology	62	9.45	20	6.39
Wholesale and Retail Trade	39	5.95	20	6.39
Conglomerates	35	5.34	22	7.03
Farming, Forestry, Animal Husbandry and Fishery	31	4.73	10	3.19
Social Services	21	3.20	8	2.56
Utilities	16	2.44	9	2.88
Construction	13	1.98	5	1.60
Transportation and Warehousing	11	1.68	4	1.28
Mining	10	1.52	4	1.28
Communication and Cultural Industry	3	0.46	1	0.32
total	**656**	100	**313**	100

The CSRC divides its sanctions of companies into five categories: internal criticism, public criticism, public condemnation, official warning, and monetary fines (Mao, 2002).

Panel D: Distribution of fraud cases and fraud firms by punishment type					
type/year	Internal criticism	Public criticism	Public condemnation	Official warning	Monetary fines
1994	0	2	0	0	0
1995	0	0	0	0	0
1996	1	3	0	0	0
1997	1	9	0	0	0
1998	1	3	0	0	1
1999	6	5	1	1	0
2000	7	3	3	1	0
2001	4	19	41	3	1
2002	5	8	29	7	6
2003	9	4	29	13	0
2004	19	0	27	15	0
2005	11	0	48	36	0
2006	16	2	38	36	0
2007	24	3	24	24	0
2008	15	0	11	11	0
2009	7	1	10	18	0
2010	5	1	2	7	0
2011	11	4	4	0	0
Total	142	67	267	172	8
Percent	21.65	10.21	40.7	26.22	1.22

Panel E: Distribution of fraud cases and fraud firms by violation types			
Types	Instances of fraud	Percent	Type #
Related party transactions	161	14.09	1
Concealment of significant contracts or events	145	12.69	2
Postponement/delay in disclosure	141	12.34	3
False statement	138	12.07	4
External loan guarantees	113	9.89	5
embezzlement by major shareholder	77	6.74	6
Fabrication of profits	61	5.34	7
Fictitious income or assets	38	3.32	8
Fictitious expenses/liabilities	26	2.27	9
False disclosure of the actual use of raised capital	38	3.32	10
Others	141	12.34	11
Concealing lawsuits	29	2.54	12
Illegal share buy and sell	21	1.84	13
Mortgage of assets or/and equities	6	0.52	14
Fictitious supporting documents	5	0.44	15
Bribe	1	0.09	16
Illegal purchase of foreign exchange	1	0.09	17
Misstatement for IPO purposes	1	0.09	18
Total	1143	100	

Table 3.3 Descriptive statistics and mean comparison between fraud and matching firms

Mean of balance sheet account values (scaled by total assets) for Fraud firms and Matching firms, and their differences. Sample period is 1994 to 2011. Summary statistics are reported for the full samples (fraud and matching; Panel A), the samples without consecutive year announcements (Panel B), and the samples with at least two years consecutive announcements. Significances at the 1%, 5%, and 10% are denoted by ***, **, and * respectively.

	Panel A. Full Sample			**Panel B. Non-consecutive event**			**Panel C. Consecutive event**		
Accounting Variables	Fraud	Matching	Diff	Fraud	Matching	Diff	Fraud	Matching	Diff
Cash and cash equivalents	0.123	0.156	-0.033***	0.129	0.155	-0.026***	0.100	0.161	-0.061***
Receivable	0.056	0.102	-0.047***	0.058	0.104	-0.046***	0.047	0.096	-0.049***
Other receivable	0.162	0.059	0.103***	0.153	0.064	0.089***	0.194	0.040	0.154***
Inventories	0.135	0.182	-0.048***	0.140	0.180	-0.040***	0.114	0.191	-0.077***
Prepaid expenses	0.038	0.038	0.000	0.040	0.038	0.002	0.033	0.038	-0.005
Others currents	0.011	0.006	0.005***	0.011	0.007	0.005***	0.012	0.004	0.008***
Fixed assets	0.274	0.279	-0.005	0.275	0.274	0.001	0.272	0.300	-0.028*
Intangible assets	0.054	0.042	0.013***	0.056	0.044	0.012***	0.047	0.034	0.013***
Other non-current	0.137	0.129	0.008	0.128	0.127	0.001	0.171	0.135	0.036***
Short-term loans	0.269	0.177	0.092***	0.253	0.179	0.074***	0.328	0.168	0.160***
Notes payable	0.023	0.027	-0.003*	0.024	0.026	-0.002	0.022	0.030	-0.008**
Accounts payable	0.086	0.081	0.005*	0.088	0.082	0.006	0.079	0.075	0.004
Employee benefits payable	0.009	0.008	0.001**	0.009	0.008	0.001*	0.010	0.008	0.002**
Taxes payable	0.015	0.013	0.002	0.014	0.014	0.000	0.019	0.010	0.008***
Other short-term liabilities	0.201	0.135	0.066***	0.186	0.141	0.046***	0.252	0.115	0.138***
Long-term debt	0.044	0.045	-0.001	0.048	0.046	0.002	0.028	0.040	-0.013**
Long-term payable	0.006	0.004	0.002**	0.005	0.004	0.002*	0.006	0.004	0.003
Deferred tax liabilities	0.001	0.001	0.000*	0.001	0.000	0.001***	0.000	0.001	-0.001*
Other non-current liabilities	0.049	0.018	0.030***	0.045	0.022	0.023***	0.061	0.005	0.057***
Share capital	0.311	0.251	0.059***	0.313	0.263	0.049***	0.303	0.207	0.096***
Capital reserves	0.299	0.237	0.062***	0.292	0.244	0.048***	0.325	0.211	0.113***
Surplus reserves	0.048	0.047	0.002	0.048	0.045	0.003	0.050	0.051	-0.001
Retained earnings	-0.449	-0.097	-0.352***	-0.412	-0.134	-0.278***	-0.585	0.040	-0.624***
Other stockholder equity	0.020	0.029	-0.010***	0.021	0.030	-0.009***	0.016	0.027	-0.012***

Table 3.4 Indicators of multicollinearity and OLS regression results

Table 3.4a Indicators of multicollinearity

Variables are defined as the balance sheet account value scaled by total assets. Panel A and Panel B: Variance inflation indicators. The differences between Panel A and Panel B are attributable to the fixed assets and retained earnings accounts. Panel A presents the original values and in Panel B the original values for fixed assets and retained earnings are replaced by the residuals of the following regressions: 1. (fixed assets)$_{it}$ = β_{oi} + β_1(cash and cash equivalents) + β_2(receivable) + β_3(other receivable) + β_4(inventories) + β_5 (prepaid expenses) + β_6 (other currents) + β_7 (intangible assets) + β_8 (other non-current assets) + e1 2. (retained earnings)$_{it}$ =β_1 (short-term loans) + β_2 (notes payable) +β_3 (accounts payable) + β_4 (other short-term liabilities) + β_5 (long-term debt) + β_6 (long-term payable) + β_7 (other non-current liabilities) + β_8 (share capital) + β_9 (capital reserves) + β_{10} (surplus reserves) +β_{11} (other stockholder equity) +e2.

Variable	Panel A	Panel B
Cash and cash equivalents	7.79	1.48
Receivable	9.16	2.09
Other receivable	13.07	2.19
Inventories	9.88	1.39
Prepaid expenses	2.20	1.09
Others currents	1.71	1.09
Fixed assets (e1 in B)	13.54	1.29*
Intangible assets	3.20	1.30
Other non-current	8.88	1.43
Short-term loans	2.25	1.75
Notes payable	1.25	1.19
Accounts payable	1.56	1.49
Employee benefits payable	1.22	1.22
Taxes payable	1.30	1.30
Other short-term liabilities	3.85	2.45
Long-term debt	1.31	1.18
Long-term payable	1.07	1.05
Deferred tax liabilities	1.06	1.06
Other non-current liabilities	2.50	2.07
Share capital	3.56	2.25
Capital reserves	3.65	2.09
Surplus reserves	1.39	1.38
Retained earnings (e2 in B)	16.38	1.25*
Other stockholder equity	1.17	1.13

Table 3.4b OLS regression results with fixed assets and retained earnings as dependent variables

Significance at the 1%, 5%, 10% is denoted by ***, **, and * respectively.

Dependent variable	Fixed assets	Dependent variable	Retained earnings
Intercept	0.962***	Intercept	1.176***
Cash and cash equivalents	-0.981***	Short-term loans	-0.870***
Receivable	-0.907***	Notes payable	-1.576***
Other receivable	-0.929***	Accounts payable	-0.878***
Inventories	-0.957***	Other short-term liabilities	-1.476***
Prepaid expenses	-1.004***	Long-term debt	-1.333***
Others currents	-1.144***	Long-term payable	-2.086***
Intangible assets	-0.976***	Other non-current liabilities	-1.314***
Other non-current	-0.954***	Share capital	-1.341***
		Capital reserves	-1.280***
		Surplus reserves	-0.788***
		Other stockholder equity	-0.992***
No. of Observations	2468	No. of Observations	2468
Adj. R square	90.47%	Adj. R square	92.32%

Table 3.5 Probit regression results of balance sheet account values (scaled by total assets) on corporate fraud indicator

Table 3.5a In-sample tests

The sample period is 1994 to 2011. The dependent variable is Fraud, which equals 1 if the firm is subject to a regulatory enforcement action for corporate fraud in the fiscal year and 0 otherwise (for matching firms) as shown in Model 1 of the text. Panels A to D are for all samples. Significances at the 1%, 5%, 10% are denoted by ***, **, and * respectively.

	Panel A	Panel B	Panel C	Panel D
	All firms			
Intercept	0.253	-0.801***	0.496	-0.559***
Cash and cash equivalents	-1.346**	-0.270	-1.346**	-0.270
Receivable	-0.962	0.033	-0.962	0.033
Other receivable	1.728***	2.746***	1.728***	2.746***
Inventories	-2.047***	-0.997***	-2.047***	-0.997***
Prepaid expenses	0.447	1.548***	0.447	1.548***
Others currents	1.774	3.029***	1.774	3.029***
Fixed assets (e1)	-1.097*	-1.097*	-1.097*	-1.097*
Intangible assets	0.467	1.537***	0.467	1.537***
Other non-current	-0.801	0.246	-0.801	0.246
Short-term loans	0.922***	0.922***	0.742***	0.742***
Notes payable	0.284	0.284	-0.041	-0.041
Accounts payable	0.532	0.532	0.351	0.351
Employee benefits payable	11.004***	11.004***	11.004***	11.004***
Taxes payable	-2.266**	-2.266**	-2.266**	-2.266**
Other short-term liabilities	0.456*	0.456*	0.151	0.151
Long-term debt	0.835*	0.835*	0.561	0.561
Long-term payable	5.081***	5.081***	4.651***	4.651***
Deferred tax liabilities	17.369**	17.369**	17.369**	17.369**
Other non-current liabilities	-0.594*	-0.594*	-0.865***	-0.865***
Share capital	0.093	0.093	-0.184	-0.184
Capital reserves	0.434**	0.434**	0.170	0.170
Surplus reserves	0.507	0.507	0.345	0.345
Retained earnings (e2)	0.206**	0.206**	0.206**	0.206**
Other stockholder equity	-1.205*	-1.205*	-1.410**	-1.410**
No. of Observations	2468	2468	2468	2468
Log Likelihood	-1501	-1501	-1501	-1501
Correct prediction 1 (r1)*	0.57	0.57	0.57	0.57
Correct prediction 0 (r0)*	0.77	0.77	0.77	0.77

Note1: Fixed assets and Retained earnings variables used in Panel A are the original values (explanations in Table 3.4a); The Fixed assets variable in Panel B is the residual (e1) (explanations in Table 3.4a); The Retained earnings variable used in Panel C is the residual (e2) (explanations in Table 3.4a); The Fixed assets and Retained earnings variables used in Panel D are the residuals (e1 and e2) (explanations in Table 3.4a).

Note2: *Correct 1 prediction stands for the case when a fraud firm is predicted as “Fraud=1” and Correct 0 prediction stands for the case when a matching firm is correctly predicted as “Fraud=0”.

Table 3.5b In-sample tests

The sample period is 1994 to 2011. The dependent variable is Fraud, which equals 1 if the firm is subject to regulatory enforcement actions for corporate fraud in the fiscal year and 0 otherwise (for matching firms) as shown in Model 1 of the text. Panel E is for samples without consecutive year announcements single announcement and Panel F is for samples with at least two years consecutive announcements. Significances at the 1%, 5%, 10% are denoted by ***, **, and * respectively.

	Panel E	Panel F
	Non-consecutive	Consecutive
Intercept	-0.437***	-4.868***
Cash and cash equivalents	-0.135	-0.415
Receivable	-0.349	1.860
Other receivable	2.273***	5.247***
Inventories	-0.939***	-2.143***
Prepaid expenses	1.756***	5.313***
Others currents	2.192**	6.184*
Fixed assets (e1)	-0.574	-21.485***
Intangible assets	1.435***	3.598*
Other non-current	-0.068	2.068***
Short-term loans	0.682***	4.878***
Notes payable	-0.386	5.345***
Accounts payable	0.794*	3.894**
Employee benefits payable	9.019***	35.559***
Taxes payable	-3.796***	14.460***
Other short-term liabilities	-0.033	3.479***
Long-term debt	0.843*	2.359
Long-term payable	4.037**	19.963***
Deferred tax liabilities	29.442***	-47.850*
Other non-current liabilities	-0.857**	10.686***
Share capital	-0.086	0.433
Capital reserves	0.024	3.814***
Surplus reserves	1.059	1.523
Retained earnings (e2)	0.173*	2.097**
Other stockholder equity	-1.870***	9.164***
No. of Observations	1938	530
Log Likelihood	-1211	-181.26
Correct prediction 1 (r1)*	0.57	0.81
Correct prediction 0 (r0)*	0.74	0.88

Note1: Variables of Fixed assets and Retained earnings used in Panel E and Panel F are residuals (e1 and e2) (explanations in Table 3.4a). These two residuals will be used for the following analyses.

Note2: *Correct 1 prediction stands for the case when a fraud firm is predicted as "Fraud=1" and Correct 0 prediction stands for the case when a matching firm is correctly predicted as "Fraud=0".

Table 3.5c Out-of-sample prediction

The sample period is 1994 to 2011. First 12 years' samples are used in the Probit regression and last 6 years' samples are used to calculate the correct prediction rates. Significances at the 1%, 5%, 10% are denoted by ***, **, and * respectively.

	Panel A. All firms	Panel B. Non-consecutive	Panel C. Consecutive
Intercept	-0.964***	-0.671***	-6.918***
Cash and cash equivalents	-0.225	-0.161	1.153
Receivable	0.469	-0.138	2.873**
Other receivable	2.985***	2.322***	7.337***
Inventories	-0.934***	-1.172***	-1.666*
Prepaid expenses	2.126***	2.244***	7.887***
Others currents	3.718***	2.757**	9.723***
Fixed assets (e1)	1.451	1.513*	-32.371***
Intangible assets	1.891***	1.697***	3.743
Other non-current	0.712**	0.26	3.009***
Short-term loans	1.412***	1.337***	5.074***
Notes payable	-0.059	-0.404	7.544**
Accounts payable	1.481***	1.843***	3.771*
Employee benefits payable	8.947**	7.13	27.691**
Taxes payable	0.087	-2.688	11.825*
Other short-term liabilities	-0.354	-0.530*	7.238***
Long-term debt	0.929*	1.246**	3.529
Long-term payable	3.603**	2.908	23.923***
Deferred tax liabilities	-21.9	-10.782	-173.83
Other non-current liabilities	-0.247	-0.564	5.865
Share capital	-0.686***	-0.506**	0.356
Capital reserves	0.616***	0.398*	6.294***
Surplus reserves	0.307	1.093	2.557
Retained earnings (e2)	0.648***	0.406**	-2.978
Other stockholder equity	-1.488*	-2.516***	9.274***
No. of Observations	1816	1422	394
Log Likelihood	-1062	-860.11	-129.22
Correct prediction 1 (r1)*	0.43	0.37	0.72
Correct prediction 0 (r0)*	0.86	0.82	0.94

Note1: Variables of Fixed assets and Retained earnings used in above three models are residuals (e1 and e2) (explanations in Table 3.4a). These two residuals will be used for the following analyses.

Note2: *Correct 1 prediction stands for the case when a fraud firm is predicted as "Fraud=1" and Correct 0 prediction stands for the case when a matching firm is correctly predicted as "Fraud=0".

Table 3.6 Probit regression results of different types of fraud violations and balance sheet accounts

Separate regressions are run for 7 violation type subsamples. Type1: Related party transactions; Type2: Concealing significant contracts or events; Type3: Postponements/delays in disclosure; Type4: False statement; Type5: External loan guarantees; Type 6: Illegal possession of funds; and Type 789: Fictitious income or assets, Recording fictitious profit and fictitious expenses/liabilities. Significance at the 1%, 5%, 10% is denoted by *, **, and *** respectively.

	type1	type2	type3	type4	type5	type6	type789
Intercept	-1.121***	0.394	0.117	-0.235	-3.089***	-3.199***	-1.075**
Cash and cash equivalents	-0.114	-0.567	-2.201***	-1.405**	0.997	2.300**	0.214
Receivable	-1.361	-1.854**	-1.158	-0.629	-0.719	1.2	-1.504
Other receivable	6.559***	1.819***	4.245***	1.479**	5.175***	6.627***	3.237***
Inventories	-2.173***	-4.037***	-2.448***	-0.667	-0.922	-3.718***	0.192
Prepaid expenses	3.879***	2.520*	1.207	0.138	3.430**	3.059	3.794*
Others currents	7.884**	-2.571	3.113	1.566	12.536**	2.003	2.786
Fixed assets	-4.502**	-4.448**	-0.902	-2.401	-2.661	3.341	-0.22
Intangible assets	1.048	-0.061	-2.329	1.880*	1.078	3.620**	1.445
Other non-current	-0.799	0.551	0.625	-0.549	0.126	-3.511***	-0.129
Short-term loans	1.815***	1.436***	0.606	0.766**	4.385***	4.678***	1.010**
Notes payable	1.438	-1.338	-0.929	1.34	2.45	3.236	-0.997
Accounts payable	1.795	0.669	4.343***	-0.401	2.723*	1.959	1.421
Employee benefits payable	37.981***	6.695	-11.389	19.903***	11.629	-23.391	16.261
Taxes payable	-14.365***	-10.592***	-8.277*	-6.351**	0.372	-9.040*	-7.319**
Other short-term liabilities	-0.138	0.131	-0.836	0.291	1.158	4.136***	-0.505
Long-term debt	2.179**	0.456	-0.969	1.309	3.607**	3.445**	1.939
Long-term payable	8.427*	-0.488	2.102	1.021	16.718*	18.438*	9.098
Deferred tax liabilities	47.149***	7.361	-8.787	-0.086	60.919***	43.569*	-13.984
Other non-current liabilities	-1.373	-1.862**	-3.265***	-0.613	5.758**	3.288	-1.589
Share capital	0.438	0.44	0.867	-0.126	0.49	2.117**	1.547***
Capital reserves	-0.199	0.086	0.031	0.31	1.544*	1.782**	0.474
Surplus reserves	-0.009	-3.343	-1.373	1.457	-3.698	6.930*	-8.341***
Retained earnings	0.542**	0.199	2.106***	0.133	1.792	-0.965	-0.129
Other stockholder equity	-0.866	-4.568***	2.367	-6.780***	0.137	-1.882	3.188
No. of Observations	564	510	354	498	342	306	276

Log Likelihood	-247.63	-272.53	-191.49	-292.2	-132.43	-110.08	-157.93
Correct prediction 1 (r1)*	0.74	0.71	0.69	0.69	0.77	0.83	0.70
Correct prediction 0 (r0)*	0.85	0.76	0.74	0.75	0.83	0.88	0.76

Note: *Correct 1 prediction stands for the case when a fraud firm is predicted as “Fraud=1” and Correct 0 prediction stands for the case when a matching firm is correctly predicted as “Fraud=0”.

Table 3.7 Probit regression results of balance sheet account values on corporate fraud indicator – Robustness checks

The sample period is from 1994 to 2011. Panel A presents annual regressions with three sub-samples in a one-year cross-section, with Year 0 representing the fraud announcement year. Panel B presents the results from repeating the Panel D in Table 3.5a and Table 3.5b in-sample tests but scaling each account by sales instead of total assets. Significance at the 1%, 5%, 10% is denoted by *, **, and *** respectively.

	Panel **A. Event year**			Panel **B. Scaled by sales**		
	Year -1	Year 0	Year +1	All firms	Non-consecutive	consecutive
Intercept	-0.567*	-0.487*	-0.650***	-0.160***	-0.111**	-0.676***
Cash and cash equivalents	-0.083	-0.68	0.096	-0.044	-0.028	-0.679***
Receivable	0.189	-0.455	-0.097	-0.067	-0.119	0.545
Other receivable	3.683***	2.905***	2.002***	0.050**	0.035	0.910***
Inventories	-1.282***	-1.530***	-0.437	-0.174***	-0.195***	-0.944***
Prepaid expenses	2.442**	1.609	0.468	0.417***	0.387**	1.587**
Others currents	3.395	3.360**	2.596	0.789***	0.625**	0.002
Fixed assets (e1)	-1.957	-2.316*	-0.059	-0.026	-0.004	-0.765***
Intangible assets	0.125	1.339	2.268***	0.376***	0.381***	0.247
Other non-current	-0.095	0.124	0.588	-0.013	-0.066*	0.315**
Short-term loans	1.332***	1.036***	0.421	0.011	0.029	0.071
Notes payable	0.401	-0.026	-0.486	0.18	-0.052	1.292
Accounts payable	0.467	0.083	0.861	0.411***	0.306**	1.566**
Employee benefits payable	7.854	17.182***	10.974**	2.610***	1.905*	17.954***
Taxes payable	-0.411	-1.712	-1.716	-0.28	-0.438*	-0.636
Other short-term liabilities	-0.242	0.535	0.005	-0.012	-0.033	-0.111
Long-term debt	0.556	-0.215	0.939	0.06	0.236**	-1.093***
Long-term payable	1.197	6.375**	5.028*	1.260***	0.956*	10.319***
Deferred tax liabilities	36.666*	18.124	8.634	8.401**	17.351***	-41.858***
Other non-current liabilities	-0.056	-0.981	-1.211**	0.255**	0.181*	2.942***

Share capital	-0.682*	-0.42	0.194	-0.135***	-0.107***	-0.182
Capital reserves	-0.132	0.249	0.215	0.058**	0.048	0.605***
Surplus reserves	1.688	0.432	-0.647	0.014	0.152	-1.514*
Retained earnings (e2)	1.294***	0.615**	0.022	-0.033**	-0.026	-0.732***
Other stockholder equity	-0.118	-1.363	-1.911*	-0.146	-0.360*	2.579***
No. of Observations	770	928	770	2416	1914	502
Log Likelihood	-458.62	-525.50	-485.30	-1562	-1244	-203.47
Correct prediction 1 (r1)*	0.61	0.61	0.56	0.45	0.45	0.73
Correct prediction 0 (r0)*	0.75	0.80	0.77	0.82	0.80	0.89

Note1: Variables of Fixed assets and Retained earnings used in Panel A are residuals (e1 and e2) (explanations in Table 3.4a). These two residuals will be used for the following analyses.

Note2: *Correct 1 prediction stands for the case when a fraud firm is predicted as “Fraud=1” and Correct 0 prediction stands for the case when a matching firm is correctly predicted as “Fraud=0”.

Table 3.8 Correct predictions of fraudulent and non-fraudulent firms

All firms includes both fraud and matching samples, Non-consecutive is for the samples without consecutive year announcements and Consecutive is for the samples with at least two years consecutive announcements. In Panel A, variables are defined as the account balance scaled by total assets. In Panel B, variables are defined as the account balance scaled by sales.

	Panel A: asset version						**Panel B: sales version**					
	All firms		Non-consecutive		Consecutive		All firms		Non-consecutive		Consecutive	
	Fraud	Matchi	Fraud	Matching	Fraud	Matching	Frau	Matchi	Fraud	Matching	Fraud	Matching
Cash and cash		**0.58**		0.49		0.44		**0.56**		**0.68**		**0.60**
Receivable		0.00	**1.00**	**0.58**	**0.67**	0.03	**1.00**	**0.52**	**0.96**	**0.53**	0.39	0.00
Other receivable	**0.61**		**0.62**		**0.82**		**0.79**		**0.69**		**0.85**	
Inventories		**0.53**		**0.52**		**0.52**		**0.53**		**0.52**		**0.56**
Prepaid expenses	0.39		0.43		0.29		0.44		0.45		0.25	
Others currents	**0.60**		**0.60**		**0.50**		**0.59**		**0.55**			
Fixed assets	0.47	0.35	0.23	0.00	**0.64**	**0.58**		0.42				0.49
Intangible assets	0.47		0.49		0.42		**0.52**		**0.52**			
Other non-current	0.44			**0.53**	0.32			**0.50**		0.47	0.26	
Short-term loans	**0.50**		**0.52**		**0.52**		0.40		**0.66**			
Notes payable				0.46	0.25		0.40			0.00	0.30	
Accounts payable	0.24		0.36		0.20		0.47		0.47		0.34	
Employee benefits	0.41		0.42	0.00	0.41		0.48	0.00	0.47	0.00	0.43	
Taxes payable	**0.67**	0.44	0.20	0.47	**0.59**	0.42	**1.00**	0.35	**1.00**	0.45	**1.00**	
Other short-term	0.43			0.00	0.48			0.13		0.28		0.00
Long-term debt	0.34		0.41		0.00		0.30		0.47			**0.58**
Long-term payable	0.48		0.49		**0.71**		**0.50**		0.49		**0.56**	
Deferred tax	**0.59**		**0.68**			**0.70**	**0.56**		**0.54**			**0.68**
Other non-current		0.21		0.24	**0.94**	0.00	**0.79**		**0.78**		**0.91**	
Share capital		0.44		0.34				0.49		0.46		0.07
Capital reserves	0.42				0.40		0.45		0.47		0.37	
Surplus reserves	**0.64**		0.38						0.38			0.47
Retained earnings	**1.00**	0.32	**0.71**	0.11	**1.00**	**0.53**	**0.76**	0.00	**0.72**	0.00	**0.86**	**0.90**
Other stockholder	**0.82**	**0.57**	**0.58**	**0.55**	0.40	0.03	**1.00**	**0.50**	**0.69**	**0.60**	0.44	0.06

Table 3.9 Probit regression results of balance sheet accounts, corporate ownership, board structure, and firm specific information on corporate fraud

This table presents the probit regression analyses of the relationship between corporate fraud and balance sheet accounts, corporate ownership, board structure and firm specific information from 2001 to 2010. The dependent variable is Fraud, which equal 1 if the firm experience regulatory enforcement actions against corporate fraud in the fiscal year and 0 otherwise. Accounting variables are defined as the account to total assets. Significance at the 1%, 5%, 10% is denoted by *, **, and *** respectively.

	Panel A		Panel B	Panel C
			Asset- based	Sales- based
Intercept	0.889	Intercept	-0.336	0.145
		Cash and cash equivalents	-0.066	-0.068
		Receivable	1.414***	0.253*
		Other receivable	3.966***	0.250***
		Inventories	-0.972***	-0.108*
		Prepaid expenses	1.170	0.310
		Others currents	5.853***	2.104***
		Fixed assets (e1)	0.611	0.004
		Intangible assets	-0.142	-0.025
		Other non-current	0.597	0.121**
		Short-term loans	0.804***	0.033
		Notes payable	1.121	0.527
		Accounts payable	1.265*	0.383
		Employee benefits payable	4.391	1.111
		Taxes payable	-2.259	-0.871
		Other short-term liabilities	-0.426	-0.154***
Tradable	-0.389	Long-term debt	2.144***	0.290**
Herfindahl	-2.256	Long-term payable	4.505*	1.351*
Dual	-0.055	Deferred tax liabilities	13.446	11.248**
Board	-0.041**	Other non-current liabilities	0.286	0.269
SBSIZE	0.011	Share capital	-1.024***	-0.329***
INDE	-0.316	Capital reserves	0.346	0.036
MEET	0.012	Surplus reserves	0.580	0.512*
SBMEET	0.017	Retained earnings (e2)	0.011	-0.077**
CPAs	0.004	Other stockholder equity	-1.886*	-0.147
Govt	-0.088	Govt	-0.219**	-0.217**
Top	-1.402***	Top	-1.026***	-1.059***
ST	1.095***	ST	1.125***	1.160***
PT	1.767***	PT	2.433***	2.680***
RET	-0.084***	RET	-0.007	-0.074*
No. of Observations	1204	No. of Observations	1204	1204
Log Likelihood	-742.09	Log Likelihood	-642.97	-686.09

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Table 4.1 Descriptive statistics for regulatory enforcements

This table reports the number of fraudulent sample during 1994-2011. This study collects 656 fraudulent announcements made by the CSRC, SHSE and SZSE (firms in finance industry are omitted). This table presents the yearly (Panel A), industry (Panel B), province distribution (Panel C), frequency of punishment (Panel D), and frequency distribution by size (Panel E) of the fraudulent sample. Fraud cases are the number of fraudulent activities committed by listed firms that are disclosed. The column ‘fraud firms’ indicates the number of listed firms that committed fraud. The column ‘fraud index’ measure the deviation between a and b, which is (c) = (a-b) ÷ b ×100.

Panel A: Yearly distribution

Years	Fraud cases		Fraud firms		Listed firms		Fraud index	Fraud firms/Listed firms
	No.	%	No.	%(a)	No.	%(b)	%(c)	%
1994	2	0.30%	2	0.37%	291	1.33%	-72.18%	0.69%
1995	0	0.00%	0	0.00%	323	1.47%	-100.00%	0.00%
1996	4	0.61%	4	0.74%	530	2.42%	-69.45%	0.75%
1997	10	1.52%	10	1.85%	745	3.40%	-45.67%	1.34%
1998	5	0.76%	5	0.92%	851	3.88%	-76.22%	0.59%
1999	13	1.98%	13	2.40%	949	4.33%	-44.56%	1.37%
2000	14	2.13%	14	2.58%	1088	4.96%	-47.92%	1.29%
2001	68	10.37%	62	11.44%	1160	5.29%	116.33%	5.34%
2002	55	8.38%	47	8.67%	1224	5.58%	55.42%	3.84%
2003	55	8.38%	44	8.12%	1287	5.87%	38.37%	3.42%
2004	61	9.30%	53	9.78%	1377	6.28%	55.78%	3.85%
2005	95	14.48%	64	11.81%	1381	6.30%	87.57%	4.63%
2006	92	14.02%	66	12.18%	1434	6.54%	86.28%	4.60%
2007	75	11.43%	58	10.70%	1550	7.07%	51.45%	3.74%
2008	37	5.64%	33	6.09%	1625	7.41%	-17.81%	2.03%
2009	36	5.49%	33	6.09%	1718	7.83%	-22.26%	1.92%
2010	15	2.29%	15	2.77%	2063	9.40%	-70.57%	0.73%
2011	19	2.90%	19	3.51%	2341	10.67%	-67.15%	0.81%
Total	656	100%	542	100%	21937	100%		
							Average	2.27%

Panel B: Industry distribution

	Fraud cases		Fraud firms		Listed firms		Fraud index
	No.	%	No.	%(a)	No.	%(b)	%(c)
Manufacturing	333	50.76%	282	52.03%	1406	60.06%	-13.37%
Real Estate	82	12.50%	69	12.73%	134	5.72%	122.41%
Information Technology	62	9.45%	45	8.30%	169	7.22%	15.01%
Wholesale and Retail Trade	39	5.95%	32	5.90%	149	6.36%	-7.24%
Conglomerates	35	5.34%	32	5.90%	23	0.98%	500.93%
Farming, Forestry, Animal Husbandry	31	4.73%	22	4.06%	36	1.54%	163.95%
Social Services	21	3.20%	19	3.51%	72	3.08%	13.98%
Utilities	16	2.44%	13	2.40%	78	3.33%	-28.01%
Construction	13	1.98%	11	2.03%	60	2.56%	-20.81%
Transportation and Warehousing	11	1.68%	10	1.85%	77	3.29%	-43.91%
Mining	10	1.52%	5	0.92%	65	2.78%	-66.78%
Communication and Cultural Industry	3	0.46%	2	0.37%	30	1.28%	-71.21%
total	656	100%	542	100%	2341		

Panel C: Frequency distribution by times of punishment

No.	Firms	%
1	153	48.88%
2	64	20.45%
3	45	14.38%
4	30	9.58%
5	11	3.51%
6	5	1.60%
7	5	1.60%
Total	313	100%

Panel D: Frequency distribution by size

Size	Frequency	%
10	13	2.02%
9	24	3.73%
8	29	4.50%
7	48	7.45%
6	55	8.54%
5	52	8.07%
4	73	**11.34%**
3	81	**12.58%**
2	90	**13.98%**
1	179	**27.80%**
Total	644[88]	100%

[88] There are 12 observations with no market value in CSMAR; therefore, the total number of cases decreases from 656 to 644.

Panel E: Provincial distribution

	Fraud cases		Fraud firms		Fraud index	Ratio of fraud cases[89]	Ratio of fraud firms[90]	MINDEX[91]
	No.	%	No.	%	%	%	%	
Guangdong	68	10.37%	34	10.83%	-25.66%	19.94%	9.97%	8.73
Shanghai	58	8.84%	26	8.28%	0.44%	30.05%	13.47%	8.44
Shandong	48	7.32%	21	6.69%	9.49%	33.57%	14.69%	6.93
Sichuan	44	6.71%	19	6.05%	57.39%	48.89%	21.11%	5.88
Hunan	38	5.79%	17	5.41%	83.68%	55.07%	24.64%	5.59
Beijing	34	5.18%	15	4.78%	-42.36%	17.53%	7.73%	7.30
Hubei	29	4.42%	17	5.41%	58.43%	36.25%	21.25%	5.67
Zhejiang	28	4.27%	16	5.10%	-46.51%	12.56%	7.17%	8.87
Fujian	27	4.12%	12	3.82%	7.79%	32.53%	14.46%	7.70
Jiangsu	26	3.96%	14	4.46%	-51.00%	12.21%	6.57%	8.08
Chongqing	26	3.96%	8	2.55%	65.68%	72.22%	22.22%	6.30
Tianjin	24	3.66%	6	1.91%	24.26%	66.67%	16.67%	7.21
Gansu	23	3.51%	9	2.87%	168.39%	92.00%	36.00%	3.95
Jilin	19	2.90%	11	3.50%	100.02%	46.34%	26.83%	5.18
Heilongjiang	19	2.90%	10	3.18%	132.98%	59.38%	31.25%	4.67
Liaoning	18	2.74%	11	3.50%	26.17%	27.69%	16.92%	6.60
Ningxia	14	2.13%	5	1.59%	210.64%	116.67%	41.67%	4.00
Anhui	13	1.98%	7	2.23%	-31.33%	17.11%	9.21%	5.89
Guangxi	13	1.98%	7	2.23%	79.96%	44.83%	24.14%	5.17
Hainan	13	1.98%	6	1.91%	78.93%	52.00%	24.00%	5.50
Xinjiang	11	1.68%	7	2.23%	41.05%	29.73%	18.92%	3.84
Hebei	11	1.68%	5	1.59%	-18.96%	23.91%	10.87%	5.89
Qinghai	10	1.52%	4	1.27%	198.22%	100.00%	40.00%	2.88
Neimenggu	9	1.37%	5	1.59%	77.51%	42.86%	23.81%	4.64
Henan	8	1.22%	5	1.59%	-39.88%	12.90%	8.06%	5.71
Shaannxi	8	1.22%	5	1.59%	6.51%	22.86%	14.29%	4.25
Shanxi	6	0.91%	4	1.27%	-6.81%	18.75%	12.50%	4.65
Guizhou	4	0.61%	3	0.96%	11.83%	20.00%	15.00%	4.09
Jiangxi	3	0.46%	3	0.96%	-32.22%	9.09%	9.09%	5.49
Yunnan	2	0.30%	1	0.32%	-74.29%	6.90%	3.45%	4.54
Xizang	2	0.30%	1	0.32%	-25.45%	20.00%	10.00%	1.48
	656	100%	313	100%				

[89] Ratio of fraud cases is the number of fraud cases divided by the number of listed firms in a province.
[90] Ratio of fraud firms is the number of fraud firms divided by the number of listed firms in a province.
[91] A comprehensive index to capture the regional market development; higher values indicate greater regional market development (Fan and Wang, 2006).

