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China Journal of Accounting Research

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4/3 China Journal of Accounting Research Vol. 4/3 (2011) 91–166

ELSEVIER

Volume 4 • Issue 3 • September 2011

China Journal *of* Accounting Research

Production and hosting by Elsevier

Available online at www.sciencedirect.com
SciVerse ScienceDirect

ISSN 1755-3091

Production and hosting by Elsevier
Radarweg 29, 1043 NX Amsterdam, The Netherlands

ISSN 1755-3091

Founded by Sun Yat-sen University and City University of Hong Kong

Sponsored by: CPA Hong Kong Institute of Certified Public Accountants 香港會計師公會

Published quarterly in March, June, September, and December

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CHINA JOURNAL OF ACCOUNTING RESEARCH

Volume 4/3 (2011)

China Journal of Accounting Research 4 (2011) 91–106

Contents lists available at SciVerse ScienceDirect

China Journal of Accounting Research

journal homepage: www.elsevier.com/locate/cjar

Macroeconomic control, political costs and earnings management: Evidence from Chinese listed real estate companies

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ARTICLE INFO

Article history:
Received 27 May 2010
Accepted 9 December 2010
Available online 31 August 2011

JEl classification:
G18
G38
E6

Keywords:
Political costs
Earnings management
State-owned enterprises
Non-state-owned enterprises

ABSTRACT

Firms in China have faced high political costs during China's economic transition, because they are affected by macroeconomic policies. However, research to date has offered no consistent conclusions on the relationship between political costs and earnings management in China. This study tests whether real estate firms attempt to decrease earnings during periods of macroeconomic control, using variables related to the national real estate market as proxies for political costs. We find that political costs are negatively related to earnings management in listed real estate firms. In addition, we find that non-state-owned enterprises utilized more income-decreasing accruals during this period. Our results are consistent with the political costs hypothesis.

1. Introduction

The political costs hypothesis of earnings management, which is one of three basic hypotheses of positive accounting theory, has long been an important issue in positive accounting research (Watts and Zimmerman, 1986). However, prior research has mainly focused on mature Western market economies (e.g., Zmijewski and Hagerman, 1981; Daley and Vigeland, 1983; McKee et al., 1984; El-Gazzar et al., 1986; Boynton et al., 1992; Han and Wang, 1998; Monem, 2003). The existing research on transition and emerging economies is limited. For instance, there has been relatively little research on China and prior studies have not been able to draw uniform conclusions (e.g., Wang, 2000; Wu et al., 2004; Liu and Jing, 2005; Liu et al., 2005; Zhang, 2008). In addition, there are huge political and economic differences in the institutional backgrounds of mature and emerging markets. These differences are clearly observable between China and most Western countries. Accordingly, the motivation for this study is to explore whether the political costs hypothesis of earnings management differs between emerging and mature markets.

This study aims to address the following questions. Is the political costs hypothesis applicable to China? Do listed companies in China face different political costs compared to listed companies in Western countries? Which variables best

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doi:10.1016/j.cjar.2011.06.002

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characterize the political costs of listed companies in China? Do China's listed companies consider political costs when they manipulate earnings?

This study examines a sample of real estate firms in China. The real estate industry is highly capital intensive and its health is vital to national well-being and people's livelihoods in general. The development and stability of the real estate market can greatly affect macroeconomic operations and social stability (Huang et al., 2009). Accordingly, the Chinese government has shown interest in regulating the development of the domestic real estate market. Nation-wide real estate development boomed in 2001 placing huge upward pressure on prices and led to strong growth of the real estate industry in China. This growth generated huge profits for real estate businesses. However, excessive development distorted the allocation of resources to such a degree that it threatened the health of China's macroeconomic operations. Since 2003, the Chinese government has promulgated a series of policy documents on the macroeconomic regulation of the real estate industry. Overall, the government's aim is to use various policy tools to control real estate prices to achieve a more reasonable price level. To avoid being subject to more stringent regulations and public scrutiny, real estate companies are likely to adopt earnings decreasing accounting policies. Thus, the rapid development of China's real estate market and the subsequent regulatory changes provide an excellent research and experimental setting in which to examine the relationship between political costs and corporate earnings management behavior in an emerging market.

Using data from listed real estate companies in China from 2002 to 2007, we conduct an empirical study to determine whether the political costs hypothesis is applicable to China. The results show that, with the implementation of increasingly tight macroeconomic controls, listed real estate companies adopted earnings decreasing accounting policies. In addition, because state-owned real estate companies have a different sensitivity to political costs, non-state-owned listed companies have more incentive to adopt earnings decreasing accounting policies.

Our study makes several contributions to the literature on earnings management. First, we associate macro-level government regulation with the micro-level corporate use of earnings management in the economic development of a transition economy. We find that macroeconomic controls can provide an incentive for earnings management, which is different from the effects of political costs found in Western countries. Second, due to the asymmetric effects of the same macroeconomic policies, different political cost sensitivities are found to exist between different types of companies. These findings enrich the political costs hypothesis and our understanding of the impact of macroeconomic policies in the institutional setting of China.

The remainder of this paper is organized as follows. Section 2 presents the literature review, theoretical analysis and hypothesis development. Section 3 describes the sample, variables and the empirical results. The final section concludes the paper, outlines the limitations of our study and proposes future research directions.

2. Literature review, theoretical analysis and hypothesis development

2.1. Literature review

There is a considerable body of research on political costs. Early research focused on the selection of political cost variables, such as the size of a company's assets that are considered to be positively correlated with political costs. Watts and Zimmerman (1978) found that, compared with small companies, large companies are more likely to accept GPLA (General Price Level Adjusted) accounting standards, because profits adjusted by the guidelines are lower than unadjusted profits. Watts and Zimmerman (1986) analyzed the reasons for this phenomenon and found that larger companies have a greater motivation to hide profits, because once profits are considered to be derived from monopoly situations, the government may institute wealth transfer policies. Zmijewski and Hagerman (1981) conducted a number of empirical tests and found that larger firms are more likely to use accounting policies that may lead to reduced profits. McKee et al. (1984) later used sales as an alternative variable for political costs and found similar results. Daley and Vigeland (1983) found that companies with higher income tend to expense rather than capitalize research and development costs. Although Daley and Vigeland (1983) analyzed a different political cost issue, unlike Zmijewski and Hagerman (1981), their results were only found in small companies.

Corporate tax rates are also an important alternative measure of political costs. In this case, corporations that are free from political involvement generally have lower tax rates. Alternatively, companies with higher profits are more easily identified by governments and tend to have higher tax rates. Therefore, enterprises have motives to reduce their current profits to reduce the amount of tax payable. El-Gazzar et al. (1986) conducted a number of tests and found that companies with high tax rates tend to capitalize their leases. Boynton et al. (1992) conducted an empirical study on the relationship between earnings management and clauses of the US Tax Reform Act of 1986 and confirmed the existence of earnings management for tax avoidance. Han and Wang (1998) showed that during the 1990 Persian Gulf crisis, many US oil processing enterprises adopted measures to reduce current profits, such as changing accounting policies and reducing their closing inventory, to avoid being liable for the windfall profit tax as a result of the sharp rise in oil prices.

A limitation of most of the previous studies on political costs is that they do not focus on particular events (Wong, 1988). However, the following studies on the relationship between political costs and earnings management do focus on specific events, which are discussed with regard to their particular political background. For example, as some industries are more likely to attract the attention of regulators, they have a greater motivation to decrease earnings to avoid regulation. Jones (1991) investigated 23 companies influenced by the US International Trade Commission (ITC) scheme to restrict imports

and found that, during the investigation, managers tended to decrease earnings through manipulating accruals. Cahan (1992) conducted a similar study of companies subject to antitrust investigations and also found that, during the investigation, companies' accruals were significantly negative. Cahan et al. (1997) carried out a study of the US chemical industry in late 1979, when companies were facing condemnation for environmental pollution. During the investigation period, when Congress discussed establishing a pollution clean-up draft fund (subsidized by the polluting companies) the reported profits of the polluting companies were significantly lower. Han and Wang (1998) studied the accounting policies used by oil companies during the 1990 Gulf crisis when oil prices were rising. They found that oil companies decreased their earnings in 1990 through inventory and special accruals in the third and fourth quarters to reduce the high political costs associated with this large abnormal growth in income. Monem (2003) studied the Australian gold mining industry. Prior to 1991, Australia had implemented a tax-free policy for the gold mining industry. However, during a period of rapid economic development in the early 1980s the gold mining industry generated very high profits and the government came under increasing public pressure to impose a tax on gold. Monem's (2003) investigation began in 1985, after the government released a draft bill on the taxation of the gold industry. The draft was adopted in 1988, and implemented in 1991. Using the Jones (1991) model, Monem (2003) found a significant reduction in accruals in the Australian gold mining industry during the 1985–1988 period. As the accruals were also significantly lower than those of Canadian gold mining companies in the same period, the findings support the political costs hypothesis.

The political costs hypothesis has been investigated in various countries over many years and has been widely verified. However, as yet, there is little consensus on whether it is applicable to China. Some scholars believe that the political costs hypothesis cannot be verified in China, because firm size has no significant effect on the choice of accounting policy. Large companies may have more robust financial systems and greater supervision over financial control, which may reduce their ability to manipulate their accounting policies (Wang, 2000). Liu et al. (2005) analyzed the effects of macroeconomic control mechanisms on listed companies from transitional markets in relation to voluntary changes in accounting policies. They found that listed companies are more willing to smooth their income. On the other hand, Wu et al. (2004) and Liu and Jing (2005) found that firm size is negatively related to big bath accounting. Zhang (2008) found that petrochemical companies decreased their earnings because of political costs in 2005 and 2006 when oil prices were high.

2.2. Background

Prior studies generally agree with the theory of "political costs of profit management" in Western contexts. However, the circumstances are quite different in China, especially as it is not suitable to use "company size" as a proxy for "political costs" in this market. This raises a series of interesting problems with regard to why "company size" is not a suitable proxy and which variables could serve as alternative measures.

To resolve this problem, it is necessary to understand the political and economic differences between China and the West. The first difference relates to the system of governance. In Western countries, political power belongs to the elected parliament. However, in China, power is distributed among many government departments (Li, 2005; Mao, 2007). Furthermore, as emerging countries invariably have weak legal systems, political power is much more easily co-opted by large corporations (Zingales, 2009). In emerging countries, settlement costs are much lower for large corporations, as a result of their imperfect and inefficient legal systems. In addition, the governments of emerging countries tend to be reliant on large corporations in various ways, which may eventually eliminate their power of governance.

A second difference is political reasons for managing the economy. In the West, the main purposes are to avoid monopolies, protect the environment or increase tax revenues (Zmijewski and Hagerman, 1981; Cahan et al., 1997; Han and Wang, 1998). In relation to industry, these aims are realized by regulating certain characteristics of large corporations. However, the goal of emerging countries, such as China, is not to limit the scale of companies, but to encourage them to become stronger and more competitive. This is clearly manifest in the Chinese government's strategies of "big over small" and "become bigger and stronger". Therefore, the development of large corporations is less restricted in China. Nonetheless, economic stability is also very important for this emerging and transforming nation. For this reason, the government often pays closest attention to firms in industries that have the greatest impact on the welfare of its citizens.

A third difference is the objective of the government's economic management. There are few state-owned companies in the West, but there are many large state-owned companies in China. These state-owned companies can earn some benefits from banks, such as "recessive guarantees" (Brandt and Li, 2003; Sun et al., 2006; Lu et al., 2009), because they are following the government's requirement for diversification. Therefore, it is unlikely that state authorities in China will control the size of a company. If there is such a possibility, the company will be non-state-owned. For example, when monetary policy is tightened, state-owned companies' requests for loans will be satisfied before those from non-state companies. Thus, non-state-owned companies are affected by government economic management more than state-owned companies.

The last difference concerns the form of economic management. It is significant that the Chinese economy started from a planned economy. Thus, the government is used to implementing industrial policies. When a company's development matches the government's industrial policies, it will be encouraged. Otherwise, it will be strictly limited.

In summary, China is an emerging country in the process of economic transition. The political costs of companies in China are quite different from those faced by companies in Western countries. These differences are reflected in many aspects of the system of government, such as the motivation for governing, the form of government and the different circumstances that are subject to economic control.

Within China, the real estate industry is quite unique. As real estate is a capital intensive industry, real estate companies are strongly affected by macroeconomic control policies. Furthermore, real estate is central to the national economy and people's livelihoods. Thus, the real estate industry provides an excellent research and experimental setting for testing the relationship between earnings management behavior and political costs in an emerging market.

During the last 30 years of reforms to China's economy, the Chinese real estate industry has evolved and developed from a state of depression to a booming industry. With the development of the real estate market, real estate has become China's most important and largest industry. In addition to the essential productive factors relating to real estate development, the real estate market has become an important investment target for families and companies. With the increase in the scale of the real estate market, its development and change now affect not only financial security and social stability, but also the health of the entire national economy.

Considering the importance of the real estate industry to people's lives, a jump or slump in house prices may create social and economic turmoil. Therefore, another priority for the government has been to determine how to control and manage the development of the real estate market. According to rule no. 30 of the "Price Law of the PRC" issued in 1997, the State Council and local governments have the right to restrict the prices of essential commodities and services, when prices appear to have risen significantly. The government may take intervention measures such as restricting the price differential ratio or profit ratio, prescribing restricted prices, or instituting a price rise submission system and price adjustment record system with respect to specific aspects of prices. The importance of the real estate industry is beyond question and it is also undoubtedly within the scope of intervention. When house prices rise too fast and cause broad public concern, or even threaten macroeconomic stability, the government can take necessary measures to manage the real estate industry.

After the real estate market stagnated between 1994 and 1997, China carried out a series of policies between 1998 and 2002 to support and encourage the growth of the real estate industry. After 2001, the real estate industry in China gradually entered a trend of rapid growth, which soon resulted in overinvestment, soaring real estate prices, an irrational structure of housing demand and supply, market disorder and other problems. In 2003, real estate investment in China increased by 30.33% compared to the previous year, which was the highest rate of growth since the last macroeconomic controls. In the first quarter of 2004, fixed asset investment nationwide increased 15.2–43% on a quarter to quarter basis. In 2004, the price of condominiums increased by 15.02% and the price of commercial and residential buildings rose by 15.99%. In the same year, house prices rose much faster than in past years, where the growth rates had been between 3% and 5%. In 2005, the prices for condominiums increased by 16.72%. In early 2006, house prices soared in Shenzhen, Beijing, Guangzhou and other cities, which was difficult for low-income people to bear. Accordingly, the sharp rise in house prices eventually became a social problem.

With the ongoing increase in house prices and enthusiasm for investing in the real estate industry, the government began to implement a number of macroeconomic policies in 2003, which lasted until 2007. The policies included: (1) credit policies, such as increasing the required percentage of capital investment in real estate projects, strengthening the risk management of real estate loans, increasing the interest rates on bank savings and loans, and increasing the initial deposit required on second homes; (2) restrictions on foreign capital, such as the policy promulgating "Opinions on Regulating the Entry of Foreign Investment into the Real Property Market and the Administration" and the reform of regulations covering real estate in the "Catalogue for the Encouragement of Foreign Investment Industries"[1]; (3) tax policies, such as imposing income tax on the sale of second homes, collecting value-added land taxes and strengthening the management of lodging business tax returns; and (4) reforming the policy on land transfer, such as strengthening the control of the supply of realty development land, implementing strict regulations to protect cultivated land and adopting strict measures for the examination and approval of the sale of all kinds of non-agricultural land.

These macroeconomic controls had a long-term impact and deeply affected the real estate industry. The policies were based on the high prices of housing and the huge profits being earned by real estate companies. Therefore, the data on real estate companies' net profits play an important and sensitive role in our analysis. Because the restrictive policy was instituted by the government, real estate companies have an incentive to decrease their reported company profits to avoid political costs.

2.3. Hypotheses

Whether government regulation can influence the behavior of listed real estate companies and whether listed real estate companies manage their earnings because of political costs, depends on the government's motivation and ability to deter and restrict the operations of real estate companies.

First, in terms of motivation, stability has important additional implications for emerging and transitional countries. Fluctuations in the economic and political environment can cause great damage to the development of an emerging country. Thus, in emerging and transitional countries, industries that have a close relationship with ordinary people, have excessive profits or are vulnerable to public opinion are more likely to face strict regulations. For the real estate industry, if prices rise

[1] The National Development and Reform Commission (NDRC) and Ministry of Commerce issued the law "Catalogue for the Encouragement of Foreign Investment Industries (Version 2007)" on December 2007. Compared with the 2004 version, the 2007 version made three main revisions in regard to the real estate industry: (1) deleted "ordinary housing development construction" from the catalogue of encouraged investments; (2) added "real estate secondary market transactions and real estate intermediary companies" into the regulated catalogue; and (3) deleted "large scale theme park construction and management" from the regulated catalogue.

too fast and go considerably beyond the purchasing power of consumers, the public will become dissatisfied, eventually leading to social conflict. In this case, the government may issue stricter regulations. After 2003, real estate prices rose so rapidly nationwide that universal complaints were heard from all parts of the country. The complaints were voiced at all levels of public opinion, thereby placing the government under tremendous pressure. To solve this problem, the government made it a priority to regulate the growth of house prices at a reasonable rate. Furthermore, excessive expansion of the real estate industry leads to the abnormal development of upstream and downstream industries, such as energy, raw materials and construction, and therefore creates a hidden danger for national industries undergoing a structural adjustment. Accordingly, strict regulation of the real estate industry was imperative.