Table 4.2 Comparison of fraudulent firms and matching firms

Descriptive statistics of fraudulent firms and univariate comparisons of fraudulent and matching firms.
This table presents firm characteristics of 1647 firm-year fraudulent observations and 1638 firm-year matching observations from 1994 to 2011. Annual observations of the fraudulent firms and matching firms from three years before to three years after the event are included in the analyses. Panel A examines the full study period of fraudulent firms' accounting data before standardization, deflated by total assets, and deflated by sales, respectively. Panel B shows summary statistics for accounting variables in both fraudulent firms and matching firms. Panel C shows summary statistics for accounting variables deflated by total assets in both fraudulent firms and matching firms. Panel D shows summary statistics on accounting variables deflated by sales in both fraudulent firms and matching firms.
Panels E, F and G presents fraudulent firms year-by-year statistics for other receivables (OREC) in million RMB, deflated by total assets, and deflated by sales, respectively. The study variables are explained in Appendix B.4. All variables are winsorized at 1% and 99%. Significance at 1%, 5%, 10% level (two-tail test) is denoted by ***, **, and * respectively.

Panel A[92]: Descriptive statistics of fraudulent firms

	Before standardization (Model 1)					TA version (Model 2)					Sales version (Model 3)				
Variable	Mean	Median	1st Pctl	99th Pctl	Std Dev	Mean	Median	1st Pctl	99th Pctl	Std Dev	Mean	Median	1st Pctl	99th Pctl	Std Dev
TaxFees	13.462	2.720	0.000	282.785	38.595	0.006	0.003	0.000	0.069	0.011	0.018	0.006	0.000	0.149	0.028
SellingExp	59.956	16.506	0.000	1081.498	147.634	0.028	0.016	0.000	0.211	0.037	0.071	0.043	0.000	0.526	0.090
G&A	92.670	52.180	1.199	723.156	119.464	0.071	0.046	0.002	0.575	0.092	0.378	0.111	0.005	8.453	1.126
FinExp	31.398	17.490	-14.558	213.464	40.681	0.023	0.016	-0.009	0.170	0.029	0.129	0.037	-0.033	2.317	0.351
Impairment	9.011	0.000	-19.831	208.853	33.265	0.010	0.000	-0.020	0.245	0.040	0.034	0.000	-0.060	0.995	0.150
OCROper	90.872	30.687	0.000	1001.293	166.308	0.278	0.027	0.000	0.845	5.510	1.848	0.061	0.000	11.665	35.716
OCPOper	143.402	62.835	2.101	1341.075	232.643	0.238	0.057	0.004	0.754	4.376	1.529	0.134	0.009	7.852	30.114
OCRInv	8.991	0.000	0.000	224.000	32.489	0.008	0.000	0.000	0.159	0.060	0.046	0.000	0.000	0.786	0.615
CPInv	35.122	0.300	0.000	622.624	100.810	0.020	0.000	0.000	0.258	0.051	0.063	0.001	0.000	1.397	0.197
NCAcq	2.692	0.000	0.000	137.483	16.759	0.001	0.000	0.000	0.044	0.007	0.002	0.000	0.000	0.108	0.014
OCPInv	9.304	0.000	0.000	275.324	39.713	0.020	0.000	0.000	0.189	0.468	0.087	0.000	0.000	0.667	2.190
OCRFin	18.969	0.000	0.000	466.386	69.675	0.024	0.000	0.000	0.318	0.253	0.095	0.000	0.000	1.364	1.441
OCPFin	14.853	0.000	0.000	398.827	56.517	0.016	0.000	0.000	0.255	0.207	0.086	0.000	0.000	0.667	2.202
NOCPOper	52.530	20.810	-312.153	797.186	174.454	0.022	0.020	-0.261	0.288	0.081	0.043	0.043	-1.943	1.545	0.413
NOCPInv	0.313	0.000	-143.197	198.370	38.976	0.000	0.000	-0.095	0.118	0.022	0.002	0.000	-0.293	0.431	0.075
NOCPFin	-4.116	0.000	-270.117	158.922	56.159	-0.003	0.000	-0.149	0.080	0.027	-0.012	0.000	-0.548	0.203	0.091
OREC	154.022	71.374	23.451	197.640	204.852	0.138	0.064	0.000	0.852	0.180	1.205	0.145	0.001	34.116	4.448
PrepaidExp	71.098	27.902	6.673	76.639	125.193	0.039	0.022	0.000	0.268	0.048	0.163	0.051	0.000	2.615	0.388
STDebt	390.966	225.000	69.090	510.890	503.473	0.254	0.211	0.000	1.362	0.242	1.279	0.495	0.000	21.497	3.047
Retained earnings	-134.249	-51.668	-326.862	65.903	526.765	-0.502	-0.043	-10.435	0.267	1.495	-3.338	-0.090	-88.683	0.975	13.247
TopRatio	0.345	0.297	0.100	0.735	0.162	0.345	0.297	0.100	0.735	0.162	0.345	0.297	0.100	0.735	0.162

[92] Accounting variables in Panel A are in million RMB.

Panel B[93]: Univariate comparison of fraudulent and matching firms

	Mean			Median		
Variable	Fraud	Matching	Diff	Fraud	Matching	Diff
Assets	1890.036	2191.740	-301.705***	1046.697	1182.915	-136.219***
Sales	1100.467	1580.234	-479.767***	440.601	629.303	-188.702***
TaxFees	13.462	20.441	-6.979***	2.720	4.437	-1.716***
SellingExp	59.956	76.875	-16.919***	16.506	26.736	-10.230***
G&A	92.670	90.291	2.379	52.180	47.534	4.646
FinExp	31.398	23.330	8.068***	17.490	10.575	6.915***
Impairment	9.011	5.732	3.278***	0.000	0.000	0.000
OCROper	90.872	70.118	20.754***	30.687	23.273	7.414***
OCPOper	143.402	143.169	0.233	62.835	65.308	-2.474
OCRInv	8.991	8.275	0.716	0.000	0.000	0.000
CPInv	35.122	54.202	-19.080***	0.300	4.634	-4.334***
NCAcq	2.692	3.508	-0.816	0.000	0.000	0.000*
OCPInv	9.304	8.089	1.216	0.000	0.000	0.000
OCRFin	18.969	12.411	6.558***	0.000	0.000	0.000**
OCPFin	14.853	10.524	4.329**	0.000	0.000	0.000
NOCPOper	52.530	73.051	-20.522***	20.810	27.466	-6.656***
NOCPInv	0.313	-0.187	0.500	0.000	0.000	0.000
NOCPFin	-4.116	-1.886	-2.229	0.000	0.000	0.000
OREC	154.022	70.577	83.446***	71.374	30.885	40.489***
PrepaidExp	71.098	82.222	-11.124**	27.902	28.982	-1.081
STDebt	390.966	321.914	69.051***	225.000	158.574	66.427***
NetProfit	-5.905	62.821	-68.726***	11.504	33.015	-21.511***
Retained earnings	-134.249	115.997	-250.247***	-51.668	57.942	-109.610***

[93] Variables in Panel B are in million RMB.

Panel C: Univariate comparisons of fraudulent and matching firms (deflated by total assets)

	Mean			Median		
Variable	Fraud	Matching	Diff	Fraud	Matching	Diff
TaxFees	0.006	0.008	-0.001***	0.003	0.004	-0.001***
SellingExp	0.028	0.036	-0.009***	0.016	0.022	-0.005***
G&A	0.071	0.052	0.019***	0.046	0.042	0.004***
FinExp	0.023	0.013	0.011***	0.016	0.010	0.006***
Impairment	0.010	0.003	0.007***	0.000	0.000	0.000
NOCPOper	0.022	0.030	-0.007***	0.020	0.024	-0.004***
CPInv	0.020	0.031	-0.012***	0.000	0.003	-0.003***
NCAcq	0.001	0.001	0.000	0.000	0.000	0.000*
NOCPInv	0.000	0.000	0.000	0.000	0.000	0.000
NOCPFin	-0.003	-0.001	-0.001*	0.000	0.000	0.000
OREC	0.138	0.058	0.080***	0.064	0.023	0.041***
PrepaidExp	0.039	0.038	0.001	0.022	0.023	0.000
STDebt	0.254	0.171	0.083***	0.211	0.145	0.065***
NetProfit	-0.038	0.023	-0.061***	0.013	0.031	-0.019***
Retained earnings	-0.502	-0.082	-0.420***	-0.043	0.047	-0.090***

Panel D: Univariate comparisons of fraudulent and matching firms (deflated by sales)

	Mean			Median		
Variable	Fraud	Matching	Diff	Fraud	Matching	Diff
TaxFees	0.018	0.019	-0.001	0.006	0.007	-0.001*
SellingExp	0.071	0.070	0.001	0.043	0.044	-0.001
G&A	0.378	0.221	0.157***	0.111	0.081	0.030***
FinExp	0.129	0.063	0.066***	0.037	0.019	0.019***
Impairment	0.034	0.010	0.025***	0.000	0.000	0.000
NOCPOper	0.043	0.059	-0.016	0.043	0.045	-0.002
CPInv	0.063	0.092	-0.028***	0.001	0.005	-0.004***
NCAcq	0.002	0.003	-0.001	0.000	0.000	0.000*
NOCPInv	0.002	0.004	-0.002	0.000	0.000	0.000
NOCPFin	-0.012	-0.005	-0.007**	0.000	0.000	0.000
OREC	1.205	0.592	0.612***	0.145	0.043	0.102***
PrepaidExp	0.163	0.120	0.043***	0.051	0.041	0.011***
STDebt	1.279	0.791	0.488***	0.495	0.270	0.225***
NetProfit	-0.400	-0.106	-0.294***	0.027	0.058	-0.031***
Retained earnings	-3.338	-0.987	-2.351***	-0.090	0.082	-0.172***

Panel E: Other receivables (in million RMB)

		OREC					ΔOREC				
Year	No.	Mean	Median	1st Pctl	99th Pctl	Std Dev	Mean	Median	1st Pctl	99th Pctl	Std Dev
1998	6	44.215	41.088	30.607	53.091	26.605	7.480	9.812	-18.533	32.123	31.472
1999	54	172.483	108.289	51.912	236.746	170.533	3.777	5.408	-25.068	49.407	105.349
2000	84	169.399	107.550	38.165	229.044	181.146	12.025	2.732	-24.358	28.740	102.347
2001	124	201.170	79.682	21.450	194.369	444.278	-14.546	-6.573	-77.316	19.612	161.076
2002	148	203.152	97.564	36.214	228.519	381.279	13.072	1.625	-29.622	55.492	137.065
2003	170	213.725	114.522	38.967	245.833	403.790	20.269	6.885	-27.134	59.278	149.249
2004	186	253.812	133.572	51.483	347.624	425.251	33.487	3.243	-17.459	63.183	146.441
2005	172	293.846	154.937	51.972	367.800	504.256	7.547	-2.353	-48.966	26.497	156.429
2006	162	241.238	111.839	39.356	272.165	459.708	-43.978	-7.797	-107.008	20.477	196.045
2007	156	111.987	48.615	14.103	97.123	338.950	-95.767	-40.353	-133.622	-0.366	153.139
2008	140	65.783	33.997	11.233	77.580	89.693	-24.690	-5.001	-37.556	4.046	110.653
2009	114	50.300	24.373	7.004	56.052	73.041	-14.227	-0.168	-31.477	4.464	54.588
2010	80	41.101	22.766	6.104	53.893	60.056	-1.921	-0.603	-15.252	7.040	51.367
2011	51	96.819	17.184	6.277	49.449	246.301	34.865	0.166	-3.523	18.738	122.128

Panel F: Other receivables deflated by total assets

		OREC					ΔOREC				
Year	No.	Mean	Median	1st Pctl	99th Pctl	Std Dev	Mean	Median	1st Pctl	99th Pctl	Std Dev
1998	6	0.096	0.106	0.029	0.138	0.064	0.024	0.008	-0.037	0.094	0.089
1999	54	0.203	0.123	0.066	0.291	0.192	0.000	0.009	-0.039	0.066	0.130
2000	84	0.181	0.123	0.051	0.253	0.184	-0.006	0.004	-0.024	0.035	0.122
2001	124	0.130	0.075	0.034	0.191	0.129	-0.049	-0.006	-0.085	0.022	0.190
2002	148	0.163	0.092	0.036	0.217	0.253	0.009	0.002	-0.039	0.041	0.134
2003	170	0.150	0.092	0.037	0.178	0.185	0.011	0.006	-0.022	0.040	0.124
2004	186	0.243	0.113	0.034	0.256	0.763	0.024	0.003	-0.011	0.047	0.114
2005	172	0.280	0.129	0.041	0.322	0.740	-0.007	-0.003	-0.033	0.039	0.132
2006	162	0.227	0.100	0.026	0.305	0.396	-0.053	-0.008	-0.095	0.013	0.214
2007	155	0.090	0.036	0.011	0.106	0.143	-0.134	-0.036	-0.155	0.000	0.217
2008	140	0.068	0.026	0.009	0.074	0.103	-0.066	-0.004	-0.037	0.004	0.205
2009	114	0.044	0.016	0.006	0.039	0.086	-0.029	-0.001	-0.013	0.004	0.137
2010	80	0.054	0.010	0.005	0.029	0.127	-0.009	0.000	-0.007	0.004	0.093
2011	51	0.050	0.012	0.004	0.047	0.130	-0.002	0.000	-0.004	0.010	0.071

Panel G: Other receivables deflated by sales

		OREC					ΔOREC				
Year	No.	Mean	Median	1st Pctl	99th Pctl	Std Dev	Mean	Median	1st Pctl	99th Pctl	Std Dev
1998	6	0.261	0.205	0.127	0.358	0.220	0.092	0.036	-0.043	0.156	0.269
1999	54	3.113	0.418	0.163	1.340	10.520	0.125	0.017	-0.079	0.239	0.793
2000	82	7.820	0.337	0.120	0.800	62.069	-0.193	0.004	-0.055	0.125	1.621
2001	124	1.281	0.231	0.080	0.797	5.021	-0.406	-0.011	-0.174	0.057	1.949
2002	147	0.880	0.279	0.077	0.777	1.839	0.022	0.004	-0.113	0.149	0.945
2003	168	1.042	0.224	0.080	0.728	3.552	0.075	0.011	-0.057	0.165	0.887
2004	183	7.345	0.208	0.058	0.843	64.590	-0.053	0.006	-0.018	0.114	1.361
2005	169	2.456	0.352	0.088	1.109	10.496	-0.117	-0.003	-0.091	0.072	1.521
2006	159	19.587	0.250	0.051	0.900	217.304	-0.469	-0.021	-0.278	0.031	2.017
2007	152	3.615	0.070	0.022	0.208	34.493	-0.792	-0.107	-0.503	-0.001	2.277
2008	134	1.766	0.067	0.016	0.166	16.926	-0.496	-0.004	-0.094	0.007	2.080
2009	109	0.366	0.038	0.013	0.108	2.280	-0.208	-0.003	-0.020	0.007	1.388
2010	76	1.702	0.022	0.009	0.052	14.087	0.044	-0.001	-0.026	0.007	0.407
2011	49	0.128	0.021	0.007	0.078	0.343	0.007	0.001	-0.003	0.017	0.282

Table 4.3 Correlation matrix of explanatory variables to explain the tunnelling process

This table presents a correlation analysis of the variables used in the fraud study. All accounting variables are deflated by total assets.[94]
The study variables are explained in Appendix B.4. This study has winsorized all variables at 1% and 99%. Significance at 1%, 5%, 10% level (two-tail test) is denoted by ***, **, and * respectively.

[94] Similar results are produced when variables are before standardization and for variables deflated by sales. Also, the VIFs in these three versions are less than 4, which is much lower than the critical value of 10.

TaxFees	1														
SellingExp	0.166***	1													
G&A	0.010	0.174***	1												
FinExp	-0.100***	0.051**	0.479***	1											
Impairment	-0.013	0.079***	0.170***	0.412***	1										
NOCPOper	0.063**	0.341***	0.045*	-0.107***	-0.022	1									
CPInv	-0.044*	-0.031	-0.047*	-0.124***	-0.053**	-0.045*	1								
NCAcq	-0.011	-0.007	-0.053**	-0.051*	-0.021	-0.007	0.039	1							
NOCPInv	0.009	0.043*	0.064**	0.034	0.043*	0.002	0.024	-0.001	1						
NOCPFin	-0.008	-0.026	-0.045*	-0.049*	-0.058**	-0.022	-0.042*	0.009	0.008	1					
ΔprepaidExp	0.008	-0.028	-0.197***	-0.224***	-0.186***	0.019	0.023	0.033	-0.015	0.012	1				
ΔSTDebt	-0.024	-0.087***	-0.269***	-0.371***	-0.293***	0.171***	0.069**	0.050**	-0.014	0.189***	0.261***	1			
Δemployee	0.019	0.046*	-0.105***	-0.139***	-0.046*	0.067**	-0.044*	0.029	-0.114***	0.015	0.088***	0.220***	1		
Δearnings	0.106***	0.018	-0.528***	-0.359***	-0.208***	-0.049*	0.071***	0.035	-0.005	-0.001	0.186***	-0.015	0.009	1	
ΔOREC	-0.027	-0.067**	-0.100***	-0.292***	-0.214***	0.273***	0.008	-0.004	0.045*	0.052**	0.082***	0.412***	0.124***	0.049*	1
	TaxFees	SellingExp	G&A	FinExp	Impairment	NOCPOper	CPInv	NCAcq	NOCPInv	NOCPFin	ΔprepaidExp	ΔSTDebt	Δemployee	Δearnings	ΔOREC

Table 4.4 OLS regression results of changes in other receivables on other operating costs and net cash flows (total assets version)

This table reports the regression results for tunnelling behaviour and the possible accounts used to engage in tunnelling. Annual observations for fraudulent firms from three years before to three years after the event are included in the regression. All variables are scaled by total assets. The dependent variable is the change in other receivables (ΔOREC). Each model includes industry dummy variables to control for industry effects.[95] The numbers in parentheses below the coefficients are t-statistics to test the significance of the variables. Significance at 1%, 5%, 10% level (two-tail test) is denoted by ***, **, and * respectively.

	Model 1	Model 2	Model 3	Model 4	Model 5
	Fraud sample	Pre-2005	Post-2005	Pre-event	Post-event
Intercept	0.000	0.002	-0.023	0.018	-0.015
	(-0.02)	(0.10)	(-0.84)	(0.80)	(-0.77)
TaxFees	-0.675**	-1.309***	-0.188	-0.061	-0.615
	(-2.00)	(-2.84)	(-0.39)	(-0.09)	(-1.59)
SellingExp	-0.697***	-0.642***	-0.673***	-0.493**	-0.723***
	(-6.27)	(-3.82)	(-4.45)	(-2.48)	(-5.49)
G&A	0.086*	-0.063	0.163**	0.153*	0.074
	(1.82)	(-0.94)	(2.41)	(1.77)	(1.32)
FinExp	-1.348***	-0.876***	-1.544***	-0.925***	-1.437***
	(-8.27)	(-3.15)	(-7.26)	(-3.15)	(-7.44)
Impairment	-0.441***	0.983*	-0.394***	-0.077	-0.469***
	(-4.35)	(1.88)	(-3.37)	(-0.40)	(-3.95)
NOCPOper	0.600***	0.689***	0.528***	0.603***	0.567***
	(12.29)	(10.13)	(7.53)	(6.67)	(9.81)
CPInv	-0.046	-0.017	-0.111	-0.034	-0.071
	(-0.63)	(-0.19)	(-0.95)	(-0.38)	(-0.68)
NCAcq	-0.351	-0.120	-0.118	-0.321	-0.304
	(-0.63)	(-0.06)	(-0.18)	(-0.34)	(-0.45)
NOCPInv	0.434***	0.292	0.547**	0.332	0.415*
	(2.63)	(1.46)	(2.08)	(1.49)	(1.88)
NOCPFin	0.239*	0.018	0.284	0.688***	0.141
	(1.73)	(0.08)	(1.57)	(2.72)	(0.87)
N	1638	766	872	463	1175
Adj R-sq	17.79%	14.00%	17.64%	14.00%	18.69%

[95] The results remain consistent when standard errors are clustered by company to correct for heteroskedasticity and time series autocorrelation within each company.

Table 4.5 OLS regression linking other operating costs, net cash flows, change of some controlling variables to the change in other receivables (total assets version)

This table reports the regression results for tunnelling behaviour and possible the possible accounts used to engage in tunnelling when other controlling variables included. Annual observations for fraudulent firms from three years before to three years after the event are included in the regression. Panel A examines the full study period for fraudulent firms. Panel B examines the sub-period before 2005 and Panel C examines the sub-period after 2005. All accounting variables are scaled by total assets. The dependent variable is change in other receivables (ΔOREC). Each model includes industry dummy variables to control for industry effects.[96] The numbers in parentheses below the coefficients are t-statistics to test the significance of the variables. Significance at 1%, 5%, 10% level (two-tail test) is denoted by ***, **, and * respectively.

[96] The results remain consistent when standard errors are clustered by company to correct for heteroskedasticity and time series autocorrelation within each company.

Panel A: Full fraud sample

	Model1	Model2	Model3	Model4	Model5
Intercept	0.003	0.005	-0.009	-0.002	-0.012
	(0.20)	(0.32)	(-0.61)	(-0.11)	(-0.74)
TaxFees	-0.652*	-0.541	-0.632**	-0.666**	-0.786**
	(-1.93)	(-1.61)	(-1.96)	(-1.98)	(-2.30)
SellingExp	-0.658***	-0.610***	-0.589***	-0.706***	-0.683***
	(-5.44)	(-5.42)	(-5.48)	(-6.30)	(-6.14)
G&A	0.086*	-0.046	0.220***	0.087	0.091*
	(1.82)	(-0.78)	(4.22)	(1.63)	(1.91)
FinExp	-1.352***	-1.400***	-0.950***	-1.299***	-1.337***
	(-8.29)	(-8.65)	(-5.97)	(-7.91)	(-8.20)
Impairment	-0.437***	-0.515***	-0.212**	-0.445***	-0.425***
	(-4.30)	(-5.01)	(-2.13)	(-4.35)	(-4.17)
NOCPOper	0.601***	0.573***	0.483***	0.591***	0.601***
	(12.30)	(11.74)	(10.17)	(12.08)	(12.32)
CPInv	-0.038	-0.017	-0.094	-0.032	-0.042
	(-0.51)	(-0.23)	(-1.34)	(-0.43)	(-0.57)
NCAcq	-0.352	-0.311	-0.581	-0.406	-0.313
	(-0.63)	(-0.56)	(-1.09)	(-0.73)	(-0.56)
NOCPInv	0.436***	0.447***	0.422***	0.501***	0.434***
	(2.64)	(2.71)	(2.67)	(3.03)	(2.63)
NOCPFin	0.244*	0.215	-0.090	0.232*	0.236*
	(1.76)	(1.57)	(-0.67)	(1.68)	(1.71)
Sales	-0.008				
	(-0.82)				
ROA		-0.098***			
		(-3.79)			
ΔprepaidExp			-0.175**	0.021	
			(-2.15)	(0.26)	
ΔSTDebt			0.315***		
			(12.48)		
Δemployee			1.114*	2.366***	
			(1.79)	(3.69)	
Δearnings			0.050***	-0.007	
			(2.84)	(-0.37)	
TopRatio					0.044*
					(1.82)
N	1638	1638	1638	1638	1638
Adj R-sq	17.77%	18.73%	25.47%	18.35%	17.91%

Panel B: Pre-2005 and Pre-event

	Calendar year pre-2005					Pre-event year				
	Model1	Model2	Model3	Model4	Model5	Model6	Model7	Model8	Model9	Model10
Intercept	0.009	0.007	-0.007	0.003	-0.011	0.033	0.015	0.011	0.020	0.003
	(0.47)	(0.38)	(-0.43)	(0.19)	(-0.56)	(1.41)	(0.68)	(0.51)	(0.91)	(0.12)
TaxFees	-1.283***	-1.291***	-1.184***	-1.323***	-1.390***	-0.069	-0.127	0.018	-0.084	-0.268
	(-2.78)	(-2.83)	(-2.65)	(-2.90)	(-3.00)	(-0.10)	(-0.18)	(0.03)	(-0.12)	(-0.37)
SellingExp	-0.585***	-0.633***	-0.678***	-0.725***	-0.623***	-0.357*	-0.522***	-0.522***	-0.521***	-0.462**
	(-3.30)	(-3.76)	(-4.12)	(-4.32)	(-3.70)	(-1.72)	(-2.61)	(-2.67)	(-2.63)	(-2.32)
G&A	-0.064	-0.156	0.041	-0.068	-0.060	0.157*	0.267**	0.463***	0.400***	0.162*
	(-0.95)	(-1.32)	(0.44)	(-0.72)	(-0.90)	(1.82)	(2.08)	(4.08)	(3.54)	(1.88)
FinExp	-0.912***	-0.985***	-0.395	-0.799***	-0.841***	-0.916***	-0.867***	-0.724**	-0.870***	-0.914***
	(-3.25)	(-3.43)	(-1.39)	(-2.84)	(-3.01)	(-3.13)	(-2.91)	(-2.47)	(-2.96)	(-3.11)
Impairment	0.978*	1.007*	0.353	0.913*	0.977*	-0.069	0.007	0.145	0.105	-0.067
	(1.87)	(1.95)	(0.68)	(1.75)	(1.87)	(-0.36)	(0.03)	(0.74)	(0.53)	(-0.35)
NOCPOper	0.691***	0.683***	0.631***	0.673***	0.688***	0.610***	0.611***	0.593***	0.613***	0.591***
	(10.15)	(10.10)	(9.50)	(9.97)	(10.11)	(6.77)	(6.74)	(6.70)	(6.85)	(6.52)
CPInv	-0.021	0.006	-0.065	-0.019	-0.014	-0.001	-0.041	-0.063	-0.028	-0.029
	(-0.23)	(0.07)	(-0.74)	(-0.21)	(-0.15)	(-0.01)	(-0.46)	(-0.72)	(-0.32)	(-0.32)
NCAcq	-0.043	0.042	0.312	-0.093	-0.191	-0.268	-0.378	-0.328	-0.189	-0.204
	(-0.02)	(0.02)	(0.16)	(-0.05)	(-0.09)	(-0.28)	(-0.40)	(-0.35)	(-0.20)	(-0.21)
NOCPInv	0.290	0.270	0.317	0.330	0.306	0.345	0.336	0.300	0.357	0.346
	(1.45)	(1.34)	(1.63)	(1.67)	(1.53)	(1.55)	(1.51)	(1.38)	(1.63)	(1.55)
NOCPFin	0.022	-0.013	-0.076	0.074	0.018	0.700***	0.697***	0.426	0.624**	0.684***
	(0.09)	(-0.06)	(-0.34)	(0.33)	(0.08)	(2.78)	(2.75)	(1.67)	(2.48)	(2.70)
Sales	-0.015					-0.037**				
	(-1.04)					(-2.19)				
ROA		-0.058					0.069			
		(-0.96)					(1.20)			
ΔprepaidExp			-0.033	0.097				-0.334***	-0.278**	
			(-0.31)	(0.93)				(-2.66)	(-2.21)	
ΔSTDebt			0.215***					0.155***		
			(5.88)					(3.45)		
Δemployee			3.752***	4.875***				-2.875**	-2.452*	
			(3.40)	(4.39)				(-2.27)	(-1.92)	
Δearnings			0.037	-0.004				0.157***	0.138***	
			(1.00)	(-0.10)				(3.98)	(3.49)	
TopRatio					0.041					0.053
					(1.41)					(1.46)
N	766	766	766	766	766	463	463	463	463	463
Adj R-sq	14.01%	14.43%	19.54%	26.93%	14.11%	14.73%	14.09%	18.84%	16.82%	14.22%

Panel C: Post-2005 and Post-event

	Calendar year post-2005					Post-event year				
	Model1	Model2	Model3	Model4	Model5	Model6	Model7	Model8	Model9	Model10
Intercept	-0.026	-0.017	-0.017	-0.025	-0.030	-0.016	-0.008	-0.018	-0.018	-0.022
	(-0.89)	(-0.63)	(-0.64)	(-0.88)	(-1.02)	(-0.81)	(-0.43)	(-0.99)	(-0.93)	(-1.06)
TaxFees	-0.202	0.053	-0.222	-0.141	-0.273	-0.624	-0.438	-0.613	-0.624	-0.681*
	(-0.42)	(0.11)	(-0.48)	(-0.29)	(-0.55)	(-1.60)	(-1.12)	(-1.66)	(-1.61)	(-1.73)
SellingExp	-0.694***	-0.548***	-0.518***	-0.669***	-0.667***	-0.737***	-0.630***	-0.572***	-0.733***	-0.717***
	(-4.16)	(-3.58)	(-3.58)	(-4.38)	(-4.40)	(-5.09)	(-4.69)	(-4.51)	(-5.53)	(-5.43)
G&A	0.163**	0.022	0.296***	0.157**	0.167**	0.074	-0.054	0.224***	0.094	0.076
	(2.41)	(0.29)	(4.26)	(2.17)	(2.46)	(1.32)	(-0.79)	(3.69)	(1.50)	(1.36)
FinExp	-1.545***	-1.577***	-1.190***	-1.529***	-1.545***	-1.435***	-1.455***	-0.969***	-1.363***	-1.429***
	(-7.26)	(-7.47)	(-5.78)	(-7.09)	(-7.26)	(-7.42)	(-7.57)	(-5.16)	(-7.03)	(-7.39)
Impairment	-0.395***	-0.503***	-0.111	-0.414***	-0.385***	-0.471***	-0.543***	-0.173	-0.454***	-0.458***
	(-3.37)	(-4.19)	(-0.95)	(-3.47)	(-3.26)	(-3.96)	(-4.52)	(-1.48)	(-3.80)	(-3.84)
NOCPOper	0.528***	0.493***	0.362***	0.521***	0.531***	0.566***	0.544***	0.419***	0.556***	0.569***
	(7.51)	(7.04)	(5.31)	(7.39)	(7.55)	(9.80)	(9.39)	(7.45)	(9.64)	(9.84)
CPInv	-0.120	-0.079	-0.144	-0.098	-0.105	-0.074	-0.046	-0.114	-0.041	-0.068
	(-1.00)	(-0.68)	(-1.31)	(-0.84)	(-0.90)	(-0.71)	(-0.44)	(-1.15)	(-0.40)	(-0.65)
NCAcq	-0.111	-0.070	-0.526	-0.141	-0.105	-0.302	-0.273	-0.530	-0.356	-0.294
	(-0.17)	(-0.11)	(-0.87)	(-0.22)	(-0.16)	(-0.45)	(-0.41)	(-0.84)	(-0.54)	(-0.44)
NOCPInv	0.546**	0.602**	0.479*	0.642**	0.540**	0.414*	0.457**	0.431**	0.543**	0.410*
	(2.08)	(2.31)	(1.91)	(2.41)	(2.05)	(1.87)	(2.07)	(2.03)	(2.44)	(1.86)
NOCPFin	0.280	0.269	-0.150	0.270	0.285	0.139	0.118	-0.212	0.138	0.140
	(1.54)	(1.50)	(-0.86)	(1.49)	(1.57)	(0.85)	(0.73)	(-1.35)	(0.85)	(0.86)
Sales	0.004					0.003				
	(0.29)					(0.23)				
ROA		-0.119***					-0.098***			
		(-3.75)					(-3.24)			
ΔprepaidExp			-0.313**	-0.058				-0.130	0.082	
			(-2.52)	(-0.45)				(-1.27)	(0.78)	
ΔSTDebt			0.371***					0.354***		
			(10.35)					(11.13)		
Δemployee			0.298	1.646**				1.622**	2.909***	
			(0.38)	(1.99)				(2.24)	(3.88)	
Δearnings			0.056**	-0.012				0.059***	0.001	
			(2.51)	(-0.54)				(2.80)	(0.03)	
TopRatio					0.028					0.027
					(0.72)					(0.90)
N	872	872	872	872	872	1175	1175	1175	1175	1175
Adj R-sq	17.55%	18.95%	26.93%	17.79%	17.60%	18.62%	19.36%	27.37%	19.61%	18.68%

Table 4.6 OLS regression results of change in other receivables on other operating costs and net cash flows (sales version)

This table reports the regression results for tunnelling behaviours and the possible accounts used to engage in tunnelling. Annual observations of the fraudulent firms from three years before to three years after the event are included in the regression. All accounting variables are scaled by sales. The dependent variable is the change in other receivables (ΔOREC). Each model includes industry dummy variables to control for industry effects.[97] The numbers in parentheses below the coefficients are t-statistics to test the significance of the variables. Significance at 1%, 5%, 10% level (two-tail test) is denoted by ***, **, and * respectively.