Second, in terms of capacity, China's economic transformation has been carried out in typical government-driven style (Zhu and Dong, 2005). Formulating industry policies is an integral part of this economic growth model. New policy goals can be achieved faster by using coercive power to carry out industrial regulations. The companies that are in accordance with the national industrial policies will be supported at every level, such as through IPOs, SEOs, bank loans or even tax preferences. Companies that do not meet the industrial policies will be subject to more constraints from government. For example, between 2003 and 2007, the real estate industry was subject to higher lending rates, incremental taxes on land value and strict control of approval for non-agricultural land use. Therefore, in terms of capacity, the government is able to affect real estate companies' levels of risk, costs and profits by using policy controls.

Generally speaking, the government is capable of effectively implementing policy controls in relation to motivation and capacity. These regulations may indeed affect the behavior of real estate companies. The aim of the macroeconomic policies introduced during 2003–2007 was to stabilize housing prices, decrease real estate industry profits and promote the rational allocation of resources. Real estate companies have incentives to manage their earnings to avoid further regulatory policies and allay suspicions of excessive profit making. Moreover, real estate companies are more likely to decrease their earnings to remove suspicion of excessive profits when house prices are rapidly increasing. In summary, we predict that:

Hypothesis 1. Listed real estate companies are more likely to decrease earnings when there are greater political costs.

Furthermore, according to the theory of ultimate property rights, listed enterprises can be classed as either state-owned or non-state-owned. The property rights of state-owned enterprises belong to the public. Because of their special relationship with the government, state-owned listed enterprises gain more protection from the government. Moreover, generating profit is not the only goal of state-owned enterprises. State-owned enterprises also undertake various social responsibilities, such as maintaining social stability and providing employment. Therefore, there are significant differences between state-owned and non-state-owned companies. Early research showed that state-owned companies gain more financial and political support from the government than non-state-owned companies (Qian, 1994). This is because the government can also gain a lot of resources to improve their political capital and promotional opportunities from the success of state-owned companies (Li and Zhou, 2005). Furthermore, Brandt and Li (2003), Sun et al. (2006) and Lu et al. (2009) show that state banks are inclined to give preferential treatment to state-owned companies. Therefore, if the government tightens its credit policy, state-owned companies are expected to have greater access to loans from state banks than non-state-owned enterprises. In other words, the actual effects of the control policies are expected to be different for state-owned and non-state-owned companies, which results in different motivations for profit management. In relation to this macroeconomic control policy, because state-owned companies endure less political pressure than private companies, state-owned companies' motivation for profit management is weaker than that of private companies. On the basis of the foregoing research we predict that:

Hypothesis 2. The potential for negative profit management in non-state-owned listed real estate enterprises is greater than that in state-owned listed real estate enterprises.

It must be noted that macroeconomic controls can also have some direct effects on corporate profitability. For example, the capital value of development projects and the increment tax on land value may increase. These policies can affect the risks and costs faced by real estate companies and ultimately affect their business profits. Encouraged by these policies, real estate companies may earn more money or their profits may be reduced. In addition, the macroeconomic control policies may have no effect on a company's profit management.[2] If a company does not take political costs into account, then negative profit management will not be necessary under these policies. This reminds us that the level of company profits should be taken into account in the following analysis.

3. Sample, variables and empirical results

3.1. Sample

The sample used in this study comprises all A-share real estate companies listed in China between 2002 and 2007, according to the industry classification system of the China Securities Regulatory Commission. Because there is an insufficient

[2] However, it may influence discretionary accruals systematically by stock, etc.

Table 1
Sample selection process.

Year	*N*	Listed less than 1 year	ST	Value missing	Sample
Panel A					
2002	42	8	3	2	29
2003	52	8	6	1	37
2004	53	10	6	1	36
2005	56	8	4	1	43
2006	56	10	6	1	39
2007	68	12	7	1	48
Sum	327	56	32	7	232

Year	All	*SOE*	Non-*SOE*
Panel B			
2002–2003	66	45	21
2004–2007	166	105	61
Sum	232	150	82

This table gives the sample selection process in Panel A and shows the distribution of all enterprises as well as the distribution of SOEs and Non-SOEs in the two periods of macroeconomic control in Panel B.

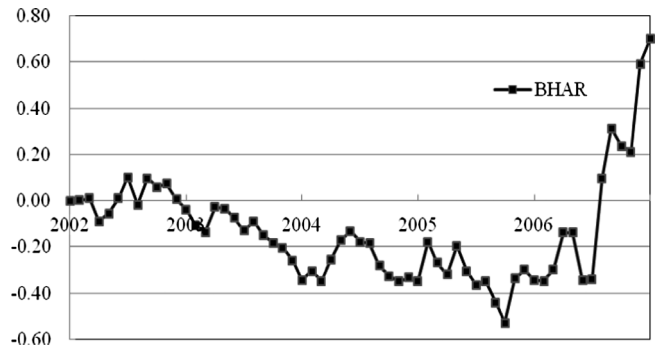

Fig. 1. The annual cumulative abnormal returns of listed real estate companies from 2002 to 2006. This figure shows the annual cumulative abnormal returns of listed real estate companies from 2002 to 2006, which are significant lower than zero during the retrenchment period (2004–2006).

sample and too much missing data prior to 2002, we choose 2002 as the starting point. With respect to the government regulation of the real estate market in China, 2002–2003 can be defined as an incentive period and 2004–2007 can be defined as a retrenchment period. Accordingly, we define 2007 as our finishing point.[3] Further selection of the data from the CSMAR database was conducted on the basis of the following points: (1) to avoid the IPO effect, companies listed for less than 1 year were removed; (2) special treatment (ST) companies, specifically for the years during, before and after the ST, were removed (Lu, 1999); (3) missing financial data was collecting manually and companies that still lacked financial data after the manual collection process were removed from the sample. Finally, we collected a total of 232 firm-year observations. The sample selection process is depicted in Table 1, Panel A. Panel B of Table 1 shows the distribution of all enterprises as well as the distribution of state-owned and non-state-owned companies in the two periods of macroeconomic control.

3.2. Event study

In this section, we investigate the impact of the real estate market control policies using event study methodology, before discussing the descriptive statistics and presenting the regression analysis.

The annual cumulative abnormal returns of listed real estate companies from 2002 to 2006 are shown in Fig. 1.[4] As can be seen in Fig. 1, there is no clear trend in the cumulative abnormal returns of the real estate industry during the incentive period (2002–2003). However, during the retrenchment period (2004–2006), the cumulative abnormal returns are significantly lower than zero.[5] This suggests that the government's real estate control policies may indeed have had a significant impact. In particular, the control policies during the retrenchment period may have had an adverse effect on the value of listed real estate companies.

[3] We also consider the lagged effects of policy implementation, as some tightening policies had in fact been introduced as early as April 2003.

[4] Because real estate companies generated huge returns in 2007, Fig. 1 ends at 2006. If the window ended at 2007, the prior fluctuations would not be obvious. The cumulative abnormal returns (BHAR) are calculated as follows: $BHAR_t = \frac{1}{N}\sum_{i=1}^{N}\Pi_{t=1}^{t}(1+\text{Return}_{i,t} - \Pi_{t=1}^{t}(1+\text{ReturnM}_t)$ Return_i is monthly accumulated returns of each stock, ReturnM is monthly accumulated returns of the capital market, N is the number of stocks, and t is the observation time.

[5] The cumulative abnormal returns after the middle of 2006 are positive at which point the market changes into a bull market. There may be some correlation between these two periods.

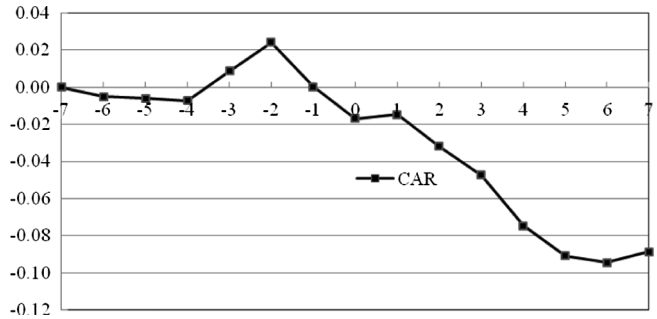

Fig. 2. The cumulative abnormal returns around 'Action Six'. This figure shows the cumulative abnormal returns of listed real estate companies around 'Action Six', which seems to have a negative effect on the market value of listed real estate companies.

Here, we also study a specific example of a single event. On May 29, 2006, the State Council issued a document titled, "Guidance on the adjustment of housing supply structure and stabilizing housing prices" (SCS (2006) 37, called "Action Fifteen" by the nine government ministries). This document supplemented the earlier "Action Six" in limiting dwelling size and the percentage of small units, and increasing the down payment on a first house. Specifically, houses smaller than 90 square meters were required to occupy at least 70% of the total construction area and at least 70% of new residential land should be used to construct affordable housing.

Why have we chosen to study this event? The main reason is that this policy had a direct impact on the future scale and standards of housing construction. It also changed people's housing needs and the supply structure of real estate companies, increasing the risks and uncertainties faced by real estate enterprises. Furthermore, as the policy makes clear reference to future housing control policies, it indicates that any subsequent regulations will be substantial. Therefore, we predict that the market will interpret this news as a negative event for listed real estate companies and that we will find negative cumulative returns.[6]

The results shown in Fig. 2 are consistent with our expectations. The figure indicates that the government's macroeconomic control policy had a negative effect on the market value of listed real estate companies.

3.3. Variable definitions

3.3.1. Dependent variables

To test our hypotheses, we use discretionary accruals (*DA*) as the dependent variable. Dechow et al. (1995) and Xia (2003) test earnings management measurement models in the United States and China, respectively. Their results indicate that the modified Jones model (Jones, 1991) provides a good estimation of corporate earnings management. Therefore, we follow their methodology to calculate discretionary accruals. Eq. (a):

$$TA_{it}/A_{it-1} = \alpha_i[1/A_{it-1}] + \beta_{1i}[\Delta REV_{it}/A_{it-1} - \Delta REC_{it}/A_{it-1}] + \beta_{2i}[PPE_{it}/A_{it-1}] + \xi_{it} \quad (a)$$

where TA_{it} is total accruals of company i in year t, which equals net profit minus net operating cash flow; ΔREV_{it} is the yearly change in operating income of company i in year t; PPE_{it} is fixed assets of property, plant and equipment of company i in year t; A_{it-1} is the previous year's total assets of company i; and ΔREC_{it} is the change in the receivables of company i in year t.

Each company's non-discretionary accruals are calculated using Eq. (b):

$$NDA_{it}/A_{it-1} = \alpha_i[1/A_{it-1}] + \beta_{1i}[\Delta REV_{it}/A_{it-1} - \Delta REC_{it}/A_{it-1}] + \beta_{2i}[PPE_{it}/A_{it-1}] \quad (b)$$

Each company's discretionary accruals are calculated by Eq. (c):

$$DA_{it} = TA_{it} - NDA_{it} \quad (c)$$

3.3.2. Independent variables

In this section, we focus on finding an appropriate proxy for political costs. We consider this issue from multiple viewpoints and by integrating the theoretical analysis presented in earlier sections of this paper. First, following previous research (Cahan et al., 1997; Key, 1997), we use the two periods of macroeconomic control of the real estate industry as the basis for the dummy variable *GROUP*. *GROUP* is a dummy variable that equals 1 if the year is between 2004 and 2007, and 0 otherwise. If companies are more sensitive to political costs during tightening years, *GROUP* will be significantly negative. Second, if the real estate industry is booming, the government may introduce regulations that focus on house prices, which are directly related to real estate companies' profits. Therefore, real estate companies may be more likely to decrease their earnings when real estate prices are rapidly increasing. As a result, we select the national average growth rate of house

[6] Notes: $CAR_t = \frac{1}{N}\sum_{i=1}^{N}\sum_{t=1}^{t} YReturn_{i,t} - ReturnM_tY$. $Return_i$ is the monthly accumulated returns of each stock, ReturnM is the monthly accumulated returns of the capital market, N is the number of stocks, and t is the observation time.

prices (*GROWTH*) as an alternative measure for political costs. Furthermore, we also derive a variable that includes the purchasing power of residents, the average growth in house prices divided by the increase in the average worker's wage (*RATIO*), as another alternative measure.

3.3.3. Control variables

Based on previous research, we control for the following variables:

Company type (*SOE*) is a dummy variable that equals 1 if company is a state-owned listed company, and 0 otherwise.

Company size (*SIZE*) is the natural logarithm of a company's total fiscal year assets. Watts and Zimmerman (1978) pointed out that, with respect to antitrust legislation, large companies are more likely to manage earnings to avoid regulation. Many Western scholars have since used size as a proxy for political costs. However, in the institutional context of China, the government does not impose regulations on large enterprises because of their monopoly situation and, on the contrary, encourages enterprises to become "become bigger and stronger". In addition, Wang (2000) and Qiao et al. (2005) agree that size is not suitable as a measure of political costs in research on China. Nevertheless, to ensure our findings are comparable with previous studies, we still take firm size (*SIZE*) into account in this paper.

We use *ROA* (return on total assets) as a measure for corporate operating conditions. A company's choice of accounting policy may be affected by its current economic condition. Companies in good operating and financial condition are more willing to adopt accounting policies that can reduce current earnings or smooth earnings. Dechow et al. (1995) found that it is necessary to control for *ROA*, which is a variable for operating conditions, when the manipulation of accruals is associated with company performance. Lei and Liu (2006) also found that company earnings management is positively related to *ROA* in China.

Asset liability ratio (*LEV*). Under uniform conditions, companies that face the risk of violating their debt contracts are more likely to choose accounting procedures that can shift future earnings to the current period to avoid default costs. Studies have found that the asset-liability ratio is positively associated with earnings management (Dechow et al., 1995, 1996; Bartov et al., 2000). This shows that, to avoid violating their debt contracts, companies will carry out aggressive accounting policies.

Accruals during the previous period (*L_TA*). Previous research has shown that accrual reversals do actually occur (Dechow et al., 1995; Sloan, 1996). The higher the accruals during the previous period, the less possible it is for managers to introduce accounting policies capable of increasing current earnings.

Change of board chairman (*CHANGE*), is a dummy variable equal to 1 if the chairman of the board changes, and 0 otherwise. A change of manager can bring changes to a company's production plan and investment and financing strategies. These changes can depreciate the original value of assets. To better fulfill a company's future profitability goals, a new manager may manage earnings to shift responsibility to the previous manager. Warner and Wruck (1988) found that a change of manager is negatively related to corporate performance in the United States. In addition, Zhu (2002) found that a change of chairman is associated with earnings management in China.

Largest shareholder (*TOP*). Whether in developed or developing countries, once in a position of majority control, the largest shareholder may accrue private benefits through certain channels within the corporation, such as payments of special dividends and connected transactions. These practices can lead to the exploitation of minority shareholders (Claessens et al., 2000). Li and Guan (2004) found that in the case of extreme shareholder concentration, large shareholders have incentives to supervise managers and to become actively involved in corporate governance. However, once they gain complete control of the company, largest shareholders often exploit the interests of minority shareholders by decreasing the quality of accounting information.

The main variables and their definitions are shown in Table 2.

Table 2
The variables.

Variables	Name	Symbols	Definitions
Dependent variables	Handling accruals	*DA*	Calculated by Jones model
Independent variables	Year groups	*GROUP*	Equals 1 if year is between 2004–2007; and 0 otherwise
	National average growth rate of house prices	*GROWTH*	National average growth rate of house prices
	Average house price growth divided by growth rate of the average worker's wage	*RATIO*	Average house price growth divided by growth rate of the average worker's wage
Control variables	Company's nature	*SOE*	Equals 1 if company is a state-owned listed company, 0 otherwise
	Company size	*SIZE*	Equals natural logarithm of total fiscal year assets
	Return on total assets	*ROA*	Return on total assets
	Asset liability ratio	*LEV*	Total liabilities divided by total assets
	Accruals of previous period	*L_TA*	Accruals of previous period divided by assets of previous year
	Change of board chairman	*CHANGE*	Equals 1 if chairman of the board changes, 0 otherwise
	Largest proportion of shareholding	*TOP*	Largest proportion of shareholding

This table describes the variables collected for the 232 sample in our study. The first column gives the types of the variable, the second column gives the name of the variables, the third column gives the symbols of the variable and the last column gives the definitions of the variables.

Table 3
Descriptive statistics of the main variables.

Variables	*N*	Mean	Lower quartile	Medium	Upper quartile	Standard deviation
GROUP	232	0.7155	0.0000	1.0000	1.0000	0.4521
GROWTH	232	0.1070	0.0484	0.1404	0.1476	0.0531
RATIO	232	0.7014	0.3719	0.7886	0.9614	0.3408
SOE	232	0.6466	0.0000	1.0000	1.0000	0.4791
SIZE	232	21.7153	21.0406	21.7601	22.2994	0.9656
ROA	232	0.0292	0.0118	0.0308	0.0492	0.0392
LEV	232	0.5634	0.4667	0.5825	0.6801	0.1577
L_TA	232	0.0341	−0.0471	0.0262	0.1063	0.1548
CHANGE	232	0.2974	0.0000	0.0000	1.0000	0.4581
TOP	232	0.3801	0.2592	0.3326	0.5052	0.1700

This table lists the descriptive statistics of the main variables used in this paper.

Table 4
DA in different groups.

Variable	Year group	*N*	Mean	Medium	*T* value	*Z* value
Panel A						
DA	2002–2003	66	0.0391	0.0078	−0.13	0.17
	2004–2007	166	0.0357	0.0276		
Panel B						
SOEs	2002–2003	45	0.0416	−0.0142	0.87	1.41
	2004–2007	105	0.0705	0.0453		
Non-SOEs	2002–2003	21	0.0338	0.0082	−1.48	−1.51
	2004–2007	61	−0.0242	−0.0201		

Variable	Year group	Nature	*N*	Mean	Medium	*T* value	*Z* value
Panel C							
DA > 0	2002–2003	*SOEs*	22	0.1723	0.1287	−1.00	−0.85
		Non-SOEs	12	0.1109	0.0745		
	2004–2007	*SOEs*	65	0.1694	0.1070	−1.05	−1.27
		Non-SOEs	27	0.1327	0.0872		
DA < 0	2002–2003	*SOEs*	23	−0.0834	−0.0634	0.48	1.01
		Non-SOEs	9	−0.0690	−0.0563		
	2004–2007	*SOEs*	40	−0.0902	−0.0677	−2.33**	−2.53**
		Non-SOEs	34	−0.1488	−0.1242		

Note: ***,**,* Indicate statistical significance at the 1%, 5%, and 10% levels.
Panel A shows that there is no significant difference in *DA* between the 2002-2003 and 2004-2007 groups. Panel B shows that the mean and median *DA* of non-state-owned companies in 2004-2007 is lower than that of 2002-2003, but the difference is not significant. Panel C shows that in the group in which *DA* are negative in 2004-2007, the *DA* of Non-SOEs is less than those of SOEs.

3.4. Descriptive statistics

Table 3 lists the descriptive statistics of the main variables used in this paper. Table 3 shows that the mean (median) of *GROWTH* is 0.1070 (0.1404), indicating that China's housing market has experienced a high rate of growth in recent years. In this case, the government is likely to impose regulations on listed real estate companies. Table 3 also shows that the mean (median) of *RATIO* is 0.7014 (0.7886), which means that 70% of the growth in wages was offset by increases in housing prices.

Next, we compare discretionary accruals (*DA*) for different years and for different types (state-owned and non-state-owned) of listed real estate companies. Table 4 Panel A shows that there is no significant difference in *DA* between the 2002–2003 and 2004–2007 groups. Table 4 Panel B shows that the mean and median *DA* of non-state-owned companies in 2004–2007 is lower than that of 2002–2003, but the difference is not significant. Furthermore, the observations were divided into two groups according to whether *DA* is positive or negative. Table 4 Panel C shows that in the group in which *DA* are negative in 2004–2007, the *DA* of non-state-owned real estate companies is less than those of state-owned real estate companies. The mean (median) *DA* is −0.0902 (−0.0677) in the state-owned group, and −0.1488 (−0.1242) in the non-state-owned group. Both mean and median tests are significant.

3.5. Regression analysis

3.5.1. Political costs and earnings management

To test Hypothesis 1: listed real estate companies are more likely to decrease earnings when there are greater political costs, we build Model (1) based on Bo and Wu (2009). *POLI* is the variable for political costs, specifically measured by the

three variables: *GROUP*, *GROWTH* and *RATIO*. According to Hypothesis 1, *POLI* should be significantly negative. Model (1) is as follows:

$$DA = \beta_0 + \beta_1 POLI + \beta_2 SIZE + \beta_3 ROA + \beta_4 LEV + \beta_5 L\_TA + \beta_6 CHANGE + \beta_7 TOP + \varepsilon \quad (1)$$

Table 5
Correlations.

	DA	*GROUP*	*GROWTH*	*RATIO*	*SIZE*	*ROA*	*LEV*	*L_TA*	*CHANGE*	*TOP*
DA	1	0.0113	0.0140	−0.0282	0.3260	0.2696	0.1071	0.2513	−0.0706	−0.0158
		0.8644	0.8322	0.6692	<.0001	<.0001	0.1036	0.0001	0.2842	0.8107
GROUP	−0.0083	1	0.7933	0.7932	0.1608	0.1026	0.0474	−0.0127	−0.0287	−0.1171
	0.9002		<.0001	<.0001	0.0142	0.1192	0.4728	0.8475	0.6642	0.0752
GROWTH	−0.0519	0.7570	1	0.9068	0.1250	0.1297	0.0482	0.0715	−0.0707	−0.0351
	0.4317	<.0001		<.0001	0.0573	0.0485	0.4653	0.2782	0.2837	0.5944
RATIO	−0.0697	0.7043	0.9627	1	0.0579	0.0661	0.0581	0.0241	−0.1119	−0.0230
	0.2908	<.0001	<.0001		0.3803	0.3161	0.3782	0.7147	0.0890	0.7278
SIZE	0.3808	0.1647	0.0986	0.0426	1	0.2653	0.1233	0.1645	−0.1261	0.0556
	<.0001	0.0120	0.1342	0.5186		<.0001	0.0608	0.0121	0.0551	0.3993
ROA	0.2373	0.0775	0.0645	0.0257	0.1865	1	−0.2596	0.1365	−0.1565	0.0063
	0.0003	0.2399	0.3283	0.6973	0.0044		<.0001	0.0378	0.0171	0.9235
LEV	0.1190	0.0480	0.0339	0.0487	0.1433	−0.2934	1	0.1296	−0.0032	−0.0778
	0.0705	0.4667	0.6071	0.4608	0.0292	<.0001		0.0487	0.9617	0.2376
L_TA	0.2550	−0.0328	0.0478	0.0400	0.1965	0.1565	0.1337	1	−0.1274	−0.0523
	<.0001	0.6196	0.4687	0.5443	0.0026	0.0171	0.0419		0.0527	0.4279
CHANGE	−0.0770	−0.0287	−0.0847	−0.1178	−0.0992	−0.1096	−0.0302	−0.0922	1	−0.0179
	0.2430	0.6642	0.1984	0.0733	0.1318	0.0958	0.6476	0.1615		0.7865
TOP	0.0008	−0.1091	−0.0241	−0.0111	0.0126	0.0384	−0.0922	−0.0288	−0.0024	1
	0.9899	0.0974	0.7150	0.8664	0.8487	0.5610	0.1615	0.6622	0.9710	

This table provides the correlation matrix of the main variables, comprising Pearson correlation coefficients in the lower triangular matrix and Spearmen correlation coefficients in the upper triangular matrix.

Table 6
The relation between *DA* and political costs in pooled samples.

Variable	Symbol	*GROUP*	
		Coefficient	*T* value
Panel A			
Intercept	*CONS*	−1.3586***	−5.24
Political costs	*POLI*	−0.0316	−1.26
Company size	*SIZE*	0.0603***	4.93
Return on total assets	*ROA*	0.9346***	3.00
Asset liability ratio	*LEV*	0.1372*	1.79
Accruals of previous period	*L_TA*	0.1746**	2.33
Change of board chairman	*CHANGE*	−0.0041	−0.17
Largest proportion of shareholding	*TOP*	−0.0045	−0.07
Adj R^2		0.1923	
F value		8.86	
N		232	

Variable	Symbol	*GROWTH*		*RATIO*	
		Coefficient	*T* value	Coefficient	*T* value
Panel B					
Intercept	*CONS*	−1.3250***	−5.15	−1.3006***	−5.04
Political costs	*POLI*	−0.3781*	−1.80	−0.0558*	−1.71
Company size	*SIZE*	0.0595***	4.93	0.0583***	4.84
Return on total assets	*ROA*	0.9320***	3.01	0.9163***	2.96
Asset liability ratio	*LEV*	0.1368*	1.79	0.1383*	1.81
Accruals of previous period	*L_TA*	0.1845**	2.48	0.1847**	2.48
Change of board chairman	*CHANGE*	−0.0068	−0.28	−0.0084	−0.34
Largest proportion of shareholding	*TOP*	0.0021	0.03	0.0040	0.06
Adj R^2		0.1983		0.1971	
F value		9.16		9.10	
N		232		232	

Note: ***,**,* indicate statistical significance at the 1%, 5%, and 10% levels.
This table shows the regression results of model 1, which is to test the relation between *DA* and political costs in the pooled samples.

Table 7
The relation between *DA* and political costs in SOEs group and non-SOEs group.

Variable	Symbol	*SOEs*		Non-*SOEs*	
		Coefficient	*T* value	Coefficient	*T* value
Panel A					
Intercept	*CONS*	−1.1052***	−3.20	−1.3894***	−2.65
Year group	*GROUP*	−0.0130	−0.42	−0.0962**	−2.17
Company size	*SIZE*	0.0488***	3.09	0.0664**	2.61
Return on total assets	*ROA*	0.8934**	1.98	1.0134**	2.31
Asset liability ratio	*LEV*	0.1429	1.49	−0.0060	−0.04
Accruals of previous period	*L_TA*	0.3294***	3.20	−0.0435	−0.39
Change of board chairman	*CHANGE*	0.0140	0.45	−0.0565	−1.34
Largest proportion of shareholding	*TOP*	−0.0526	−0.66	0.1178	0.82
Adj R^2		0.1821		0.1815	
F value		5.74		3.57	
N		150		82	
Panel B					
Intercept	*CONS*	−1.0857***	−3.17	−1.1361**	−2.24
National average growth rate of house prices	*GROWTH*	−0.0281	−0.11	−1.1978***	−3.43
Company size	*SIZE*	0.0477***	3.05	0.0564**	2.32
Return on total assets	*ROA*	0.8942**	1.98	1.0375**	2.48
Asset liability ratio	*LEV*	0.1400	1.47	0.0074	0.06
Accruals of previous period	*L_TA*	0.3294***	3.19	0.0018	0.02
Change of board chairman	*CHANGE*	0.0137	0.44	−0.0648	−1.60
Largest proportion of shareholding	*TOP*	−0.0503	−0.63	0.1492	1.08
Adj R^2		0.18		0.25	
F value		5.71		4.83	
N		150		82	
Panel C					
Intercept	*CONS*	−1.0836***	−3.17	−1.0501**	−2.02
Average house price growth divided by growth rate of the average worker's wage	*RATIO*	−0.0095	−0.24	−0.1751***	−3.10
Company size	*SIZE*	0.0477***	3.08	0.0516**	2.08
Return on total assets	*ROA*	0.8922**	1.98	0.9751**	2.31
Asset liability ratio	*LEV*	0.1404	1.47	0.0347	0.27
Accruals of previous period	*L_TA*	0.3303***	3.20	0.0031	0.03
Change of board chairman	*CHANGE*	0.0132	0.43	−0.0694*	−1.68
Largest proportion of shareholding	*TOP*	−0.0500	−0.63	0.1414	1.01
Adj R^2		0.18		0.23	
F value		5.72		4.45	
N		150		82	

Note: ***,** indicate statistical significance at the 1% and 5% levels.
This table shows the relation between *DA* and political costs in SOEs group and Non-SOEs group.

Table 8
Test using interaction variable method.

Variable	Symbol	*GROUP*	*GROWTH*	*RATIO*
Intercept	*CONS*	−1.2227***	−1.1070***	−1.0873***
Political costs	*POLI*	−0.0673	−1.0892***	−0.1589***
Company's nature	*SOE*	−0.0179	−0.0910*	−0.0790
Company's nature * political costs	*SOE*POLI*	0.0567	1.0738**	0.1508**
Company size	*SIZE*	0.0549***	0.0525***	0.0512***
Return on total assets	*ROA*	0.9694***	0.9892***	0.9469***
Asset liability ratio	*LEV*	0.1360*	0.1378*	0.1457*
Accruals of previous period	*L_TA*	0.1659**	0.1773**	0.1768**
Change of board chairman	*CHANGE*	−0.0066	−0.0095	−0.0121
Largest proportion of shareholding	*TOP*	−0.0172	−0.0113	−0.0138
Adj R^2		0.19	0.21	0.21
F value		7.10	8.02	7.82
N		232	232	232

Note: ***,**,* indicate statistical significance at the 1%, 5%, and 10% levels.
This table shows the regression results of model 2 using interaction variable *SOE*POLI* to test the difference of political costs between SOEs and Non-SOEs.

Table 9
Analysis of central government enterprises.

Variable	Symbol	*GROUP*	*GROWTH*	*RATIO*
Intercept	*CONS*	−1.0285***	−1.0444***	−1.0463***
Political costs	*POLI*	−0.0169	0.0189	0.0055
Companies' nature	*CEN*	0.0211	0.0918	0.1438
Companies' nature * political costs	*CEN*POLI*	0.0402	−0.3609	−0.1281
Company size	*SIZE*	0.0451***	0.0452***	0.0453***
Return on total assets	*ROA*	0.7976*	0.7729*	0.7572
Asset liability ratio	*LEV*	0.1395	0.1316	0.1305
Accruals of previous period	*L_TA*	0.3188***	0.3278***	0.3313***
Change of board chairman	*CHANGE*	0.0089	0.0082	0.0057
Largest proportion of shareholding	*TOP*	−0.036	−0.0255	−0.0247
Adj R^2		0.18	0.18	0.18
F value		4.63	4.62	4.76
N		150	150	150

Note: ***,* indicate statistical significance at the 1% and 10% levels.
This table shows the regression results to test the difference of political costs between ordinary SOEs and central government enterprises. *CEN* is a dummy variable, which equals 1 if the firm is a central government enterprise, and 0 otherwise.

Table 5 provides the correlation matrix of the main variables, comprising Pearson correlation coefficients in the lower triangular matrix and Spearmen correlation coefficients in the upper triangular matrix. Table 5 shows that *DA* is negatively correlated with political costs and positively correlated with *SIZE*. This confirms that *SIZE* is not an appropriate variable for political costs in China. As the correlation matrix also shows, *DA* has a stronger relationship with *ROA*, *LEV*, *L_TA* and other variables.

The regression results of Model 1 are displayed in Table 6. Table 6 Panel A shows that the coefficient on *GROUP* is negative, but not significant. Table 6 Panel B shows that *DA* is significantly negatively related to *GROWTH* and *RATIO*. These results are consistent with our hypothesis, that the faster house prices grow, the more likely companies will manage earnings.

3.5.2. State-owned versus non-state-owned companies

We also compare the political costs of state-owned versus non-state-owned companies to test Hypothesis 2.

Table 7 shows the regression results. Table 7 Panel A shows that the coefficient on *GROUP* is negative in the state-owned group, but not significant. However, the coefficient on *GROUP* is significantly negative in the non-state-owned group, at the level of 5%. This shows that non-state-owned real estate companies had a stronger motivation to decrease their current earnings in the 2004–2007 period compared with the 2002–2003 period. However, this difference is not found in state-owned real estate listed companies.

Table 7 Panel B and Panel C show that the coefficients on *GROWTH* and *RATIO* are not significant in the state-owned group. However, in the non-state-owned group, the coefficient on *GROWTH* is −1.1978 and the coefficient on *RATIO* is −0.1751, both are significant at the 1% level. This suggests that, when house prices are used as a reference for political costs, non-state-owned companies are more sensitive to government regulation compared to state-owned enterprises. As political pressure increases, non-state-owned listed companies have a stronger motivation to decrease their current earnings. As state-owned real estate companies are able to get more implicit benefits from the government, such as more bank loans, they are not so sensitive to political costs.

To show our results are robust to different specifications, we use an additional model with interaction terms on the full sample. According to Hypothesis 2, the interaction term *SOE*POLI* should be significantly positive. Model (2) is as follows:

$$DA = \beta_0 + \beta_1 POLI + \beta_2 SOE + \beta_3 SOE * POLI + \beta_4 SIZE + \beta_5 ROA + \beta_6 LEV + \beta_7 L\_TA + \beta_8 CHANGE + \beta_9 TOP + \varepsilon \quad (2)$$

Table 8 shows the regression results. The coefficients on *SOE*GROWTH* and *SOE*RATIO* are both positive and significant at the 5% level, while the coefficient on *SOE*GROUP* is positive but not significant. These results confirm that non-state-owned enterprises are more sensitive to political costs than state-owned enterprises.

3.5.3. Analysis of central government enterprises

If non-state-owned enterprises are relatively more sensitive to political costs than state-owned enterprises, then it should also be the case that ordinary state-owned enterprises are more sensitive to political costs than central government enterprises. Therefore, we segregate our sample of state-owned enterprises by adding a dummy variable *CEN*, which equals 1 if the firm is a central government enterprise, and 0 otherwise to test our hypothesis. If ordinary state-owned enterprises are more sensitive to political costs than central government enterprises, then *CEN*POLI* should be significantly positive.

Table 9 shows these regression results. However, the coefficients on *CEN*POLI* are not significant, which means that ordinary state-owned enterprises are no more sensitive to political costs than central government enterprises.

Table 10
Robustness test on deposits.