	Model 1	Model 2	Model 3	Model 4	Model 5
	Fraud sample	Fraud sample	Fraud sample	Pre-2005	Post-2005
Intercept	0.040	0.033	0.017	-0.186	-0.047
	(0.31)	(0.26)	(0.13)	(-1.31)	(-0.20)
TaxFees	-0.416	-0.552	-0.215	-2.730*	1.837
	(-0.35)	(-0.46)	(-0.18)	(-1.71)	(1.07)
SellingExp	-0.745*	-1.094***	-1.056**	1.243**	-3.362***
	(-1.83)	(-2.72)	(-2.57)	(2.39)	(-5.62)
G&A	-0.214***		-0.444***	-0.478***	-0.517***
	(-4.81)		(-13.70)	(-10.87)	(-11.19)
FinExp	-1.083***	-1.576***			
	(-7.38)	(-14.91)			
Impairment	-1.564***	-1.509***	-2.036***	5.755***	-2.313***
	(-6.78)	(-6.50)	(-9.04)	(6.72)	(-9.26)
NOCPOper	1.433***	1.408***	1.504***	1.055***	1.770***
	(18.01)	(17.62)	(18.74)	(10.23)	(15.17)
CPInv	-0.473***	-0.511***	-0.429**	-0.509***	-0.226
	(-2.87)	(-3.08)	(-2.56)	(-2.83)	(-0.71)
NCAcq	0.958	1.249	0.673	-4.960	-0.039
	(0.42)	(0.54)	(0.29)	(-0.63)	(-0.02)
NOCPInv	1.180***	1.125***	1.274***	1.590***	1.107
	(2.75)	(2.61)	(2.92)	(3.15)	(1.54)
NOCPFin	0.504	0.627*	0.433	0.360	0.053
	(1.41)	(1.74)	(1.19)	(0.66)	(0.11)
N	1612	1612	1612	764	848
Adj R-sq	34.07%	33.15%	31.86%	27.28%	40.92%

[97] The results remain consistent when standard errors are clustered by company to correct for heteroskedasticity and time series autocorrelation within each company.

Table 4.7 OLS regression linking other operating costs, net cash flows, change of some controlling variables to the change in other receivables (sales version)

This table reports the regression results for tunnelling behaviours and the possible accounts used to engage in tunnelling when other controlling variables included. Annual observations of the fraudulent firms from three years before to three years after the event are included in the regression. Panel A examines the full study period for fraudulent firms. Panel B examines the sub-period before 2005 and Panel C examines the sub-period after 2005. All variables are scaled by sales. The dependent variable is the change in other receivables (ΔOREC). Each model includes industry dummy variables to control for industry effects.[98] The numbers in parentheses below the coefficients are t-statistics to test the significance of the variables. Significance at 1%, 5%, 10% level (two-tail test) is denoted by ***, **, and * respectively.

[98] The results remain consistent when standard errors are clustered by company to correct for heteroskedasticity and time series autocorrelation within each company.

Panel A: Full fraud sample

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	-0.041	0.006	0.038	0.030	-0.022
	(-0.32)	(0.04)	(0.31)	(0.23)	(-0.16)
TaxFees	0.159	0.046	0.351	0.268	-0.351
	(0.14)	(0.04)	(0.31)	(0.23)	(-0.29)
SellingExp	-0.970**	-1.054**	-0.823**	-1.236***	-1.033**
	(-2.46)	(-2.57)	(-2.15)	(-3.07)	(-2.50)
G&A	-0.076*	-0.513***	-0.310***	-0.448***	-0.444***
	(-1.72)	(-11.53)	(-7.12)	(-10.04)	(-13.67)
Impairment	-0.869***	-2.035***	-1.221***	-1.909***	-2.020***
	(-3.67)	(-9.05)	(-5.65)	(-8.60)	(-8.91)
NOCPOper	1.451***	1.498***	1.105***	1.411***	1.504***
	(18.83)	(18.68)	(14.10)	(17.78)	(18.73)
CPInv	-0.457***	-0.403**	-0.496***	-0.361**	-0.426**
	(-2.85)	(-2.40)	(-3.17)	(-2.19)	(-2.54)
NCAcq	0.074	0.631	0.034	0.209	0.740
	(0.03)	(0.27)	(0.02)	(0.09)	(0.32)
NOCPInv	1.376***	1.297***	0.903**	1.450***	1.272***
	(3.29)	(2.98)	(2.22)	(3.39)	(2.91)
NOCPFin	0.311	0.462	-0.047	0.374	0.433
	(0.89)	(1.27)	(-0.14)	(1.05)	(1.19)
ROA	0.220***				
	(11.91)				
ΔprepaidExp			0.025	0.238**	
			(0.24)	(2.22)	
ΔSTDebt			0.476***		
			(13.63)		
Δemployee			5.584***	8.908***	
			(4.99)	(7.72)	
Δearnings		-0.037**	0.010	-0.024	
		(-2.26)	(0.66)	(-1.46)	
TopRatio					0.146
					(0.69)
N	1604	1604	1604	1604	1604
Adj R-sq	37.39%	32.03%	41.49%	34.68%	31.83%

Panel B: Pre-2005

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	-0.197	-0.171	-0.104	-0.111	-0.279
	(-1.39)	(-1.21)	(-0.87)	(-0.84)	(-1.75)
TaxFees	-2.737*	-2.993*	-0.928	-2.093	-2.930*
	(-1.71)	(-1.87)	(-0.69)	(-1.41)	(-1.82)
SellingExp	1.244**	1.349***	0.846*	1.031**	1.269**
	(2.39)	(2.60)	(1.94)	(2.12)	(2.44)
G&A	-0.389***	-0.359***	-0.147***	-0.365***	-0.474***
	(-5.30)	(-5.76)	(-2.70)	(-6.27)	(-10.78)
Impairment	5.788***	6.101***	2.172***	4.276***	5.748***
	(6.76)	(7.07)	(2.87)	(5.18)	(6.71)
NOCPOper	1.070***	1.019***	0.798***	0.992***	1.059***
	(10.33)	(9.84)	(8.96)	(10.13)	(10.26)
CPInv	-0.535***	-0.583***	-0.561***	-0.433**	-0.501***
	(-2.96)	(-3.21)	(-3.64)	(-2.53)	(-2.78)
NCAcq	-5.916	-4.371	20.055***	-2.727	-5.024
	(-0.75)	(-0.55)	(2.95)	(-0.37)	(-0.64)
NOCPInv	1.545***	1.545***	0.764*	1.592***	1.606***
	(3.06)	(3.07)	(1.80)	(3.40)	(3.19)
NOCPFin	0.190	0.054	-0.550	-0.133	0.354
	(0.34)	(0.10)	(-1.19)	(-0.26)	(0.65)
ROA	0.052				
	(1.50)				
ΔprepaidExp			-0.224**	0.036	
			(-2.03)	(0.30)	
ΔSTDebt			0.667***		
			(13.45)		
Δemployee			9.533***	16.972***	
			(6.26)	(10.72)	
Δearnings		0.063***	0.049**	0.028	
		(2.66)	(2.43)	(1.23)	
TopRatio					0.329
					(1.28)
N	758	758	758	758	758
Adj R-sq	27.40%	27.87%	49.65%	37.41%	27.34%

Panel C: Post-2005

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	-0.105	-0.042	0.014	-0.022	0.011
	(-0.49)	(-0.18)	(0.06)	(-0.10)	(0.04)
TaxFees	2.653	2.302	1.755	1.962	2.132
	(1.66)	(1.33)	(1.04)	(1.14)	(1.21)
SellingExp	-3.235***	-3.263***	-2.967***	-3.371***	-3.411***
	(-5.81)	(-5.45)	(-5.01)	(-5.65)	(-5.67)
G&A	-0.080	-0.605***	-0.453***	-0.524***	-0.518***
	(-1.39)	(-9.94)	(-6.88)	(-8.02)	(-11.21)
Impairment	-0.908***	-2.311***	-1.743***	-2.188***	-2.335***
	(-3.45)	(-9.27)	(-6.68)	(-8.73)	(-9.28)
NOCPOper	1.606***	1.739***	1.511***	1.742***	1.772***
	(14.67)	(14.83)	(12.15)	(14.75)	(15.18)
CPInv	-0.088	-0.213	-0.282	-0.188	-0.240
	(-0.30)	(-0.67)	(-0.91)	(-0.60)	(-0.76)
NCAcq	-0.612	-0.041	-1.342	-0.627	-0.104
	(-0.26)	(-0.02)	(-0.53)	(-0.25)	(-0.04)
NOCPInv	1.403**	1.100	0.935	1.137	1.136
	(2.10)	(1.54)	(1.33)	(1.59)	(1.58)
NOCPFin	0.334	0.014	-0.107	0.088	0.045
	(0.76)	(0.03)	(-0.23)	(0.19)	(0.10)
ROA	0.250***				
	(11.38)				
ΔprepaidExp			0.375**	0.557***	
			(2.15)	(3.20)	
ΔSTDebt			0.260***		
			(5.22)		
Δemployee			0.965	1.502	
			(0.61)	(0.93)	
Δearnings		-0.049**	-0.021	-0.046**	
		(-2.23)	(-0.89)	(-1.99)	
TopRatio					-0.249
					(-0.75)
N	846	846	846	846	846
Adj R-sq	48.87%	41.21%	43.69%	41.90%	40.89%

Table 4.8 OLS regression results of change in other receivables on other operating costs and net cash flows when earnings management is controlled

This table reports the regression results for tunnelling behaviours and the possible accounts used to engage in tunnelling. Annual observations of the fraudulent firms from three years before to three years after the event are included in the regression. All variables are scaled by total assets. The dependent variable is the change in OREC minus provision of OREC plus reversal of OREC (newΔOREC). Each model includes industry dummy variables to control for industry effects.[99] The numbers in parentheses below the coefficients are t-statistics to test the significance of the variables. Significance at 1%, 5%, 10% level (two-tail test) is denoted by ***, **, and * respectively.

	Model 1		Model 2
Intercept	0.040**	Intercept	0.025
	(2.44)		(1.51)
TaxFees	-1.005	TaxFees	-0.896
	(-1.14)		(-1.02)
SellingExp	-0.558**	SellingExp	-0.634**
	(-1.99)		(-2.27)
G&A	-0.551***	G&A	-0.314**
	(-4.10)		(-2.17)
FinExp	-3.305***	FinExp	-2.970***
	(-7.05)		(-6.19)
Impairment	-0.959**	New Impairment	-0.601***
	(-2.32)		(-3.70)
NOCPOper	0.881***	NOCPOper	0.922***
	(6.45)		(6.76)
CPInv	-0.123	CPInv	-0.068
	(-0.53)		(-0.30)
NCAcq	-0.175	NCAcq	-0.281
	(-0.12)		(-0.20)
NOCPInv	0.691	NOCPInv	0.786*
	(1.51)		(1.75)
NOCPFin	0.038	NOCPFin	0.017
	(0.10)		(0.04)
N	589		589
Adj R-Sq	29.84%		30.83%

[99] The results remain consistent when standard errors are clustered by company to correct for heteroskedasticity and time series autocorrelation within each company.

Table 4.9 OLS regression linking other operating costs, net cash flows, change of some controlling variables to the impairment losses (total assets version)

This table reports the regression results for tunnelling costs to detect possible accounts used as vehicles for tunnelling transactions when other controlling variables included. Annual observations of the fraudulent firms from three years before to three years after the event are included in the regression. Panel A examines the full study period for fraudulent firms. Panel B examines the sub-period before 2005 and Panel C examines the sub-period after 2005. All variables are scaled by total assets. The dependent variable is impairment losses (Impairment). Each model includes industry dummy variables to control for industry effects.[100] The numbers in parentheses below the coefficients are t-statistics to test the significance of the variables. Significance at 1%, 5%, 10% level (two-tail test) is denoted by ***, **, and * respectively.

[100] The results remain consistent when standard errors are clustered by company to correct for heteroskedasticity and time series autocorrelation within each company.

Panel A: Full fraud sample

	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	0.008**	0.005	0.006*	0.009**	0.006
	(2.13)	(1.28)	(1.77)	(2.30)	(1.61)
∆OREC	-0.049***	-0.048***	-0.050***	-0.051***	-0.028***
	(-8.39)	(-8.30)	(-8.84)	(-8.42)	(-4.49)
∆prepaidExp	-0.149***	-0.151***	-0.113***	-0.147***	-0.072***
	(-7.15)	(-7.22)	(-5.42)	(-7.04)	(-3.42)
Sales		0.005**			
		(2.24)			
ROA			-0.050***		
			(-10.55)		
NOCPOper				0.016	0.019
				(1.34)	(1.61)
CPInv				-0.038**	-0.013
				(-2.01)	(-0.72)
NCAcq				-0.086	-0.001
				(-0.60)	(0.00)
NOCPInv				0.091**	0.082**
				(2.13)	(1.99)
NOCPFin				-0.069*	-0.010
				(-1.94)	(-0.27)
∆STDebt					-0.057***
					(-8.83)
∆employee					0.190
					(1.17)
∆earnings					-0.030***
					(-8.01)
N	1638	1638	1638	1638	1638
Adj R-sq	6.98%	7.21%	13.08%	7.52%	14.20%

Panel B: Pre-2005 and Pre-event

	Calendar year pre-2005					Pre-event year				
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Intercept	0.004***	0.005***	0.004***	0.004***	0.004***	0.022***	0.021***	0.017***	0.022***	0.016***
	(3.82)	(4.04)	(3.57)	(3.89)	(3.43)	(4.03)	(3.61)	(3.27)	(4.04)	(3.07)
ΔOREC	0.002	0.002	0.002	0.002	0.001	-0.022*	-0.022*	-0.021*	-0.019	-0.006
	(0.96)	(0.94)	(0.95)	(0.96)	(0.42)	(-1.94)	(-1.90)	(-1.91)	(-1.57)	(-0.47)
ΔprepaidExp	-0.028***	-0.028***	-0.023***	-0.028***	-0.024***	-0.075**	-0.075**	-0.028	-0.079**	-0.032
	(-3.78)	(-3.69)	(-3.04)	(-3.71)	(-3.15)	(-2.34)	(-2.35)	(-0.89)	(-2.47)	(-1.01)
Sales		-0.001					0.002			
		(-1.32)					(0.44)			
ROA			-0.008***					-0.054***		
			(-4.04)					(-6.77)		
NOCPOper				-0.001	-0.005				0.020	-0.007
				(-0.15)	(-0.98)				(0.91)	(-0.32)
CPInv				-0.005	-0.005				-0.017	-0.012
				(-0.81)	(-0.81)				(-0.74)	(-0.56)
NCAcq				-0.016	0.010				0.011	0.026
				(-0.11)	(0.07)				(0.05)	(0.11)
NOCPInv				-0.008	-0.010				-0.078	-0.082
				(-0.56)	(-0.72)				(-1.37)	(-1.48)
NOCPFin				0.000	-0.008				-0.206***	-0.190***
				(0.01)	(-0.48)				(-3.17)	(-2.96)
ΔSTDebt					0.009***					-0.015
					(3.32)					(-1.35)
Δemployee					0.007					0.819**
					(0.09)					(2.58)
Δearnings					-0.010***					-0.037***
					(-5.99)					(-5.72)
N	766	766	766	766	766	463	463	463	463	463
Adj R-sq	1.91%	2.00%	3.95%	1.38%	6.78%	1.65%	1.47%	10.57%	3.41%	10.62%

Panel C: Post-2005 and Post-event

	Calendar year post-2005					Post-event year				
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Intercept	0.014*	0.010	0.013	0.015*	0.009	0.002	-0.002	0.002	0.003	-0.001
	(1.74)	(1.10)	(1.66)	(1.79)	(1.08)	(0.40)	(-0.33)	(0.35)	(0.56)	(-0.18)
ΔOREC	-0.063***	-0.063***	-0.065***	-0.066***	-0.030***	-0.053***	-0.052***	-0.053***	-0.055***	-0.026***
	(-6.61)	(-6.57)	(-7.14)	(-6.74)	(-2.96)	(-7.47)	(-7.42)	(-7.77)	(-7.59)	(-3.47)
ΔprepaidExp	-0.245***	-0.245***	-0.182***	-0.244***	-0.114***	-0.181***	-0.182***	-0.141***	-0.180***	-0.093***
	(-6.56)	(-6.58)	(-5.01)	(-6.54)	(-3.02)	(-6.75)	(-6.80)	(-5.33)	(-6.71)	(-3.43)
Sales		0.005					0.006**			
		(1.48)					(2.16)			
ROA			-0.069***					-0.049***		
			(-9.26)					(-8.52)		
NOCPOper				0.028	0.047**				0.019	0.030**
				(1.35)	(2.34)				(1.31)	(2.14)
CPInv				-0.057	-0.023				-0.047*	-0.009
				(-1.61)	(-0.67)				(-1.75)	(-0.35)
NCAcq				-0.200	-0.044				-0.105	-0.013
				(-1.02)	(-0.23)				(-0.60)	(-0.08)
NOCPInv				0.224***	0.215***				0.196***	0.178***
				(2.81)	(2.80)				(3.42)	(3.18)
NOCPFin				-0.051	0.049				-0.042	0.031
				(-0.92)	(0.91)				(-0.99)	(0.75)
ΔSTDebt					-0.085***					-0.071***
					(-7.94)					(-8.71)
Δemployee					0.339					0.203
					(1.40)					(1.06)
Δearnings					-0.043***					-0.031***
					(-7.37)					(-6.68)
N	872	872	872	872	872	1175	1175	1175	1175	1175
Adj R-sq	9.07%	9.20%	17.23%	9.97%	19.25%	8.47%	8.75%	13.78%	9.46%	17.15%

Table 4.10 OLS regression linking other operating costs, net cash flows, change of some controlling variables to the impairment losses (sales version)

This table reports the regression results for tunnelling costs to detect possible accounts used as vehicles for tunnelling transactions when other controlling variables included. Annual observations of the fraudulent firms from three years before to three years after the event are included in the regression. Panel A examines the full study period for fraudulent firms. Panel B examines the sub-period before 2005 and Panel C examines the sub-period after 2005. All variables are scaled by sales. The dependent variable is impairment losses (Impairment). Each model includes industry dummy variables to control for industry effects.[101] The numbers in parentheses below the coefficients are t-statistics to test the significance of the variables. Significance at 1%, 5%, 10% level (two-tail test) is denoted by ***, **, and * respectively.

[101] The results remain consistent when standard errors are clustered by company to correct for heteroskedasticity and time series autocorrelation within each company.

Panel A: Full fraud sample

	Model 1	Model 2	Model 3	Model 4
Intercept	0.027*	0.020	0.025*	0.020
	(1.92)	(1.49)	(1.79)	(1.45)
ΔOREC	-0.022***	-0.005*	-0.027***	-0.017***
	(-9.26)	(-1.89)	(-10.98)	(-6.09)
ΔprepaidExp	-0.062***	-0.019*	-0.057***	-0.034***
	(-5.46)	(-1.74)	(-5.07)	(-2.90)
ROA		-0.022***		
		(-15.64)		
NOCPOper			0.061***	0.064***
			(6.63)	(6.94)
CPInv			-0.030	-0.018
			(-1.66)	(-0.99)
NCAcq			-0.062	-0.041
			(-0.24)	(-0.17)
NOCPInv			0.021	0.042
			(0.44)	(0.89)
NOCPFin			-0.114***	-0.078**
			(-2.89)	(-1.99)
ΔSTDebt				-0.031***
				(-7.47)
Δemployee				0.165
				(1.28)
Δearnings				-0.004***
				(-2.92)
N	1604	1604	1604	1604
Adj R-sq	7.95%	20.12%	10.70%	13.94%

Panel B: Pre-2005

	Model 1	Model 2	Model 3	Model 4
Intercept	0.028***	0.022***	0.026***	0.018***
	(4.47)	(3.87)	(4.20)	(3.10)
ΔOREC	0.006***	0.009***	0.004***	0.004**
	(4.13)	(6.50)	(2.93)	(2.39)
ΔprepaidExp	-0.024***	-0.012**	-0.028***	-0.016***
	(-4.33)	(-2.19)	(-4.82)	(-2.89)
ROA		-0.008***		
		(-10.20)		
NOCPOper			0.016***	0.011**
			(3.16)	(2.45)
CPInv			0.007	0.011
			(0.79)	(1.40)
NCAcq			0.053	0.212
			(0.15)	(0.63)
NOCPInv			-0.013	-0.013
			(-0.58)	(-0.63)
NOCPFin			0.027	0.048**
			(1.11)	(2.13)
ΔSTDebt				0.007***
				(2.70)
Δemployee				0.239***
				(3.16)
Δearnings				-0.008***
				(-11.99)
N	758	758	758	758
Adj R-sq	4.53%	16.07%	5.39%	22.04%

Panel C: Post-2005

	Model 1	Model 2	Model 3	Model 4
Intercept	0.044	0.042	0.042	0.032
	(1.44)	(1.47)	(1.38)	(1.09)
ΔOREC	-0.032***	-0.006	-0.040***	-0.027***
	(-8.48)	(-1.35)	(-10.05)	(-6.45)
ΔprepaidExp	-0.090***	-0.027	-0.065***	-0.008
	(-4.24)	(-1.34)	(-3.04)	(-0.35)
ROA		-0.028***		
		(-11.58)		
NOCPOper			0.099***	0.122***
			(5.96)	(7.44)
CPInv			-0.016	0.002
			(-0.39)	(0.06)
NCAcq			-0.295	-0.119
			(-0.87)	(-0.37)
NOCPInv			0.032	0.031
			(0.34)	(0.34)
NOCPFin			-0.147**	-0.084
			(-2.37)	(-1.40)
ΔSTDebt				-0.049***
				(-7.93)
Δemployee				-0.361*
				(-1.77)
Δearnings				-0.006**
				(-2.42)
N	846	846	846	846
Adj R-sq	12.34%	24.40%	16.06%	22.42%

Table 4.11 OLS regression results of change in other receivables in both fraud and matched sample

This table reports the regression results for tunnelling behaviours and the possible accounts used to engage in tunnelling. Annual observations of the fraudulent firms and matching firms from three years before to three years after the event are included in the regression. Panel A examines the full study period in both fraudulent firms and matching firms. Panel B examines the sub-period before 2005 and Panel C examines the sub-period after 2005. Models 1, 2 and 3 show regression results for the fraudulent sample, matching sample and full sample, respectively. All variables are scaled by total assets. The dependent variable is the change in other receivables (ΔOREC). Each model includes industry dummy variables to control for industry effects. The numbers in parentheses below the coefficients are t-statistics to test the significance of the variables. Standard errors are clustered by company to correct for heteroskedasticity and time series autocorrelation within each company. Significance at 1%, 5%, 10% level (two-tail test) is denoted by ***, **, and * respectively.

Panel A: Full sample

	Model 1	Model 2	Model 3
	Fraud sample	Matched sample	Full sample
Intercept	0.000	0.021	
	(-0.03)	(1.93)	
TaxFees	-0.675**	0.044	-0.811**
	(-2.51)	(0.36)	(-2.52)
SellingExp	-0.697***	-0.117	-0.605***
	(-5.58)	(-1.46)	(-5.68)
G&A	0.086	-0.742***	0.788***
	(1.02)	(-3.72)	(11.27)
FinExp	-1.348***	-0.135	-1.301***
	(-5.19)	(-0.26)	(-6.19)
Impairment	-0.441***	-0.095	-0.341
	(-2.70)	(-0.42)	(-1.50)
NOCPOper	0.600***	0.375***	0.218***
	(7.77)	(5.28)	(3.18)
CPInv	-0.046	0.041*	-0.106
	(-0.49)	(1.71)	(-1.59)
NCAcq	-0.351	0.076	-0.523
	(-0.61)	(0.78)	(-0.93)
NOCPInv	0.434*	0.119	0.318
	(1.85)	(1.06)	(1.74)
NOCPFin	0.239	-0.071	0.307
	(1.10)	(-1.10)	(1.62)
N	1646	1647	3293
Adj R-sq	17.79%	29.43%	20.58%

Panel B: Pre-2005

	Model 1	Model 2	Model 3
	Fraud sample	Matched sample	Full sample
Intercept	0.002	0.035	
	(0.11)	(1.78)	
TaxFees	-1.309***	0.304	-1.601***
	(-3.94)	(1.49)	(-3.38)
SellingExp	-0.642***	-0.312***	-0.367**
	(-3.47)	(-3.36)	(-2.33)
G&A	-0.063	-0.859***	0.785***
	(-0.43)	(-3.69)	(8.79)
FinExp	-0.876*	-0.344	-0.719**
	(-1.91)	(-1.60)	(-2.01)
Impairment	0.983**	0.182	0.581
	(2.56)	(0.23)	(0.61)
NOCPOper	0.689***	0.579***	0.128
	(7.91)	(6.39)	(1.41)
CPInv	-0.017	0.062*	-0.088
	(-0.18)	(1.83)	(-1.08)
NCAcq	-0.120	0.261	-0.285
	(-0.29)	(0.75)	(-0.14)
NOCPInv	0.292	0.139	0.128
	(0.95)	(1.00)	(0.58)
NOCPFin	0.018	-0.026	0.041
	(0.07)	(-0.16)	(0.14)
N	772	765	1537
Adj R-sq	14.00%	40.00%	22.11%

Panel C: Post-2005

	Model 1	Model 2	Model 3
	Fraud sample	Matched sample	Full sample
Intercept	-0.023	0.008	
	(-0.94)	(0.92)	
TaxFees	-0.188	0.063	-0.372
	(-0.51)	(0.46)	(-0.85)
SellingExp	-0.673***	-0.048	-0.699***
	(-3.64)	(-0.59)	(-4.56)
G&A	0.163*	-0.519**	0.588***
	(1.72)	(-2.25)	(5.05)
FinExp	-1.544***	-0.318	-1.282***
	(-5.05)	(-0.50)	(-4.63)
Impairment	-0.394**	-0.203	-0.193
	(-2.25)	(-1.01)	(-0.75)
NOCPOper	0.528***	0.192*	0.320***
	(4.60)	(1.88)	(3.12)
CPInv	-0.111	0.018	-0.165
	(-0.67)	(0.64)	(-1.52)
NCAcq	-0.118	0.223**	-0.477
	(-0.20)	(1.99)	(-0.75)
NOCPInv	0.547	-0.037	0.648**
	(1.47)	(-0.20)	(2.16)
NOCPFin	0.284	-0.076	0.363
	(1.03)	(-1.43)	(1.44)
N	874	872	1746
Adj R-sq	17.64%	19.64%	19.85%

Table 4.12 OLS regression results of the determinants of other receivables (OREC)

This table examines the determinants of OREC. Annual observations of the fraudulent firms and matching firms from three years before to three years after the event are included in regression. Model 1 examines the full study period of fraudulent firms. Model 2 examines the sub-period before 2005 and Model 3 examines the sub-period after 2005. Model 4 examines the full study period in matching firms. Model 5 examines the sub-period before 2005 and Model 6 examines the sub-period after 2005. The dependent variable is OREC (other receivables deflated by total assets). The independent variables are: TopRatio is the percentage of shares held by the largest shareholder; newROA is operating profit deflated by total assets; Govt is a dummy variable with a value of one if the government or a government-owned institution is the largest shareholder and a value of zero otherwise; Size is the log of total assets; MINDEX is a comprehensive index to capture the regional market development; State is the proportion of shares owned by state stockholders; Dual is a dummy variable that takes the value of 1 if the company's CEO is also the chairperson of the board and 0 otherwise; BOARD (board size) is the number of directors on the board; SBSIZE is the number of members on the supervisory board; SBMEET is the number of meetings of the supervisory board in the calendar year; INED (board composition) is the percentage of independent directors on the board; MEET is the number of meetings of the board of directors in the calendar year; CPAs is a dummy variable coded one if the auditor was one of the 10 biggest auditors by market share; ST is a dummy variable coded 1 if the firm has a special treatment, 0 otherwise; PT (Particular transfer), is a dummy variable coded 1 if the firm has a particular transfer, 0 otherwise; RET is annual stock return over the risk free rate.
Each model includes industry dummy variables to control for industry effects. Standard errors are clustered by year to correct for heteroskedasticity and time series autocorrelation. The numbers in parentheses below the coefficients are t-statistics to test the significance of the variables. Significance at 1%, 5%, 10% level (two-tail test) is denoted by ***, **, and * respectively.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	Fraud sample	Pre-2005	Post-2005	Matched sample	Pre-2005	Post-2005
Intercept	0.887***	0.594**	0.973**	0.506***	0.672***	0.257**
	(7.82)	(4.98)	(3.74)	(6.68)	(7.45)	(3.41)
TopRatio	-0.073**	-0.101	-0.046***	-0.012	-0.008	-0.008
	(-3.13)	(-1.95)	(-4.58)	(-1.61)	(-0.55)	(-0.85)
newROA	-0.082**	-0.337*	-0.057*	-0.008***	-0.135**	-0.008***
	(-3.20)	(-3.10)	(-2.22)	(-23.43)	(-3.53)	(-22.49)
Govt	-0.018***	-0.008	-0.021**	-0.013**	-0.034	-0.007
	(-3.52)	(-0.75)	(-2.78)	(-2.55)	(-2.31)	(-1.80)
Size	-0.034***	-0.022**	-0.037**	-0.018***	-0.023**	-0.011**
	(-6.03)	(-3.68)	(-3.60)	(-5.62)	(-5.00)	(-3.94)
MINDEX	0.000	0.001	0.001	0.000	-0.002	0.002**
	(0.17)	(0.52)	(0.15)	(-0.39)	(-0.94)	(2.70)
State	0.061***	0.032	0.074**	-0.002	-0.031**	0.012
	(3.75)	(2.13)	(3.33)	(-0.26)	(-3.74)	(1.59)
DUAL	0.010	0.017	-0.001	-0.020**	-0.032**	-0.007
	(0.58)	(0.69)	(-0.04)	(-3.15)	(-3.94)	(-0.70)
Board	-0.002**	-0.003**	-0.002	0.002*	0.003	0.001
	(-3.12)	(-3.35)	(-0.78)	(2.11)	(1.83)	(1.19)
SBSIZE	0.011***	0.008**	0.013***	-0.003	-0.006	-0.001
	(5.25)	(3.68)	(4.81)	(-1.89)	(-1.99)	(-0.88)
INDE	-0.044	-0.003	-0.093	-0.081**	-0.072	0.045
	(-0.66)	(-0.05)	(-0.61)	(-2.77)	(-2.17)	(1.61)
MEET	0.003**	0.004**	0.002	0.002*	0.002	0.001
	(2.38)	(3.37)	(0.97)	(2.19)	(1.47)	(1.24)
SBMEET	-0.010***	-0.003	-0.015***	0.001	0.006***	-0.001
	(-3.56)	(-2.37)	(-4.53)	(0.39)	(6.79)	(-0.70)
CPAs	-0.011	0.022*	-0.035***	-0.007*	0.000	-0.013**
	(-1.16)	(2.68)	(-4.10)	(-2.08)	(0.06)	(-3.08)
ST	0.072***	0.091***	0.056	0.128***	0.132**	0.104***
	(3.25)	(7.39)	(1.91)	(6.26)	(3.34)	(5.34)
PT	0.069*	0.014	0.073	0.211	-0.080***	0.744***
	(1.90)	(0.71)	(1.56)	(0.82)	(-6.12)	(39.42)
RET	-0.019	-0.123**	-0.012	-0.007	0.002	-0.002
	(-1.80)	(-5.27)	(-0.99)	(-1.62)	(0.11)	(-0.61)
N	1495	707	788	1548	712	836
Adj R-sq	16.32%	21.76%	17.66%	35.10%	41.98%	39.77%

Table 4.13 OLS regression results of the determinants of impairment losses (Impairment)

This table examines the determinants of Impairment. Annual observations of the fraudulent firms and matching firms from three years before to three years after the event are included in the regression. Model 1 examines the full study period and Model 2 examines the sub-period after 2005 for fraudulent firms. Model 3 examines the full study period and Model 4 examines the sub-period after 2005 for matching firms. The dependent variable is Impairment (impairment losses deflated by total assets). The independent variables are: TopRatio is the percentage of shares held by the largest shareholder; newROA is operating profit deflated by total assets; Govt is a dummy variable with a value of one if the government or a government-owned institution is the largest shareholder and a value of zero otherwise; Size is the log of total assets; MINDEX is a comprehensive index to capture the regional market development; State is the proportion of shares owned by state stockholders; Dual is a dummy variable that takes the value of 1 if the company's CEO is also the chairperson of the board and 0 otherwise; BOARD (board size) is the number of directors on the board; SBSIZE is the number of members on the supervisory board; SBMEET is the number of meetings of the supervisory board in the calendar year; INED (board composition) is the percentage of independent directors on the board; MEET is the number of meetings of the board of directors in the calendar year; CPAs is a dummy variable coded one if the auditor was one of the 10 biggest auditors by market share; ST is a dummy variable coded 1 if the firm has a special treatment, 0 otherwise; PT (Particular transfer), is a dummy variable coded 1 if the firm has a particular transfer, 0 otherwise; RET is annual stock return over the risk free rate.

Each model includes industry dummy variables to control for industry effects. The numbers in parentheses below the coefficients are t-statistics to test the significance of the variables. Significance at 1%, 5%, 10% level (two-tail test) is denoted by ***, **, and * respectively.

	Model 1	Model 2	Model 3	Model 4
	Fraud sample	Post-2005	Matched sample	Post-2005
Intercept	0.021	0.066*	0.013*	0.027**
	(1.10)	(1.76)	(1.85)	(2.06)
TopRatio	-0.019***	-0.031***	-0.005**	-0.006
	(-3.01)	(-2.63)	(-2.13)	(-1.43)
newROA	-0.026***	-0.027***	0.000	0.000
	(-7.50)	(-5.53)	(0.45)	(0.57)
Govt	0.006***	0.011***	0.001	0.004**
	(3.21)	(2.89)	(1.65)	(2.48)
Size	-0.001	-0.002	-0.001*	-0.001*
	(-0.72)	(-1.08)	(-1.81)	(-1.72)
MINDEX	-0.001*	-0.001	0.000	0.000
	(-1.72)	(-1.19)	(0.00)	(0.01)
State	-0.008*	-0.015	-0.003*	-0.007**
	(-1.76)	(-1.64)	(-1.86)	(-2.09)
DUAL	-0.003	-0.004	-0.001	-0.002
	(-1.46)	(-1.00)	(-1.18)	(-1.40)
Board	-0.001**	-0.002*	0.000	0.000
	(-2.46)	(-1.92)	(-1.26)	(-1.17)
SBSIZE	0.001*	0.002*	0.000	0.000
	(1.95)	(1.73)	(0.42)	(0.16)
INDE	0.022***	0.000	0.006**	-0.006
	(2.92)	(0.01)	(2.03)	(-0.50)
MEET	0.000	0.000	0.000	0.000
	(0.39)	(0.34)	(0.04)	(0.44)
SBMEET	0.001**	0.002**	0.000	0.000
	(2.50)	(2.21)	(1.59)	(1.37)
CPAs	0.002	0.003	0.001	0.002
	(0.82)	(0.68)	(1.52)	(1.21)
ST	0.011***	0.017***	0.005***	0.010***
	(5.81)	(4.93)	(3.62)	(4.32)
PT	0.031***	0.033***	0.036***	0.117***
	(5.34)	(3.92)	(5.23)	(7.44)
RET	0.002**	0.000	0.002***	0.001**
	(2.09)	(-0.11)	(4.68)	(2.17)
N	1495	788	1548	836
Adj R-sq	12.60%	12.98%	6.65%	10.32%

Figure 4.1: The differences between fraudulent and matching firms in some soft balance sheet accounts

These charts plot the differences between fraudulent and matching firms in some soft balance sheet accounts from 1993 to 2011. The x-axis is the calendar year, the y-axis in the left-side figure is the percentage, and the y-axis in the middle and right-side figures are the million RMB. The middle figures represent the differences between fraudulent and matching firms on mean account values. The right-side figures represent the differences between fraudulent and matching firms on median account values. The solid lines with dots in the middle and right-side figures represent the value of account balances in million RMB for fraudulent firms. The solid lines without dots in the middle and right-side figures represent the value of account balances in million RMB for matching firms.