Variable	Symbol	*SOE*s		Non-*SOE*s	
		Coefficient	*T* value	Coefficient	*T* value
Panel A					
Intercept	*CONS*	−13.4479***	−5.31	−19.3200***	−3.28
Year group	*GROUP*	−0.4744**	−2.08	1.4918***	−3.07
Company size	*SIZE*	1.4299***	−12.40	1.5531***	−5.48
Return on total assets	*ROA*	2.5751	−0.78	8.1250*	−1.68
Asset liability ratio	*LEV*	2.8971***	−4.11	5.4331***	−3.63
Accruals of previous period	*L_TA*	−1.3533*	−1.81	−0.0098	−0.01
Change of board chairman	*CHANGE*	−0.0015	−0.01	0.7896*	−1.71
Largest proportion of shareholding	*TOP*	−0.5369	−0.92	−0.6835	−0.44
Adj R^2		0.58		0.43	
F value		30.43		9.76	
N		148		81	
Panel B					
Intercept	*CONS*	−12.8344***	−5.04	−21.4755***	−3.52
National average growth rate of house prices	*GROWTH*	−1.6310	−0.85	8.8298**	−2.15
Company size	*SIZE*	1.3952***	−12.09	1.6759***	−5.77
Return on total assets	*ROA*	2.6087	−0.79	9.3873*	−1.90
Asset liability ratio	*LEV*	2.8159***	−3.95	5.0865***	−3.31
Accruals of previous period	*L_TA*	−1.3427*	−1.77	−0.8164	−0.67
Change of board chairman	*CHANGE*	−0.0194	−0.08	0.7638	−1.6
Largest proportion of shareholding	*TOP*	−0.4463	−0.75	−1.0199	−0.63
Adj R^2		0.57		0.40	
F value		29.17		8.58	
N		148		81	
Panel C					
Intercept	*CONS*	−12.7059***	−5.00	−22.4959***	−3.68
Average house price growth divided by growth rate of the average worker's wage	*RATIO*	−0.2220	−0.76	1.5482**	−2.37
Company size	*SIZE*	1.3886***	−12.10	1.7221***	−5.94
Return on total assets	*ROA*	2.5809	−0.78	9.6211*	−1.97
Asset liability ratio	*LEV*	2.8132***	−3.95	4.8591***	−3.19
Accruals of previous period	*L_TA*	−1.3432*	−1.76	−0.8074	−0.67
Change of board chairman	*CHANGE*	−0.0228	−0.10	0.8343*	−1.74
Largest proportion of shareholding	*TOP*	−0.4406	−0.74	−0.9804	−0.61
Adj R^2		0.57		0.41	
F value		29.12		8.83	
N		148		81	

Note: ***,**,* indicate statistical significance at the 1%, 5%, and 10% levels.
This table shows the regression results of model 3, which is to test the relation between deposits and political costs in SOEs group and Non-SOEs group.

3.6. Robustness tests

The magnitude of earnings management is an important issue to be explained in our paper. However, whether *DA* as calculated by the Jones model is applicable in this study is questionable for the following reasons. First, the Jones model has more explanatory power in relation to earnings management if there are a large number of sample years. However, as China's securities market has been in existence for less than 20 years, we do not have a long enough time-series sample of large-scale real estate companies. Second, real estate companies often have huge amounts of accrued profits and it is easier for them to manipulate profits through deposits received. Therefore, it is insufficient to only examine *DA*.

We therefore also investigate the deposits received by listed real estate companies. Real estate companies can manipulate earnings by reorganizing sales (e.g., confirming sales as deposits received). We build Model (3) using (*REP*) as the dependent variable based on deposits received. *REP* is the natural logarithm of deposits received:

$$REP = \beta_0 + \beta_1 POLI + \beta_2 SIZE + \beta_3 ROA + \beta_4 LEV + \beta_5 L\_TA + \beta_6 CHANGE + \beta_7 TOP + \varepsilon \quad (3)$$

We divide the sample based on company type (state and non-state). The results are shown in Table 10. Panel A shows that the coefficient on *GROUP* in the case of state-owned companies is significantly negative at the 5% level, after controlling for *ROA*. The coefficient on *GROUP* is significantly negative (−1.4918) at the 1% significance level, for non-state-owned companies. This means that in policy tightening years, non-state-owned real estate companies are more willing to recognize sales as deposits received to defer revenue recognition. However, the results are in contrast to those for state-owned real estate companies.

Table 11
Deposits test using interaction variable method.

Variable	Symbol	*GROUP*	*GROWTH*	*RATIO*
Intercept	*CONS*	−16.1524***	−15.8844***	−16.0880***
Political costs	*POLI*	1.3660***	8.3729**	1.4158***
Companies' nature	*SOE*	1.3150***	1.0345**	1.0767**
Companies' nature * political costs	*SOE*POLI*	−1.8851***	−10.2081**	−1.6443***
Company size	*SIZE*	1.4636***	1.4592***	1.4656***
Return on total assets	*ROA*	5.6684**	6.3966**	6.6431**
Asset liability ratio	*LEV*	3.5721***	3.4159***	3.3401***
Accruals of previous period	*L_TA*	−0.7652	−1.0566	−1.0395
Change of board chairman	*CHANGE*	0.2642	0.2504	0.2755
Largest proportion of shareholding	*TOP*	−0.2889	−0.2439	−0.2170
Adj R^2		0.53	0.51	0.52
F value		29.98	27.78	27.93
N		229	229	229

Note: ***,** indicate statistical significance at the 1% and 5% levels.
This table shows the regression results of model 4 using interaction variable *SOE*POLI* to test the difference between SOEs and Non-SOEs.

Table 10 Panel B and Panel C show that the coefficients on *GROWTH* and *RATIO* are not significant for state-owned companies, but are for non-state-owned companies. For non-state-owned enterprises, the coefficients on *GROWTH* and *RATIO* are positive and significant (8.8298 and 1.5482) at the 5% level. This suggests that, when house prices are used as a reference for national macroeconomic control policies, non-state-owned enterprises have a stronger motivation to hide profits by recognizing sales as deposits received compared to state-owned enterprises. This result confirms that state-owned enterprises face less pressure from political costs.

To reveal the connections more clearly, we use model (4) with interaction terms on the full sample. According to Hypothesis 2, the coefficient on *SOE*POLI* should be significantly negative. Model (4) is as follows:

$$REP = \beta_0 + \beta_1 POLI + \beta_2 SOE + \beta_3 SOE * POLI + \beta_4 SIZE + \beta_5 ROA + \beta_6 LEV + \beta_7 L\_TA + \beta_8 CHANGE + \beta_9 TOP + \varepsilon \quad (4)$$

The regression results are shown in Table 11. The coefficients on *POLI*SOE* are all negative. The coefficients on *SOE*GROUP* and *SOE*RATIO* are significant at the 1% level. The coefficient on *SOE*GROWTH* is significant at the 5% level.[7] Consistent with Table 10, these results show that non-state-owned enterprises are more sensitive to political costs than state-owned enterprises.

4. Conclusions, limitations and future research directions

Using a sample of listed real estate companies between 2002 and 2007, we conduct an empirical study of the political costs hypothesis for earnings management in the context of China. The results show that, to avoid the negative impact of tightening government policies, listed real estate companies have an incentive to decrease current earnings. The motivation to conduct earnings management is greater for non-state-owned real estate companies than state-owned companies. However, we do not find evidence that ordinary state-owned enterprises are more sensitive to political costs compared to central government enterprises. The results of our study demonstrate that close attention needs to be paid to economic indicators that act as references for macroeconomic controls when conducting earnings management research in the context of China.

Our first contribution to the earnings management literature is that company size, commonly used as a proxy for political costs in traditional Western research, does not apply in the context of China. Economic indicators that act as references to macroeconomic controls may be more accurate. Second, we test for differences in political cost sensitivity in different types of corporations, thereby enriching the approach to political costs research in China. Our findings provide a reference for government industrial policy during transition periods.

There are a number of limitations to this study. First, we created new variables as proxies for political costs that have never been used in previous studies. We do not study the importance of real estate prices for government regulation or how political costs are applied to the real estate industry. Further research is needed in this field, for example, to examine whether the ease of re-financing and the level of tax incentives play important roles in earnings manipulation. Second, our political cost indicator is limited to the macroeconomic level and we fail to identify the political costs of individual companies. In addition, as there are a variety of real estate price indexes, it may be questionable whether our indicator is the most appropriate. These choices may all have an impact on the final results. Third, our sample is limited to the real estate industry, which weakens the generalizability of our conclusions. Nonetheless, these limitations all provide directions for future research.

[7] We also conducted a test using the following variables: (1) *REP1* = deposit received/total revenue during the previous year; (2) *REP2* = deposit received/total assets during the previous year; (3) *REP3* = deposit received/total revenue; and (4) *REP4* = deposit received/total assets. The interceptions are always negative, but not always significant.

Acknowledgments

This paper is based on research supported by the National Social Science Foundation (08CJY2009) and the National Nature Science Foundation of China (70732002 and 70602011). We are grateful for the support we received from the International Accounting PhD Programs (IAPHD) scheme of Nanjing University as well as the support of the Accounting and Finance Research Institute of the Shanghai University of Finance and the Center for Economic Transformation and Development; the Study of Economic Growth and Structural Transformation and the 985 plan topics of Nanjing University; the New Century Excellent Talents Project; and the First Scholarship Award for Excellent Doctoral Student of the Education Ministry. We also appreciate the suggestions made by scholars attending the 2010 China Journal of Accounting Research Workshop, the 10th China Economics Annual Conference, and the 9th International Symposium on Empirical Accounting Research in China. We are thankful for the helpful advice of scholars, such as Yang Xiongsheng, Li Zhen, Su Xijia, Liu Feng, Wang Yuetang, Li Xinhe, Huang Zhizhong, Li Xiang, Yu Xin, Long Yuee, Qi Xiangqin, Shen Yongjian, Jiang Dequan and Xin Fu. However, we recognize that we are completely responsible for the content of this paper.

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China Journal of Accounting Research 4 (2011) 107–119

Contents lists available at SciVerse ScienceDirect

China Journal of Accounting Research

journal homepage: www.elsevier.com/locate/cjar

Do institutional investors have superior stock selection ability in China?

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ARTICLE INFO

Article history:
Received 18 October 2010
Accepted 28 March 2011
Available online 7 September 2011

JEL classification:
G14
G20

Keywords:
Institutional investors
Stock selection ability
Individual investors

ABSTRACT

This paper uses unique data on the shareholdings of both institutional and individual investors to directly investigate whether institutional investors have better stock selection ability than individual investors in China. Controlling for other factors, we find that institutional investors increase (decrease) their shareholdings in stocks that subsequently exhibit positive (negative) short- and long-term cumulative abnormal returns. In contrast, individual investors decrease (increase) their shareholdings in stocks that subsequently exhibit positive (negative) short- and long-term cumulative abnormal returns. These findings indicate that institutional investors have superior stock selection ability in China.

1. Introduction

Institutional investors are playing an increasingly important role in global capital markets. In 2005, institutional investors held 65% of the equity in firms listed on the NYSE/AMEX, indicating a compound annual growth rate of 6.3% over the past 25 years (Agarwal, 2005). In China, institutional investors held 44% of the tradable equity value in the stock market in July 2007, an increase of 25% since the end of 2004. To identify profitable investments, institutional investors incur large expenses on stock selection. As indicated by Kent et al. (1997), total costs in the mutual fund industry exceed $10 billion per year and more than half of these expenses are incurred in their stock selection efforts. However, the extent to which institutional investors' stock selection costs and efforts are transformed into superior stock selection remains an important and open research question for both practitioners and academic researchers. While there is already a large body of literature on this issue, the results have been mixed. Further research on this issue, particularly in the context of China, provides us with a greater understanding of investor behavior in the stock market.

A number of academic studies have examined the stock selection ability of mutual funds. Beginning with Jensen (1968), most academic studies have concluded that mutual funds do not have superior stock selection ability. Later studies have come to similar conclusions, including Chang and Lewellen (1984), Malkiel (1995) and Gruber (1996). Most recently, Fama and French (2010) find that the aggregate portfolio of actively managed US equity mutual funds is close to the market

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1755-3091/$ - see front matter
doi:10.1016/j.cjar.2011.06.001

portfolio, but the high costs of active management result in lower returns to investors. Their bootstrap simulations suggest that few funds produce benchmark-adjusted excess returns sufficient to cover their costs. However, the results of other studies, such as Grinblatt and Titman (1989), Lee and Rahman (1991), Grinblatt and Titman (1992), Hendricks et al. (1993), Goetzmann and Ibbotson (1994), Womack (1996), Bello and Janjigian (1997), Kent et al. (1997) and Chen et al. (2000), suggest that mutual funds in the US do have some stock selection ability.

More recently, studies have started investigating the trading of individual investors relative to institutional investors. San (2007) finds that individual investors are more likely to realize their profits by selling their holdings and their stock selection earned about 2% per month more than institutional investors in the late 1990s bubble. Kaniel et al. (2008) find that individual investors tend to buy stocks following a price decline in the previous month and sell following a price increase. They document positive excess returns in the month following intense buying by individual investors and negative excess returns after selling by individual investors. Because institutional investors are trading in the same markets as individual investors, these results suggest that individual investors are better at stock selection than institutional investors.

Although these studies have frequently provided important insights into US markets and US institutional investors, the applicability of these findings to other markets is questionable because of institutional and environmental differences between countries and regions. In fact, a number of researchers have been working on this issue. Kang and Stulz (1997) study stock ownership in Japanese firms by non-Japanese investors from 1975 to 1991. Their results suggest that foreign investors, mostly foreign institutional investors, have superior stock selection ability in Japan. Grinblatt and Keloharju (2000) find that foreign investors, mostly institutional investors, seem to outperform the portfolios of households in Finland. Seasholes (2000) finds that foreign institutional investors buy (sell) ahead of good (bad) earnings announcements in Taiwan, whereas local investors do the opposite. These findings suggest that institutional investors have superior stock selection ability in these markets. Other studies suggest that institutional investors do not have superior stock selection ability in other countries, such as Korea (Choe et al., 2001) and Turkey (Aragon et al., 2007). Taken together, the evidence indicates that institutional and environmental differences between markets are important.

Most of the above studies focus on the US market. They use indirect methods, Jensen's alpha or a decomposition of Jensen's alpha, or a Treynor-Mazuy model, a modified security market line approach first suggested by Treynor and Mazuy (1966) and later refined by Bhattacharya and Pfleiderer (1983), to examine the stock selection ability of institutional investors through analysis of their performance. The key is to decompose the excess performance of institutional investors into two sources: stock selection ability and timing ability. Bollen and Busse (2001) use daily tests that are more powerful than the previously used monthly tests to examine the timing ability of mutual funds and find that mutual funds may possess better timing ability than previously documented. San (2007) provides a possible explanation for the inferior performance of institutional investors, which are found to hold winners too long and miss-time momentum cycles.

With its increasing economic scale and growing stock market, China is playing an increasingly significant role in global capital markets. In July 2009, the market value of stocks in China's capital market reached US$3.2 trillion, ranking China second worldwide. However, the literature covering institutional investors in China is scarce. Table 1 compares the performance of mutual funds and the market index in China. It shows that more than 50% of both open funds and closed-end funds outperform the market index (net of management fees). However, closed-end funds insignificantly outperform the market, indi-

Table 1
Performance comparison between mutual funds and the market index in China. This table reports the performance (net of fees) comparison between mutual funds and the market index in China from 2001 to 2010. Panel A, Panel B, Panel C and Panel D report the results based on monthly, quarterly, half-yearly and yearly averaged daily performance, respectively.

	N	Fund	Market	Fund-Market	*T*-Value	Proportion outperforming (%)
Panel A: Monthly averaged daily performance (%)						
Closed-end funds	300	0.1465	−0.0181	0.1646	1.61	63.33
Open funds	23,717	0.0676	0.0309	0.0367***	12.22	54.37
Total	24,017	0.0686	0.0302	0.0383***	11.86	54.48
Panel B: Quarterly averaged daily performance (%)						
Closed-end funds	83	0.1746	−0.0009	0.1755	1.28	57.88
Open funds	7692	0.0735	0.0449	0.0286***	12.30	60.70
Total	7775	0.0746	0.0444	0.0302***	11.05	60.67
Panel C: Half-yearly averaged daily performance (%)						
Closed-end funds	39	0.2002	0.0109	0.1893	1.27	58.97
Open funds	3720	0.0704	0.0405	0.0299***	9.66	61.53
Total	3759	0.0718	0.0402	0.0315***	9.19	61.51
Panel D: Yearly averaged daily performance (%)						
Closed-end funds	14	0.0323	−0.0150	0.0473	1.49	71.43
Open funds	1690	0.0730	0.0447	0.0282***	9.59	68.22
Total	1704	0.0726	0.0443	0.0284***	9.69	68.25

*Denote significance at the confidence level of 10%.
**Denote significance at the confidence level of 5%.
*** Denote significance at the confidence level of 1%.

cating that performance among them may vary significantly, with some extremely high returns and some extremely low returns. Open funds consistently outperform the market and they comprise more than half of the mutual fund industry in China. In total, the annualized data shows that mutual funds in China outperform the market by 0.0284% per day,[1] suggesting the huge effort that mutual funds put into research and stock selection is not a zero-sum game. Furthermore, Yu et al. (2009) investigate differences in the returns between institutional and individual investors and find that institutional investors outperform individual investors in China. However, they do not document the performance difference due to stock selection.

We use unique data on the shareholdings of both institutional and individual investors to directly investigate whether institutional investors have better stock selection ability than individuals in China. Based on the intuitive idea that institutional investors will be more likely to buy future winners and sell future losers than individual investors, we first sort stocks by future price performance into ten deciles and examine the difference between institutional and individual investor daily trading among deciles. The sorting evidence is consistent with our hypothesis that institutional investors have better stock selection ability than individual investors. We also regress institutional and individual investor daily trading on future stock performance while controlling for other factors, such as size and momentum effects. We find that institutional investors increase (decrease) their shareholdings in stocks that subsequently exhibit positive (negative) short- and long-term cumulative abnormal returns. In contrast, individual investors decrease (increase) their shareholdings in stocks that subsequently exhibit positive (negative) short- and long-term cumulative abnormal returns. These findings indicate that institutional investors have superior stock selection ability in China.

To our knowledge, this paper is the first to use daily trading data for institutional and individual investors to directly examine whether institutional investors have superior stock selection ability. We find that institutional investors have better stock selection ability than individual investors in China. The remainder of the paper is organized as follows. Section 2 reviews the extant literature and develops our research hypotheses. Section 3 describes our research design. The empirical results are provided in Section 4 and Section 5 concludes.

2. Literature review and hypotheses

2.1. Literature review

Trueman (1988) presents a theoretical model showing that the incentive for one type of institutional investor – managers of investment funds – to engage in noise trading arises because of the positive signal that the level of the manager's trading provides about his or her ability to collect private information concerning current and potential investments. If the manager's compensation is directly related to investors' perceptions of his or her ability, the manager will trade more frequently than is justified on the basis of his or her private information. This suggests that institutional investors are not necessarily rational investors with superior stock selection ability.