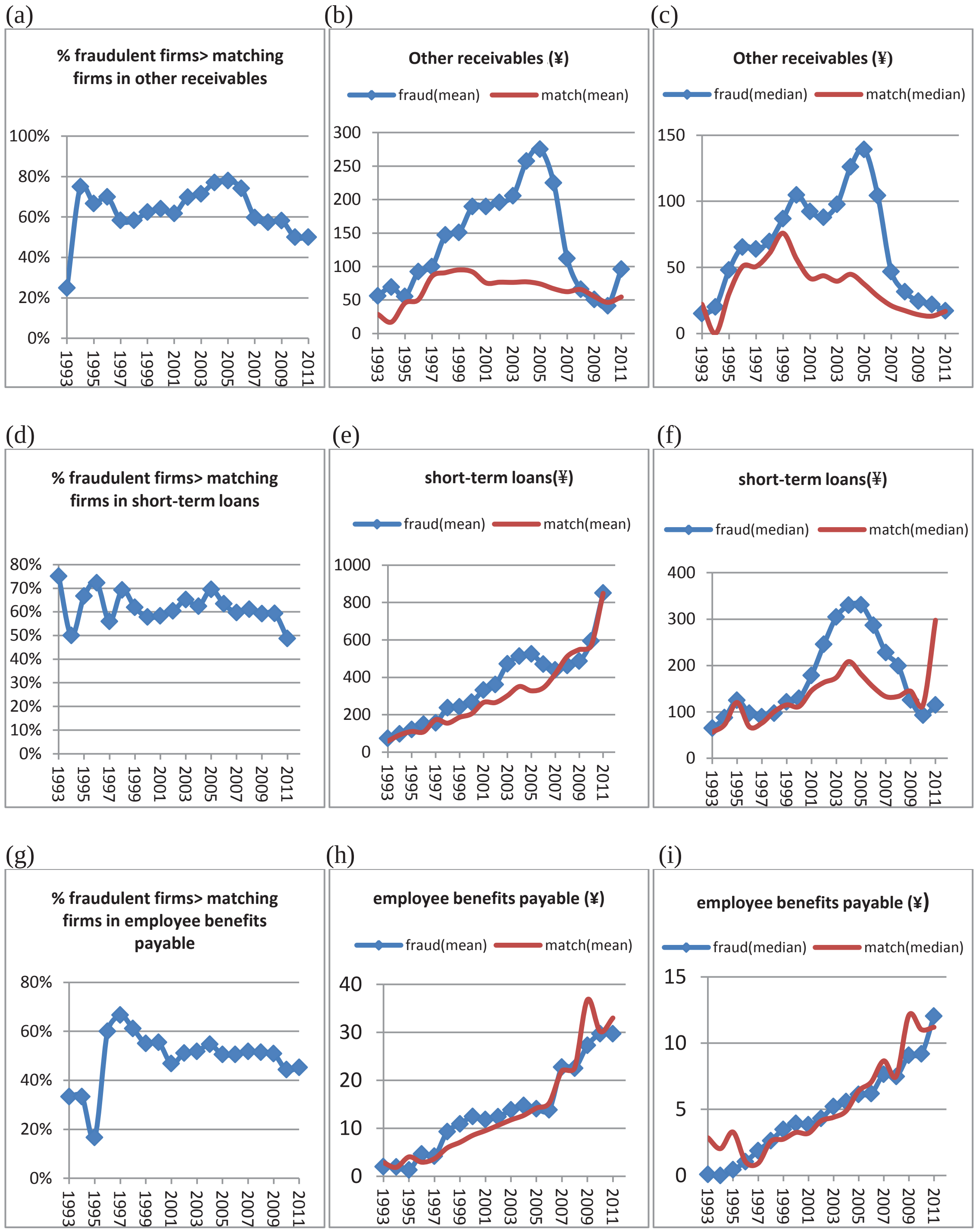
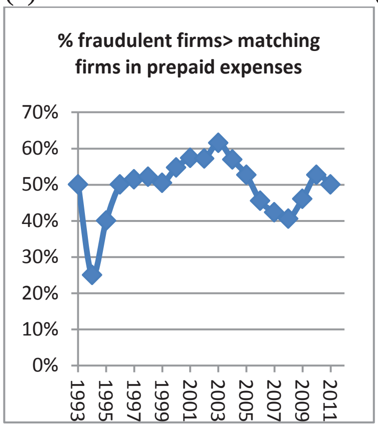


Figure 4.2: The differences between fraudulent and matching firms in some solid balance sheet accounts

These charts plot the differences between fraudulent and matching firms in some solid balance sheet accounts from 1993 to 2011. The x-axis is the calendar year, the y-axis in the left-side figure is the percentage, and the y-axis in the middle and right-side figures are the million RMB. The middle figures represent the differences between fraudulent and matching firms on mean account values. The right-side figures represent the differences between fraudulent and matching firms on median account values. The solid lines with dots in the middle and right-side figures represent the value of account balances in million RMB for fraudulent firms. The solid lines without dot in the middle and right-side figures represent the value of account balances in million RMB for matching firms.

(a)



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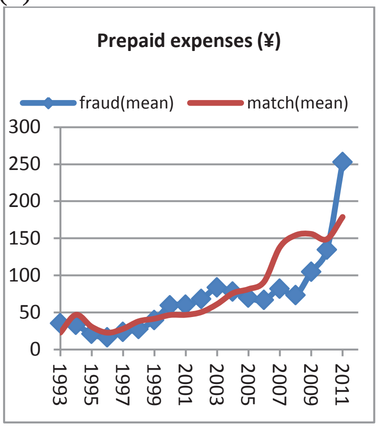

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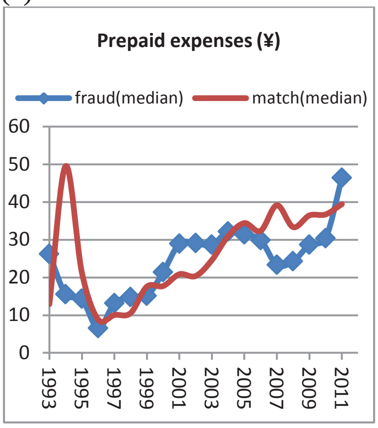

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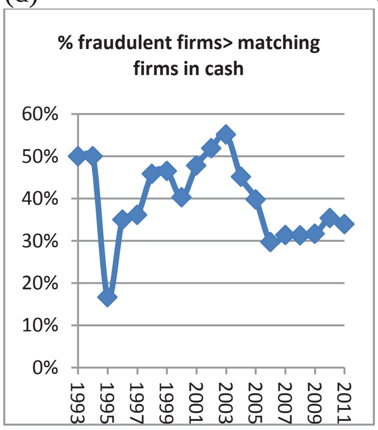

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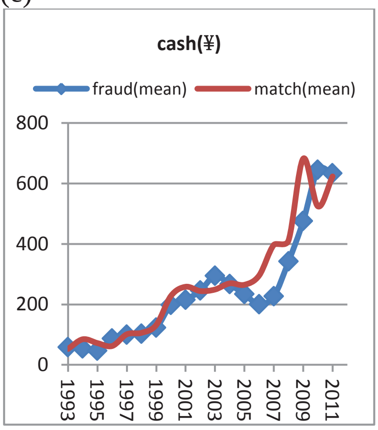

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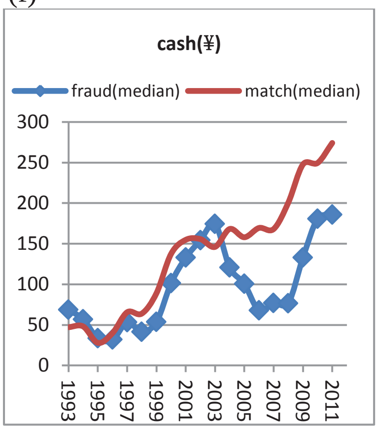
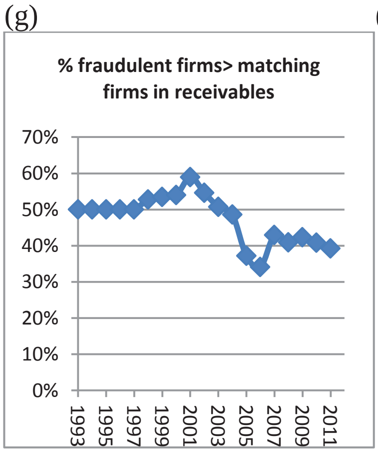


(g)



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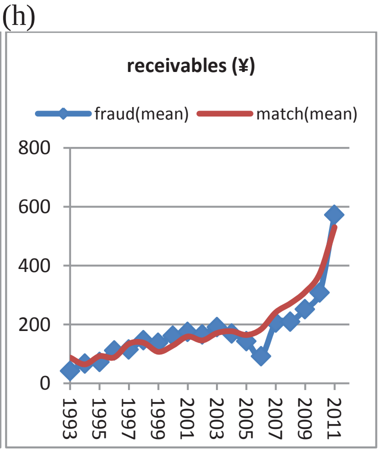

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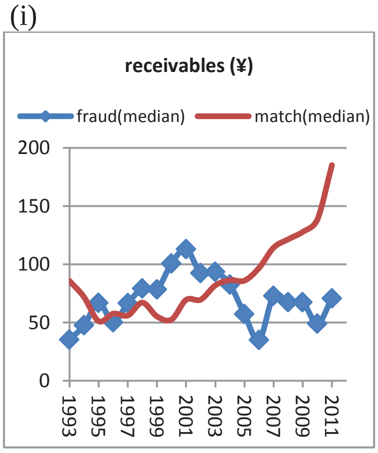
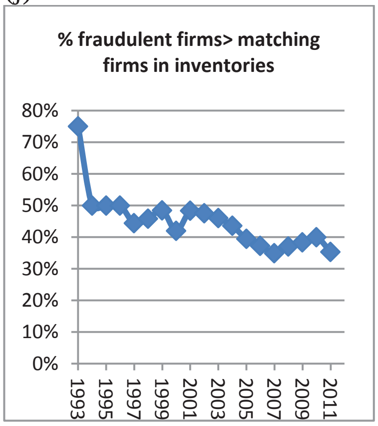


(j)



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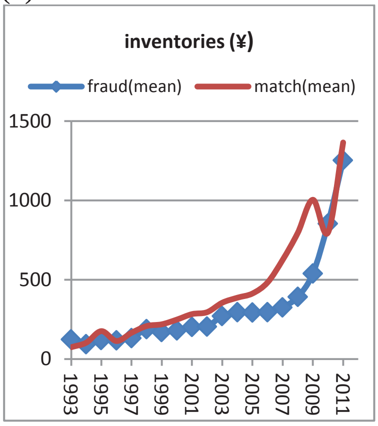

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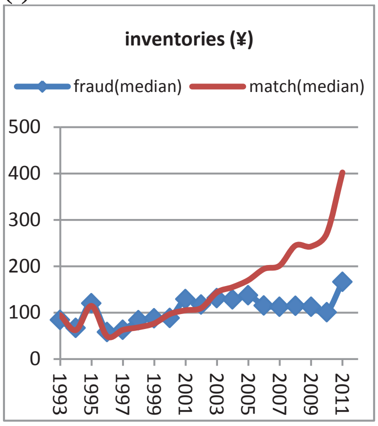
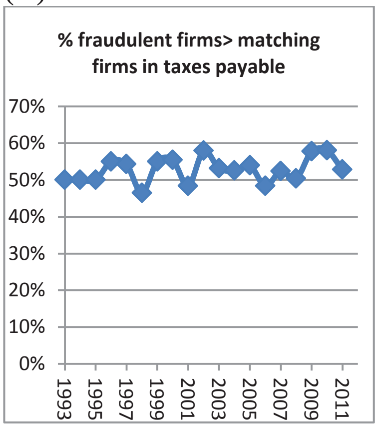


(m)



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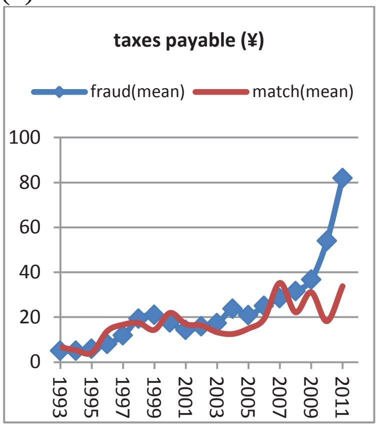


(o)

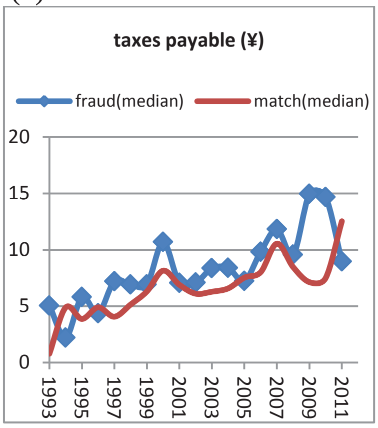


Figure 4.3: The differences between fraudulent firms and matching firms in operating revenue

This chart plots the differences between fraudulent firms and matching firms in operating revenue from 1993 to 2011. The x-axis is the calendar year; the y-axis represents the million RMB. The solid line with dot represents the value of account balances in million RMB for fraudulent firms; the solid line without dot represents the value of account balances in million RMB for matching firms.

(a)

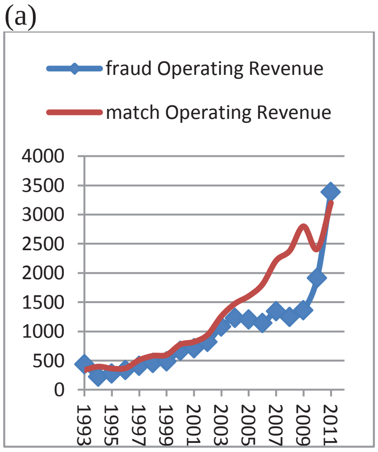
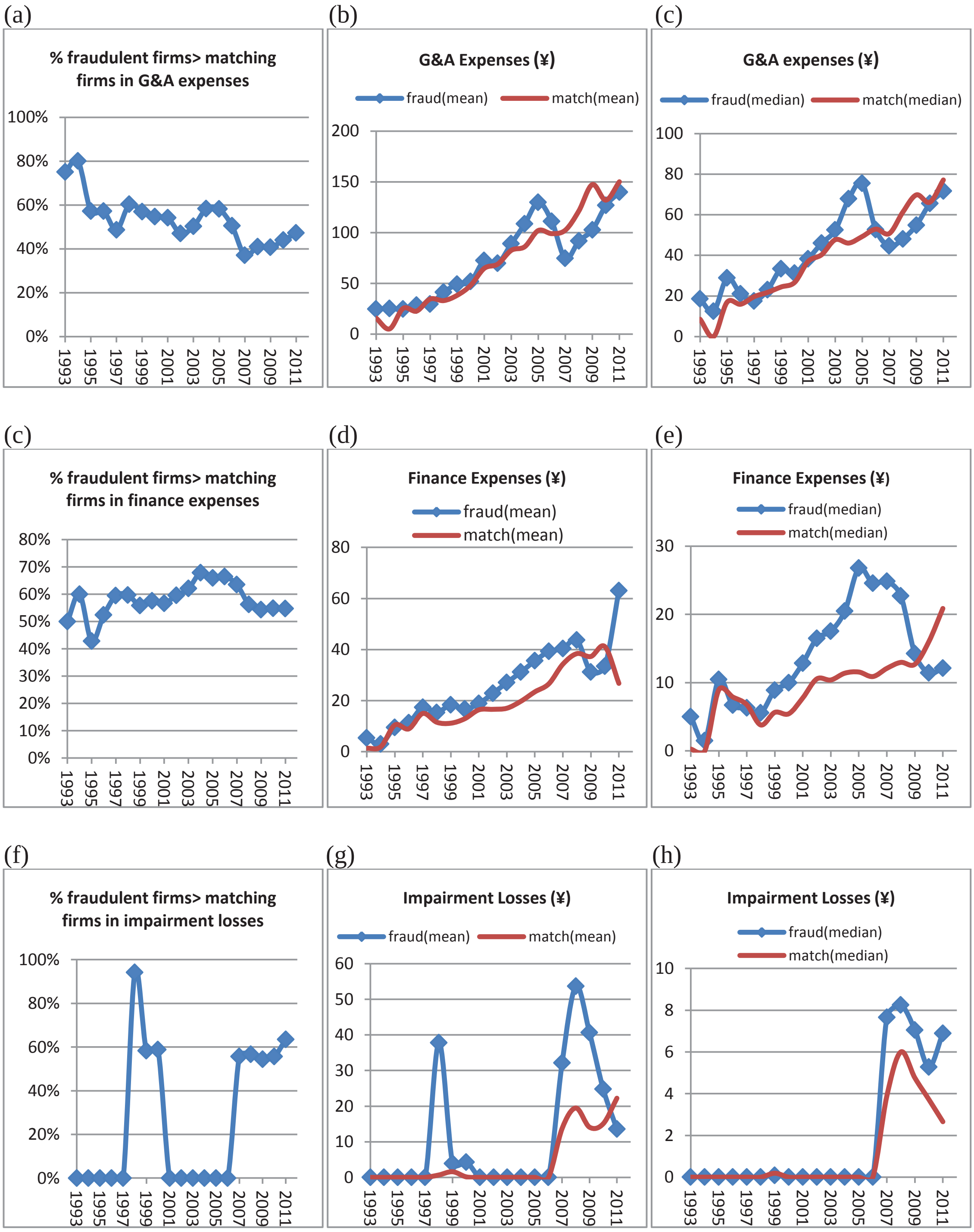


Figure 4.4: The differences between fraudulent and matching firms in some income statement accounts

These charts plot the differences between fraudulent and matching firms in some income statement accounts from 1993 to 2011. The x-axis is the calendar year, the y-axis in the left-side figure is the percentage, and the y-axis in the middle and right-side figures are the million RMB. The middle figures represent the differences between fraudulent and matching firms on mean account values. The right-side figures represent the differences between fraudulent and matching firms on median account values. The solid lines with dots in the middle and right-side figures represent the value of account balances in million RMB for fraudulent firms. The solid lines without dot in the middle and right-side figures represent the value of account balances in million RMB for matching firms.



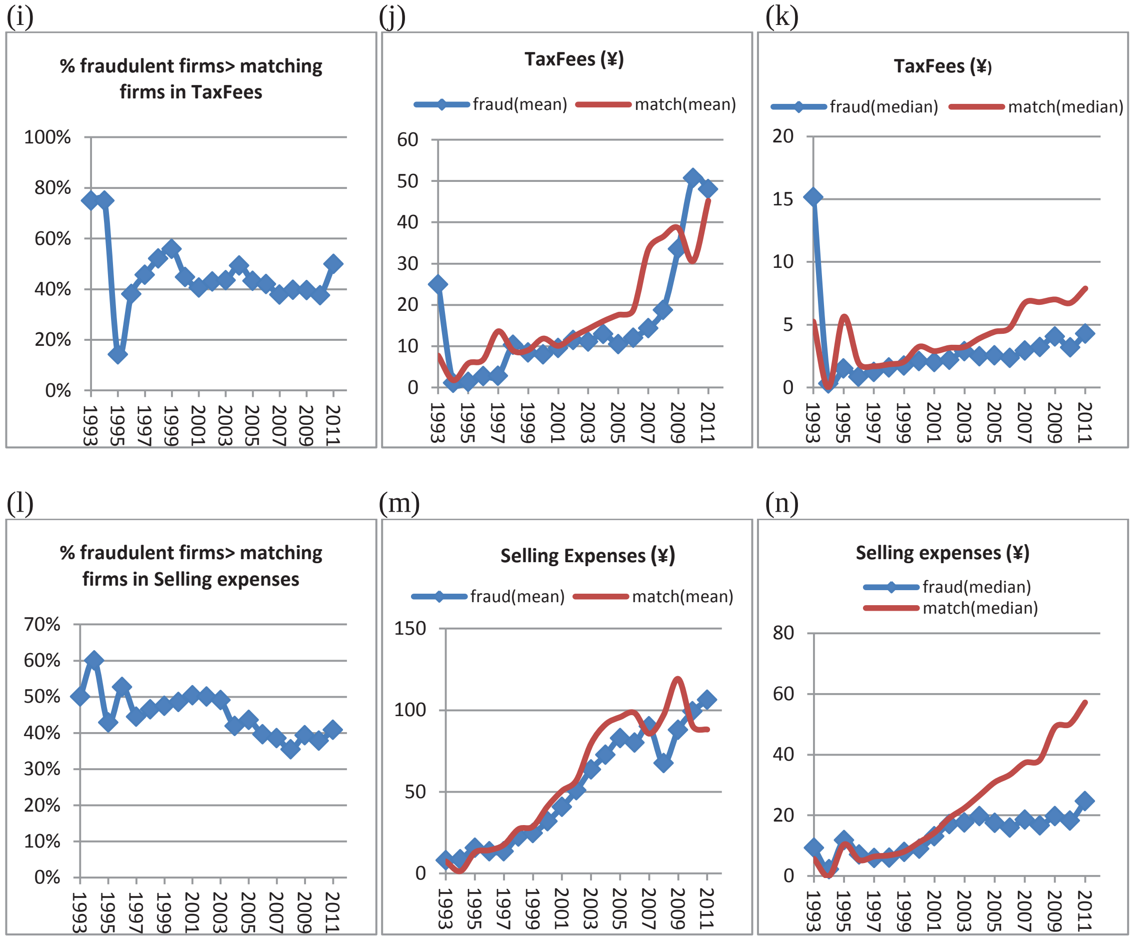


Figure 4.5: The differences between fraudulent firms and matching firms in non-operating income and non-operating expenses

These charts plot the differences between fraudulent firms and matching firms in non-operating income and non-operating expenses from 1993 to 2011. The x-axis is the calendar year and the y-axis is the million RMB. The solid line with a dot in the figure represents the value of account balances in million RMB for fraudulent firms. The solid line without dot figure represents the value of account balances in million RMB for matching firms.

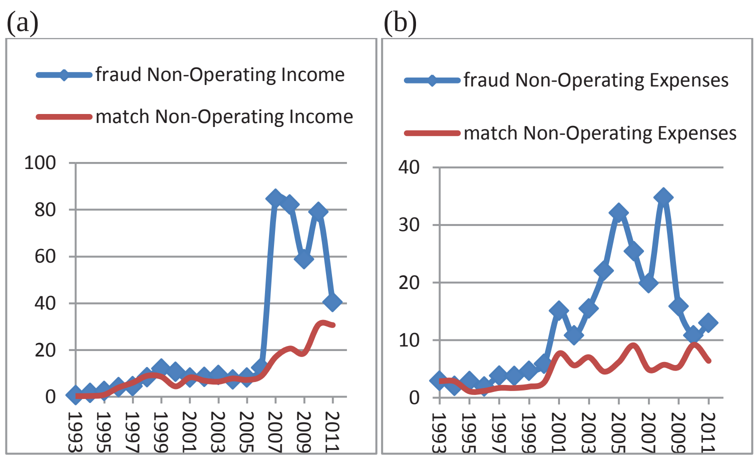
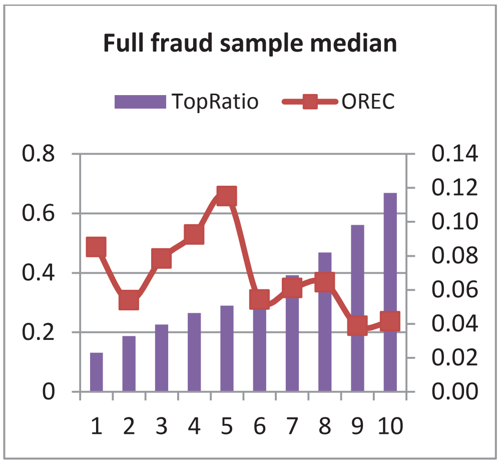


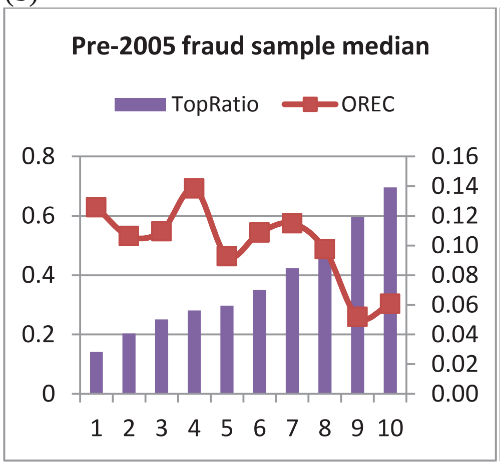
Figure 4.6: The relationship between TopRatio and OREC

These charts plot the relationship between *OREC* and the percentage of shares held by the largest shareholder (*TopRatio*). This study sorts fraudulent firms annually into ten deciles based on *TopRatio*. This study then computes the median *OREC* in each decile (the line graph), as well as the average *TopRatio* value (the bar graphs). The x-axis is decile rankings based on *TopRatio*. Numerical values for *TopRatio* are reported on the left side of the graphs; numerical values for *OREC* are reported on the right.

(a)



(b)



(c)

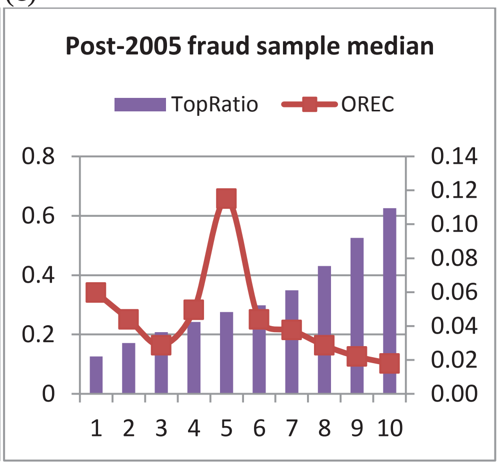
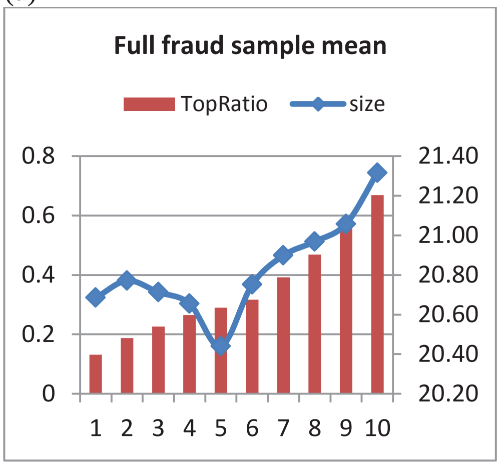


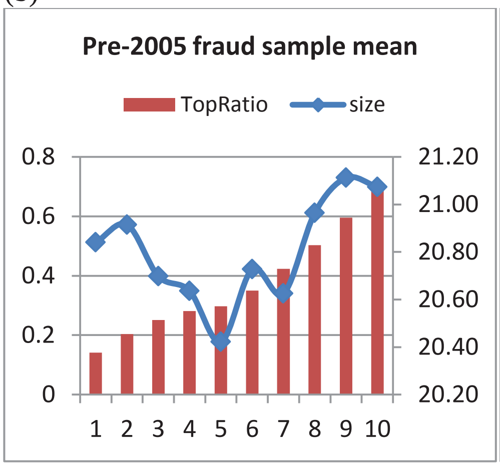
Figure 4.7: The relationship between TopRatio and Size

These charts plot the relationship between *Size* and the percentage of shares held by the largest shareholder (*TopRatio*). This study sorts fraudulent firms annually into ten deciles based on *TopRatio*, this study then computes the mean *Size* in each decile (the line graph), as well as the average *TopRatio* value (the bar graphs). The x-axis is decile rankings based on *TopRatio*. Numerical values for *TopRatio* are reported on the left side of the graphs; numerical values for *Size* are reported on the right.

(a)



(b)



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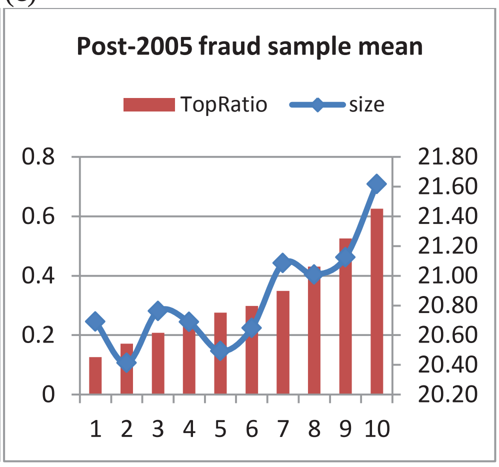
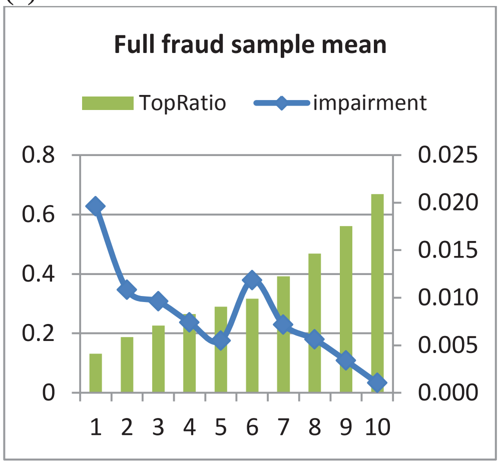


Figure 4.8: The relationship between TopRatio and impairment

These charts plot the relationship between *impairment* and the percentage of shares held by the largest shareholder (*TopRatio*). This study sorts fraudulent firms annually into ten deciles based on *TopRatio*, this study then computes the mean *impairment* in each decile (the line graph), as well as the average *TopRatio* value (the bar graphs). The x-axis is decile rankings based on *TopRatio*. Numerical values for *TopRatio* are reported on the left side of the graphs; numerical values for *impairment* are reported on the right.

(a)



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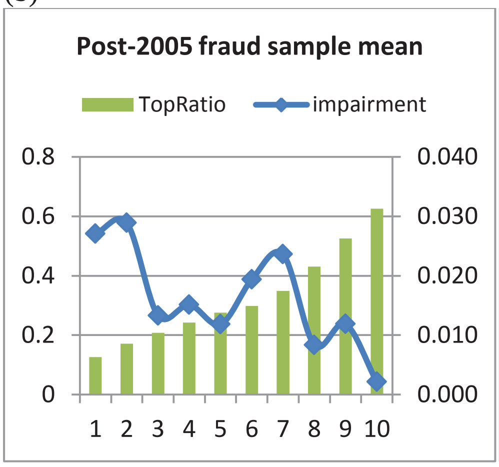
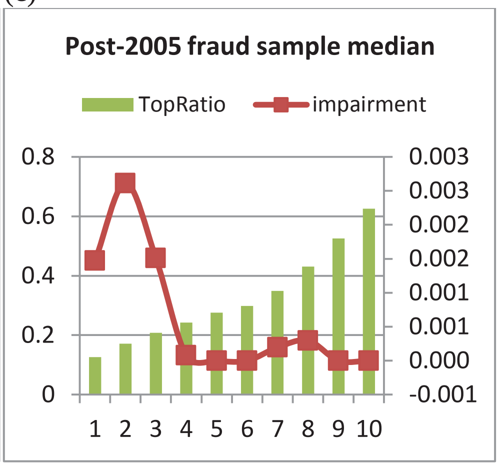


(c)



LIST OF TABLES AND FIGURES: CHAPTER FIVE: ESSAY THREE: LONG-TERM STOCK PRICE AND ACCOUNTING PERFORMANCE OF FRAUDULENT FIRMS IN CHINA

Table 5.1 Cumulative abnormal returns around the enforcement announcements in the short run

This table reports the mean cumulative abnormal returns (CRAARs and CMAARs) over two event windows, (-2, +2) and (-1, +1). The cumulative abnormal returns are estimated by cumulating daily abnormal stock returns within the two event windows around the enforcement event date.

The event day is the first day of public disclosure of fraudulent behaviour. The full sample is categorized into: a sample with at least two years of consecutive fraud announcements (consecutive events) and a sample without consecutive year violation announcements (non-consecutive event). There are five types of enforcement actions: internal criticism, public criticism, public condemnation, official warning, and monetary fines. The three sources of first announcements are the CSRC, SZSE and SHSE.

This study uses t-statistics for testing the significance of mean and the Wilcoxon signed-rank test for testing the significance of medians. Significance at 1%, 5%, 10% level (two-tail test) is denoted by ***, **, and * respectively.

			CRAAR (-2, +2)	CRAAR (-1, +1)	CMAAR (-2, +2)	CMAAR (-1, +1)
Panel A	Consecutive event	Mean	-0.018	-0.015	-0.023	-0.017
		Median	-0.021**	-0.015**	-0.031**	-0.018**
		N	57	57	57	57
	Non-consecutive event	Mean	-0.014***	-0.013***	-0.015***	-0.014***
		Median	-0.012***	-0.016***	-0.014***	-0.016***
		N	207	207	207	207
	Full sample	Mean	-0.015***	-0.014***	-0.016***	-0.007***
		Median	-0.014***	-0.015*	-0.015***	-0.016***
		N	264	264	264	264
Panel B	Internal criticism	Mean	-0.012	-0.005	-0.012	-0.007
		Median	-0.024	-0.007	-0.015**	-0.007
		N	39	39	39	39
	Public criticism	Mean	0.014	0.005	0.016	0.006
		Median	-0.005	-0.007	-0.004	-0.005
		N	29	29	29	29
	Public condemnation	Mean	-0.005	-0.006	-0.008	-0.008
		Median	-0.008**	-0.014***	-0.013***	-0.015***
		N	127	127	127	127
	Official warning	Mean	-0.049***	-0.043***	-0.050***	-0.043***
		Median	-0.043***	-0.040***	-0.046***	-0.039***
		N	65	65	65	65
	Monetary fines	Mean	-0.003	-0.001	-0.007	-0.004
		Median	-0.008	-0.001	-0.013	-0.006
		N	4	4	4	4
Panel C	CSRC	Mean	-0.028***	-0.022***	-0.027***	-0.022***
		Median	-0.024***	-0.022***	-0.021***	-0.021***
		N	120	120	120	120
	SZSE	Mean	-0.003	-0.004	-0.008	-0.008
		Median	-0.005	-0.014**	-0.012**	-0.014***
		N	80	80	80	80
	SHSE	Mean	-0.007	-0.009	-0.007	-0.009
		Median	-0.012	-0.016*	-0.016	-0.017
		N	56	56	56	56

Table 5.2 Determinants of CARs

This table reports the cross-sectional regression results on CARs.
The dependent variable is CAR, the cumulative abnormal return around enforcement announcements over two event windows, (-1, +1) and (-2, +2), using CRAAR and CMAAR as measures of CAR. The independent variables are: Three dummy variables are employed for when enforcement action is internal criticism, public condemnation, or official warning. To represent first disclosures of enforcement by source, two dummy variables, CSRC and SHSE denote first disclosures by the CSRC and the SHSE, respectively. MINDEX, is a comprehensive index to capture the regional market development; TopRatio is the percentage of shares held by the largest shareholder; Size is the log of total assets; CPAs is a dummy variable coded one (1) if the auditor was one of the 10 biggest auditors by market share. The numbers in the parentheses below the coefficients are the t-statistics to test the significance of the variables. Significance at 1%, 5%, 10% level (two-tail test) is denoted by ***, **, and * respectively.

	Model 1				Model 2				Model 3			
	CAR (-1,+1)		CAR (-2, +2)		CAR (-1, +1)		CAR (-2, +2)		CAR (-1, +1)		CAR (-2, +2)	
	CRAAR	CMAAR	CRAAR	CMAAR	CRAAR	CMAAR	CRAAR	CMAAR	CRAAR	CMAAR	CRAAR	CMAAR
Intercept	0.004	0.005	0.012	0.013	-0.004	-0.006	-0.003	-0.007	0.185**	0.188**	0.196	0.177
	(0.36)	(0.45)	(0.78)	(0.88)	(-0.54)	(-0.83)	(-0.30)	(-0.71)	(1.98)	(2.02)	(1.53)	(1.40)
Internal criticism	-0.013	-0.014	-0.031	-0.029					-0.018	-0.021	-0.036	-0.037
	(-0.78)	(-0.83)	(-1.42)	(-1.38)					(-1.03)	(-1.18)	(-1.48)	(-1.55)
Public condemnation	-0.010	-0.012	-0.017	-0.020					-0.004	-0.001	-0.011	-0.008
	(-0.80)	(-0.96)	(-0.99)	(-1.22)					(-0.17)	(-0.07)	(-0.36)	(-0.28)
Official warning	-0.046***	-0.048***	-0.061***	-0.063***					-0.049***	-0.052***	-0.063***	-0.067***
	(-3.33)	(-3.43)	(-3.33)	(-3.48)					(-3.16)	(-3.37)	(-2.97)	(-3.23)
CSRC					-0.019**	-0.017*	-0.026**	-0.021	0.008	0.015	0.006	0.016
					(-2.00)	(-1.73)	(-2.02)	(-1.64)	(0.34)	(0.62)	(0.16)	(0.47)
SHSE					-0.005	-0.002	-0.004	0.000	-0.001	0.001	-0.001	0.003
					(-0.40)	(-0.19)	(-0.23)	(0.01)	(-0.12)	(0.10)	(-0.07)	(0.18)
MINDEX									0.001	0.001	0.003	0.002
									(0.55)	(0.50)	(0.79)	(0.69)
TopRatio									-0.019	-0.018	-0.024	-0.020
									(-0.74)	(-0.71)	(-0.67)	(-0.59)
Size									-0.009**	-0.010**	-0.010	-0.009
									(-2.13)	(-2.21)	(-1.63)	(-1.54)
CPAs									0.004	0.005	0.007	0.008
									(0.37)	(0.45)	(0.45)	(0.54)
N	250	250	250	250	250	250	250	250	248	248	248	248
Adj R-sq	5.21%	5.29%	4.69%	4.80%	0.98%	0.64%	1.14%	0.64%	5.57%	5.98%	4.08%	4.13%

Table 5.3 Changes in operating performance of fraudulent firms

This table presents the mean change/growth in operating performance of fraudulent firms surrounding the announcement of fraud.
ROA1 is net profit deflated by total assets (return on assets); ROA2 is operating profit deflated by total assets; ATO is the asset turnover measured as net sales over total assets; CFOA is the operating cash flow deflated by total assets; Sale_G is the growth rate of net sales. The industry-adjusted change/growth rate for a given firm is the deviation from the industry median. Year 0 is the fiscal year when the fraudulent firm is publicly exposed.
Significance at 1%, 5%, 10% level (two-tail test) is denoted by ***, **, and * respectively.

Measure of operating performance	Year relative to the announcement year			
	From -1 to 0	From -1 to 1	From -1 to 2	From -1 to 3
Return on assets (ROA1)				
Mean change(%)	-1.24	3.18**	3.38**	2.98*
Mean industry-adjusted change(%)	-0.96	3.50**	4.00***	2.98*
Operating return on assets (ROA2)				
Mean change(%)	0.11	1.55***	2.95***	2.88***
Mean industry-adjusted change(%)	-0.10	0.99**	2.12***	1.80***
Asset turnover (ATO)				
Mean change(%)	3.61***	8.81***	13.24***	18.80***
Mean industry-adjusted change(%)	1.04	3.89	6.63**	11.05***
Operating cash flows/total assets (CFOA)				
Mean change(%)	1.60*	3.23***	2.90***	2.02**
Mean industry-adjusted change(%)	1.33	2.75***	2.42**	1.61*
Sales growth rate (Sale_G)				
Mean change(%)	20.22	12.86	36.93**	28.29**
Mean industry-adjusted change(%)	20.16	12.40	35.92**	26.73*
N	223	223	223	223

Table 5.4 Financial performance--before event and post event

This table reports the post financial performance of firms subject to announcements of fraud. ROA1 is average three-year ROA (return on assets) before or after the announcement of fraud. ROA2 is average three-year operating profit deflated by total assets before or after the announcement of fraud. ΔROA3 is average three-year non-operating profit deflated by total assets before or after the announcement of fraud. ΔROS1 is average three-year ROS (return on sales) before or after the announcement of fraud. ΔROS2 is average three-year operating profit deflated by sales before or after the announcement of fraud. ΔROS3 is average three-year non-operating profit deflated by before or after the announcement of fraud.
This study uses t-statistics for mean significance testing and Wilcoxon signed-rank test for median significance testing. Significance at 1%, 5%, 10% level (two-tail test) is denoted by ***, **, and * respectively.

Panel A: Mean Value

	Fraud sample			Matched sample			Difference	
	Pre-event	Post-event	Change	Pre-event	Post-event	Change	Pre-event	Post-event
ROA1	-0.023	-0.035	-0.012	0.027	0.023	-0.004	-0.050***	-0.058***
ROS1	-0.225	-0.633	-0.408***	-0.061	-0.137	-0.076	-0.165**	-0.497***
ROA2	0.090	0.094	0.004	0.122	0.131	0.010**	-0.032***	-0.038***
ROS2	0.229	0.204	-0.024***	0.261	0.255	-0.006	-0.032***	-0.051***
ROA3	-0.112	-0.130	-0.018**	-0.095	-0.110	-0.016***	-0.017***	-0.019***
ROS3	-0.454	-0.834	-0.381***	-0.319	-0.390	-0.072	-0.135**	-0.444***

Panel B: Median Value

	Fraud sample			Matched sample			Difference	
	Pre-event	Post-event	Change	Pre-event	Post-event	Change	Pre-event	Post-event
ROA1	0.017	0.014	-0.003	0.035	0.031	-0.005	-0.018***	-0.017***
ROS1	0.039	0.026	-0.013**	0.068	0.054	-0.014***	-0.029***	-0.028***
ROA2	0.079	0.078	-0.001	0.106	0.117	0.011**	-0.027***	-0.039***
ROS2	0.204	0.178	-0.027***	0.231	0.221	-0.011	-0.027***	-0.043***
ROA3	-0.075	-0.086	-0.010**	-0.077	-0.090	-0.013***	0.001	0.004
ROS3	-0.183	-0.191	-0.007	-0.159	-0.168	-0.009**	-0.025***	-0.023***

Panel C: Differences in the change of operating performance around the fraud events between fraud and matching firms

	Mean
ROA1	-0.008
ROS1	-0.332***
ROA2	-0.006
ROS2	-0.018
ROA3	-0.002
ROS3	-0.309**

Table 5.5 Cumulative abnormal returns around the enforcement announcements in the long run—buy and hold abnormal returns approaches

This table reports buy-and-hold returns for the sample firms, buy-and-hold adjusted returns for the sample firms relative to control firms, and wealth relative. Control firms are based on four benchmarks: size-matched, size-and-industry-matched, book-to-market-matched, and size-and-book-to-market-matched. The buy-and-hold return (BHR) is estimated by cumulating monthly abnormal stock returns within various event windows that range from three years before to three years after the enforcement event month. The event month is the first month of public disclosure of fraudulent behaviour. The buy-and-hold adjusted return (AD-BHR) is the difference between the BHR on the sample firm and that of the matching firm. Wealth relative is computed as [(1+avarege BHR for sample firms)/ (1+average BHR for matching firms)].
This study uses cross-sectional t-statistics to estimate the statistical significance of means. To estimate the statistical significance medians, this study uses the Wilcoxon signed-rank (two-tailed) test. Significance at 1%, 5%, 10% level (two-tail test) is denoted by ***, **, and * respectively.

Panel A: Size-matched

	Non-consecutive sample (Model 1)					
	N	Mean	Median	Wealth relative	Mean AD-BHR	Median AD-BHR
BHR(-36, 0)	152	0.245**	-0.143	1.061	0.071	-0.036
BHR(-36, -24)	78	0.144*	-0.049	1.082	0.087	0.017
BHR(-24, 0)	183	0.304**	-0.166	1.161	0.181*	0.033
BHR(-24, -12)	131	0.132	-0.076	0.950	-0.060	-0.050
BHR(-12, 0)	205	0.168*	-0.192***	1.131	0.136	-0.019
BHR(0, +12)	205	0.228**	-0.100	1.053	0.062	-0.029
BHR(+12, +24)	153	0.113*	-0.163	0.995	-0.005	-0.027
BHR(0, +24)	202	0.621***	-0.247*	1.344	0.415*	0.032
BHR(+24, +36)	130	0.128*	-0.147	0.899	-0.127	-0.066**
BHR(0, +36)	185	0.412***	-0.273	0.784	-0.389	-0.059
	Consecutive sample (Model 2)					
	N	Mean	Median	Wealth relative	Mean AD-BHR	Median AD-BHR
BHR(-36, 0)	32	-0.354***	-0.606***	0.847	-0.117	-0.130**
BHR(-36,-24)	19	-0.021	-0.097	1.086	0.077	0.055
BHR(-24, 0)	39	-0.203	-0.487***	0.895	-0.093	-0.131***
BHR(-24,-12)	29	-0.132**	-0.140***	0.910	-0.086	-0.037
BHR(-12, 0)	47	-0.127	-0.306***	0.843	-0.163**	-0.208***
BHR(0, +12)	48	-0.033	-0.207*	0.800	-0.242*	-0.147***
BHR(+12, +24)	25	-0.151**	-0.248**	0.754	-0.277*	-0.109**
BHR(0, +24)	46	0.388**	-0.165	1.126	0.156	-0.028
BHR(+24, +36)	19	-0.080	-0.142	0.741	-0.321	-0.109**
BHR(0, +36)	42	0.544**	0.056	1.292	0.349*	0.063
	Full sample (Model 3)					
	N	Mean	Median	Wealth relative	Mean AD-BHR	Median AD-BHR
BHR(-36, 0)	184	0.141	-0.299	1.035	0.039	-0.064
BHR(-36,-24)	97	0.111	-0.074	1.083	0.085	0.027
BHR(-24, 0)	222	0.215*	-0.262**	1.123	0.133	-0.016
BHR(-24,-12)	160	0.084	-0.087	0.944	-0.065	-0.045
BHR(-12, 0)	252	0.113	-0.212***	1.077	0.080	-0.049**
BHR(0, +12)	253	0.178**	-0.108	1.004	0.004	-0.052*
BHR(+12, +24)	178	0.076	-0.174	0.961	-0.044	-0.041
BHR(0, +24)	248	0.578***	-0.237	1.303	0.367**	0.007
BHR(+24, +36)	149	0.101	-0.142	0.879	-0.152*	-0.069***
BHR(0, +36)	227	0.436***	-0.204	0.851	-0.252	-0.029

Panel B: Size-and-industry-matched

	Non-consecutive sample (Model 1)					
	N	Mean	Median	Wealth relative	Mean AD-BHR	Median AD-BHR
BHR(-36, 0)	156	0.194	-0.164	0.768	-0.361	-0.060
BHR(-36,-24)	77	0.059	-0.118	1.015	0.015	-0.020
BHR(-24, 0)	183	0.257**	-0.198*	1.024	0.029	-0.041
BHR(-24,-12)	137	0.112	-0.083	1.099	0.100	0.042
BHR(-12, 0)	204	0.171*	-0.189***	1.117	0.123	-0.031
BHR(0, +12)	203	0.233**	-0.096	1.022	0.026	-0.014
BHR(+12, +24)	149	0.075	-0.163	0.956	-0.050	-0.035
BHR(0,+24)	199	0.600***	-0.245	1.303	0.372*	0.035
BHR(+24, +36)	129	0.128*	-0.108	0.931	-0.083	-0.027
BHR(0, +36)	183	0.355**	-0.273	0.677	-0.646	-0.020
	Consecutive sample (Model 2)					
	N	Mean	Median	Wealth relative	Mean AD-BHR	Median AD-BHR
BHR(-36, 0)	38	-0.315***	-0.542***	1.052	0.034	-0.048
BHR(-36,-24)	23	-0.003	-0.074	1.082	0.076	0.009
BHR(-24, 0)	42	-0.179	-0.479***	0.993	-0.006	-0.046
BHR(-24,-12)	36	-0.150***	-0.203***	0.939	-0.055	-0.003
BHR(-12, 0)	47	-0.122	-0.306***	0.830	-0.180***	-0.164***
BHR(0, +12)	48	-0.033	-0.207*	0.900	-0.107	-0.180**
BHR(+12, +24)	24	-0.176**	-0.257**	0.803	-0.203***	-0.131***
BHR(0, +24)	46	0.388**	-0.165	0.899	-0.155	-0.027
BHR(+24, +36)	17	-0.134	-0.209*	0.826	-0.182*	-0.028
BHR(0, +36)	41	0.561**	0.086*	1.191	0.250	0.039
	Full sample (Model 3)					
	N	Mean	Median	Wealth relative	Mean AD-BHR	Median AD-BHR
BHR(-36, 0)	194	0.094	-0.309**	0.794	-0.284	-0.060
BHR(-36,-24)	100	0.045	-0.085	1.029	0.029	-0.013
BHR(-24, 0)	225	0.176	-0.272***	1.020	0.023	-0.041
BHR(-24,-12)	173	0.057	-0.099**	1.068	0.068	0.023
BHR(-12, 0)	251	0.116	-0.210***	1.063	0.066	-0.048*
BHR(0, +12)	251	0.182**	-0.105	1.001	0.001	-0.029
BHR(+12, +24)	173	0.040	-0.178*	0.936	-0.071	-0.043**
BHR(0, +24)	245	0.560***	-0.233	1.212	0.273	0.010
BHR(+24, +36)	146	0.098	-0.129	0.921	-0.095	-0.028
BHR(0, +36)	224	0.392***	-0.203	0.743	-0.482	-0.004

Panel C: Book-to-market-matched

	Non-consecutive sample (Model 1)					
	N	Mean	Median	Wealth relative	Mean AD-BHR	Median AD-BHR
BHR(-36, 0)	153	0.142*	-0.075	0.772	-0.336**	-0.078
BHR(-36,-24)	71	0.066	-0.118	0.882	-0.143	-0.070
BHR(-24, 0)	173	0.142	-0.166	0.887	-0.145	-0.037
BHR(-24,-12)	134	0.037	-0.082	0.824	-0.221**	-0.017
BHR(-12, 0)	202	0.139	-0.193***	1.010	0.012	-0.055*
BHR(0, +12)	201	0.140**	-0.127	1.032	0.036	0.034**
BHR(+12, +24)	152	0.058	-0.180	1.063	0.063	0.035*
BHR(0, +24)	202	0.631***	-0.247*	1.004	0.006	0.082*
BHR(+24, +36)	128	0.074	-0.169	0.811	-0.250	0.035
BHR(0, +36)	183	0.321**	-0.274	0.931	-0.098	0.020
	Consecutive sample (Model 2)					
	N	Mean	Median	Wealth relative	Mean AD-BHR	Median AD-BHR
BHR(-36, 0)	33	-0.293**	-0.595**	0.472	-0.791	-0.080*
BHR(-36,-24)	24	0.005	-0.194	0.915	-0.093	-0.102
BHR(-24, 0)	41	-0.171	-0.487***	0.740	-0.291*	-0.129**
BHR(-24,-12)	31	-0.183***	-0.219***	1.012	0.010	-0.009
BHR(-12, 0)	46	-0.112	-0.305***	0.808	-0.211**	-0.134***
BHR(0, +12)	48	0.003	-0.207	0.875	-0.143	-0.073
BHR(+12, +24)	25	-0.157**	-0.248**	0.927	-0.067	-0.072
BHR(0, +24)	46	0.425**	-0.103	0.921	-0.122	0.017
BHR(+24, +36)	16	-0.088	-0.176	0.782	-0.254	-0.021
BHR(0, +36)	40	0.647***	0.088**	1.378	0.452**	0.109*
	Full sample (Model 3)					
	N	Mean	Median	Wealth relative	Mean AD-BHR	Median AD-BHR
BHR(-36, 0)	186	0.065	-0.184	0.719	-0.417**	-0.079*
BHR(-36,-24)	95	0.051	-0.120	0.890	-0.130	-0.082
BHR(-24, 0)	214	0.082	-0.265***	0.862	-0.173	-0.062*
BHR(-24,-12)	165	-0.004	-0.096**	0.849	-0.178**	-0.011
BHR(-12, 0)	244	0.089	-0.194***	0.965	-0.039	-0.061**
BHR(0, +12)	249	0.113**	-0.142	1.001	0.001	0.030
BHR(+12, +24)	177	0.028	-0.196**	1.045	0.044	0.034
BHR(0, +24)	248	0.593***	-0.232	0.989	-0.018	0.076*
BHR(+24, +36)	144	0.056	-0.169	0.809	-0.250	0.035
BHR(0, +36)	223	0.379***	-0.223	1.001	0.001	0.036*

Panel D: Size-and-book-to-market-matched

	Non-consecutive sample (Model 1)					
	N	Mean	Median	Wealth relative	Mean AD-BHR	Median AD-BHR
BHR(-36, 0)	150	0.184**	-0.126	1.002	0.002	-0.047
BHR(-36,-24)	78	0.034	-0.110	0.913	-0.098	-0.112
BHR(-24, 0)	174	0.314**	-0.161	1.116	0.136	-0.011
BHR(-24,-12)	123	0.046	-0.085	0.919	-0.093	-0.020
BHR(-12, 0)	201	0.180*	-0.192***	1.120	0.126	-0.056
BHR(0, +12)	204	0.157***	-0.101	1.001	0.001	-0.012
BHR(+12, +24)	155	0.063	-0.181*	0.938	-0.070	-0.032
BHR(0, +24)	200	0.528**	-0.250**	1.056	0.081	0.014
BHR(+24, +36)	129	0.156*	-0.163	1.023	0.026	-0.012
BHR(0, +36)	181	0.326**	-0.274	0.969	-0.043	-0.006
	Consecutive sample (Model 2)					
	N	Mean	Median	Wealth relative	Mean AD-BHR	Median AD-BHR
BHR(-36, 0)	34	-0.340***	-0.625***	0.873	-0.096	-0.102
BHR(-36,-24)	25	-0.090	-0.189	0.960	-0.038	-0.011
BHR(-24, 0)	41	-0.184	-0.519***	0.889	-0.102	-0.098
BHR(-24,-12)	33	-0.190***	-0.219***	0.878	-0.112	-0.030
BHR(-12, 0)	48	-0.119	-0.305***	0.866	-0.137*	-0.121**
BHR(0, +12)	48	-0.033	-0.207*	0.896	-0.112	-0.148**
BHR(+12, +24)	23	-0.151*	-0.248**	0.899	-0.095	-0.081
BHR(0, +24)	46	0.388**	-0.165	0.920	-0.121	-0.142
BHR(+24, +36)	17	-0.116	-0.204*	0.931	-0.066	-0.060
BHR(0, +36)	41	0.450**	0.026	0.883	-0.192	0.003
	Full sample (Model 3)					
	N	Mean	Median	Wealth relative	Mean AD-BHR	Median AD-BHR
BHR(-36, 0)	184	0.087	-0.299	0.986	-0.016	-0.068
BHR(-36,-24)	103	0.004	-0.120	0.923	-0.083	-0.102
BHR(-24, 0)	215	0.219*	-0.249**	1.081	0.091	-0.046
BHR(-24,-12)	156	-0.004	-0.115***	0.912	-0.097	-0.024
BHR(-12, 0)	249	0.122	-0.215***	1.072	0.075	-0.072*
BHR(0, +12)	252	0.121**	-0.119	0.982	-0.020	-0.050
BHR(+12, +24)	178	0.036	-0.193**	0.934	-0.074	-0.055
BHR(0, +24)	246	0.502***	-0.243	1.029	0.043	-0.001
BHR(+24, +36)	146	0.124	-0.165	1.014	0.015	-0.035
BHR(0, +36)	222	0.349***	-0.213	0.951	-0.070	-0.001

Table 5.6 Cumulative abnormal returns around enforcement announcements in the long run—calendar time abnormal returns

This table reports results from calendar-time portfolio regressions where the dependent variables are event portfolio returns, R_p, in excess of the risk free rate, R_f. In the case of the post-announcement period of 36 months, in each calendar month, value weighted portfolios are formed, which include all sample firms that have experienced fraudulent activities in the previous 36 months period after the event month.[102] The event portfolio is rebalanced monthly to drop all companies that reach the end of their 3-year period and add all firms that have newly experienced a fraudulent activity. This study follows Fama and French (1993) to construct the Fama French 3 factor model in China. The equation is $R_{pt}-R_{ft} = \alpha + \beta_m(R_{mt}-R_{ft}) + \beta_s SMB_t + \beta_h HML_t + e_t$. The three factors are the market return in excess of the risk-free rate (R_m-R_f), the return difference between the simple average of small stock portfolios and the simple average of big stock portfolios (SMB), and the return difference between the simple average of high stock portfolios and the simple average of low stock portfolios (HML). This study estimates the Fama French 3 factor model in both the fraud sample and matched sample. The intercept (α) measures the average monthly abnormal returns on the portfolio of event firms and matching firms, respectively. This study uses a dummy variable to differentiate event firms and matching firms, for which the adjusted intercept (Adj α) is the coefficient, representing the difference between the intercepts of the event portfolio and the control portfolio. The t-statistics are reported in parentheses, and the number of monthly observations is reported in square brackets. The implied 3-year AR $[(1+\text{Intercept})^{36} - 1]$ is the estimated average buy-and-hold return from earning the intercept return every month for 36 months.
Significance at 1%, 5%, 10% level (two-tail test) is denoted by ***, **, and * respectively.

[102] If this study forms equal weighted portfolios, the calendar-time portfolio regression results are quantitatively similar.

Panel A: Non-consecutive sample

	Non-consecutive sample (Model 1)			
	α		Adj α	Adj. R2
	Fraud sample	Matched sample	Diff	[N Obs.]
Calendar time AR (-3,0)year	-0.009**	-0.012***	0.002	78.19%
	(-2.07)	(-3.49)	(0.37)	[362]
Implied 3-year AR	-0.274	-0.343	0.073	
Calendar time AR (-3,-2)year	-0.010*	-0.009	0.000	62.32%
	(-1.81)	(-1.54)	(0.01)	[303]
Implied 1-year AR	-0.117	-0.104	0.001	
Calendar time AR (-2,0)year	-0.008	-0.013***	0.001	71.09%
	(-1.59)	(-3.07)	(0.15)	[362]
Implied 2-year AR	-0.176	-0.268	0.024	
Calendar time AR (-2,-1)year	-0.012**	-0.013**	-0.002	67.96%
	(-2.54)	(-2.33)	(-0.25)	[324]
Implied 1-year AR	-0.140	-0.143	-0.022	
Calendar time AR (-1,0)year	-0.014**	-0.011**	-0.004	66.89%
	(-2.26)	(-2.29)	(-0.50)	[347]
Implied 1-year AR	-0.158	-0.127	-0.045	
Calendar time AR (0,+1)year	-0.015***	-0.012***	-0.002	69.03%
	(-2.97)	(-2.68)	(-0.27)	[361]
Implied 1-year AR	-0.170	-0.133	-0.021	
Calendar time AR (+1,+2)year	-0.006	-0.007*	0.007	76.28%
	(-1.41)	(-1.90)	(1.13)	[377]
Implied 1-year AR	-0.074	-0.081	0.084	
Calendar time AR (0,+2)year	-0.013***	-0.009***	0.001	72.65%
	(-2.70)	(-2.65)	(0.21)	[412]
Implied 2-year AR	-0.270	-0.203	0.030	
Calendar time AR (+2,+3)year	-0.012**	-0.008*	-0.003	70.85%
	(-2.45)	(-1.72)	(-0.47)	[361]
Implied 1-year AR	-0.136	-0.093	-0.037	
Calendar time AR (0,+3)year	-0.014***	-0.010***	0.001	77.31%
	(-3.29)	(-3.24)	(0.28)	[420]
Implied 3-year AR	-0.387	-0.312	0.054	

Panel B: Consecutive sample

	Consecutive sample (Model 2)			
	α		Adj α	Adj. R2
	Fraud sample	Matched sample	Diff	[N Obs.]
Calendar time AR (-3,0)year	-0.017***	-0.013**	0.002	64.58%
	(-3.11)	(-2.28)	(0.21)	[271]
Implied 3-year AR	-0.457	-0.372	0.062	
Calendar time AR (-3,-2)year	-0.021***	-0.002	-0.013	48.94%
	(-2.88)	(-0.32)	(-1.28)	[221]
Implied 1-year AR	-0.228	-0.027	-0.145	
Calendar time AR (-2,0)year	-0.015**	-0.009	-0.002	62.21%
	(-2.57)	(-1.42)	(-0.26)	[259]
Implied 2-year AR	-0.306	-0.200	-0.052	
Calendar time AR (-2,-1)year	-0.011**	-0.016**	0.007	60.99%
	(-2.03)	(-2.20)	(0.73)	[230]
Implied 1-year AR	-0.129	-0.175	0.082	
Calendar time AR (-1,0)year	-0.026***	0.002	-0.024**	51.35%
	(-3.60)	(0.23)	(-2.03)	[233]
Implied 1-year AR	-0.268	0.029	-0.255	
Calendar time AR (0,+1)year	-0.026***	-0.004	-0.016	53.65%
	(-2.94)	(-0.54)	(-1.35)	[249]
Implied 1-year AR	-0.274	-0.046	-0.176	
Calendar time AR (+1,+2)year	-0.004	0.003	-0.003	34.41%
	(-0.30)	(0.35)	(-0.16)	[251]
Implied 1-year AR	-0.046	0.036	-0.030	
Calendar time AR (0,+2)year	-0.020**	0.002	-0.015	45.10%
	(-2.03)	(0.26)	(-1.22)	[287]
Implied 2-year AR	-0.379	0.048	-0.301	
Calendar time AR (+2,+3)year	0.003	-0.011*	0.016	61.13%
	(0.39)	(-1.83)	(1.64)	[254]
Implied 1-year AR	0.039	-0.121	0.213	
Calendar time AR (0,+3)year	-0.013**	-0.001	-0.006	54.80%
	(-2.07)	(-0.20)	(-0.61)	[314]
Implied 3-year AR	-0.378	-0.048	-0.188	

Panel C: Full sample

	Full sample (Model 3)			
	α		Adj α	Adj. R2
	Fraud sample	Matched sample	Diff	[N Obs.]
Calendar time AR (-3,0)year	-0.012***	-0.012***	0.002	71.78%
	(-3.43)	(-3.95)	(0.42)	[633]
Implied 3-year AR	-0.351	-0.357	0.071	
Calendar time AR (-3,-2)year	-0.015***	-0.007	-0.006	57.05%
	(-3.37)	(-1.48)	(-0.90)	[524]
Implied 1-year AR	-0.169	-0.078	-0.066	
Calendar time AR (-2,0)year	-0.011***	-0.011***	0.000	67.11%
	(-2.76)	(-3.13)	(-0.05)	[621]
Implied 2-year AR	-0.232	-0.241	-0.007	
Calendar time AR (-2,-1)year	-0.013***	-0.014***	0.002	65.26%
	(-3.37)	(-3.23)	(0.27)	[554]
Implied 1-year AR	-0.142	-0.157	0.018	
Calendar time AR (-1,0)year	-0.018***	-0.006	-0.012*	59.59%
	(-3.80)	(-1.23)	(-1.74)	[580]
Implied 1-year AR	-0.199	-0.070	-0.131	
Calendar time AR (0,+1)year	-0.021***	-0.009**	-0.008	60.29%
	(-4.19)	(-2.22)	(-1.21)	[610]
Implied 1-year AR	-0.224	-0.100	-0.088	
Calendar time AR (+1,+2)year	-0.005	-0.003	0.003	54.80%
	(-0.83)	(-0.78)	(0.45)	[628]
Implied 1-year AR	-0.058	-0.037	0.039	
Calendar time AR (0,+2)year	-0.015***	-0.005	-0.005	58.91%
	(-3.12)	(-1.28)	(0.38)	[699]
Implied 2-year AR	-0.309	-0.109	-0.122	
Calendar time AR (+2,+3)year	-0.005	-0.009**	-0.010	66.16%
	(-1.21)	(-2.51)	(-2.47)	[615]
Implied 1-year AR	-0.064	-0.104	0.064	
Calendar time AR (0,+3)year	-0.013***	-0.007*	-0.002	66.38%
	(-3.54)	(-1.91)	(-0.35)	[734]
Implied 3-year AR	-0.374	-0.211	-0.061	

Table 5.7 Cumulative abnormal returns--Robustness test

This table reports the mean cumulative abnormal returns (CAR and BHAR) over various event windows.
Model 1 (CAR) and Model 2 (BHAR) present cumulative abnormal returns around the enforcement announcements in the long run. The cumulative abnormal returns are estimated by cumulating monthly abnormal stock returns within various event windows that range from three years before to three years after the enforcement event month. The event month is the first month of public disclosure of fraudulent behaviours.
This study uses t-statistics for mean significance testing, [103] Wilcoxon signed-rank test for median significance testing and χ^2-test for significance of percent negative. Significance at 1%, 5%, 10% level (two-tail test) is denoted by ***, **, and * respectively.

Model 1				Model 2			
	N	220	% negative		N	220	% negative
CAR(-36, 0)	mean	-0.069	53.64	BHAR(-36, 0)	mean	-0.041	53.64
	median	-0.053			median	-0.043**	
	N	220			N	220	
CAR(-24, 0)	mean	-0.036	55.45	BHAR(-24, 0)	mean	-0.013	56.36*
	median	-0.046			median	-0.089	
	N	220			N	220	
CAR(-12, 0)	mean	-0.049	56.82**	BHAR(-12, 0)	mean	0.02	56.82**
	median	-0.083			median	-0.052**	
	N	188			N	188	
CAR(-24, -12)	mean	-0.023	51.6	BHAR(-24, -12)	mean	0.03	47.87
	median	-0.01			median	0.02	
	N	239			N	239	
CAR(0, +12)	mean	0.005	43.51**	BHAR(0, +12)	mean	0.039	47.77
	median	0.038			median	0.013	
	N	239			N	239	
CAR(0, +24)	mean	0.053	48.54	BHAR(0, +24)	mean	0.177*	49.37
	median	0.037			median	0.012	
	N	239			N	239	
CAR(0, +36)	mean	0.088*	46.44	BHAR(0, +36)	mean	0.203*	49.79
	median	0.071			median	0.001	

[103] This study also uses bootstrapped p-values for mean significance testing in BHARs; none of the seven bootstrapped p-values estimated suggests statistical significance at 5 percent level. Furthermore, none of the seven bootstrapped p-values estimated suggests statistical significance even at the 10 percent level.

Table 5.8 The relationship between stock performance and other receivables

The relationship between cumulative buy-and-hold abnormal returns (BHAR) and other receivables (OREC) around the enforcement announcements over various event windows for three sub-samples (the bottom tercile, middle tercile, and top tercile).
This table presents the long-term stock performance in the range of three years before to three years after the enforcement event month, in the form of buy-and-hold abnormal returns estimated relative to the returns of matching firms. The event month is the first month of public disclosure of fraudulent behaviour. The difference in the mean and median BHARs between the top tercile and bottom tercile are also reported. The terciles are ranked by average OREC in each range of BHARs. Significance at 1%, 5%, 10% level (two-tail test) is denoted by ***, **, and * respectively.

		Bottom tercile	Middle tercile	Top tercile	Difference between top and bottom tercile
OREC	Mean	0.011	0.060	0.296	0.285***
	Median	0.010	0.050	0.214	0.203***
BHAR(-36,0)	Mean	-0.144	0.052	0.010	0.154
	Median	-0.128	0.017	0.005	0.133
BHAR(-24,0)	Mean	-0.058	-0.037	0.141	0.199
	Median	-0.114	-0.089	0.022	0.136
BHAR(-12,0)	Mean	0.090	-0.054	0.063	-0.027
	Median	-0.065	-0.053	-0.038	0.027
No of firms		67	67	66	
		Bottom tercile	Middle tercile	Top tercile	Difference between top and bottom tercile
OREC	Mean	0.010	0.059	0.284	0.274***
	Median	0.010	0.048	0.216	0.206***
BHAR(-24,-12)	Mean	0.081	-0.044	0.025	-0.056
	Median	0.040	0.004	0.024	-0.015
No of firms		59	60	59	
		Bottom tercile	Middle tercile	Top tercile	Difference between top and bottom tercile
OREC	Mean	0.010	0.055	0.291	0.282***
	Median	0.010	0.048	0.196	0.186***
BHAR(0, +12)	Mean	0.152	0.063	-0.064	-0.143**
	Median	0.059	0.013	-0.052	-0.063**
BHAR(0, +24)	Mean	0.126	0.580	-0.178	-0.304*
	Median	0.063	0.058	-0.092	-0.155*
BHAR(0, +36)	Mean	0.238	0.399	-0.064	-0.301
	Median	0.091	0.018	-0.052	-0.143
No of firms		70	71	70	

Table 5.9 Cross-sectional regressions of post-event stock returns on operating performance

This table presents the mean change/growth in operating performance of fraudulent firms surrounding the fraud announcement.
The dependent variable is the one-year and three-year stock abnormal returns following the announcement of fraud. The independent variables are contemporaneous changes in industry-adjusted operating performance measures. ROA1 is net profit deflated by total assets (return on assets); ROA2 is operating profit deflated by total assets; ATO is the asset turnover measured as net sales over total assets; CFOA is the operating cash flow deflated by total assets; and Sale_G is the growth rate of net sales. The industry-adjusted change/growth rate for a given firm is the deviation from the industry median. Year 0 is the fiscal year when the fraudulent firm is announced.
The numbers in parentheses below the coefficients are the t-statistics to test the significance of the variables. Significance at 1%, 5%, 10% level (two-tail test) is denoted by ***, **, and * respectively.