A number of empirical studies focus on mutual funds. Jensen (1968) was the first to evaluate the performance of mutual funds over the period 1945–1964 and documents evidence that mutual funds do not have significant stock selection ability. Similar results are found in subsequent research, such as Chang and Lewellen (1984), Malkiel (1995), Gruber (1996) and Kent et al. (1997). However, Grinblatt and Titman (1989) examined the 1975–1984 quarterly holdings of a sample of mutual funds and found that the risk-adjusted gross returns of some funds were significantly positive. Other research also suggests that mutual funds have some stock selection ability, such as Lee and Rahman (1991), Grinblatt and Titman (1992), Hendricks et al. (1993), Goetzmann and Ibbotson (1994), Womack (1996), Bello and Janjigian (1997), Kent et al. (1997) and Chen et al. (2000). Moreover, Chen et al. (2000) document evidence that funds with the best past performance have better stock-picking skills than funds with the worst past performance, suggesting that stock selection ability may differ among institutional investors.

Researchers have also examined the stock-picking ability of other types of institutional investors. Womack (1996) analyzes the new buy and sell recommendations of security analysts at major US brokerage firms and finds that analysts appear to have stock-picking ability. Metrick (1999) analyzes the equity-portfolio recommendations made by investment newsletters between July 1980 and December 1996 and finds no significant evidence of superior stock-picking ability for the overall sample of 153 newsletters, suggesting that investment newsletters in the US do not have superior stock selection ability.

Other studies have recently investigated trading by individual investors relative to institutional investors. San (2007) uses data on institutional holdings and trading volume for all NYSE and Nasdaq-NM stocks from 1986 to 2001 and examines whether trading by institutional investors is more profitable than trading by individual investors. He finds that individual investors realize superior gains by selling and that their trading was about 2% per month more profitable than institutional investors in the late 1990s bubble. He also provides a possible explanation for the inferior performance of institutional investors, as they tend to hold winners too long and miss-time momentum cycles. Kaniel et al. (2008) investigate the dynamic relation between net individual investor trading and short-horizon returns for a large cross-section of NYSE stocks. They find

[1] There may be a question as to why individuals do not invest all of their money in mutual funds given that they outperform the market index in China. This can be partly explained by behavioral considerations, such as people preferring to control their own money or that they *ex ante* expect that they can beat mutual funds because some mutual funds do underperform the market index *ex post*. The sometimes irrational trading behavior of mutual fund managers disclosed by the China Securities Regulatory Commission may also dent individuals' confidence in mutual funds. Moreover, some people in China regard investing in the stock market by themselves as an interesting form of entertainment.

that individual investors tend to buy stocks following declines in the previous month and sell following price increases. They also document positive excess returns in the month following intense buying by individual investors and negative excess returns after selling by individual investors. Because institutional investors are trading opponents of individual investors, institutional investors suffer from negative excess returns in the month following buying and positive excess returns after selling. These findings indicate that individual investors have better stock selection ability than institutional investors.

The above mentioned literature concentrates on institutional investors in the US, however, researchers are increasingly studying institutional investors in other markets. Kang and Stulz (1997) studied stock ownership in Japanese firms by non-Japanese investors from 1975 to 1991. They find that foreign investors, mostly foreign institutional investors, outperform domestic investors in Japan. Grinblatt and Keloharju (2000) conducted a simultaneous analysis of the investment behavior and performance of various investor types and find that foreign investors, mostly institutional investors, seem to outperform the portfolios of households, even after controlling for behavioral differences showing that foreign investors tend to be momentum investors and households tend to be contrarians. Seasholes (2000) finds that foreign institutional investors buy (sell) ahead of good (bad) earnings announcements in Taiwan, whereas local investors do the opposite. Using trading data from Korea from December 1996 to November 1998, Choe et al. (2001) find that foreign investors, all of whom are institutional investors, buy at significantly higher prices and sell at significantly lower prices than domestic individuals for medium and large trades. They also find that foreign institutional investors are at less of a disadvantage relative to domestic institutions than relative to domestic individuals. However, for large trades, the disadvantage of foreign institutional investors seems to persist.

Recently, Aragon et al. (2007) examined whether institutional investors have superior stock selection ability relative to individual investors in Turkey. They compared the portfolio returns of each investor group with a benchmark portfolio that has the same exposure to local market, size, and book-to-market factors and estimate the intercepts of the domestic market model to be 7.71% and 7.12% for individual investors and institutional investors, respectively, with the difference between these estimates statistically insignificant. They also use the "benchmark-free" measure developed by Grinblatt and Titman (1993) and estimate the annualized risk-adjusted returns as −0.08% and −0.45% for individual investor and institutional investor portfolios respectively, with the difference statistically insignificant.

In summary, the mixed results in the extant literature indicate that the extent to which institutional investors' stock selection costs and efforts are transformed into superior stock selection ability remains an open research question. Furthermore, the stock selection abilities of institutional investors also seem to differ across markets.

2.2. Hypothesis development

Assuming that institutional investors have better stock selection ability than individuals, they should be able to form a more accurate estimate of the intrinsic value of companies to better predict future stock price performance. Thus, institutional investors will buy stocks which they believe are going to be future winners and sell those which they predict to be future losers, which will be more accurate than individual investors' predictions. Furthermore, since individual investors are the trading counterparty of institutional investors, they are more likely to buy future losers and sell future winners. Therefore, our hypotheses are as follows:

H1: Changes in institutional investor ownership are positively correlated with subsequent abnormal returns.
H2: Changes in individual investor ownership are negatively correlated with subsequent abnormal returns.

3. Research design

3.1. Data and sample selection

Institutional and individual investor ownership data are drawn from Topview software, an official information source of daily ownership held by three different groups of investors provided by the Shanghai Stock Exchange (SSE). The data service is offered to investors at the price of over *RMB* 19,800 per year, which is hardly affordable to most individual investors in China. Topview classifies all investors in the stock market into three categories: institutions, individuals and non-professional legal persons. Institutional investors conceptually include mutual funds, qualified foreign institutional investors, insurance companies, social insurance funds and securities companies.[2] For each day from June 1st, 2007 to December 31st, 2008, Topview reports the total ownership held by each of the three groups of investors on each of the 849 stocks listed on the Shanghai Stock Exchange. Data on stock returns and control variables are drawn from the China Stock Market and Accounting Research (CSMAR) database.

Deng and Lee (2000) find that institutional investors never trade on certain stocks during the sample period, with small firm size as the main driver. We therefore delete 29 firms from the original sample because institutional investors never

[2] The Qualified Foreign Institutional Investor program is a Chinese program that was launched in 2002 to allow licensed foreign investors to buy and sell A stocks in China's mainland stock exchanges (in Shanghai and Shenzhen). Chinese mainland stock exchanges were previously closed off to foreign investors due to China's tight capital controls which restrict the movement of assets in-and-out of the country. As of February 2009, a total of 79 foreign institutional investors had been approved under the QFII program. Foreign access to China's A stocks are still limited, with quotas placed under the QFII program amounting to US$30 billion.

trade their stock. Finally, we delete those observations with missing data on changes in institutional ownership or subsequent abnormal returns. Table 2 describes the sample selection process and Table 3 breaks down the institutional and individual ownership data by year.

Table 3 illustrates that institutional investor shareholdings in the SSE average 13.84%, much lower than the 65% in the NYSE/AMEX (Agarwal, 2005). Institutional investors increased their shareholdings in 2007 and decreased them in 2008, whereas individuals were net buyers during the whole period. Moreover, net daily changes in both institutional and individual ownership are small, averaging less than 0.01%.

3.2. Variable definitions

Change in ownership is measured as the daily ownership change between the measurement day and the previous trading day:

$$\text{Change in institutional ownership of stock } i \text{ on date } t\ (INSTCH_{i,t}) = \text{Institutional ownership on date } t\ (INST_{i,t}) - \text{Institutional ownership on date } t-1\ (INST_{i,t-1}); \quad (1)$$

and

$$\text{Change in individual ownership } (INDICH_{i,t}) = \text{Individual ownership on date } t\ (INDI_{i,t}) - \text{Individual ownership on date } t-1\ (INDI_{i,t-1}). \quad (2)$$

Subsequent abnormal returns are obtained by summing the daily abnormal returns ($AR_{i,t+n}$) over the measurement window:

$$\text{Subsequent abnormal returns } (CAR_{i,t+1,t+N}) = \sum_{n=1}^{N} AR_{i,t+n}, \quad (3)$$

where $AR_{i,t+n}$ is calculated as the raw return of the stock minus the corresponding daily average-weighted return of the market portfolio of the stocks with institutional investor trading.

For the short-term window for measuring subsequent abnormal returns, we select the subsequent one day ($N = 1$) and subsequent five days ($N = 5$). We also choose the subsequent 30 days ($N = 30$) and subsequent 120 days ($N = 120$), because institutional investors in China change their stock portfolios relatively frequently during the year. Fig. 1 illustrates the timeline and measurement of our dependent and explanatory variables.

Tests of the relationship between changes in institutional (individual) ownership and subsequent abnormal returns are conducted while controlling for contemporary and historical returns, prior changes in institutional (individual) ownership,

Table 2
Sample selection criteria. This table describes the sample selection process. We delete stocks that no institutions had traded during the whole sample period and stock-day observations with missing data on changes in institutional and individual ownership or subsequent abnormal returns.

	Firm observations	Stock-day observations
Firms with reported daily institutional and individual ownership (June, 2007–December, 2008)	849	311,515
Delete stocks that no institutions traded during the whole sample period	(29)	(9543)
Delete stock-days with missing data on changes in institutional and individual ownership or subsequent abnormal returns	0	(822)
Final sample	820	301,150

Table 3
Descriptive statistics of ownership variables. This table describes the institutional and individual shareholding data. All the variables are winsorized at the top and bottom 1 percent of the final sample.

Variable	Year	N	Mean	Median	STD	Min	Max
Institutional ownership (%)	2007	110,492	15.1841	3.5200	21.2380	0.0000	76.7200
	2008	191,480	13.0599	3.1600	18.7535	0.0000	76.7200
	Total	301,972	13.8372	3.2750	19.7255	0.0000	76.7200
INSTCH (%)	2007	109,684	0.0044	0.0000	0.3311	−1.3000	1.1900
	2008	191,468	−0.0050	0.0000	0.2642	−1.3000	1.1900
	Total	301,152	−0.0016	0.0000	0.2904	−1.3000	1.1900
Individual ownership (%)	2007	110,492	73.0289	81.0400	24.3095	10.1800	99.4600
	2008	191,480	70.5002	76.7300	23.3609	10.1800	99.4600
	Total	301,972	71.4255	78.2000	23.7436	10.1800	99.4600
INDICH (%)	2007	109,684	0.0068	0.0000	0.3987	−1.4010	1.4200
	2008	191,468	0.0094	0.0000	0.3105	−1.4010	1.4200
	Total	301,152	0.0084	0.0000	0.3453	−1.4010	1.4200

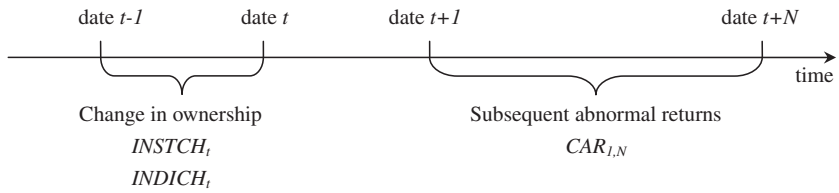


Fig. 1. Timeline and measurement of main variables.

beginning institutional (individual) ownership, firm size, year, weekday and industry effects. We define these variables as follows:

AR_t = daily abnormal returns for the stock on the measurement day.
AR_{t-j} = daily abnormal returns for the stock j days before the measurement day (j = 1, 2, 3, 4, 5).
$INSTCH_{t-j}$ = daily change in institutional ownership j days before the measurement day (j = 1, 2, 3, 4, 5).
$INDICH_{t-j}$ = daily change in individual ownership j days before the measurement day (j = 1, 2, 3, 4, 5).
$INST_{t-1}$ = institutional ownership at the end of the day before the measurement day.
$INDI_{t-1}$ = individual ownership at the end of the day before the measurement day.
SIZE = log of the market value of the firm's equity at the end of the day before the measurement day.
Year = dummy vector indicating the year of the measurement day.
Weekday = dummy vector indicating the weekday of the measurement day.
Industry = dummy vector indicating the three-digit CSRC standard industry code for the firm.

Table 4 summarizes the variable definitions.

3.3. Research method

We first sort stocks by future price performance into ten deciles and examine the difference between institutional investor and individual investor daily trading among the deciles. The following two regressions form the basis of our cross-sectional tests:

$$\begin{aligned} INSTCH_{i,t} = {} & \alpha_0 + \alpha_1 CAR_{i,t+1,t+N} + \alpha_2 AR_{i,t} + \alpha_3 AR_{i,t-1} + \alpha_4 AR_{i,t-2} + \alpha_5 AR_{i,t-3} + \alpha_6 AR_{i,t-4} + \alpha_7 AR_{i,t-5} + \alpha_8 INSTCH_{i,t-1} \\ & + \alpha_9 INSTCH_{i,t-2} + \alpha_{10} INSTCH_{i,t-3} + \alpha_{11} INSTCH_{i,t-4} + \alpha_{12} INSTCH_{i,t-5} + \alpha_{13} INST_{i,t-1} + \alpha_{14} SIZE + \chi_1 Year \\ & + \phi_1 Weekday + \varphi_1 Industry + \varepsilon_{i,t} \end{aligned} \quad (4)$$

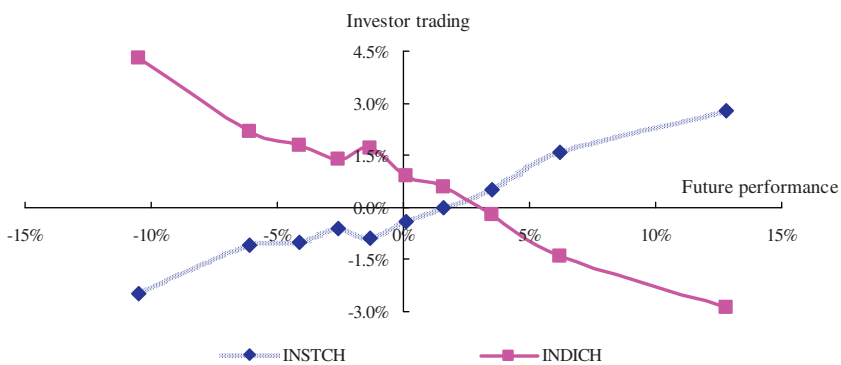
Table 4
Variable definitions.

Variable	Label	Definition
Panel A: Dependent variables		
Change in institutional ownership	*INSTCH*	Daily change in institutional ownership between the measurement day and the nearest previous trading day
Change in individual ownership	*INDICH*	Daily change in individual ownership between the measurement day and the nearest previous trading day
Panel B: Explanatory variables		
Subsequent abnormal returns	*CAR11*	Abnormal returns on the subsequent day following the measurement day
	CAR15	Cumulative abnormal returns during the subsequent 5 days following the measurement day
	CAR130	Cumulative abnormal returns during the subsequent 30 days following the measurement day
	CAR1120	Cumulative abnormal returns during the subsequent 120 days following the measurement day
Panel C: Control variables		
Contemporary abnormal return	*AR*	Daily abnormal returns on the measurement day
Momentum returns	AR_{-i}	Daily abnormal returns i days before the measurement day for the stock (i = 1, 2, 3, 4, 5)
Prior changes in institutional ownership	$INSTCH_{-i}$	Daily change in institutional ownership i days before the measurement day (i = 1, 2, 3, 4, 5)
Prior changes in individual ownership	$INDICH_{-i}$	Daily change in individual ownership i days before the measurement day (i = 1, 2, 3, 4, 5)
Beginning institutional ownership	$INST_{-1}$	Institutional ownership at the end of the day before the measurement day
Beginning individual ownership	$INDI_{-1}$	Individual ownership at the end of the day before the measurement day
Firm size	*SIZE*	Log of the market value of equity at the end of the day before the measurement day
Year effect	*Year*	Dummy vector indicating the year of the measurement day
Weekday effect	*Weekday*	Dummy vector indicating the weekday of the measurement day
Industry effect	*Industry*	Dummy vector indicating the three-digit CSRC standard industry code

Table 5
Descriptive statistics of independent variables. This table reports the mean, median, standard deviation, minimum, maximum, and the number of observations (*N*) of the independent variables. All variables are defined as in Table 4. All the variables are winsorized at the top and bottom 1 percent of the final sample, and *SIZE* exhibited in the table is the market value of equity in units of Million RMB ¥.