	BHAR(0, +1)		BHAR(0, +3)	
	Model 1	Model 2	Model 3	Model 4
Intercept	-0.012	-0.013	0.100	0.082
	(-0.25)	(-0.26)	(0.74)	(0.62)
ΔROA1	0.421*		1.625***	
	(1.80)		(2.65)	
ΔROA2		1.387		6.004***
		(1.36)		(3.19)
ΔATO	-0.064	-0.145	-0.013	-0.386
	(-0.36)	(-0.71)	(-0.04)	(-1.08)
ΔCFOA	0.539	0.527	0.434	0.318
	(1.36)	(1.29)	(0.41)	(0.30)
ΔSale_G	0.023	0.033	0.010	-0.010
	(0.68)	(0.97)	(0.15)	(-0.14)
N	163	163	163	163
Adj R-sq	2.70%	1.85%	2.81%	4.61%

Table 5.10 The effects of enforcement actions from the CSRC on fraudulent firms

This table reports the OLS regression results of post-announcement performance. The dependent variables are BHAR, ∆ROA1, ∆ROA2, ∆ROA3, ∆ROS1, ∆ROS2, and ∆ROS3, respectively. BHAR is the buy-and-hold abnormal return over the event window (0, +3), using fraudulent firms' buy-and-hold returns minus matching firms' buy-and-hold returns as measures of BHAR. ∆ROA1 is the three-year average of ROA (return on assets) after the fraud announcement minus the three-year average of ROA before the announcement, adjusted for the change of industry median. This study follows the same procedure for ∆ROA2, ∆ROA3, ∆ROS1, ∆ROS2, and ∆ROS3.

The independent variables are: ∆newOREC, computed as the three-year average of other receivables after the event minus the three-year average of other receivables before the event, adjusted for the change of industry median and scaled by total assets; ∆Impairment, calculated as the three-year average of impairment losses after the event minus the three-year average of impairment losses before the event, adjusted for the change of industry median and scaled by total assets; PreROA1, being the three-year average ROA before the event; PreSize, which is the average value of the natural logarithm of total assets in the three years before the event; and PreSTDebt, being the three-year average of short-term loans before the event. Panel A shows OLS regression results of BHAR (0, +3), ∆ROA1, ∆ROA2, and ∆ROA3 on independent variables. Panel B shows OLS regression results of ∆ROS1, ∆ROS2, and ∆ROS3 on independent variables.

The numbers in parentheses below the coefficients are the t-statistics to test the significance of the variables. Significance at 1%, 5%, 10% level (two-tail test) is denoted by ***, **, and * respectively.

Panel A:

Dependent variable	BHAR(0, +3)			ΔROA1			ΔROA2			ΔROA3		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
Intercept	1.941	1.933	1.870	-0.341*	-0.375**	-0.387**	-0.063	-0.070	-0.074	-0.217	-0.251	-0.259
	(0.65)	(0.64)	(0.62)	(-1.93)	(-2.09)	(-2.51)	(-0.67)	(-0.72)	(-0.80)	(-1.26)	(-1.51)	(-1.67)
ΔnewOREC	-1.937**		-1.924**	-0.386***		-0.378***	-0.127***		-0.125***	-0.253***		-0.245***
	(-2.28)		(-2.26)	(-7.71)		(-8.63)	(-4.73)		(-4.75)	(-5.15)		(-5.58)
ΔImpairment		-3.184	-2.938		-1.962***	-1.914***		-0.450***	-0.434***		-1.751***	-1.720***
		(-0.68)	(-0.64)		(-7.09)	(-8.05)		(-3.01)	(-3.05)		(-6.86)	(-7.21)
PreROA1	-1.710	-2.060	-1.442	-0.955***	-0.903***	-0.781***	-0.078*	-0.079*	-0.039	-0.916***	-0.838***	-0.760***
	(-1.22)	(-1.42)	(-0.98)	(-11.54)	(-10.45)	(-10.35)	(-1.77)	(-1.69)	(-0.86)	(-11.30)	(-10.53)	(-10.03)
PreSize	-0.099	-0.098	-0.096	0.017**	0.019**	0.019**	0.003	0.003	0.003	0.011	0.013	0.013*
	(-0.69)	(-0.67)	(-0.67)	(2.01)	(2.19)	(2.58)	(0.65)	(0.72)	(0.77)	(1.34)	(1.61)	(1.75)
PreSTDebt	1.265	1.259	1.356	-0.184***	-0.144**	-0.125**	0.022	0.030	0.036	-0.211***	-0.170***	-0.157***
	(1.37)	(1.33)	(1.45)	(-3.38)	(-2.57)	(-2.59)	(0.77)	(0.98)	(1.25)	(-3.95)	(-3.28)	(-3.25)
N	211	211	211	211	211	211	211	211	211	211	211	211
Adj R-sq	4.87%	2.69%	4.60%	53.58%	51.92%	64.56%	12.46%	7.03%	15.85%	47.26%	51.56%	57.73%

Panel B:

Dependent variable	ΔROS1			ΔROS2			ΔROS3		
	Model 13	Model 14	Model 15	Model 16	Model 17	Model 18	Model 19	Model 20	Model 21
Intercept	0.332	0.124	0.026	-0.042	-0.049	-0.054	0.494	0.281	0.190
	(0.13)	(0.05)	(0.01)	(-0.20)	(-0.23)	(-0.26)	(0.19)	(0.11)	(0.07)
ΔnewOREC	-3.056***		-3.001***	-0.162***		-0.160***	-2.857***		-2.802***
	(-4.10)		(-4.12)	(-2.71)		(-2.68)	(-3.85)		(-3.86)
ΔImpairment		-13.079***	-12.695***		-0.525	-0.505		-12.983***	-12.624***
		(-3.19)	(-3.21)		(-1.60)	(-1.56)		(-3.19)	(-3.21)
PreROA1	-3.271***	-3.080**	-2.117*	-0.193*	-0.198*	-0.147	-3.363***	-3.114**	-2.215*
	(-2.66)	(-2.41)	(-1.69)	(-1.95)	(-1.93)	(-1.43)	(-2.75)	(-2.45)	(-1.77)
PreSize	-0.020	-0.008	-0.006	0.001	0.001	0.001	-0.025	-0.013	-0.011
	(-0.16)	(-0.06)	(-0.05)	(0.07)	(0.11)	(0.12)	(-0.20)	(-0.11)	(-0.09)
PreSTDebt	-1.117	-0.873	-0.720	0.042	0.050	0.058	-1.235	-0.983	-0.840
	(-1.38)	(-1.05)	(-0.90)	(0.65)	(0.75)	(0.88)	(-1.53)	(-1.19)	(-1.05)
N	211	211	211	211	211	211	211	211	211
Adj R-sq	11.37%	8.63%	15.20%	6.07%	3.92%	6.72%	10.77%	8.85%	14.62%

Table 5.11 Cumulative and mean net income, dividend and grey accounts in both fraud and matched samples

This table presents the results of grey, dividend and net income accounts in both the fraud and matched sample from three years before the event to three years after the event. All the accounts are deflated by total assets. Panel A shows the cumulative balances of net income, dividend and grey accounts in the matched sample and fraud sample, respectively. Panel B shows the comparison of mean value of net income, dividend, and grey accounts between fraud sample and matched sample.

Panel A: Cumulative balances

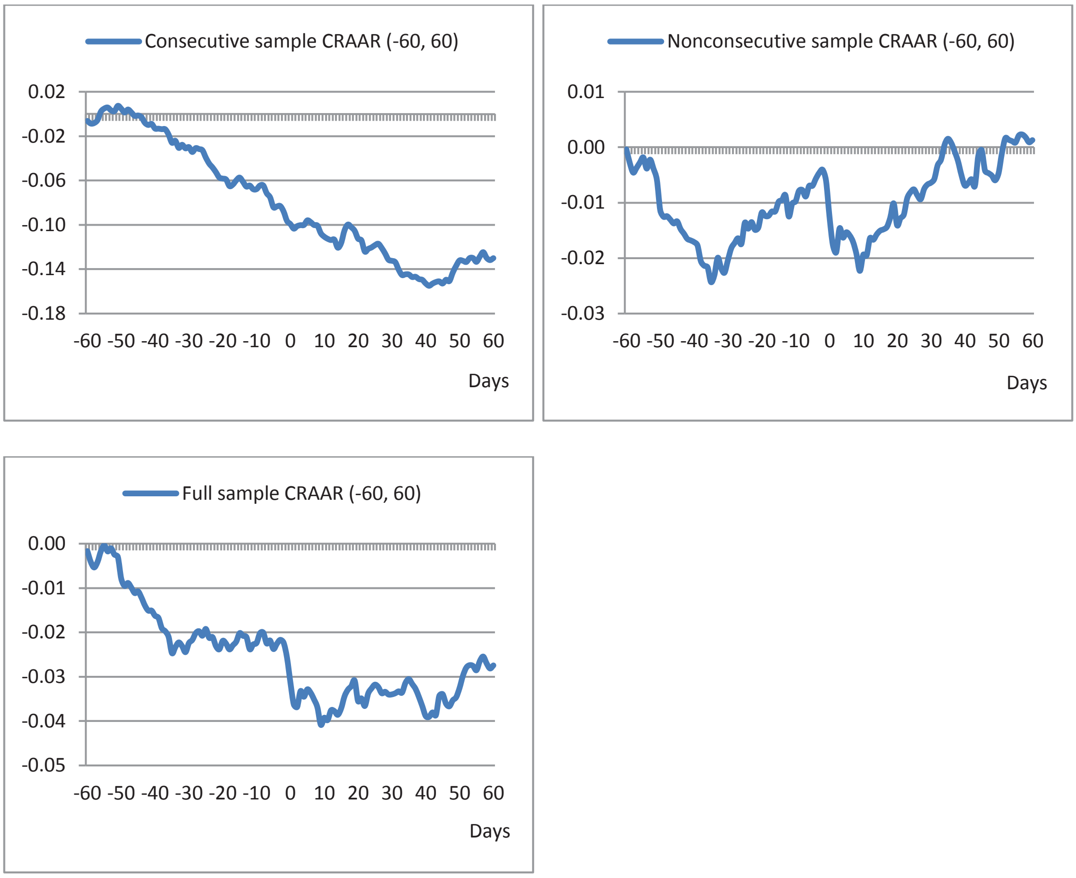
	Fraud sample	Matched sample	Difference
Net income	-16.98%	18.10%	-35.08%***
Dividend payments	3.22%	7.38%	-4.16%***
Grey value	-38.31%	-6.91%	-31.40%***

Panel B: Mean value

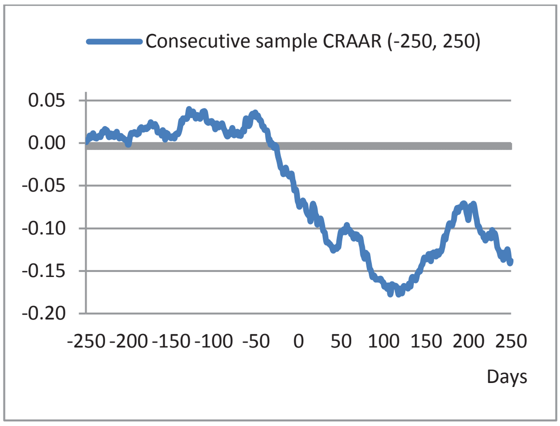
	Fraud sample	Matched sample	Difference
Net income	-2.50%	2.58%	-5.08%***
Dividend payments	0.46%	1.06%	-0.60%***
Grey value	-6.47%	-2.06%	-4.41%***

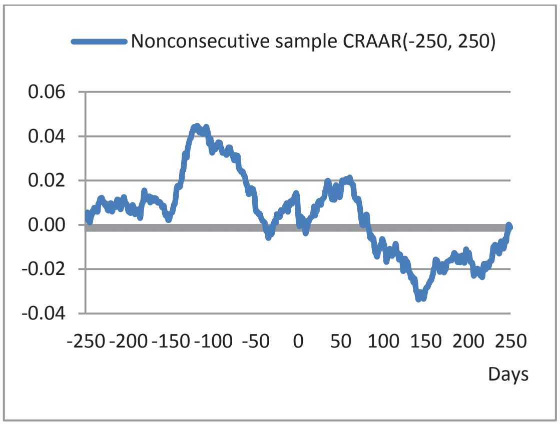
Figure 5.1 Cumulative risk adjusted abnormal returns (CRAARs)

Panel A: Mean daily cumulative risk-adjusted abnormal returns from 60 days before the announcement to 60 days after the announcement in consecutive sample, non-consecutive sample and full sample, respectively. Day 0 is the date the enforcement action is announced.



Panel B: Mean daily cumulative risk-adjusted abnormal returns from 250 days before the announcement to 250 days after the announcement in consecutive sample, non-consecutive sample and full sample, respectively. Day 0 is the date the enforcement action is announced.





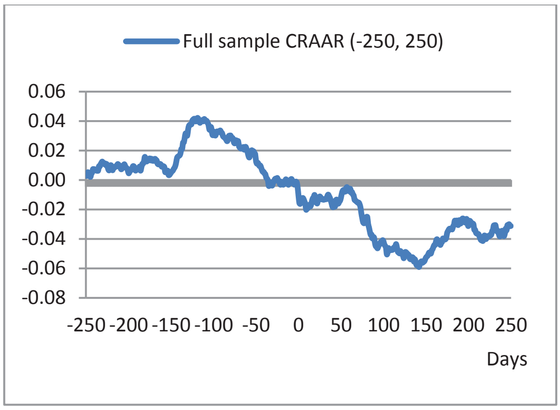
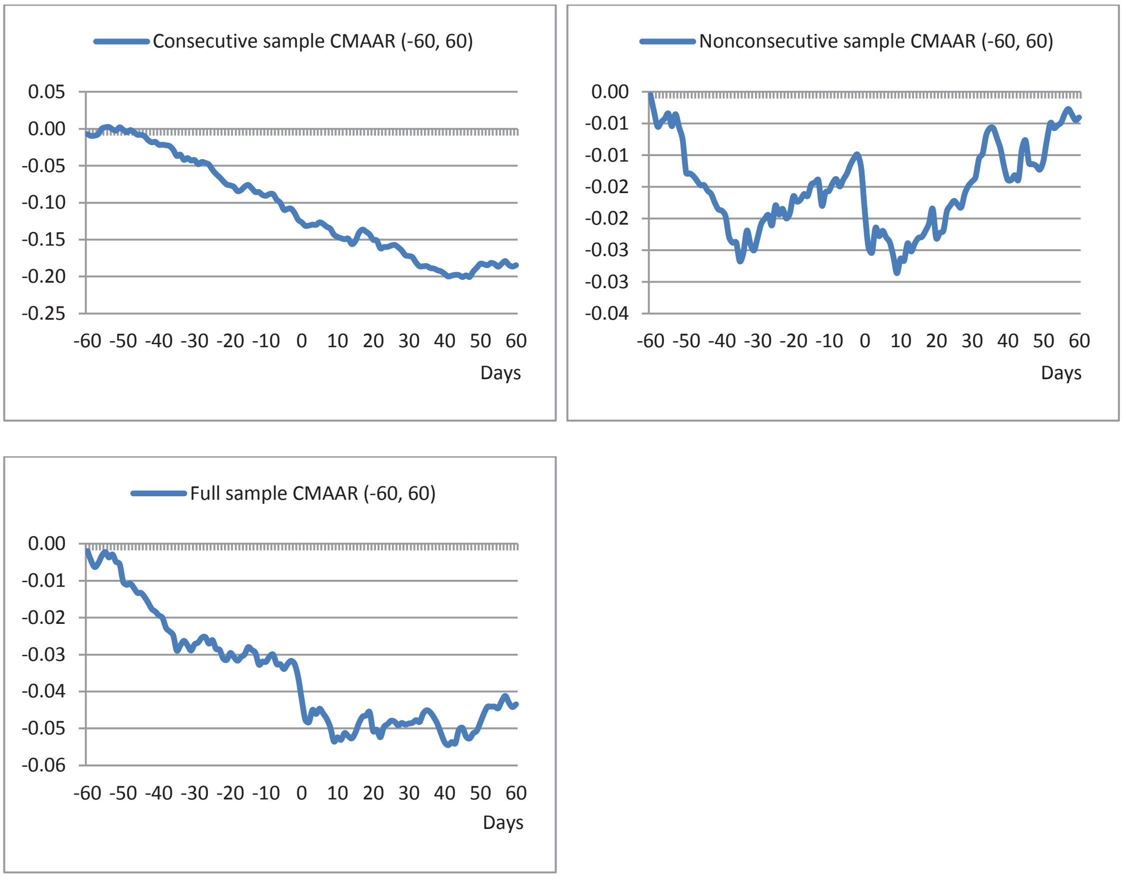


Figure 5.2 Cumulative market adjusted abnormal returns (CMAARs)

Panel A: Mean daily cumulative market-adjusted abnormal returns from 60 days before the announcement to 60 days after the announcement in consecutive sample, non-consecutive sample and full sample, respectively. Day 0 is the date the enforcement action is announced.



Panel B: Mean daily cumulative market-adjusted abnormal returns from 250 days before the announcement to 250 days after the announcement in consecutive sample, non-consecutive sample and full sample, respectively. Day 0 is the date the enforcement action is announced.

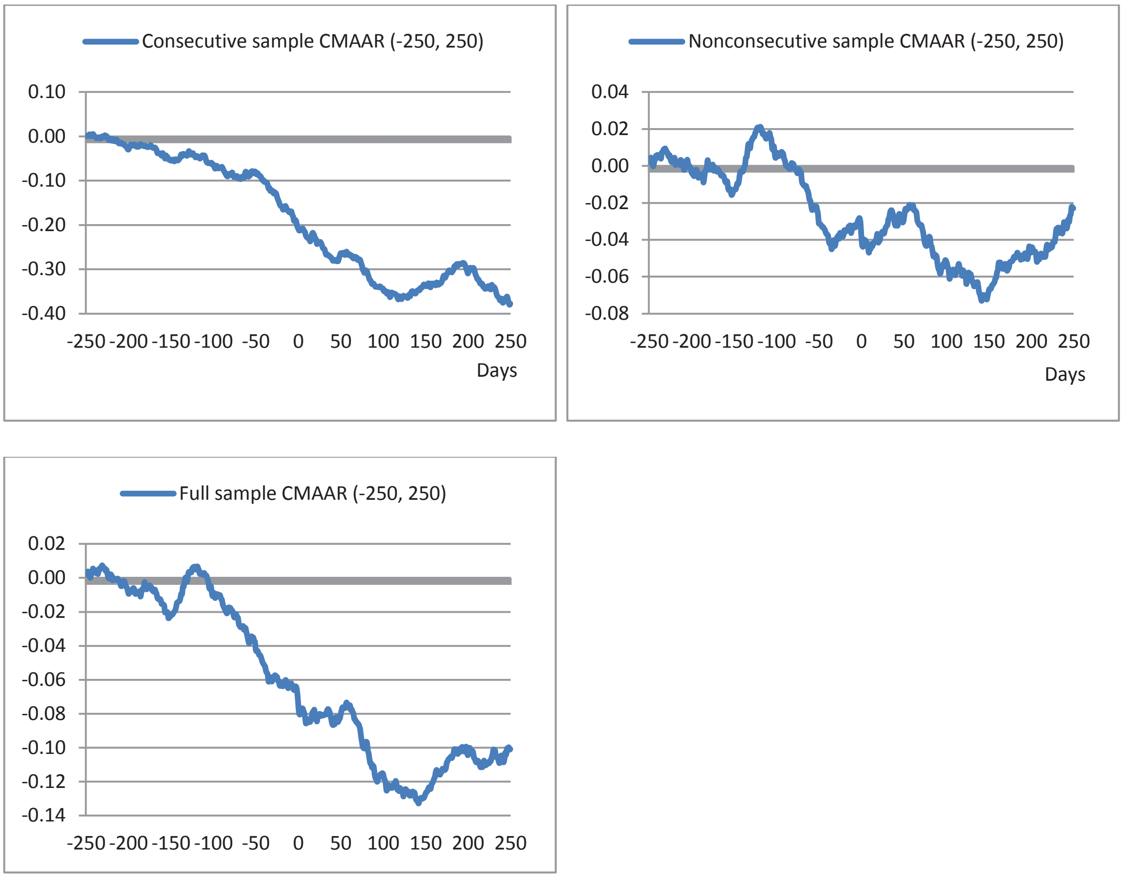
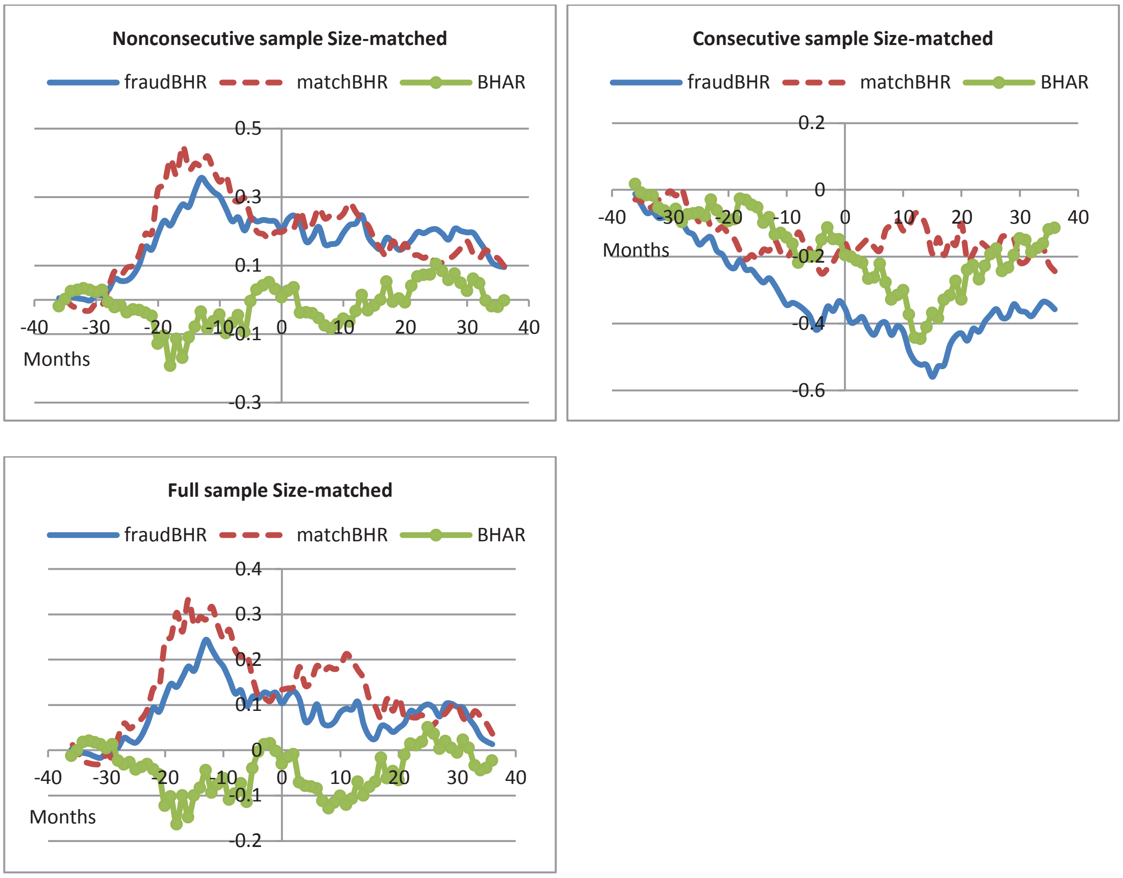


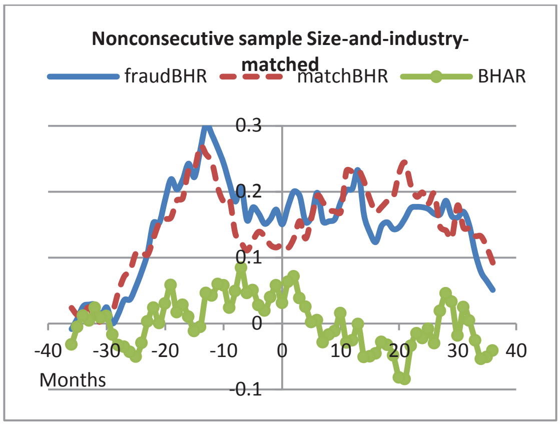
Figure 5.3 Monthly cumulative abnormal returns—buy and hold abnormal returns approaches

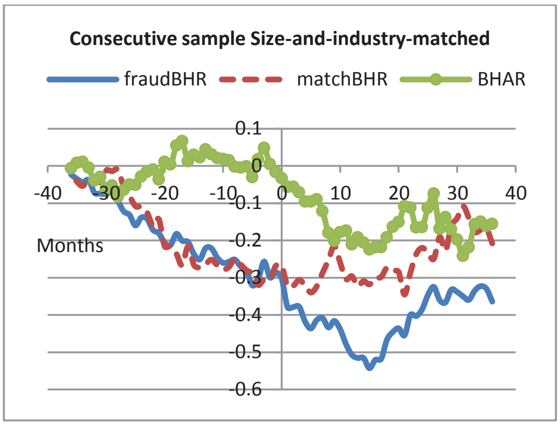
Figure 5.3 shows the long-term monthly cumulative returns from 3 years before the announcement to 3 years after the announcement in the consecutive sample, non-consecutive sample and full sample, respectively. Fraudulent firms are matched by size, or both size and industry, B/M, or both size and B/M. Event 0 is the month the enforcement action is announced.

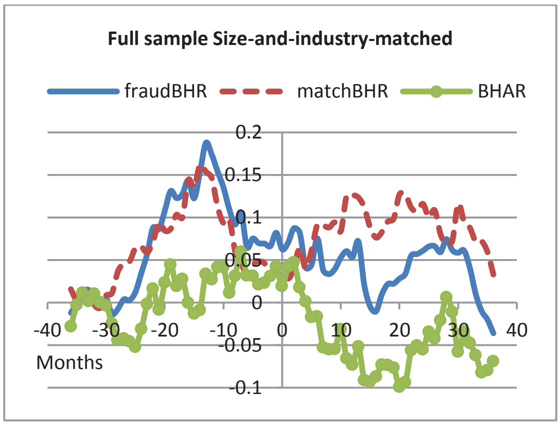
Panel A: Size-matched



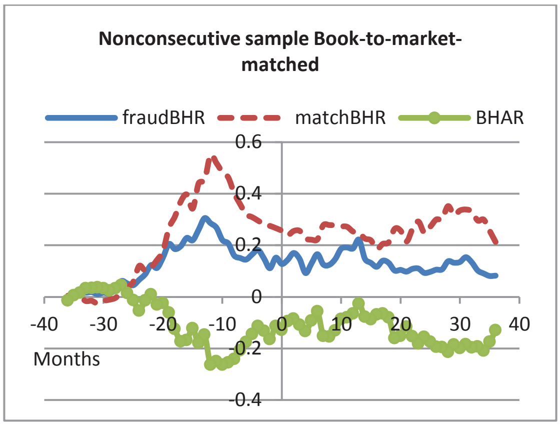
Panel B: Size-and-industry-matched

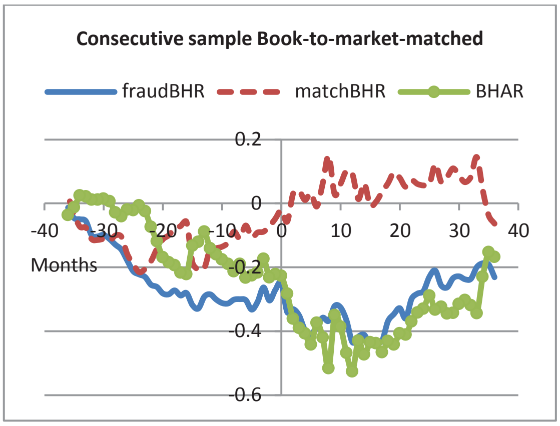


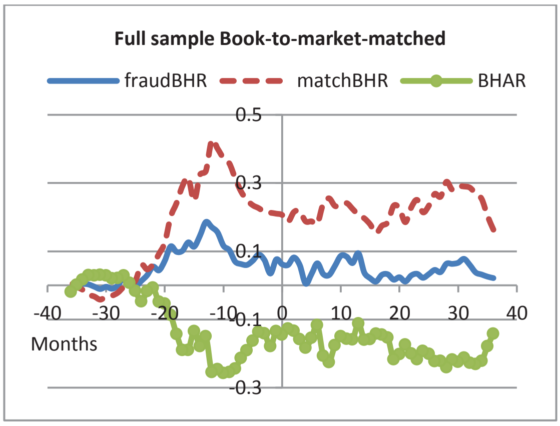




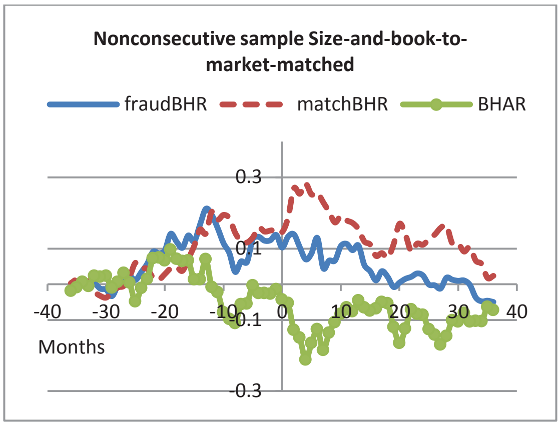
Panel C: Book-to-market-matched

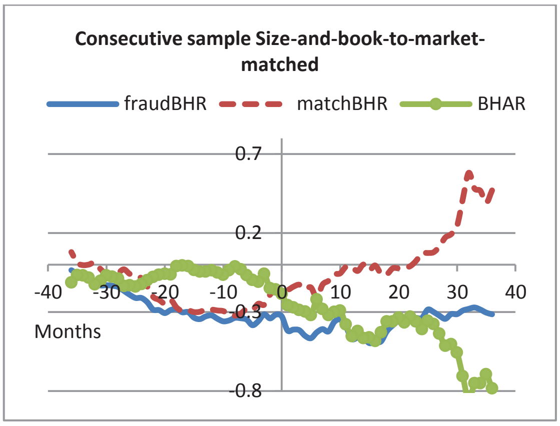






Panel D: Size-and-book-to-market-matched





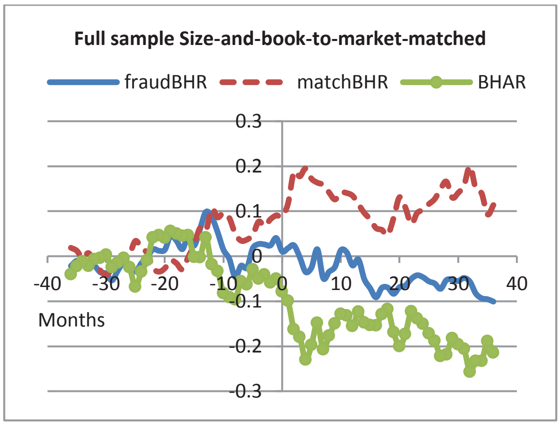
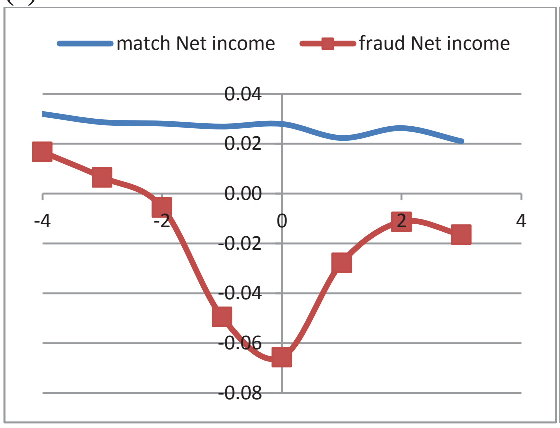


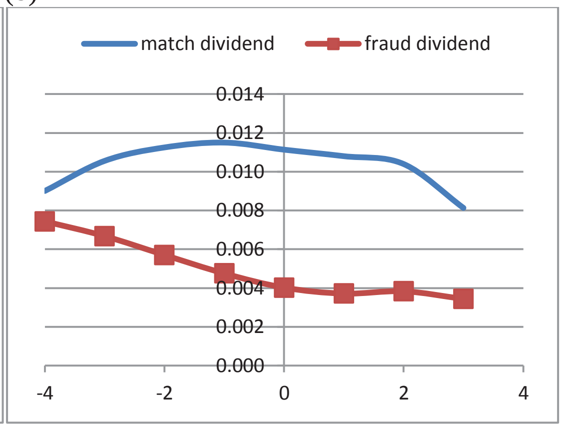
Figure 5.4 The differences between fraudulent and matching firms in selected accounts from Equation 20

These charts plot the differences between fraudulent and matching firms in net income, dividends, retained earnings, net retained earnings and grey accounts (as depicted in Equation 20) from the event year -3 to +3. The x-axis is the calendar year; the y-axis represents the account value deflated by total assets. The solid dotted line represents the value of account balances for fraudulent firms; the solid line without dots represents the value of account balances for matching firms.

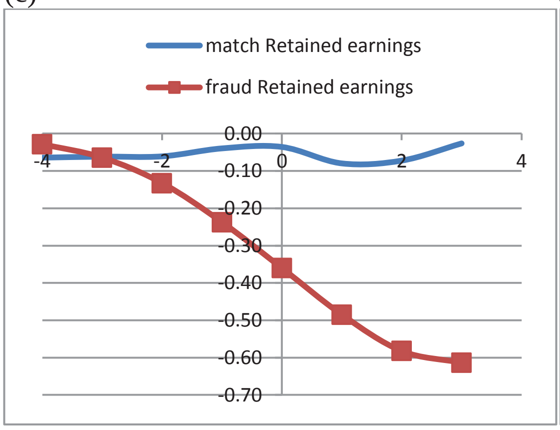
(a)



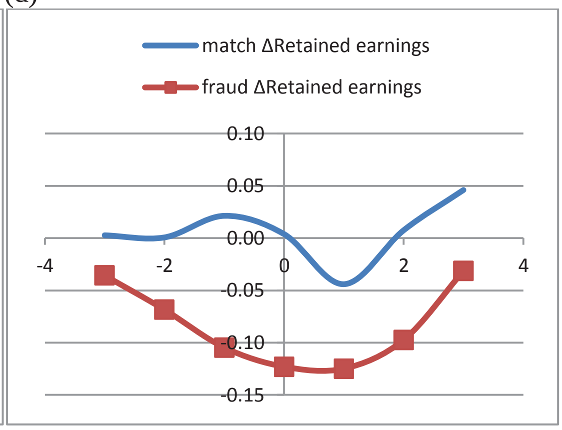
(b)



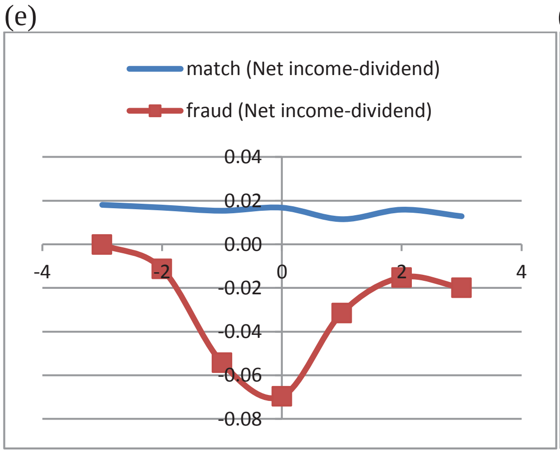
(c)



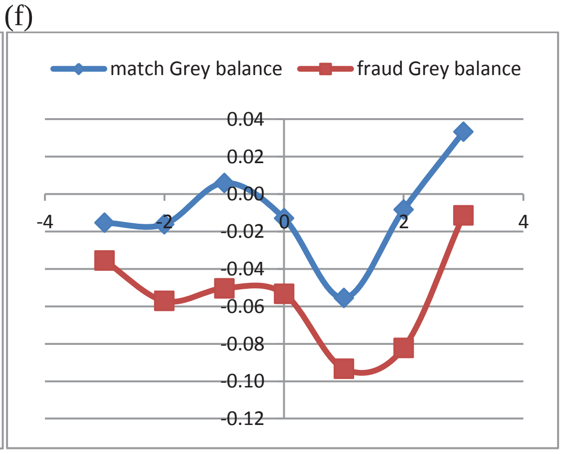
(d)



(e)



(f)



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APPENDIX A: ESSAY ONE: DETECTING FRAUD IN CHINESE LISTED COMPANIES USING BALANCE SHEET ACCOUNTING VALUES

Appendix A.1: Examples of the violation types

Lengguang Industrial: Type 1 (Related party transactions)

Shanghai Lengguang Industrial Co., Ltd. (stock code 600629, abv. Lengguang Industrial) was penalized by the Shanghai Stock Exchange in 1999. Lengguang Industrial did not disclose the exact amount of a major loan guarantee in a timely manner. In their 1998 annual report, Lengguang Industrial disclosed a total loan guarantee of 186.3 million RMB. However, in their 1999 interim report, Lengguang Industrial's actual loan guaranteed for its related parties and other legal person was 3593.9 million RMB.

S*ST Yahua: Type 2 (Concealment of significant contracts or events)

Hunan Yahua Holding Co., Ltd (stock code 000918, abv. S*ST Yahua) was punished by the Shenzhen Stock Exchange and the CSRC in 2005. S*ST Yahua used off-balance sheet funds of 100.5 million RMB to invest in stock markets. Between 2000 and 2002, S*ST Yahua suffered aggregate stock market losses of 69.46 million RMB, representing annual losses of between 0.7% and 125% of audited net profits. Moreover, S*ST Yahua failed to recognize any stock trading gains or losses in their financial statements until the end of 2004. Furthermore, S*ST Yahua failed to disclose the fact that it was controlled by the company Hongyi.

S*ST Jiazhi: Type 3 (Postponements/delays in disclosure)

Jiamusijindi Paper Co., Ltd. (stock code 000699, abv. S*ST Jiazhi) was punished by the Shenzhen Stock Exchange in 2002. S*ST Jiazhi failed to disclose the 2001 annual performance in a timely manner.

ST Meiya: Type4 (False statement)

Guangdong Meiya Group Co., Ltd. (stock code 000529, abv. ST Meiya) was punished by the Shenzhen Stock Exchange in 2005. ST Meiya initially forecast a positive profit in the third quarter report; but afterwards, ST Meiya reported a net loss of 203.36 million RMB in their 2004 annual report. The large difference before and after the 2004 annual results, and the time lag of disclosure means that ST Meiya failed to timely, accurately and completely reveal the company's risk.

Sunshiny Mining: Type 5 (External loan guarantees)

Qinghai Sunshiny Mining Co., Ltd. (stock code 600381, abv. Sunshiny Mining) was penalized by the Shanghai Stock Exchange in 2007. Before October 30, 2006, Sunshiny Mining offered total loan guarantees of 569.432 million. However, Sunshiny Mining's actual controlling shareholder and its related parties are the beneficiaries of 469.032 million RMB of these supposed external loan guarantees. In total, the loan guarantees represent 247% of the latest audited net assets. Sunshiny Mining failed to disclose this information by the deadline of October 30, 2006, but ultimately made the disclosure on January 30, 2007.

Koyo Group: Type 6 (Embezzlement by major shareholder)

Anhui Koyo (Group) Co., Ltd. (stock code 000979, abv. Koyo Group) was punished by the Shenzhen Stock Exchange and the CSRC in 2005. The controlling shareholder (Anhui Keyuan Institute of Applied Technology) illegally used 3,276.18 million RMB (18% of net assets) belong to the Koyo Group.

ST Yantai Development: Type 789 (Fictitious income or assets; fabrication of profits, expenses or liabilities)

Yantai Yuancheng Enterprise Group Co., Ltd. (stock code 600766, abv. ST Yuancheng) was punished by the CSRC in 2004. ST Yantai Development disclosed that its 2002 annual profit was 28.48 million RMB of which 4.72 million RMB was fictitious. A subsidiary of ST Yantai Development, Hualian Real Estate, also understated cost of sales equal to 2.89 million RMB. In addition, Hualian Real Estate sold real estate to another subsidiary firm and obtained income of 2.72 million RMB, resulting in a profit of 1.83 million RMB. ST Yantai Development failed to report the above activities in its financial statements, resulting in inflated profits of 1.83 million RMB.

Appendix A.2: Weighted probit regression results

Table A.2.1 Weighted probit regression results of balance sheet account values on corporate fraud indicator

This table presents the weighted probit regression analyses of balance sheet account values on corporate fraud indicator – Robustness checks. The sample period is from 1994 to 2011. Panel A presents the results from repeating the Panel D in Table 3.5a and Table 3.5b in-sample tests and Panel B presents the results from repeating the Table 3.5c out-of-sample tests but employing the weighted probit model instead of unweighted probit model[104].

	Panel A. In-sample tests			Panel B. Out-of-sample prediction		
	All firms	Non-consecutive	Consecutive	All firms	Non-consecutive	Consecutive
Intercept	-1.513***	-1.412***	-5.974***	-1.858***	-1.625***	-8.363***
Cash and cash equivalents	-0.295	-0.168	0.039	-0.193	-0.125	1.528
Receivable	0.012	-0.423	2.528	0.247	-0.319	2.882
Other receivable	2.488***	2.025***	5.337**	2.756***	2.142***	7.061***
Inventories	-0.928**	-0.854*	-2.172	-0.916*	-1.066*	-2.008
Prepaid expenses	1.420	1.513	7.229*	1.838	1.822	9.223**
Others currents	2.919*	2.171	7.270	3.605*	2.834	11.105
Fixed assets (e1)	-0.204	-0.009	-22.970**	1.534	1.380	-37.514**
Intangible assets	1.543*	1.362	4.163	1.843*	1.618	4.610
Other non-current	0.296	-0.032	2.072	0.645	0.199	3.200*
Short-term loans	0.591*	0.541	4.821***	1.275***	1.168**	5.035**
Notes payable	0.096	-0.125	4.637	0.081	-0.036	8.359
Accounts payable	0.389	0.816	3.191	1.532	1.766	3.440
Employee benefits payable	9.098*	7.292	38.064**	8.670	6.611	29.593
Taxes payable	-2.356	-3.455	13.636**	-0.110	-2.455	10.812
Other short-term liabilities	0.031	-0.220	3.663**	-0.529	-0.738	8.019
Long-term debt	0.316	0.614	3.075	0.737	1.093	4.553
Long-term payable	4.286	3.798	22.603**	3.253	2.741	26.957*
Deferred tax liabilities	13.796	24.286*	-60.356	-18.693	-9.277	-184.997
Other non-current liabilities	-0.546	-0.472	10.020	0.124	-0.107	6.851
Share capital	-0.385	-0.206	-0.310	-1.010**	-0.687	0.364
Capital reserves	0.198	0.073	3.917***	0.581	0.408	7.027*
Surplus reserves	0.639	1.202	2.084	0.964	1.451	2.767

[104] The weight employed in the weighted probit model is the percentage of number of fraudulent firms to the population of all listed companies, which is 13.36% (313/2342).

Retained earnings (e2)	0.219	0.203	1.792	0.876**	0.591	-4.595
Other stockholder equity	-1.526	-1.848	9.542**	-1.548	-2.253	9.232*
No. of Observations	2468	1938	530	1816	1422	394
Log Likelihood	-431.57	-347.18	-50.73	-303.86	-246.16	-36.13
Correct prediction 1 (r1)*	0.61	0.58	0.83	0.36	0.30	0.68
Correct prediction 0 (r0)*	0.74	0.72	0.83	0.86	0.83	0.99

Note1: Variables of Fixed assets and Retained earnings used in above models are residuals (e1 and e2) (explanations in Table 3.4a). These two residuals will be used for the following analyses.
Note2: *Correct 1 prediction stands for the case when a fraud firm is predicted as “Fraud=1” and Correct 0 prediction stands for the case when a matching firm is correctly predicted as “Fraud=0”.

Table A.2.2 Probability cutoffs that minimize the expected costs of misclassification

		Estimation sample			out-of-sample		
relative costs of Type I and Type II errors	cutoff probability	Type I error	Type II error	cost of model errors relative to Naïve Strategy	Type I error	Type II error	cost of model errors relative to Naïve Strategy
1:1	0.3281	0.7950	0.0211	0.9316	0.8681	0.0337	1.0868
2:1	0.2991	0.7601	0.0316	0.8626	0.8620	0.0368	0.9813
3:1	0.2191	0.6467	0.0786	0.8165	0.7883	0.0583	0.9143
4:1	0.1821	0.5494	0.1207	0.7451	0.7515	0.0798	0.8808
5:1	0.1837	0.5527	0.1183	0.7061	0.7515	0.0767	0.8510
6:1	0.1837	0.5527	0.1175	0.6796	0.7515	0.0767	0.8344
7:1	0.1222	0.3371	0.3128	0.6268	0.6196	0.1656	0.7730
8:1	0.1200	0.3266	0.3266	0.5912	0.6135	0.1656	0.7477

Note1: The expected costs of misclassification, ECM=13.36%*$P_I C_I$ + (1-13.36%)*$P_{II} C_{II}$, where 13.38% stands for the prior probability of fraud for the weighted probit regression. P_I and P_{II} are the conditional probabilities of Type I error and Type II error, and C_I and C_{II} are the costs of Type I error and Type II error. Cutoff probability is the probability when ECM is minimized.
Note2: The expected cost for a naïve strategy is 13.36%C_I, which classify all listed firms as non-fraudulent firms.

Table A.2.3 Weighted probit regression results of balance sheet account values (scaled by sales) on corporate fraud indicator

Probit regression results of balance sheet account values on corporate fraud indicator – Robustness checks. The sample period is from 1994 to 2011. Panel A presents the results from repeating the Panel D in Table 3.5a and Table 3.5b in-sample tests and Panel B presents the results from repeating the Table 3.5c out-of-sample tests but scaling each account by sales instead of total assets and employing the weighted probit model instead of unweighted probit model.

	Panel A. In-sample tests			Panel B. Out-of-sample prediction		
	All firms	Non-consecutive	Consecutive	All firms	Non-consecutive	Consecutive
Intercept	-1.225***	-1.204***	-1.624***	-1.208***	-1.179***	-1.680***
Cash and cash equivalents	-0.026	0.001	-0.697	-0.092	-0.054	-0.850
Receivable	-0.084	-0.134	0.410	-0.107	-0.173	0.400
Other receivable	0.051	0.033	0.976	0.177***	0.119*	1.611**
Inventories	-0.142**	-0.148**	-0.950**	-0.181**	-0.170*	-0.959
Prepaid expenses	0.450*	0.377	2.071	0.632**	0.544	1.526
Others currents	0.830**	0.639	-0.154	0.969**	0.710	0.365
Fixed assets	-0.010	0.023	-0.916***	-0.001	0.030	-1.621***
Intangible assets	0.340**	0.314**	0.346	0.287*	0.273*	-0.728
Other non-current	0.010	-0.043	0.264	0.078	0.034	0.429
Short-term loans	0.003	0.021	0.137	0.069	0.068	0.687
Notes payable	0.186	-0.020	0.939	0.281	0.140	0.882
Accounts payable	0.313	0.291	1.264	0.214	0.191	1.875
Employee benefits payable	2.393	1.635	19.724***	0.572	0.554	20.184*
Taxes payable	-0.330	-0.486	-0.721	-0.220	-0.357	0.282
Other short-term liabilities	-0.020	-0.047	-0.169	-0.033	-0.058	0.026
Long-term debt	0.036	0.175	-0.989	0.039	0.195	-0.858
Long-term payable	1.103	0.692	11.789***	0.958	0.607	17.139***
Deferred tax liabilities	7.688	17.052**	-51.611**	1.539	9.094	-65.471
Other non-current liabilities	0.289	0.203	3.181	0.371	0.216	0.764
Share capital	-0.146**	-0.115	-0.255	-0.233***	-0.158**	-1.101**
Capital reserves	0.040	0.029	0.740**	0.111	0.048	1.126**
Surplus reserves	-0.010	0.146	-1.669	-0.284	-0.140	-0.120
Retained earnings	-0.037	-0.032	-0.710**	-0.003	-0.011	-0.944**
Other stockholder equity	-0.166	-0.311	3.125**	-0.136	-0.306	3.508*
No. of Observations	2468	1914	502	1782	1410	372

Log Likelihood	-444.99	-354.75	-55.17	-321.40	-259.74	-36.10
Correct prediction 1 (r1)*	0.49	0.48	0.76	0.37	0.41	0.68
Correct prediction 0 (r0)*	0.78	0.77	0.85	0.85	0.83	0.97

Note1: *Correct 1 prediction stands for the case when a fraud firm is predicted as “Fraud=1” and Correct 0 prediction stands for the case when a matching firm is correctly predicted as “Fraud=0”.

Appendix A.3: Probit regression results of balance sheet account values (scaled by sales) on corporate fraud indicator

Table A.3.1 Out-of-sample prediction

Probit regression results of balance sheet account values on corporate fraud indicator– Robustness checks. This table presents the results from repeating the Table 3.5c out-of-sample prediction but scaling each account by sales instead of total assets. The sample period is 1994 to 2011. The dependent variable is Fraud, which equals 1 if the firm is subject to a regulatory enforcement action for corporate fraud in the fiscal year and 0 otherwise (for matching firms) as shown in Model 1 of the text. First 12 years' samples are used in the Probit regression and last 6 years' samples are used to calculate the correct prediction rates. Significances at the 1%, 5%, 10% are denoted by ***, **, and * respectively.

	Panel A. All firms	Panel B. Non-consecutive	Panel C. Consecutive
Intercept	-0.148***	-0.108*	-0.711***
cash and cash equivalents	-0.110	-0.055	-0.758**
receivable	-0.086	-0.139	0.636
other receivable	0.165***	0.114***	1.683***
inventories	-0.187***	-0.193***	-0.876***
prepaid expenses	0.566***	0.567***	1.431**
others currents	0.947***	0.732***	0.518
fixed assets	-0.021	0.018	-1.488***
intangible assets	0.376***	0.369***	-0.563
other non-current	0.055	0.026	0.479
short-term loans	0.078**	0.077**	0.506*
notes payable	0.337	0.139	0.845
accounts payable	0.258*	0.202	1.930**
employee benefits payable	1.292	1.323	15.562***
taxes payable	-0.256	-0.387	0.482
other short-term liabilities	-0.036	-0.057*	0.086
long-term debt	0.092	0.246**	-0.748
long-term payable	0.980*	0.774	15.303***
deferred tax liabilities	-1.019	7.530	-66.962*
other non-current liabilities	0.334***	0.182	0.731
hare capital	-0.224***	-0.163***	-1.010***
capital reserves	0.122***	0.047	0.971***
surplus reserves	-0.275*	-0.165	-0.040
retained earnings	-0.006	-0.017	-0.919***
other stockholder equity	-0.077	-0.341	3.086***
No. of Observations	1782	1410	372
Log Likelihood	-1133	-912.77	-134.64
Correct prediction 1 (r1)*	0.33	0.35	0.63
Correct prediction 0 (r0)*	0.89	0.85	0.97

Note1: *Correct 1 prediction stands for the case when a fraud firm is predicted as "Fraud=1" and Correct 0 prediction stands for the case when a matching firm is correctly predicted as "Fraud=0".

Appendix A.4: An example of the spurious relationship

The following table reports the partial balance sheet accounts scaled by total assets and sales, respectively. Assume Firm H and Firm L are two identical firms, except differ in retained earnings and profitability. This study explores the relation between each balance sheet account and FFS. In general, balance sheet accounts scaled by total assets to allow for different size. In this context, due to the feature of total assets = total liabilities + total equities, the difference in retained earnings may cause the total assets different. Then this change in total assets associate with the change in liabilities ratios even liabilities accounts do not change. This spurious relationship can be reduced significantly if balance sheet accounts scaled by sales. This table demonstrates that when liabilities and equity accounts are scaled by total assets, all ratios except retained earnings will be greater for Firm H. When liabilities and equity accounts are scaled by sales, all ratios expect for retained earnings will be identical for Firms H and L. The difference in retained earnings causes the spurious relation between ROA and debt ratio when account scaled by total assets but not in scaled by sales.

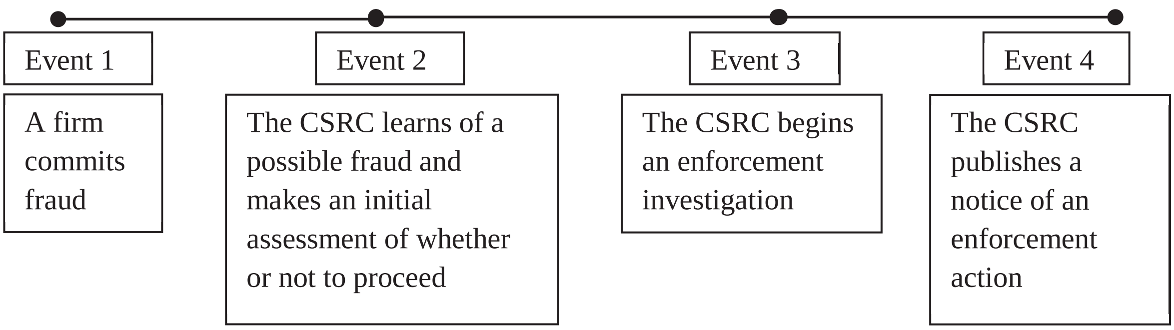
Partial Balance Sheet	Firm H			Firm L		
Current liabilities & equity	$	%Assets	%Sales	$	%Assets	%Sales
Current liabilities	10	10.00%	20.00%	10	12.50%	20.00%
Long-term debt	40	40.00%	80.00%	40	50.00%	80.00%
Share capital	20	20.00%	40.00%	20	25.00%	40.00%
Retained earnings	30	30.00%	60.00%	10	12.50%	20.00%
Total liabilities & equity	100	100.00%	200.00%	80	100.00%	160.00%
Total assets	100			80		
Total sales	50			50		
NI	20			20		
ROA		20.00%			25.00%	

APPENDIX B: ESSAY TWO: CASH TUNNELLING IN CHINESE FIRMS

Appendix B.1: Torch Automobile: A typical fraudulent case

Torch Automobile (Group) Co., Ltd (stock code 000549, abv. Torch) employed accounting deceptions such as creating fictitious sales of 23,259,770.10 RMB in 1997 and 5,820,143.10 RMB in 1998. These two amounts account for 88.98% and 8.64% of after-tax profit in the 1997 and 1998 financial reports, respectively. Torch also increased its profit by 17,936,746.51 RMB in 1999 by understating costs of 7,179,848 RMB and by overstating investment income of 11,733,043.77 RMB. The aggregate fictitious profit represents 31.41% of 1999 total profit. Torch's placement report also contained false information in 2000. For 1997, 1998 and 1999, it showed that ROE was 11.03%, 21.84% and 16.11%, respectively, when the actual ROE was 1.35%, 21.83% and 12.64%. This means that Torch could not meet the ROE criterion for a rights issue in those continuous three years. Furthermore, in its 2003 report, Torch fabricated a false disclosure of the actual use of raised capital. Also in 2003, Torch concealed external loan guarantees of related party transactions of 1.1 billion. Lastly, in 2004, it was revealed that Torch concealed 2003 investment losses of 504,485.15 RMB.

Appendix B.2: enforcement action process



Appendix B.3: From the view of event year

In general, this study finds that there are some accounts with more soft meanings and some accounts with more solid meanings in balance sheets from a calendar year perspective. For example, OREC and short-term loans are more aligned with the feature of softness. Cash, receivables, inventories, prepaid expenses and taxes payable are more aligned with solid account features. Furthermore, firms are more likely to use soft accounts to transfer money to personal pockets. Also, firms tunnel firm value mainly in the form of other operating costs, such as G&A expenses, finance expenses and impairment losses. This study also expects to find similar patterns from an event study perspective.

B.3.1 Soft accounts

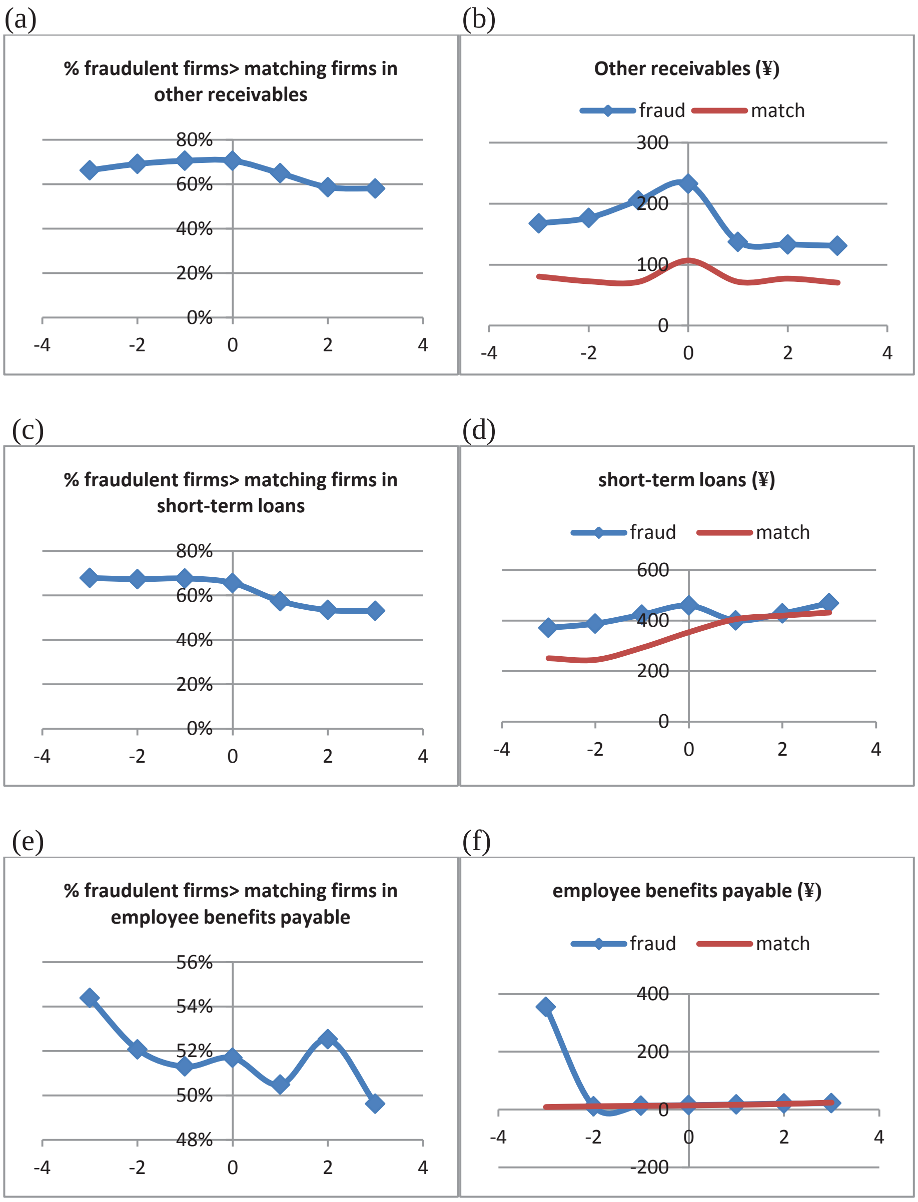
First, this study expects to find that fraudulent firms have higher soft account balances than matching firms. Accordingly, this study graphs the soft account balances of OREC, short-term loans and employee benefits payable for the samples of fraudulent and matching firms between three years before the event and three years after the event. From Figure B.3.1.1 (a), it is evident that more than 58% of fraudulent firms have higher OREC than the matching firms during the whole study period. Before the announcement date, around 70% fraudulent firms have higher OREC. The percentage decreases after the announcement date, but is still around 60%. According to Figure B.3.1.1 (b), the balances of OREC in fraudulent firms gradually increase from three years before the announcement and peak in the announcement year. The average balance of OREC in fraudulent firms is about 1.18 times that of matching firms. Though the OREC balance decreases dramatically after the enforcement action, the balance in fraudulent firms is still about 0.86 times larger than the matching firms in the three years after the announcement year.

Figure B.3.1.1 (c) illustrates that approximately 70% of fraudulent firms have higher short-term loans than matching firms before the announcement date; the percentage then gradually decreases after the event to roughly 53% in the third year post announcement. Next, Figure B.3.1.1 (d) shows that, on average, fraudulent firms have a higher balance of short-term loans than matching firms before the event. This balance is almost more than twice that of the matching firms. The average balance starts to decrease after the event year and reaches a similar level to the matching firms one year after the event.

From Figure B.3.1.1 (e), it is clear that, on average, fraudulent firms do not have an obviously higher percentage of employee benefits payable balances than matching firms. According to Figure B.3.1.1 (f), fraudulent firms are 38.60 times larger than matching firms in year -3 (this is not caused by some extreme values; for each pair of observations where fraudulent firms have higher values, fraudulent firms have significantly higher employee benefits payable than for the matching firms).

Figure B.3.1.1 The differences between fraudulent firms and matching firms in some soft balance sheet accounts

These charts plot the differences between fraudulent firms and matching firms in some soft balance sheet accounts from event year -3 to +3. The x-axis is the event year, the y-axis in the left-side figure is the percentage, and the y-axis in the right-side figure is the million RMB. The solid line with dots in the right-side figure represents the value of account balances in million RMB for fraudulent firms. The solid line without dot in right-side figure represents the value of account balances in million RMB for matching firms.



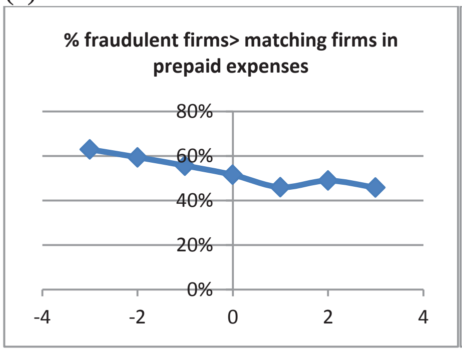
B.3.2 Solid accounts

As summarised in Hypothesis 1 and Hypothesis 1A, fraudulent firms are more likely to employ soft accounts to decrease detection by auditors and the CSRC. This study then expects to find that fraudulent firms are not greater than matching firms in these solid accounts. Accordingly, in Figure B.3.2.1 this study graphs the solid account balances of prepaid expenses, cash, receivables, inventories, and taxes payable for the samples of fraudulent firms and matching firms. As can be seen from Figure B.3.2.1, more than 50% of fraudulent firms have higher prepaid expenses, cash, receivables, and inventories than matching firms before the announcement year. Figure B.3.2.1 shows that fraudulent firms have a slightly higher balance of prepaid expenses, cash, receivables, and taxes payable before the event. In particular, fraudulent firms have higher amounts of taxes payable before the event year; up to 26.21 times larger than matching firms (Data in year -3 is not caused by some extreme values. For each pair of observations with higher values in fraudulent firms, fraudulent firms have significantly higher employee benefits payable than matching firms.). In addition, fraudulent firms have lower inventories balances across the whole study period. The above results are consistent with previous results from a calendar year perspecitive and are more aligned with solid accounts.

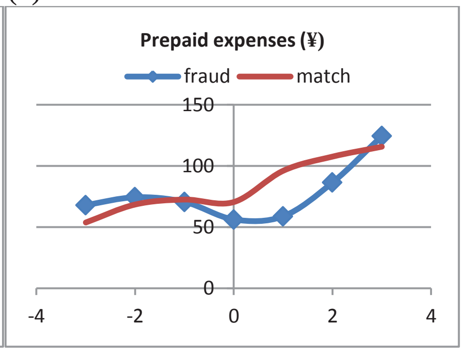
Figure B.3.2.1 The differences between fraudulent firms and matching firms in a set of solid accounts

These charts plot the differences between fraudulent firms and matching firms in a set of solid accounts from the event year -3 to +3. The x-axis is the event year, the y-axis in the left-side figure is the percentage, and the y-axis in the right-side figure is the million RMB. The solid line with dots in the right-side figure represents the value of account balances in million RMB for fraudulent firms. The solid line without dot in right-side figure represents the value of account balances in million RMB for matching firms.

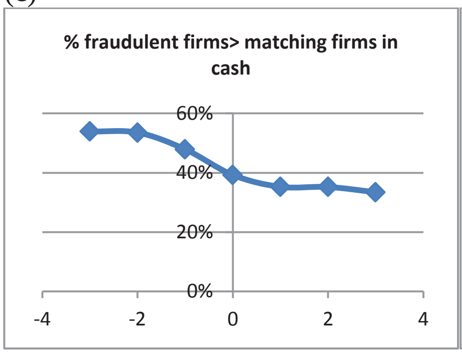
(a)



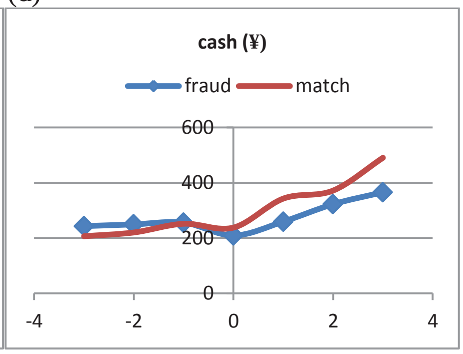
(b)



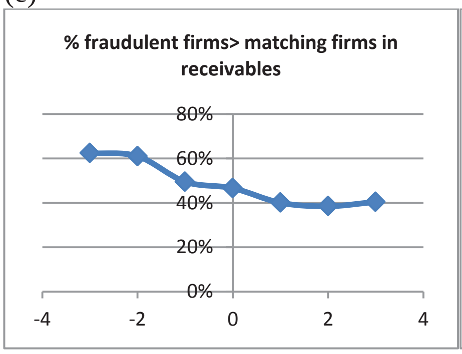
(c)



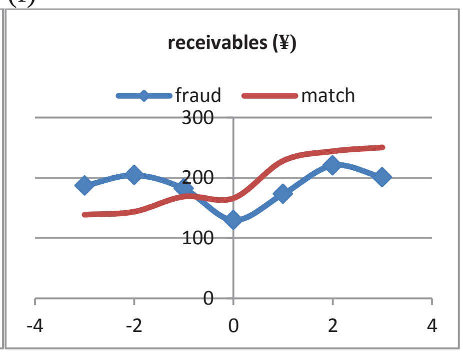
(d)



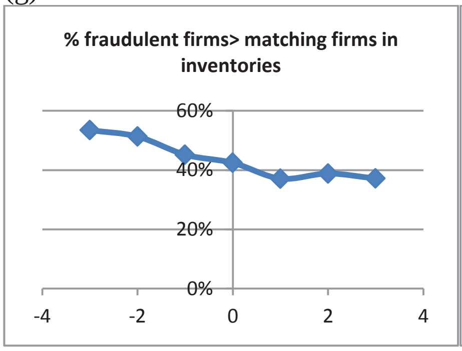
(e)



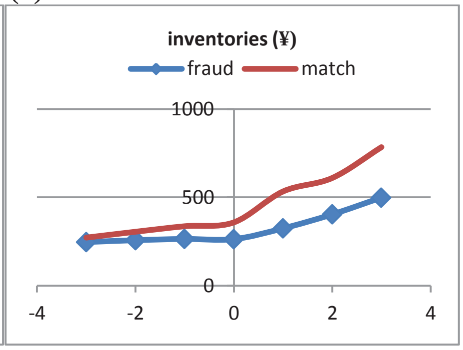
(f)



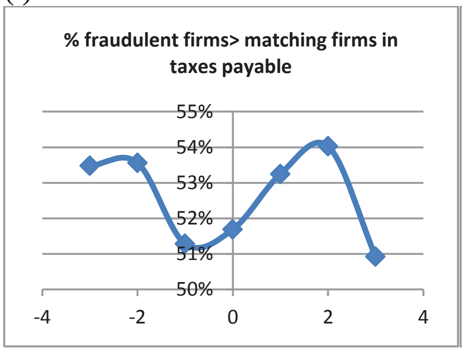
(g)



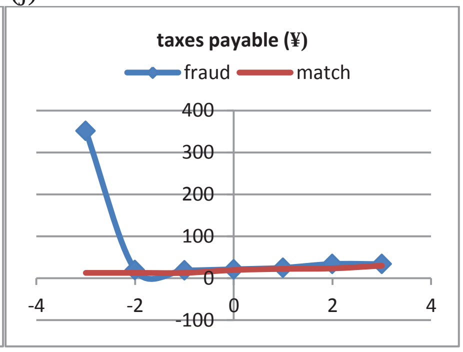
(h)



(i)



(j)



B.3.3 Cost accounts

This study redraws Figures B.3.3.1 and B.3.3.2 to consider the effect of enforcement actions in terms of operating revenue, cost accounts and non-operating accounts for the samples of fraudulent and matching firms from three years before the event to three years after the event. If Hypothesis 1A is correct, this study expects to find that fraudulent firms have a higher balance of soft cost accounts than matching firms. Next, from Figure B.3.3.1, it is evident that fraudulent firms have lower operating revenue than matching firms. According to Figure B.3.3.2, fraudulent firms have higher balances in G&A expenses (from year -3 to year 1), finance expenses (from year -3 to year 2), and impairment losses. Also, fraudulent firms have lower balances in TaxFees and selling expenses.

Taken together, fraudulent firms have higher balances of OREC and short-term loans before the event relative to the matching firms. Also, fraudulent firms have higher G&A expenses before the event, higher finance expenses from three years before the event to two years after the event, and higher impairment losses from three years before the event to three years after the event. This evidence is consistent with the expectations that fraudulent firms are more likely to employ those soft accounts, such as OREC and short-term loans, to tunnel firm value. Moreover, firms may record tunnelling loss in different non-operating vehicles.

Figure B.3.3.1 The differences between fraudulent firms and matching firms in operating revenue

This chart plots the differences between fraudulent firms and matching firms in operating revenue from the event year -3 to +3. The x-axis is the calendar year; the y-axis represents the million RMB. The solid line with dot represents the value of account balances in million RMB for fraudulent firms; the solid line without dot represents the value of account balances in million RMB for matching firms.