Variable	*N*	Mean	Median	STD	Min	Max
Panel A: Subsequent abnormal returns						
AR1	301,970	−0.0001	−0.0033	0.0283	−0.0644	0.0920
CAR15	301,942	−0.0004	−0.0059	0.0643	−0.1527	0.1998
CAR130	301,892	−0.0018	−0.0126	0.1440	−0.3401	0.4468
CAR1120	301,301	−0.0045	−0.0195	0.2628	−0.6203	0.7277
Panel B: Control variables						
AR	301,952	−0.0001	−0.0033	0.0283	−0.0644	0.0924
AR_1	301,931	−0.0001	−0.0033	0.0285	−0.0644	0.0929
AR_2	301,910	−0.0001	−0.0034	0.0285	−0.0644	0.0931
AR_3	301,889	−0.0001	−0.0034	0.0285	−0.0644	0.0930
AR_4	301,868	−0.0001	−0.0034	0.0285	−0.0643	0.0930
AR_5	301,847	−0.0001	−0.0034	0.0285	−0.0643	0.0929
INSTCH_1 (%)	300,332	−0.0017	0.0000	0.2905	−1.3000	1.1900
INSTCH_2 (%)	299,512	−0.0017	0.0000	0.2906	−1.3000	1.1900
INSTCH_3 (%)	298,692	−0.0017	0.0000	0.2906	−1.3000	1.1900
INSTCH_4 (%)	297,872	−0.0018	0.0000	0.2907	−1.3000	1.1900
INSTCH_5 (%)	297,052	−0.0018	0.0000	0.2909	−1.3000	1.1900
INDICH_1 (%)	300,332	0.0086	0.0000	0.3456	−1.4030	1.4240
INDICH_2 (%)	299,512	0.0086	0.0000	0.3459	−1.4060	1.4250
INDICH_3 (%)	298,692	0.0087	0.0000	0.3459	−1.4030	1.4270
INDICH_4 (%)	297,872	0.0087	0.0000	0.3463	−1.4060	1.4300
INDICH_5 (%)	297,052	0.0088	0.0000	0.3467	−1.4090	1.4300
INST_1 (%)	301,152	13.8429	3.2790	19.7310	0.0000	76.7270
INDI_1 (%)	301,152	71.4338	78.2100	23.7426	10.1890	99.4600
SIZE (*Million RMB*)	301,951	14,875.95	3,691.36	43,684.37	545.36	331,294.45

Panel A: Short-term subsequent stock performance and investor trading



Panel B: Long-term subsequent stock performance and investor trading

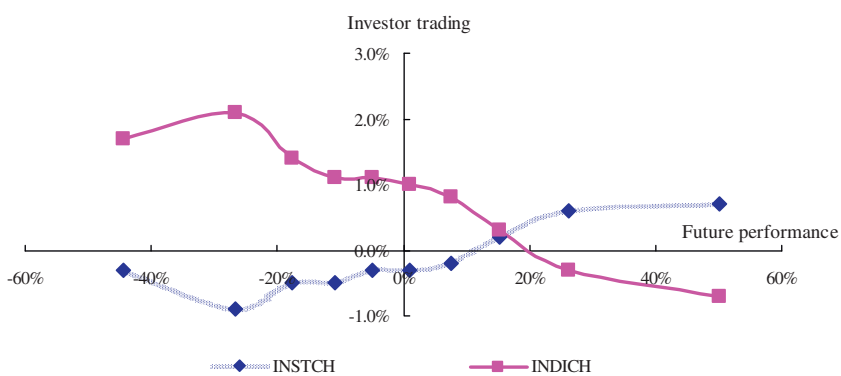


Fig. 2. Subsequent stock performance and investor trading.

$$INDICH_{i,t} = \beta_0 + \beta_1 CAR_{i,t+1,t+N} + \beta_2 AR_{i,t} + \beta_3 AR_{i,t-1} + \beta_4 AR_{i,t-2} + \beta_5 AR_{i,t-3} + \beta_6 AR_{i,t-4} + \beta_7 AR_{i,t-5} + \beta_8 INDICH_{i,t-1} + \beta_9 INDICH_{i,t-2} + \beta_{10} INDICH_{i,t-3} + \beta_{11} INDICH_{i,t-4} + \beta_{12} INDICH_{i,t-5} + \beta_{13} INDI_{i,t-1} + \beta_{14} SIZE + \chi_2 Year + \phi_2 Weekday + \varphi_2 Industry + \delta_{i,t} \quad (5)$$

4. Empirical results

Table 5 reports the descriptive statistics of the independent variables for the total sample. It shows that stock performance in the sample is diversely distributed. Daily abnormal returns range from −6.44% to 9.20% and weekly (five trading day) cumulative abnormal returns range from −15.27% to 19.98%. From a long-term perspective, monthly (30 trading day) cumulative abnormal returns range from −34.01% to 44.68% and half-yearly (120 trading day) cumulative abnormal returns range from 62.03% to 72.77%. Firm size varies widely, with the market value of equity ranging from *RMB* 545.36 million to *RMB* 331,294.45 million.

4.1. Sorting evidence

Panel A of Fig. 2 plots the average investor trading and short-term (five trading day) future performance of the 10 deciles sorted by future performance. Basically, it shows that institutional investors buy stocks with positive future abnormal returns and sell stocks with negative future abnormal returns. The higher (lower) the future performance ranking, the more institutional investors buy (sell). The opposite is true for individual investors. The average investor trading and long-term (120 trading days) future performance of the 10 deciles sorted by future performance is plotted in Panel B of Fig. 2. It documents a similar trend to Panel A for the correlation between long-term subsequent stock performance and investor trading. In summary, Fig. 2 illustrates that changes in institutional (individual) ownership are positively (negatively) correlated with subsequent abnormal returns.

Table 6 reports the average daily change in institutional and individual ownership of each decile sorted by subsequent abnormal returns. Several patterns are worth noting. First, institutional investors sell stocks with low-ranked future abnor-

Table 6
Deciles of subsequent CARs. This table reports the ranking of stocks by both short-term and long-term subsequent *CARs*. Stocks are ranked according to subsequent *CARs*, sorted into decile, and the equally weighted average changes in institutional and individual ownership within each decile are reported. *T*-statistics are stated in parentheses.

	Ranked by *CARs*(1,1)			Ranked by *CARs*(1,5)		
CAR rankings	*CAR11*	*INSTCH*	*INDICH*	*CAR15*	*INSTCH*	*INDICH*
Panel A: Sorted by short-term subsequent CARs						
Lowest	−0.044	−0.030	0.047	−0.105	−0.025	0.043
1	−0.026	−0.011	0.023	−0.061	−0.011	0.022
2	−0.018	−0.005	0.014	−0.041	−0.010	0.018
3	−0.012	−0.002	0.009	−0.026	−0.006	0.014
4	−0.006	−0.004	0.011	−0.013	−0.009	0.017
5	0.000	0.000	0.004	0.001	−0.004	0.009
6	0.006	0.000	0.005	0.016	0.000	0.006
7	0.014	0.003	−0.001	0.035	0.005	−0.002
8	0.027	0.012	−0.011	0.062	0.016	−0.014
Highest	0.059	0.022	−0.018	0.128	0.028	−0.029
Highest–Lowest	0.103***	0.053***	−0.066***	0.233***	0.053***	−0.072***
	(858.11)	(19.13)	(−19.67)	(912.62)	(19.58)	(−22.17)
	Ranked by *CARs*(1,30)			Ranked by *CARs*(1,120)		
CAR rankings	*CAR130*	*INSTCH*	*INDICH*	*CAR1120*	*INSTCH*	*INDICH*
Panel B: Sorted by long-term subsequent CARs						
Lowest	−0.238	−0.015	0.032	−0.445	−0.003	0.017
1	−0.140	−0.007	0.020	−0.266	−0.009	0.021
2	−0.094	−0.008	0.017	−0.177	−0.005	0.014
3	−0.059	−0.008	0.016	−0.109	−0.005	0.011
4	−0.028	−0.008	0.014	−0.049	−0.003	0.011
5	0.003	−0.006	0.011	0.010	−0.003	0.010
6	0.037	−0.002	0.006	0.075	−0.002	0.008
7	0.078	0.003	−0.001	0.153	0.002	0.003
8	0.137	0.011	−0.008	0.262	0.006	−0.003
Highest	0.284	0.024	−0.023	0.501	0.007	−0.007
Highest–Lowest	0.522***	0.039***	−0.055***	0.945***	0.010***	−0.023***
	(913.63)	(14.45)	(−17.37)	(1,072.97)	(4.01)	(−7.51)

*** Denote significance at the confidence level of 1%.

Table 7
Cross-sectional regression tests of changes in ownership on short-term future *CAR*s. This table reports the estimates from multivariate regressions of change in institutional ownership on short-term subsequent *CAR*s. Refer to Table 4 for variable definitions. *T*-statistics are stated in parentheses.

Variable	*INSTCH*	*INSTCH*	*INSTCH*	*INSTCH*	*INSTCH*	*INSTCH*
Panel A: Cross-sectional regressions of changes in institutional ownership						
Intercept	−0.002***	−0.076***	−0.002***	−0.085***	−0.002***	−0.082***
	(−2.99)	(−5.93)	(−2.87)	(−6.662)	(−2.94)	(−6.39)
CAR(1,1)	0.459***	0.247***				
	(24.52)	(14.31)				
CAR(1,5)			0.223***	0.187***		
			(27.07)	(24.68)		
CAR(2,5)					0.167***	0.171***
					(18.16)	(20.27)
AR		1.465***		1.488***		1.498***
		(84.89)		(86.44)		(86.96)
*AR*_1		0.336***		0.348***		0.337***
		(19.27)		(19.92)		(19.33)
*AR*_2		0.191***		0.205***		0.201***
		(10.96)		(11.72)		(11.50)
*AR*_3		0.059***		0.073***		0.071***
		(3.38)		(4.17)		(4.07)
*AR*_4		0.006		0.011		0.003
		(0.33)		(0.64)		(0.20)
*AR*_5		0.017		0.018		0.014
		(0.98)		(1.04)		(0.78)
*INSTCH*_1		0.267***		0.266***		0.267***
		(145.82)		(145.42)		(145.79)
*INSTCH*_2		0.089***		0.089***		0.089***
		(47.34)		(47.14)		(47.27)
*INSTCH*_3		0.063***		0.063***		0.063***
		(33.27)		(33.14)		(33.18)
*INSTCH*_4		0.044***		0.044***		0.044***
		(23.19)		(23.18)		(23.22)
*INSTCH*_5		0.027***		0.027***		0.027***
		(14.84)		(14.87)		(14.87)
*INST*_1		−0.000***		−0.000***		−0.000***
		(−12.16)		(−12.54)		(−12.39)
SIZE		0.004***		0.004***		0.004***
		(6.32)		(7.07)		(6.79)
Year, Weekday and Industry	No	Yes	No	Yes	No	Yes
N	301,150	297,050	301,142	297,042	301,142	297,042
Adj. *R*-square (%)	0.20	16.21	0.24	16.32	0.11	16.27
Variable	*INDICH*	*INDICH*	*INDICH*	*INDICH*	*INDICH*	*INDICH*
Panel B: Cross-sectional regressions of changes in individual ownership						
Intercept	0.008***	0.112***	0.008***	0.125***	0.008***	0.120***
	(13.36)	(6.79)	(13.22)	(7.55)	(13.29)	(7.25)
CAR(1,1)	−0.584***	−0.348***				
	(−26.26)	(−16.64)				
CAR(1,5)			−0.298***	−0.247***		
			(−30.43)	(−26.79)		
CAR(2,5)					−0.231***	−0.222***
					(−21.17)	(−21.60)
AR		−1.487***		−1.519***		−1.532***
		(−70.96)		(−72.70)		(−73.25)
*AR*_1		−0.427***		−0.440***		−0.427***
		(−20.20)		(−20.87)		(−20.22)
*AR*_2		−0.218***		−0.236***		−0.230***
		(−10.33)		(−11.16)		(−10.90)
*AR*_3		−0.046**		−0.064***		−0.061***
		(−2.16)		(−3.03)		(−2.91)
*AR*_4		0.007		0.001		0.011
		(0.34)		(0.04)		(0.52)
*AR*_5		−0.047**		−0.048**		−0.042**
		(−2.23)		(−2.28)		(−1.99)
*INDICH*_1		0.229***		0.228***		0.228***
		(124.96)		(124.47)		(124.90)
*INDICH*_2		0.087***		0.086***		0.087***
		(46.46)		(46.17)		(46.33)
*INDICH*_3		0.058***		0.058***		0.058***
		(31.06)		(30.87)		(30.95)

(*continued on next page*)

Table 7 (*continued*)

Variable	*INSTCH*	*INSTCH*	*INSTCH*	*INSTCH*	*INSTCH*	*INSTCH*
INDICH_4		0.042***		0.042***		0.043***
		(22.88)		(22.82)		(22.91)
INDICH_5		0.027***		0.027***		0.027***
		(14.84)		(14.83)		(14.85)
INDI_1		−0.000***		−0.000***		−0.000***
		(−12.81)		(−13.22)		(−13.04)
SIZE		−0.004***		−0.004***		−0.004***
		(−5.51)		(−6.31)		(−6.00)
Year, Weekday and Industry	No	Yes	No	Yes	No	Yes
N	301,150	297,050	301,142	297,042	301,142	297,042
Adj. *R*-square (%)	0.23	12.36	0.31	12.49	0.15	12.42

** Denote significance at the confidence level of 5%.
*** Denote significance at the confidence level of 1%.

mal returns and buy stocks with high-ranked future abnormal returns, with a statistically and economically significant difference. Second, the daily change in institutional ownership basically increases with the ranking of subsequent abnormal returns, whereas individual investor ownership decreases. These patterns hold regardless of whether they are measured in the short-term or long-term, and vice versa for individual investors. In summary, this initial evidence shows that institutional investors have better stock picking ability than individual investors.

4.2. Regression tests on short-term subsequent abnormal returns

Table 7 reports the results of the cross-sectional regression tests of changes in institutional and individual ownership on short-term subsequent abnormal returns. Panel A shows that institutional investors increase (decrease) their shareholdings in stocks that subsequently exhibit positive (negative) short-term cumulative abnormal returns. In particular, institutional investor ownership increases (decreases) by 0.247% as subsequent one-day abnormal stock returns increase (decrease) by 1%. In addition, institutional investor ownership increases (decreases) by 0.187% as subsequent five-day cumulative abnormal returns increase (decrease) by 1%. Therefore, changes in institutional ownership are significantly positively related to short-term future abnormal returns, as Hypothesis 1 predicts.

Panel B illustrates that individual investors decrease (increase) their shareholdings in stocks that subsequently exhibit positive (negative) short-term cumulative abnormal returns. In particular, individual ownership decreases (increases) by 0.348% as subsequent one-day abnormal stock returns increase (decrease) by 1%. Furthermore, individual investor ownership decreases (increases) by 0.247% of the stock as subsequent five-day cumulative abnormal returns increase (decrease) by 1%. Thus, we find that changes in individual ownership are significantly negatively related to short-term future abnormal returns.

4.3. Regression tests on long-term subsequent abnormal returns

Table 8 reports the cross-sectional regression results for changes in institutional and individual ownership on long-term subsequent abnormal returns. Panel A shows that institutional investors increase (decrease) their shareholdings in stocks that subsequently exhibit positive (negative) long-term cumulative abnormal returns. More specifically, institutional investor ownership increases (decreases) by 0.061% as subsequent 30-day cumulative abnormal returns increase (decrease) by 1%. In addition, institutional ownership increases (decreases) by 0.018% as subsequent 120-day abnormal stock returns increase (decrease) by 1%. This illustrates that change in institutional ownership is significantly positively related to long-term future performance, as Hypothesis 1 predicts. However, when we run the regression on changes in institutional ownership over the long window [30 and 120 day] abnormal returns, it turns out to be insignificant, suggesting that institutional investors shortsightedly focus on short-term returns more than long-term returns.

Panel B shows that individual investors decrease (increase) their shareholdings in stocks that subsequently exhibit positive (negative) long-term cumulative abnormal returns. In particular, individual investor ownership decreases (increases) by 0.084% as subsequent 30-day abnormal stock returns increase (decrease) by 1%. Furthermore, individual investor ownership decreases (increases) by 0.026% as subsequent 120-day cumulative abnormal returns increase (decrease) by 1%. Thus, we find that changes in individual ownership are significantly negatively related to long-term future abnormal returns.

4.4. Sensitivity analysis

Since institutions may prefer more risky stocks that lead to higher subsequent performance, we apply risk-adjusted abnormal returns calculated using the CAPM model as a robustness check. Beta is estimated on a daily basis for each stock, using the return data during the 60 trading days before the measurement date (no less than 20 trading days if there is

Table 8
Cross-sectional regression tests of changes in ownership on long-term future *CAR*s. This table reports the estimates from multivariate regressions of change in institutional ownership on long-term subsequent *CAR*s. Refer to Table 4 for variable definitions. *T*-statistics are stated in parentheses.

Variable	*INSTCH*	*INSTCH*	*INSTCH*	*INSTCH*	*INSTCH*	INSTCH
Panel A: Cross-sectional regressions of changes in institutional ownership						
Intercept	−0.001***	−0.093***	−0.002***	−0.094***	−0.081***	−0.071***
	(−2.78)	(−7.29)	(−2.90)	(−7.24)	(−6.36)	(−5.49)
CAR(1,30)	0.077***	0.061***				
	(20.82)	(18.00)				
CAR(1,120)			0.017***	0.018***		
			(8.30)	(9.38)		
CAR(5,30)					0.032***	
					(8.70)	
CAR(30,120)						−0.002
						(−0.78)
AR		1.491***		1.492***	1.488***	1.487***
		(86.58)		(86.38)	(86.31)	(86.10)
*AR*_1		0.337***		0.331***	0.328***	0.326***
		(19.30)		(18.94)	(18.78)	(18.65)
*AR*_2		0.199***		0.193***	0.191***	0.189***
		(11.39)		(11.04)	(10.95)	(10.78)
*AR*_3		0.069***		0.063***	0.062***	0.059***
		(3.95)		(3.63)	(3.53)	(3.37)
*AR*_4		0.006		0.001	−0.001	−0.004
		(0.37)		(0.05)	(−0.04)	(−0.20)
*AR*_5		0.019		0.016	0.014	0.012
		(1.12)		(0.89)	(0.82)	(0.66)
*INSTCH*_1		0.267***		0.268***	0.268***	0.268***
		(145.76)		(145.95)	(146.13)	(146.09)
*INSTCH*_2		0.089***		0.090***	0.090***	0.090***
		(47.22)		(47.35)	(47.39)	(47.42)
*INSTCH*_3		0.063***		0.063***	0.063***	0.063***
		(33.11)		(33.21)	(33.23)	(33.26)
*INSTCH*_4		0.043***		0.044***	0.044***	0.044***
		(23.09)		(23.19)	(23.18)	(23.22)
*INSTCH*_5		0.026***		0.027***	0.027***	0.027***
		(14.67)		(14.80)	(14.75)	(14.82)
*INST*_1		−0.000***		−0.000***	−0.000***	−0.000***
		(−12.33)		(−11.83)	(−12.10)	(−12.00)
SIZE		0.004***		0.004***	0.004***	0.003***
		(7.70)		(7.61)	(6.75)	(5.87)
Year, Weekday and Industry	No	Yes	No	Yes	No	Yes
N	301,092	296,992	300,501	296,401	296,992	296,401
Adj. *R*-square (%)	0.14	16.24	0.02	16.18	16.17	16.16
Variable	*INDICH*	*INDICH*	*INDICH*	*INDICH*	*INDICH*	*INDICH*
Panel B: Cross-sectional regressions of changes in individual ownership						
Intercept	0.008***	0.137***	0.008***	0.138***	0.121***	0.106***
	(13.08)	(8.26)	(13.20)	(8.20)	(7.29)	(6.36)
CAR(1,30)	−0.109***	−0.084***				
	(−24.91)	(−20.39)				
CAR(1,120)			−0.030***	−0.026***		
			(−12.63)	(−11.30)		
CAR(5,30)					−0.047***	
					(−10.56)	
CAR(30,120)						0.001
						(0.32)
AR		−1.524***		−1.522***	−1.519***	−1.515***
		(−72.90)		(−72.62)	(−72.62)	(−72.28)
*AR*_1		−0.427***		−0.419***	−0.415***	−0.411***
		(−20.24)		(−19.79)	(−19.65)	(−19.44)
*AR*_2		−0.228***		−0.221***	−0.218***	−0.214***
		(−10.82)		(−10.42)	(−10.32)	(−10.10)
*AR*_3		−0.060***		−0.053**	−0.050***	−0.046***
		(−2.85)		(−2.50)	(−2.37)	(−2.19)
*AR*_4		0.007		0.014	0.016	0.021
		(0.32)		(0.68)	(0.77)	(0.99)
*AR*_5		−0.049**		−0.044**	−0.042**	−0.038**
		(−2.36)		(−2.11)	(−2.02)	(−1.83)
*INDICH*_1		0.228***		0.229***	0.229***	0.230***
		(124.80)		(125.16)	(125.26)	(125.37)

(*continued on next page*)

Table 8 (*continued*)

Variable	*INSTCH*	*INSTCH*	*INSTCH*	*INSTCH*	*INSTCH*	INSTCH
INDICH_2		0.087***		0.087***	0.087***	0.087***
		(46.26)		(46.48)	(46.51)	(46.60)
INDICH_3		0.058***		0.058***	0.058***	0.058***
		(30.85)		(31.06)	(31.03)	(31.16)
INDICH_4		0.042***		0.043***	0.043***	0.043***
		(22.74)		(22.89)	(22.88)	(22.97)
INDICH_5		0.026***		0.027***	0.027***	0.027***
		(14.62)		(14.77)	(14.74)	(14.83)
INDI_1		−0.000***		−0.000***	−0.000***	−0.000***
		(−13.04)		(−12.37)	(−12.77)	(−12.60)
SIZE		−0.005***		−0.005***	−0.004***	−0.003***
		(−7.12)		(−7.13)	(−6.09)	(−5.08)
Year, Weekday and Industry	No	Yes	No	Yes	No	Yes
N	301,092	296,992	300,501	296,401	296,992	296,401
Adj. *R*-square (%)	0.21	12.40	0.05	12.33	12.31	12.29

** Denote significance at the confidence level of 5%.
*** Denote significance at the confidence level of 1%.

incomplete data) and our main results hold.[3] We also measure the subsequent abnormal returns after institutional investors buy or sell by longer or shorter windows, such as (+1, +2), (+1, +3) and (+1, +10) for short-term subsequent performance and (+1, +60), (+1, +90), (+1, +240), (+1, +360) and (+1, +480) for long-term subsequent performance. Our main results still hold. We also use total assets instead of market value to control for the firm size effect, which does not change our main results.

5. Conclusions

In this paper, we use unique data on the shareholdings of both institutional and individual investors to directly investigate whether institutional investors have better stock selection ability than individual investors in China. Our methodology is based on the intuitive idea that if institutional investors are better at selecting stocks than individual investors, then institutional investors are more likely to buy future winners and sell future losers. Thus we first sort stocks by future price performance into ten deciles and examine the difference between institutional and individual investor daily trading among the deciles. The sorting evidence supports our hypothesis that institutional investors have better stock selection ability than individual investors.

We also regress institutional and individual investor daily trading on future stock performance while controlling for other factors, such as size and momentum effects. We find that institutional investors increase (decrease) their shareholdings in stocks that subsequently exhibit positive (negative) short- and long-term cumulative abnormal returns. In contrast, individual investors decrease (increase) their shareholdings in stocks that subsequently exhibit positive (negative) short- and long-term cumulative abnormal returns. These results indicate that institutional investors have superior stock selection ability in China.

The empirical results in this paper are not consistent with some of the research on institutional investors in the US market. This may suggest that institutional investors in China have more private information than those in the US. However, it is possible that they achieve their information advantage by illegal or unethical means, i.e. through unethical channels of inside information in a specific setting without effective regulation of insider trading. In fact, the *Wall Street Journal* reported on December 2, 2010 that "Several hedge funds under scrutiny in an insider-trading investigation made big bets on health-care stocks also being examined in the probe, according to a Wall Street Journal analysis. Hedge funds SAC Capital Advisors LP, Diamondback Capital Management LP, Jana Partners LLC and Balyasny Asset Management LP all increased their holdings in one or more of three health-care stocks during the quarters in which the companies announced mergers and the stock shot up in price, according to public filings." However, institutional investors have seldom been investigated and punished because of insider trading in China, although mutual fund star managers (such as Yawei Wang, etc.) often perfectly time their trading around valuable information disclosures (such as merger and acquisition announcements, etc.) and achieve superior performance. This suggests that China still has a long way to go in effectively regulating insider trading and improving its stock market mechanisms.

The above conclusions are subject to the caveat that we treat all institutional investors in China as the same due to the limited availability of detailed investor trading data. Chen et al. (2000) document evidence that stock selection abilities

[3] One referee also suggests that there may be reverse causality, because institutional trading may cause stock price movements or institutions may manipulate stock prices because of the significant amount of money they control. As we use daily data to test whether institutions have a superior ability to pick stocks in this paper, we believe that institutions' daily demand will only lead to contemporary stock price movements, but not in the subsequent period. If that were the case, institutions would just buy stocks and wait for the stock prices go up. That is, institutional ownership would become higher and higher. In our sample period from June 2007 to December 2008, however, institutional ownership decreased, as shown in Table 3. Therefore, the potential reverse causality problem is not severe in this paper.

among mutual funds vary significantly, suggesting that different institutional investors may vary in their stock selection abilities. Unfortunately, our data does not differentiate between different types of institutional investors. We leave this issue for future research with more detailed and complete data.

Acknowledgments

Yihong Deng is a doctoral candidate at Tsinghua University and Yongxing Xu is a postdoctoral researcher at Tsinghua University. We are grateful to Yuan Ding, Raffi Indjejikian, Jeong-Bon Kim, Jevons Chi-Wen Lee, Zhen Li, Jinghong Liang, James A. Ohlson, Liandong Zhang and other participants at the 4th Symposium of China Journal of Accounting Research at the Central University of Finance and Economics. We also thank Peikun Yu for collecting data on institutional trading positions. All remaining errors are our own. A China Scholarship Council Grant and accommodation provided by the University of Michigan to Yihong Deng are acknowledged.

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China Journal of Accounting Research 4 (2011) 121–133

Contents lists available at SciVerse ScienceDirect

China Journal of Accounting Research

journal homepage: www.elsevier.com/locate/cjar

Why are social network transactions important? Evidence based on the concentration of key suppliers and customers in China

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ARTICLE INFO

Article history:
Received 14 April 2010
Accepted 22 February 2011
Available online 31 August 2011

JEL classification:
L22
M21
M41

Keywords:
Social network
Social capital
Transaction costs
Industry shocks

ABSTRACT

Based on a new institutional economy framework, this study examines the formation and economic consequences of social networks (*guanxi*) from the perspective of key suppliers and customers in China. Results show that commercial activities which depend on networks are determined by the institutional environment. For example, companies that have lower accumulated social capital (less trust among people) and are subject to more government invention depend more on social network transactions than on the market. In addition, this study shows that network transactions can provide benefits to firms, especially in weak institutional environments. Networks can reduce transaction costs by reducing information asymmetry, i.e., increased network dependence is associated with lower credit costs and lower advertising and sales costs. Networks can also reduce the effect of industry shocks, especially negative shocks, by creating a bonding mechanism. This study contributes to our understanding of social networks in emerging markets by providing evidence on network transactions with key suppliers and customers and their influence on firms' accounting behavior.

1. Introduction

Previous studies have generally concluded that social networks play an important role in information sharing among connected parties (see a review paper by Allen and Babus (2008)). Nonetheless, there is little academic work examining the role that social networks play in emerging markets. Khanna and Thomas (2009) find that companies in Chile which have social ties have greater synchronicity due to information correlation. Bunkanwanich et al. (2008) find that family firms use marriages between different groups to form social networks and that the market reacts positively to the announcement of such marriages. Ball et al. (2003) argue that companies in East Asia conduct business activities using social networks (*guanxi*), which means the effect of financial accounting on capital markets is limited. However, without a direct measurement of social networks, we still know little about the role they play in accounting behavior. Using unique data on key suppliers and the concentration of customers in China, the aim of this study is to provide empirical evidence on how institutions in emerging

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doi:10.1016/j.cjar.2011.06.003

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markets influence the formation of social networks and how the characteristics of network transactions influence accounting behavior.

Following a new institutional framework proposed by Williamson (2000), the paper begins with a brief analysis of both informal (i.e., *religion and customs*) and formal (i.e., *the legal system*, *degree of property rights protection*, *market arrangements*) institutions in China and their effect on the governance structure of firms. We focus mainly on the influence of social network transactions, proxied by the concentration of key customers and suppliers. The specific analysis paths are presented in the diagram below.

	Degree 1	Degree 2	Degree 3	Conclusion
Question	Why are social networks transactions necessary?	How can social network transactions be retained?	What are the benefits of social network transactions?	
Theoretical analysis	Transaction behavior is endogenously determined by the institutional background	An optimal governance structure is matched with the external environment	An optimal governance structure can minimize transaction costs from ex-ante and ex-post perspectives	
Arguments addressed in this study	Social network transactions are determined by informal and formal institutions in China	Firms accomplish transactions with key customers and suppliers	Dependence on social network transactions can reduce transaction costs and industry shocks	Social networks are important and valued by firms
Hypothesis		Hypothesis 1	Hypothesis 2 and 3	

Based on a unique dataset of Chinese listed firms, we measure the concentration of key suppliers and customers as a measure of their dependence on social network transactions. Specifically, if a firm accomplishes its commercial activities with a limited number of key suppliers or customers, the firm will depend more on social network transactions. If the firm has a diverse range of suppliers or customers, it will depend less on social networks. Our sample consists of 7401 firm-level observations from 2001 to 2008. We find that firms are more likely to establish key customer or supplier connections in regions where the local economy is less market-oriented or has low social capital, as measured by the level of trust. We also find that the concentration of key customers and suppliers tends to reduce transaction costs, measured by the cost of sales/advertising and credit, especially in areas with weak institutions. We then find that the concentration of key customers and suppliers can reduce the effect of exogenous industry shocks, although, after distinguishing between positive and negative shocks, we find that the result is only significant for negative shocks. These results are robust to controlling for various firm characteristics.

This research contributes to the literature in several ways. First, we complement previous studies (La Porta et al., 2002; Zinglas and sapienza, 2004) by showing that institutional differences in the protection of property rights, the local government's propensity to expropriate from local firms and social capital accumulation have direct effects on firms' dependence on social networks. In addition, this research provides further insights into the findings of recent studies on the role of social networks in the finance and accounting fields. Anecdotal evidence suggests that as an informal mechanism, social networks can play a large part in how people conduct business in China, although empirical evidence is rarely provided. The current research mainly focuses on the role of information sharing among corporate officers (e.g., Cohen et al., 2008; Hwang and Kim, 2009). The findings in this paper provide further evidence on the potential benefits of social network transactions and the risk management process.

The rest of the paper is organized as follows. Section 2 reviews the literature and develops hypotheses. Section 3 introduces the methodology and data. Sections 4 and 5 report the empirical results and robustness checks, and Section 6 concludes.

2. Literature review and hypotheses

2.1. Institutional influences and endogenous determinants of social network transactions

The role of institutions is to reduce uncertainty by establishing a stable (but not necessarily efficient) structure for human interactions (Acemoglu et al., 2005). We can think of economic institutions as determining the economic rules of the game, such as the degree of property rights enforcement, the set of contracts that can be written and enforced, and the rules and regulations that determine the economic opportunities open to people. It is conventional to subdivide institutions into formal institutions, such as the legal system and property rights protection system, and informal institutions, such as customs and religion. In constructing a new institutional economy framework, Williamson (2000) explains the progressive relationships between institutions including formal and informal institutions, governance structures and economic performance. In

a micro-level analysis, Williamson (1979, 1985) points out that to minimize transaction costs, efficient economic organizations should adopt governance structures that match the external environment. The cross-country results of Acemoglu et al. (2005) suggest that institutions, including the protection of citizens' property rights from expropriation by the government, have a first-order effect on long-term economic development. As a transitional economy, China offers an ideal setting for testing the influence of different institutions (both formal and informal) on firm activity. Following Williamson's, 2000 framework, we analyze firms' dependence on social network transactions among different regions of China.

2.1.1. Social capital (informal institutions) and dependence on social networks

Social capital is defined as the advantages and opportunities that are available for people through their membership of particular communities (Putnam et al., 1993). The source of social capital lies with the people that a person is connected to, which is an important part of informal institutions, as measured by a trust index. Zinglas and Sapienza (2004) document that social capital plays an important part in financial development. Zhou (2009) use survey data in China and find that the parents of students often pay a New Year call to teachers, which helps to build social ties and helps their children gain entrance to better high schools. Social capital affects the behavior of individuals because it enhances the level of social punishment in a society. High levels of social capital generate higher levels of trust towards others, which influences the way people do business and their dependence on social network transactions.

Klein et al. (1978) document post-contractual opportunistic behavior in the use of market systems, especially when a specific investment is made. To overcome this cost there are two forms of long-term contracts that can be used: (1) an explicit contractual guarantee that is legally enforced by the government and legal system; and (2) an implicit contractual guarantee that is enforced by the withdrawal of future business if opportunistic behavior occurs. Due to the weak legal protection in China, implicit contracts play an even more important part. Trust, as a composition of social capital, is a self-enforcing mechanism that reinforces implicit contracts. When one party engages in opportunistic behavior for a current gain, the loss of trust will result in a loss of value in future transactions. In regions with a weak level of trust among people, implicit contracts will not be fulfilled among the general public; instead, transactions will be limited to familiar groups, such as friends and families. Such groups (*quanzi* in Chinese) will construct social networks to fulfill implicit contracts. In the sociological literature on China's institutions, a great deal of attention is paid to trust. Weber (1920) argues that the low level of trust among Chinese people is an important reason why capitalism did not initially develop in China. Furthermore, Fei (1948) emphasizes that trust in Chinese people is based on family or blood connections, and that trust is like a pecking order in which people only have trust in people who belong to the same group. He documents that a lack of trust induces people to conduct business in limited groups to reduce opportunistic behavior, which creates social network transactions. We therefore make the following prediction, formally stated in the form of a hypothesis:

H1a. Dependence on social network transactions is negatively related to social capital accumulation (trust level).

2.1.2. Rent seeking incentives (formal institutions) and dependence on social networks

China has experienced remarkable economic growth in the process of moving from a centrally-planned to a market-oriented economy. Although the central government retains its control of political aspects, particularly the appointment of government personnel, economic decision-making rights have become greatly decentralized to local government, so that local parties have great influence over local businesses (Xu, forthcoming). On the one hand, government policies at both central and local levels still dominate the allocation of resources through licensing, which tend to promote various rent-seeking activities. For example, Cull and Xu (2005) find that local SOEs can obtain credit from local SOE banks due to natural government networks, whereas anecdotal evidence suggests that private firms have to raise capital through social network financing that depends on personal connections. On the other hand, local governments can take the role of a 'grabbing hand' (Shleifer and Vishny, 1994), either by imposing extra fees and fines on firms or by setting unfavorably high prices for resources supplied by local governments.

There are ways for firms, especially private firms, to reduce rent-seeking activities and protect their property rights. Chen et al. (2011) document that private firms build political connections to reduce local governments' rent-seeking activities. We argue that social network transactions can also play a part in stopping the 'grabbing hand' of local government. First, local governments often segment local markets so that firms cannot undertake outside transactions. Second, rent-seeking activities jeopardize product development; although an undeveloped market needs limited scientific knowledge, it will need more specific knowledge and network transactions are more suitable for the type of knowledge needed in this setting. Third, transactions that take place within a limited group will be kept at a distance from government, which can reduce rent-seeking opportunities. We therefore make the following prediction, formally stated in the form of a hypothesis:

H1b. Dependence on social network transactions is positively associated with the rent-seeking incentives of local government.