(a)

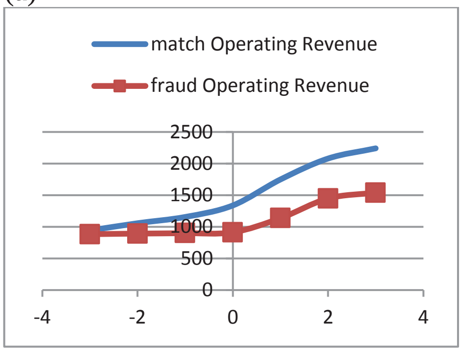
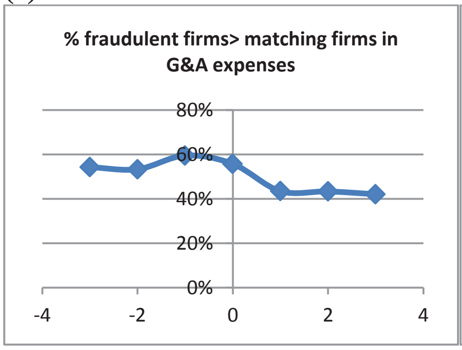


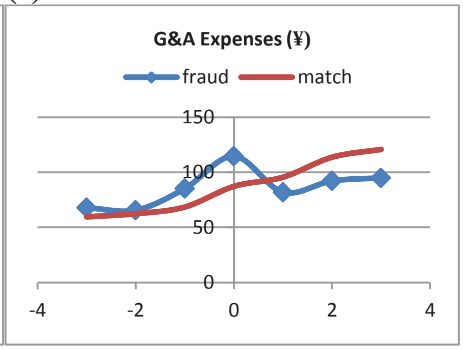
Figure B.3.3.2 The differences between fraudulent firms and matching firms in other-operating costs

These charts plot the differences between fraudulent firms and matching firms in other-operating costs from the event year -3 to +3. The x-axis is the event year. In figures with one line, the y-axis represents the percentage, and in figures with two lines, the y-axis represents the million RMB. In figures with two lines, the solid line with dot represents the value of account balances in million RMB for fraudulent firms; the solid line without dot represents the value of account balances in million RMB for matching firms.

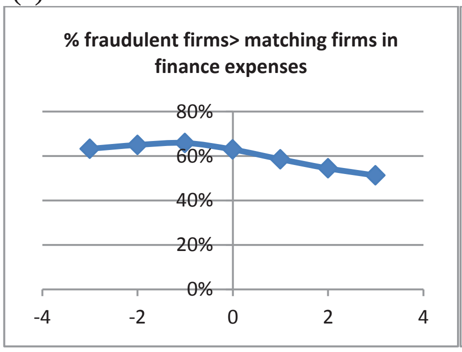
(a)


% fraudulent firms> matching firms in G&A expenses
80%
60%
40%
20%
0%
-4 -2 0 2 4

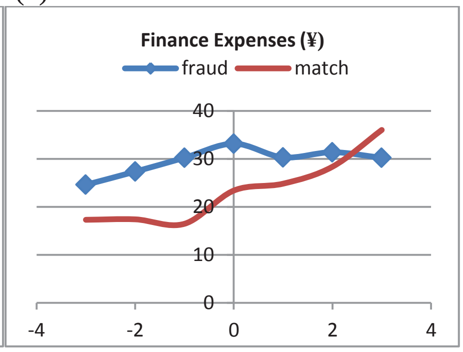
(b)


G&A Expenses (¥)
fraud
match
150
100
50
0
-4 -2 0 2 4

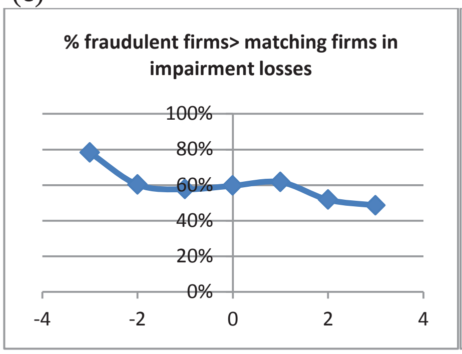
(c)


% fraudulent firms> matching firms in finance expenses
80%
60%
40%
20%
0%
-4 -2 0 2 4

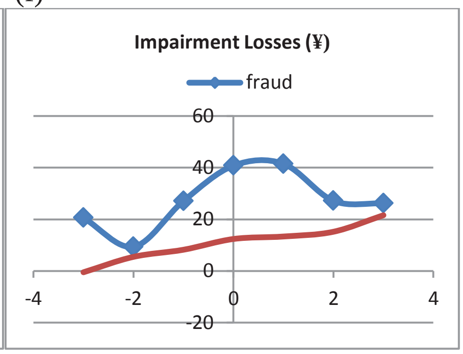
(d)


Finance Expenses (¥)
fraud
match
40
30
20
10
0
-4 -2 0 2 4

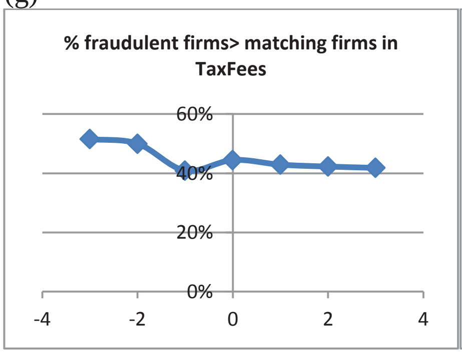
(e)


% fraudulent firms> matching firms in impairment losses
100%
80%
60%
40%
20%
0%
-4 -2 0 2 4

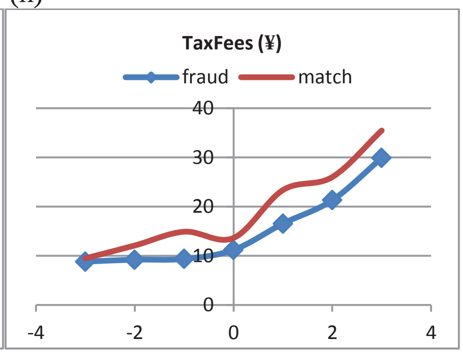
(f)


Impairment Losses (¥)
fraud
60
40
20
0
-20
-4 -2 0 2 4

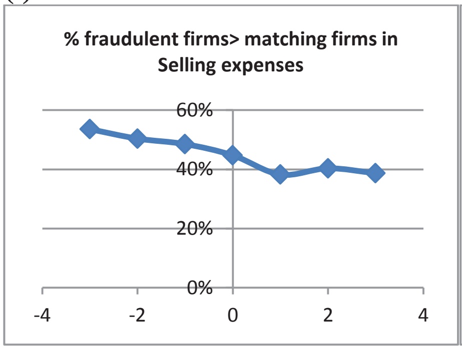
(g)


% fraudulent firms> matching firms in TaxFees
60%
40%
20%
0%
-4 -2 0 2 4

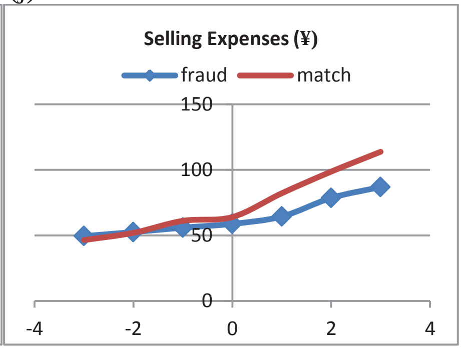
(h)


TaxFees (¥)
fraud
match
40
30
20
10
0
-4 -2 0 2 4

(i)



(j)



B.3.4 Measuring the level of overstated amounts in identified accounts after adjustment based on matching firms

To roughly estimate the overstated costs in fraudulent firms, the adjustment is carried out following these steps. Firstly, this study runs each other operating cost based on the operating revenue for the matching sample in different industries. That is, TaxFees = $\alpha_1+\beta_1$sales; SellingExp = $\alpha_2+\beta_2$sales; G&A = $\alpha_3+\beta_3$sales; FinExp = $\alpha_4+\beta_4$sales; impairment= $\alpha_5+\beta_5$sales. Then, the results of α and β are used to calculate the predicted operating costs in the fraudulent sample. The overstated balances of each of the five other operating costs are equal to the fraudulent operating cost minus the predicted operating cost. The results overstated balances and percentages in fraudulent firms are presented as below:

Table B.3.4.1 Overstated balances of operating expenses and non-operating expenses in fraudulent firms

Overstated(million RMB)	Total OpExp	OpExp	G&A	FinExp	Impairment
-3	¥29.81	¥34.97	¥1.21	¥5.79	¥1.10
-2	¥19.58	¥22.26	-¥1.53	¥8.39	-¥0.30
-1	¥63.07	¥32.75	¥19.11	¥11.25	¥4.87
0	¥100.74	¥34.84	¥47.29	¥13.84	¥8.26
1	¥25.22	-¥1.98	¥7.38	¥9.26	¥13.65
2	-¥22.12	-¥43.96	¥6.86	¥7.83	¥8.12
3	¥33.91	¥25.67	¥2.61	¥3.21	¥8.68

Table B.3.4.2 Overstated percentage of operating expenses and non-operating expenses in fraudulent firms

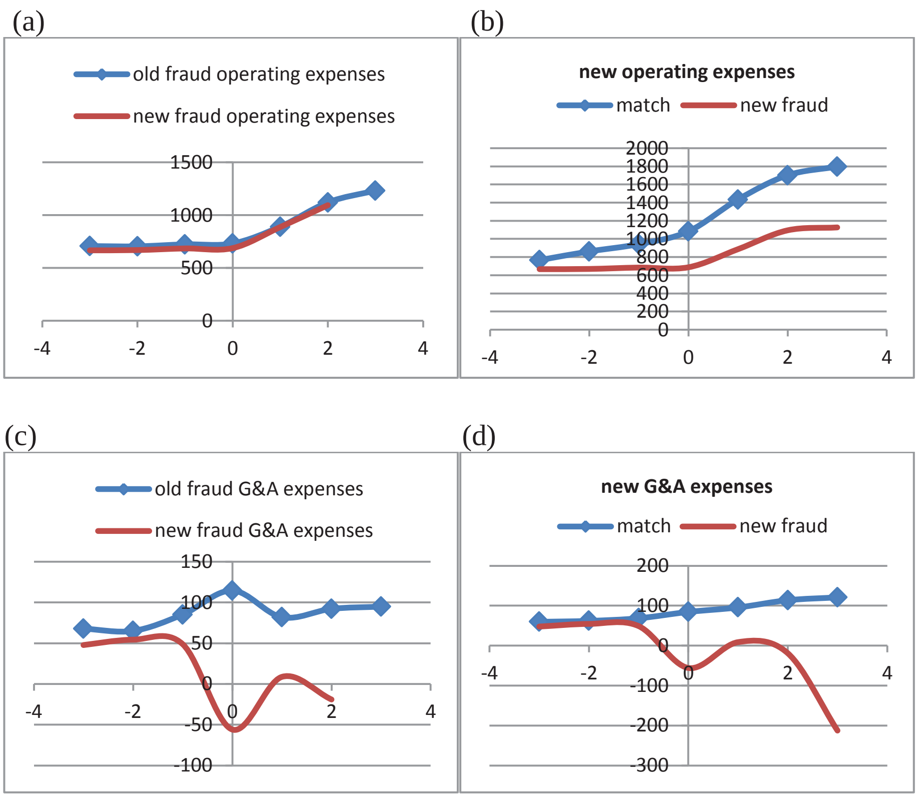
Overstated (%)	Total OpExp	OpExp	G&A	FinExp	Impairment
-3	-0.87%	-80.87%	-240.70%	121.24%	47.19%
-2	449.08%	3.24%	-22.46%	76.68%	99.55%
-1	130.97%	46.39%	143.12%	74.30%	183.02%
0	-136.21%	-50.35%	339.48%	116.51%	91.15%
1	91.40%	-35.87%	-93.50%	140.99%	1181.88%
2	219.11%	-26.80%	-57.40%	93.21%	-52.07%
3	38.77%	-72.01%	167.57%	128.50%	586.94%

As can be seen from Table B.3.4.2, other operating costs of G&A expenses, finance expenses and impairment losses are significantly overstated when fraudulent firms use matching firms to get the predicted expenses. Firstly, this study calculates the fraudulent new other operating costs (predicted fraudulent expenses) based on matching firms and record this as *new*; then this study uses the original fraudulent other operating costs to calculate the overstatement percentage based on the *new* other operating costs. The negative signs in Tables B.3.4.1 and B.3.4.2 do not mean that fraudulent firms understate these other operating costs. Since these calculations are based on operating revenue in matching firms and fraudulent firms, lower balances of sales in fraudulent firms lead to some negative *new* operating costs. Also it should be noted that, although fraudulent firms overstate operating expenses by 3.24% in year -2 (Table B.3.4.1), the actual amount of overstatement is substantial. This 3.24% corresponds to 22.26 million RMB in year -2. Therefore, this study can conclude that firms tunnel firm value in the cost of both operating costs and other operating costs, but mainly in the form of other operating costs during the period of (-3, 3).

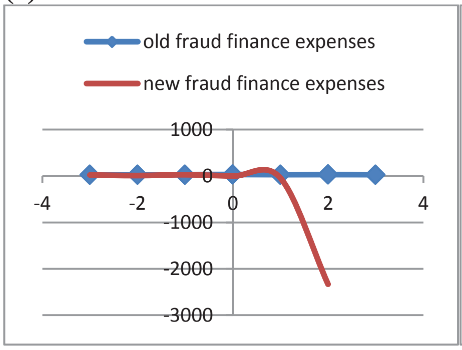
In Figure B.3.4.1 below, this study graphs both the balances of operating expenses and the five other operating expenses to reflect the differences between the original fraudulent sample and the predicted fraudulent sample, and between the matching sample and the predicted fraudulent sample. From Figure B.3.4.1, it is evident that the predicted fraudulent operating expenses are similar to the original fraudulent operating expenses; however, the predicted fraudulent other operating expenses are only similar to the original fraudulent operating expenses two years before the event, and then start to show differences after this period. Next, the predicted operating expenses and the other operating expenses in the fraudulent sample are less than in the matching sample.

Figure B.3.4.1 The adjustment based on matching firms in a set of other-operating costs

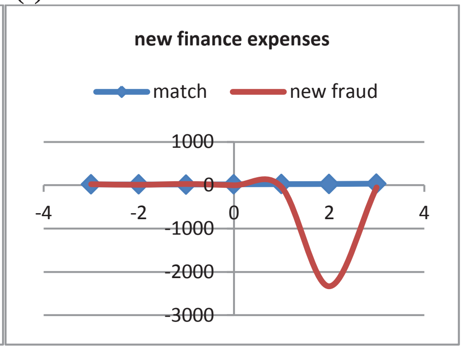
These charts plot the adjustment based on matching firms in a set of other-operating costs from the event year -3 to +3. The x-axis is the event year and the y-axis is the million RMB. The left-side figures represent the differences between old and new adjusted fraudulent firms on a set of costs. The solid line with dot in left-side figure represents the numerical value for old fraudulent firms. The solid line without dot in left-side figure represents the numerical value for new adjusted fraudulent firms. The right-side figures represent the differences between matching and new adjusted fraudulent firms on a set of costs. The solid line with dot in right-side figure represents the value of account balances in million RMB for matching firms. The solid line without dot in right-side figure represents the value of account balances in million RMB for new costs of fraudulent firms.



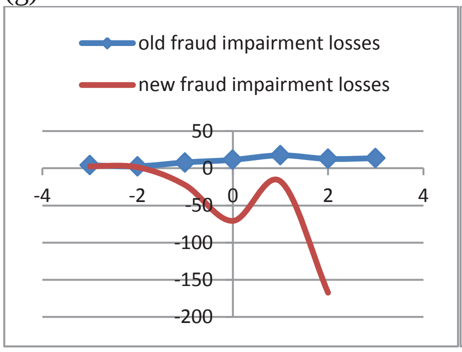
(e)


old fraud finance expenses
new fraud finance expenses
1000
0
-1000
-2000
-3000
-4
-2
0
2
4

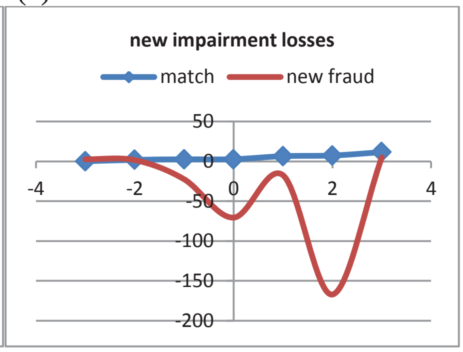
(f)


new finance expenses
match
new fraud
1000
0
-1000
-2000
-3000
-4
-2
0
2
4

(g)


old fraud impairment losses
new fraud impairment losses
50
0
-50
-100
-150
-200
-4
-2
0
2
4

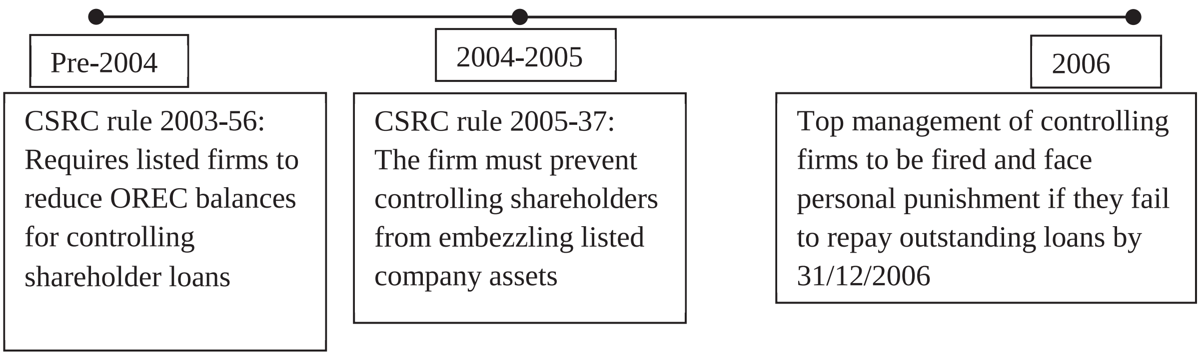
(h)


new impairment losses
match
new fraud
50
0
-50
-100
-150
-200
-4
-2
0
2
4

Appendix B.4: Variable definitions

Variables	Definition
TaxFees	Tax And Additional Fees Of Operations
SellingExp	Selling Expenses
G&A	General And Administrative Expenses
FinExp	Finance Expenses
Impairment	Impairment Losses
OCROper	Other Cash Received Relating To Operating Activities
OCPOper	Other Cash Paid Relating To Operating Activities
OCRInv	Other Cash Received Relating To Investing Activities
CPInv	Cash Paid For Investments
NCAcq	Net Cash Paid For Acquisition Of Subsidiaries And Other Business
OCPInv	Other Cash Paid Relating To Investing Activities
OCRFin	Other Proceeds Relating To Financing Activities
OCPFin	Other Cash Payment Relating To Financing Activities
NOCPOper	Other Cash Paid Relating To Operating Activities (OCPOper) minus Other Cash Received Relating To Operating Activities(OCROper)
NOCPInv	Other Cash Paid Relating To Investing Activities(OCPInv) minus Other Cash Received Relating To Investing Activities(OCRInv)
NOCPFin	Other Cash Payment Relating To Financing Activities(OCPFin) minus Other Proceeds Relating To Financing Activities(OCRFin)
Sales	Operating Revenue
NetProfit	Net Profit
OREC	Other receivables
ΔOREC	Other receivables in year t minus other receivables in year t-1
ΔprepaidExp	Prepaid expenses in year t minus prepaid expenses in year t-1
ΔSTDebt	Short-term loans in year t minus short-term loans in year t-1
Δemployee	Employee benefits payable in year t minus employee benefits payable in year t-1
Δearnings	Retained earnings in year t minus retained earnings in year t-1
ROA	Return on assets
TopRatio	The percentage of shares held by the largest shareholder
Size	The natural logarithm of total assets
MINDEX	A comprehensive index to capture the regional market development

Appendix B.5: Regulations of tunnelling



Appendix B.6: The approximate total losses

Table B.6.1 Annual loss in fraud sample

Fraud sample	ORECPro	ORECRev	Loss	Net income(NI)	Loss/NI
2002	24551153.10	0	24551153.10	-20024770.55	-122.60%
2003	17832818.16	0	17832818.16	13886146.79	128.42%
2004	32979085.04	0	32979085.04	29861992.90	110.44%
2005	40110093.02	0	40110093.02	-45399090.97	-88.35%
2006	106117012.60	1741092.72	104375919.80	-71491517.72	-146.00%
2007	81618770.58	6759016.35	74859754.23	110727681.00	67.61%
2008	73451245.71	3356901.04	70094344.67	83337336.34	84.11%
2009	47132186.69	1463152.63	45669034.06	62575920.38	72.98%
2010	38737685.99	317136.57	38420549.42	109042079.90	35.23%
2011	47617473.72	739535.82	46877937.89	172187547.60	27.22%
Sum	31271209384.86	735631241.07	30535578143.79	5512883703.48	553.89%

Table B.6.2 Annual loss in matched sample

Matched sample	ORECPro	ORECRev	Loss	Net income(NI)	Loss/NI
2002	7320015.61	0	7320015.61	10538757.57	69.46%
2003	8477641.66	0	8477641.66	50603881.11	16.75%
2004	18434882.08	0	18434882.08	54032354.38	34.12%
2005	16113158.97	0	16113158.97	22809825.19	70.64%
2006	20489956.51	664962.11	19824994.41	66818968.64	29.67%
2007	53209121.06	250360.12	52958760.95	139825547.28	37.87%
2008	50089892.86	-197910.15	50287803.01	41655632.18	120.72%
2009	31030019.93	-456283.25	31486303.17	135164784.83	23.29%
2010	16935372.92	1123490.23	15811882.69	393274950.47	4.02%
2011	14391937.34	3451095.56	10940841.78	1408036043.09	0.78%
Sum	12031662609.49	98791426.88	11932871182.61	43528955363.45	27.41%

Appendix B.7: Robustness tests in three typical violation types

Table B.7.1 OLS regression results of change in other receivables in three different fraudulent types

This table reports the regression results for tunnelling behaviours and the possible accounts used to engage in tunnelling. Annual observations of the fraudulent firms from three years before to three years after the event are included in the regression. Panel A examines related party transaction violations in fraudulent firms. Panel B examines external loan guarantee violations in fraudulent firms. Panel C examines illegal possession of funds violations in fraudulent firms. All variables are scaled by total assets. The dependent variable is the change of other receivables (ΔOREC). Each model includes industry dummy variables to control for industry effects.[105] The numbers in parentheses below the coefficients are t-statistics to test the significance of the variables. Significance at 1%, 5%, 10% level (two-tail test) is denoted by ***, **, and * respectively.

Panel A: Type1: Related party transactions

	Model 1	Model 2	Model 3
	Fraud sample	Pre-2005	Post-2005
Intercept	0.018	0.039	-0.014
	(0.89)	(1.51)	(-0.45)
TaxFees	-0.863	-1.745	-0.103
	(-1.43)	(-0.80)	(-0.14)
SellingExp	-0.632***	-0.490**	-0.690***
	(-4.38)	(-2.26)	(-3.56)
G&A	-0.102	-0.312**	-0.006
	(-1.50)	(-2.59)	(-0.07)
FinExp	-0.737***	0.329	-0.842***
	(-3.71)	(0.80)	(-3.36)
Impairment	-0.355***	2.585	-0.281**
	(-2.89)	(0.81)	(-2.01)
NOCPOper	0.625***	0.680***	0.564***
	(10.10)	(8.33)	(6.19)
CPInv	0.087	-0.036	0.240
	(0.91)	(-0.37)	(1.08)
NCAcq	1.170	0.984	1.385
	(1.29)	(0.26)	(1.32)
NOCPInv	0.332*	0.350	0.242
	(1.75)	(1.54)	(0.80)
NOCPFin	0.217	0.538	0.104
	(1.53)	(1.66)	(0.60)
N	831	368	463
Adj R-sq	16.30%	16.58%	13.78%

[105] The results remain consistent when standard errors are clustered by company to correct for heteroskedasticity and time series autocorrelation within each company.

Panel B: Type5: External loan guarantees

	Model1	Model2	Model3
	Fraud sample	Pre-2005	Post-2005
Intercept	0.031	0.024	0.016
	(1.02)	(0.65)	(0.34)
TaxFees	-0.519	-0.258	-0.353
	(-0.55)	(-0.10)	(-0.30)
SellingExp	-0.645***	-0.760	-0.522*
	(-2.77)	(-1.58)	(-1.73)
G&A	-0.004	-0.267	0.094
	(-0.05)	(-1.50)	(0.81)
FinExp	-1.064***	0.182	-1.169***
	(-4.08)	(0.31)	(-3.41)
Impairment	-0.641***	1.235	-0.548***
	(-4.46)	(0.31)	(-3.23)
NOCPOper	0.401***	0.491***	0.320**
	(4.53)	(4.29)	(2.40)
CPInv	0.063	-0.061	0.249
	(0.43)	(-0.41)	(0.80)
NCAcq	0.789	-4.441	1.000
	(0.45)	(-0.17)	(0.50)
NOCPInv	0.475	0.415	0.399
	(1.66)	(1.28)	(0.81)
NOCPFin	0.192	0.591	0.030
	(0.93)	(1.11)	(0.12)
N	500	220	280
Adj R-sq	13.63%	5.75%	10.03%

Panel C: Type6: Illegal possession of funds

	Model1	Model2	Model3
	Fraud sample	Pre-2005	Post-2005
Intercept	0.041	0.006	0.035
	(1.32)	(0.15)	(0.71)
TaxFees	-0.092	-0.019	0.748
	(-0.14)	(-0.02)	(0.82)
SellingExp	-0.750***	-0.777***	-0.767***
	(-4.14)	(-2.84)	(-3.15)
G&A	-0.052	0.124	-0.239
	(-0.46)	(0.75)	(-1.43)
FinExp	-0.920***	1.151*	-1.030***
	(-3.34)	(1.75)	(-2.83)
Impairment	-0.485***	-4.607	-0.388*
	(-2.65)	(-1.09)	(-1.88)
NOCPOper	0.683***	0.900***	0.538***
	(7.04)	(6.68)	(4.00)
CPInv	0.124	0.260*	0.044
	(0.99)	(1.78)	(0.21)
NCAcq	0.444	3.426	0.494
	(0.42)	(0.15)	(0.41)
NOCPInv	0.067	0.025	0.354
	(0.24)	(0.07)	(0.76)
NOCPFin	0.122	0.364	0.056
	(0.55)	(0.93)	(0.20)
N	446	202	244
Adj R-sq	14.68%	19.37%	13.86%

Appendix B.8: Robustness tests in the determinants of other receivables

Table B.8.1 OLS regression results of the determinants of other receivables (OREC)

This table examines the determinants of OREC. Annual observations of the fraudulent firms and matching firms from three years before to three years after the event are included in the regression. Model 1 examines the full study period for fraudulent firms. Model 2 examines the sub-period before 2005 and Model 3 examines the sub-period after 2005. Model 4 examines the full study period for matching firms. Model 5 examines the sub-period before 2005 and Model 6 examines the sub-period after 2005. The dependent variable is OREC (other receivables deflated by total assets). The independent variables are: TopRatio is the percentage of shares held by the largest shareholder; ROA is return on assets; Size is the log of total assets; MINDEX is a comprehensive index to capture the regional market development; State is the proportion of shares owned by state stockholders; Dual is a dummy variable that takes the value of 1 if the company's CEO is also the chairperson of the board and 0 otherwise; BOARD (board size) is the number of directors on the board; SBSIZE is the number of members on the supervisory board; SBMEET is the number of meetings of the supervisory board in the calendar year; INED (board composition) is the percentage of independent directors on the board; MEET is the number of meetings of the board of directors in the calendar year; CPAs is a dummy variable coded one if the auditor was one of the 10 biggest auditors by market share; ST is a dummy variable coded 1 if the firm has a special treatment, 0 otherwise; PT (Particular transfer), is a dummy variable coded 1 if the firm has a particular transfer, 0 otherwise; RET is annual stock return over the risk free rate.

Each model includes industry dummy variables to control for industry effects. Standard errors are clustered by year to correct for heteroskedasticity and time series autocorrelation. The numbers in parentheses below the coefficients are t-statistics to test the significance of the variables. Significance at 1%, 5%, 10% level (two-tail test) is denoted by ***, **, and * respectively.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	Fraud sample	Pre-2005	Post-2005	Matched sample	Pre-2005	Post-2005
Intercept	0.705***	0.466	0.797***	0.410***	0.480***	0.205***
	(6.77)	(2.18)	(4.78)	(7.28)	(8.12)	(4.07)
TopRatio	-0.066**	-0.064	-0.047*	-0.005	-0.003	-0.008
	(-2.57)	(-1.51)	(-2.23)	(-0.53)	(-0.33)	(-0.57)
ROA	-0.258**	-0.449***	-0.199*	-0.308***	-0.355***	-0.261
	(-3.11)	(-8.67)	(-2.22)	(-4.27)	(-10.30)	(-1.73)
Size	-0.027***	-0.017	-0.030***	-0.014***	-0.016***	-0.009***
	(-5.53)	(-1.71)	(-4.43)	(-7.17)	(-7.82)	(-6.21)
MINDEX	0.001	0.004	0.001	0.000	-0.002	0.003**
	(0.74)	(2.39)	(0.26)	(0.31)	(-2.08)	(2.62)
State	0.046**	0.021	0.056**	-0.009	-0.044**	0.007
	(3.14)	(0.99)	(2.77)	(-0.91)	(-5.23)	(0.66)
DUAL	0.013	0.025	0.002	-0.016**	-0.026*	-0.003
	(0.77)	(0.92)	(0.07)	(-2.35)	(-2.70)	(-0.31)
Board	-0.002	-0.002**	-0.002	0.002	0.002	0.001
	(-1.43)	(-3.27)	(-0.60)	(1.74)	(1.06)	(1.28)
SBSIZE	0.010***	0.009**	0.010**	-0.003	-0.004	-0.002
	(5.02)	(3.92)	(3.25)	(-1.72)	(-1.01)	(-1.29)
INDE	-0.058	-0.005	-0.101	-0.048	-0.041	0.063*
	(-0.97)	(-0.11)	(-0.64)	(-1.66)	(-1.18)	(2.49)
MEET	0.003**	0.004**	0.002	0.002**	0.003	0.001
	(2.93)	(4.67)	(1.31)	(2.66)	(2.42)	(1.58)
SBMEET	-0.010***	-0.004*	-0.014***	0.001	0.005***	-0.001
	(-3.73)	(-2.90)	(-4.43)	(0.70)	(7.21)	(-0.42)
CPAs	-0.009	0.017*	-0.029***	-0.006	0.002	-0.013***
	(-0.97)	(3.18)	(-4.44)	(-1.71)	(0.36)	(-4.15)
ST	0.049**	0.064***	0.036	0.106***	0.102*	0.101***
	(2.76)	(6.04)	(1.43)	(5.43)	(2.67)	(5.88)
PT	0.057	0.055	0.063	0.245	-0.066***	0.811***
	(1.36)	(1.73)	(1.24)	(0.88)	(-9.22)	(27.39)
RET	-0.015	-0.038**	-0.009	-0.004	0.009	0.000
	(-1.33)	(-3.91)	(-0.71)	(-0.85)	(1.43)	(-0.04)
N	1495	707	788	1548	712	836
Adj R-sq	22.49%	27.98%	22.22%	40.39%	48.98%	39.65%

Appendix B.9: Robustness tests in the determinants of impairment losses

Table B.9.1 OLS regression results of the determinants of impairment losses (Impairment)

This table examines the determinants of Impairment. Annual observations of the fraudulent firms and matching firms from three years before to three years after the event are included in the regression. Model 1 examines the full study period and Model 2 examines the sub-period after 2005 for fraudulent firms. Model 3 examines the full study period and Model 4 examines the sub-period after 2005 for matching firms. The dependent variable is Impairment (impairment losses deflated by total assets). The independent variables are: TopRatio is the percentage of shares held by the largest shareholder; ROA is return on assets; Size is the log of total assets; MINDEX is a comprehensive index to capture the regional market development; State is the proportion of shares owned by state stockholders; Dual is a dummy variable that takes the value of 1 if the company's CEO is also the chairperson of the board and 0 otherwise; BOARD (board size) is the number of directors on the board; SBSIZE is the number of members on the supervisory board; SBMEET is the number of meetings of the supervisory board in the calendar year; INED (board composition) is the percentage of independent directors on the board; MEET is the number of meetings of the board of directors in the calendar year; CPAs is a dummy variable coded one if the auditor was one of the 10 biggest auditors by market share; ST is a dummy variable coded 1 if the firm has a special treatment, 0 otherwise; PT (Particular transfer), is a dummy variable coded 1 if the firm has a particular transfer, 0 otherwise; RET is annual stock return over the risk free rate. Each model includes industry dummy variables to control for industry effects. Standard errors are clustered by company to correct for heteroskedasticity and time series autocorrelation within each company. The numbers in parentheses below the coefficients are t-statistics to test the significance of the variables. Significance at 1%, 5%, 10% level (two-tail test) is denoted by ***, **, and * respectively.

	Model 1	Model 2	Model 3	Model 4
	Fraud sample	Post-2005	Matched sample	Post-2005
Intercept	-0.019	-0.018	0.002	0.002
	(-0.81)	(-0.43)	(0.28)	(0.16)
TopRatio	-0.018***	-0.035***	-0.005**	-0.005
	(-2.79)	(-3.14)	(-2.41)	(-1.42)
ROA	-0.061***	-0.078***	-0.028	-0.066**
	(-5.19)	(-5.41)	(-1.69)	(-2.24)
Size	0.001	0.002	0.000	0.000
	(1.01)	(0.88)	(-0.58)	(0.04)
MINDEX	-0.001	-0.001	0.000	0.000
	(-1.16)	(-1.35)	(0.38)	(0.55)
State	0.001	0.003	-0.001	-0.002
	(0.16)	(0.44)	(-1.42)	(-1.10)
DUAL	-0.002	-0.003	-0.001	-0.002
	(-0.94)	(-0.70)	(-1.20)	(-1.59)
Board	-0.001**	-0.001*	0.000	0.000
	(-2.15)	(-1.79)	(-1.30)	(-0.93)
SBSIZE	0.001*	0.001	0.000	0.000
	(1.72)	(1.13)	(0.87)	(0.45)
INDE	0.016***	0.010	0.007***	-0.001
	(3.49)	(0.36)	(3.40)	(-0.06)
MEET	0.000	0.000	0.000	0.000
	(0.10)	(0.23)	(-0.42)	(-0.34)
SBMEET	0.001**	0.002***	0.000**	0.001***
	(2.44)	(2.65)	(2.22)	(2.79)
CPAs	0.002	0.005	0.001	0.002
	(1.28)	(1.57)	(1.36)	(1.07)
ST	0.006**	0.009**	0.002	0.007
	(2.37)	(2.41)	(0.72)	(1.49)
PT	0.030**	0.032**	0.040	0.136***
	(2.53)	(2.22)	(1.18)	(16.59)
RET	0.003***	0.001	0.002***	0.002***
	(3.36)	(1.59)	(3.67)	(2.82)
N	1495	788	1548	836
Adj R-sq	21.30%	26.88%	10.78%	21.63%