2.2. Economic consequences of social network transactions

Recent research provides supportive evidence for the information dissemination effect of social networks in corporate finance, as reviewed by Allen and Babus (2008). Cohen et al. (2008) find that fund managers hold more stock issued by firms in

which the senior officers share their educational ties. They also find that school ties give sell-side analysts an information advantage and their stock recommendations earn significantly higher returns than those who do not have such social ties. Similarly, Hochberg et al. (2007) find that social networks provide better investment performance in venture capital firms. There is also evidence to show that social networks are associated with less monitoring of managers among directors, which can be regarded as a weak corporate governance mechanism (Nguyen-Dang, 2005). Nevertheless, there is little evidence to show how social networks affect the commercial activities of firms, especially in emerging countries. This section will provide such evidence.

2.2.1. Social network transactions to reduce transaction costs

Williamson (1979) uses *uncertainty, frequency with which transactions occur* and whether *durable transaction-specific investments have incurred* to characterize the different dimensions of transaction costs. As documented in the previous section, social networks are used to arrange non-governmental contracts (or *implicit contracts*). There are two reasons why transaction costs will be reduced by this arrangement. First, the creation of a social network will build expectations for repeat-purchase transactions, which means the interaction will last longer, occur more frequently and will reduce information asymmetry. Second, social network transactions require both parties to make specific investments. As documented by Klein and Leffler (1981), a premium is offered to other parties to reduce opportunistic behavior *ex post*; in equilibrium, the premium will equal a discounted stream of rents on future sales entitled by specific investments. The premium can be offered in various ways, especially during transactions with customers and suppliers who share a social network. For instance, customers and suppliers will not demand advertisements that signal a product's quality because they have a private information channel. They will also demand less prepayment and will not require a high credit payment pattern. In regions with low social capital (where there is less trust to fulfill contracts), the fulfillment of transactions will depend more on implicit contracts, and social network transactions will become more important in reducing transaction costs.[1] Thus, we make the following prediction, formally stated in the form of a hypothesis:

H2. Firms with more social network transactions have lower transaction costs, especially in regions with low social capital.

2.2.2. Social network transactions to overcome external shocks

Contagion is used by Allen and Gale (2000) to explain the emergence of an economic crisis. Furfine (2003) and Degryse and Nguyen (2005) find that the failure of one bank can cause contagion and create an industry shock, which refers to an exogenous factor that affects the industry's level of profitability. Such shocks can cause the collapse of the whole banking industry. A report from the Guangdong Academy of Social Science (2009) states that the financial crisis in 2008 caused over 11,000 companies in Guangdong, particularly export companies, to report large losses in earnings. As argued in the previous section, social networks offer a premium in the fulfillment of implicit contracts; the premium may take many different forms and a reduction in the effects of industry shocks is one such form.

There are a number of incentives for the parties in a social network to reduce the effects of industry shocks. First, the parties have an incentive to protect specific investments, such as research and development costs. If the company makes a big loss, or even fails, as the result of an industry shock, the specific investment will not be recouped. Previous studies have found that a series of mechanisms can be used to protect specific investments, such as low leverage (Maksimovic and Titman, 1991; Kale and Shahrur, 2007), greater conservatism (Chen et al., 2008) and greater likelihood of cross-holding stock (Fee et al., 2006). In this section, we argue that reducing industry shocks also acts as a mechanism for protecting specific investments. Second, industry shocks can cause *contagion* in a firm's network counterparts, which will mean that the whole group fails together. Thus, to protect specific investments and prevent *contagion*, there are incentives for firms to reduce industry shocks for their partners.

There are many methods for reducing industry shocks in accounting behavior. Take the key customers and suppliers in a social network transaction as an example. When facing a negative industry shock, such as a widespread increase in production costs, the firm can alleviate the negative consequences by expediting accounts receivable and postponing accounts payable; when facing a positive industry shock, they may negotiate with key customers or suppliers to hide a proportion of their earnings, as in *cookie jar* accounting. The firm may also do the opposite; because the benefit of doing so is small, the incentive will be much less than when facing a negative shock. If there is a strong social network, all of these activities should take place in collaboration with key suppliers and customers[2] because they have the incentive to cooperate with each other. Thus, we make the following prediction, formally stated in the form of a hypothesis:

H3. The effect of industry shocks, particularly negative shocks, is reduced in firms with more social network transactions.

[1] Some may argue that a social network transaction is endogenously determined by the external environment. In equilibrium, after we control for endogenous factors, there should be no relation between transaction costs and social networks. Similar arguments are made by Lehn and Demsetz (1985) concerning the relationship between firm performance and ownership structure. However, we believe that this argument does not apply in our setting, because apart from transaction costs, there will also be production costs, which are influenced by social networks, both of which should be endogenously determined by the transaction mode. In our research design, after we control for endogenous arguments in 2SLS regressions, our results remain robust.

[2] Anecdotal evidence suggests that Huangguangyu uses key customer and supplier relations for short term financing for his retail enterprise building, especially when the firm faces severe financial constraints, which also supports our argument.

3. Research design

The regression models used to test the hypotheses are explained below. The measures for social network transactions, firm's transaction costs and industry shocks are introduced after each regression model.

To test hypotheses H1a and H1b, we employ the following models:

$$\begin{aligned} Networktransaction_{it} = {} & \alpha_0 + \beta_1 Trustindex + \beta_2 Controller_{it} \\ & + \beta_3 ROA_{it} + \beta_4 Age_{it} + \beta_5 Shr1_{it} + \beta_6 Loss_{it} \\ & + \beta_7 Tobin'sQ_{it} + \beta_8 Related_{it} + \beta_9 Leverage_{it} + \beta_{10} Size_{it} \\ & + YearDummies + IndustryDummies + \varepsilon \end{aligned} \quad (1)$$

$$\begin{aligned} Networktransaction_{it} = {} & \alpha_0 + \beta_1 Marketindex + \beta_2 Controller_{it} \\ & + \beta_3 ROA_{it} + \beta_4 Age_{it} + \beta_5 Shr1_{it} + \beta_6 Loss_{it} \\ & + \beta_7 Tobin'sQ_{it} + \beta_8 Related_{it} + \beta_9 Leverage_{it} + \beta_{10} Size_{it} \\ & + YearDummies + IndustryDummies + \varepsilon \end{aligned} \quad (2)$$

β_1 is the variable to be tested and we expect β_1 to be negative. The key variables are defined as follows. Social network transactions are proxied by the concentration of key suppliers and customers, with greater concentration implying more dependence on social networks. The CSRC introduced a mandatory disclosure requirement for the concentration of big 5 customers and suppliers in 2001. In the regression model, we separate the level of concentration into S-network transactions (*concentration of top 5 suppliers*) and C-network transactions (*concentration of top 5 customers*). The trust index (*proxy for social capital accumulation*) is derived from survey data from Zhang and Ke (2002) and the market-oriented index is derived from Fan et al. (2007), on which higher levels imply better institutions (greater accumulation of social capital or less incentive for government entrenchment).[3] The following are included as control variables: *Controller* is the proxy for the property rights of the firm; *ROA* is the proxy for performance; *Age* is the number of years a firm has been listed; *Shr1* is the largest shareholder ownership of the firm; *Loss* indicates if the firm earns a loss; *Tobin's Q* measures growth opportunities; *Related* is a measure of related party transactions; and *Leverage* measures the firm's capital structure. A more detailed description is provided in Table 1.

To test Hypothesis 2, we employ the following model, similar to Liu et al. (2009):

$$\begin{aligned} TransactionCost_{it} = {} & \alpha_0 + \beta_1 TrustIndex + \beta_2 Networktransaction_{it} + \beta_3 TrustIndex * Networktransaction_{it} \\ & + \beta_4 Controller_{it} + \beta_5 Shr1_{it} + \beta_6 Tobin'sQ_{it} + \beta_7 Size_{it} + \beta_8 Leverage_{it} + \beta_9 ROA_{it} + YearDummies \\ & + IndustryDummies + \varepsilon \end{aligned} \quad (3)$$

β_2 and β_3 are the variables to be tested; according to Hypothesis 2, we expect β_2 to be significantly negative, and β_3 to be significantly positive.

Following Liu et al. (2009), we use the following variables for proxies: *Sales expense* (cost of sales and discounts as a proportion of total sales), *Trust cost-pijk* (notes payable as a proportion of credit sales) and *Trust cost-yf* (prepayments as a proportion of total assets). We also use principal components analysis to generate a new factor, which is the linear function of the three factors above. Details of the control variables can be found in Table 1. To reduce the endogenous determinants of social network transactions, we use the 2SLS method[4] as a robustness check; the first stage is the model used to test hypothesis 1.

To test Hypothesis 3, we employ the following model, similar to Bertrand et al. (2002) and (Jian and Wong, 2010):

$$\begin{aligned} Per_{it} = {} & \alpha_0 + \beta_1 Industryshock_t + \beta_2 Industryshock_t * Networktransaction_{it} + \beta_3 Size_{it} + \beta_4 Leverage_{it} + YearDummies \\ & + IndustryDummies + \varepsilon \end{aligned} \quad (4)$$

β_2 is the variable to be tested; according to Hypothesis 3, we expect β_2 to be significantly negative.

Per is the operating profitability of the firm. Chen and Yuan (2004) document that listed firms can use a *below the line* method for earnings management; in this setting, social network transactions help the firm to reduce industry shocks mainly through normal commercial activities, thus operating profitability is more suitable than net profitability. We adopt industry codes according to the "Guide on Industry Classification for Listed Firms" set by the CSRC. For manufacturing industries, we include one character and two numerals; for other industries, after deleting financial industry, we include only the character. Thus, we have 21 sub-sectors in the whole sample. *Industry shock* is the industry median *per*, excluding the firm itself. Further details on the control variables can be found in Table 1.

[3] Trust index is mainly by a survey for 15,000 entrepreneurs, in order to make the index normalization, we take logarithmic transformation, market oriented index is about five dimensions including market and government relation, development of product market, development of factor and material, development of market intermediaries, and legal environments.

[4] Thanks to an anonymous referee for this constructive suggestion.

Table 1
Variable definitions.

Variables	Definitions
S-network transaction (%)	The proportion of total purchases accounted for by the five largest suppliers
C-network transaction (%)	The proportion of total sales accounted for by the five largest customers
Sales expense (%)	The cost of sales and discounts in the sales revenue
Trust cost-pjzk (%)	Notes payable/(notes payable + accounts payable), which reflects the proportion of credit transactions
Trust cost-Yf (%)	Prepayments/total assets, which reflects the the amount paid in advance during a transaction
Inventory (%)	Inventory/total assets
Per	Operating profit/operating income
Industry shock	The industry median per excluding the firm itself, which is similar to Bertrand (2002).
Market index	Used in the market report, from Fan et al. (2007)
Trust index	Survey data from Zhang and Ke (2002)
Size	The natural logarithm of total assets
Leverage	Total liabilities/total assets
Tobin's Q	According to the CSMAR definition, we use flow per share price × number of shares + net assets per share × number of non-tradable shares + book value of liabilities)/book value per share
Controller	Dummy variable which equals one when the firm is not a stated-owned enterprise, and equals zero when the firm is an SOE.
Shr1	The proportion of the largest shareholder
ROA	According to the CSMAR definition, net profit/average total assets
Age	Listing years, from the time of listing to August 2010 as the baseline
Loss	Dummy variable which equals one when the firm earns a loss, and otherwise equals zero
Related	Related party transactions as a proportion of the total revenue

4. Empirical analysis

4.1. Distribution of the sample

Data on the concentration of key suppliers and customers is hand collected from annual reports from 2001 to 2008 and financial data is sourced from the CSMAR database. After deleting observations relating to the financial industry and those that have missing financial data needed for the regression model, there are 7800 observations which disclose information on their five biggest suppliers and 9069 observations which disclose information on their five biggest customers. We only include the data which discloses the level of both customer and supplier concentration. Our final sample has 7401 firm-year observations. The sample distribution by year is shown in Fig. 1.

From Fig. 1, we can see that there is a high concentration of key suppliers and customers. The average concentration of big 5 customers is higher than 30% per year and the concentration of big 5 suppliers is higher than 35%. From the time series trend, we can see that the concentration slowly decreases, which implies that dependence decreases with time. Fig. 2 also shows the concentration distribution among different regions across China. Taking the concentration of big 5 suppliers as an example, we can see that there are differences among provinces, with a much lower concentration in Zhejiang, Shandong and Beijing than in Yunnan, Xizhang and Hainan provinces. The concentration of customers shows a similar trend across regions.

4.2. Descriptive statistics

All variables are winsorized at 1% and 99% levels to reduce extreme values. Table 2 presents descriptive statistics. On average, big 5 suppliers are 39% of purchases and big 5 customers are 31% of sales. We also use principal components analysis for the basic transaction cost proxy to obtain the linear function[5]; the coefficients are 0.7177, 0.6977 and −0.4877, which explains 41.28% of the variable.

Table 3 shows the Pearson correlation matrix. The table shows that *S-network transactions* and *C-network transactions* are significantly negatively correlated with *Market index* and *Trust index*, which supports the prediction of Hypothesis 1. *Trust cost-pjzk* is significantly negatively correlated with *C-network transaction*, and *Trust cost-yf* and *Sales expense* are significantly negatively correlated with *S-network transactions* and *C-network transactions,* which supports the prediction of Hypothesis 2. We find no statistical correlation between *Trust cost-pjzk* and *S-network transactions.*

4.3. Regression results

This section reports the main regression results. All the OLS regression models are adjusted according to White (1980) standard errors and include controls for industry and year effects. We also confirm that the VIF for each variable is less than 4, except for year and industry dummies, which suggests that there is no problem with multicollinearity.

[5] This is for the first component. The figures for the second variable are 0.4850, 0.5142 and 0.7621 which can explain 31.48% of the variables. For a robustness check, we use the second component and our empirical results remain basically unchanged.

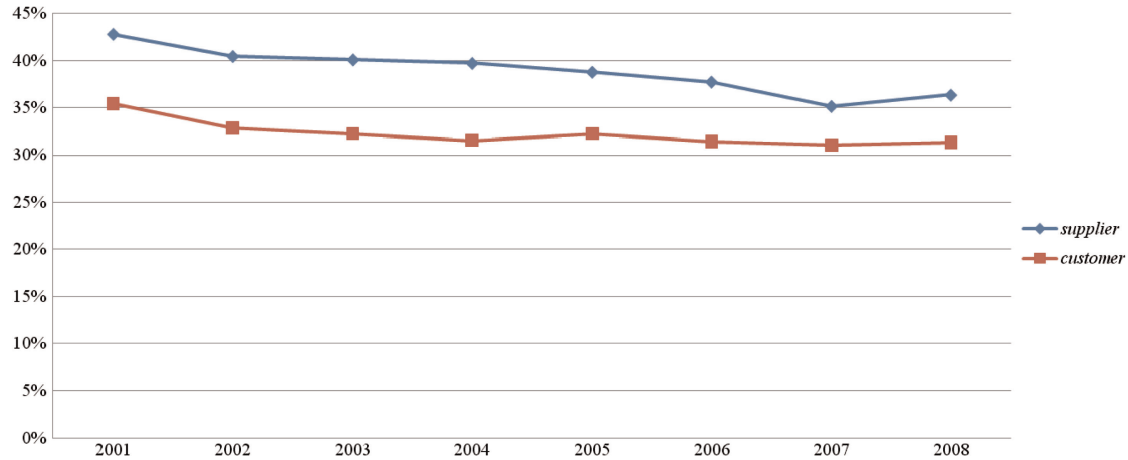
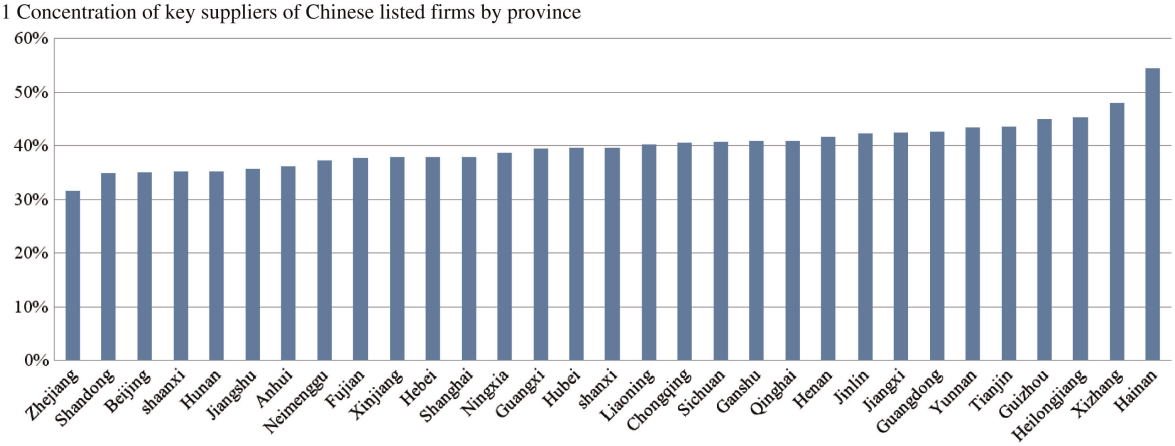


Fig. 1. Concentration of key suppliers and customers of Chinese listed firms by year.

2.1 Concentration of key suppliers of Chinese listed firms by province



2.2 Concentration of key customers of Chinese listed firms by province

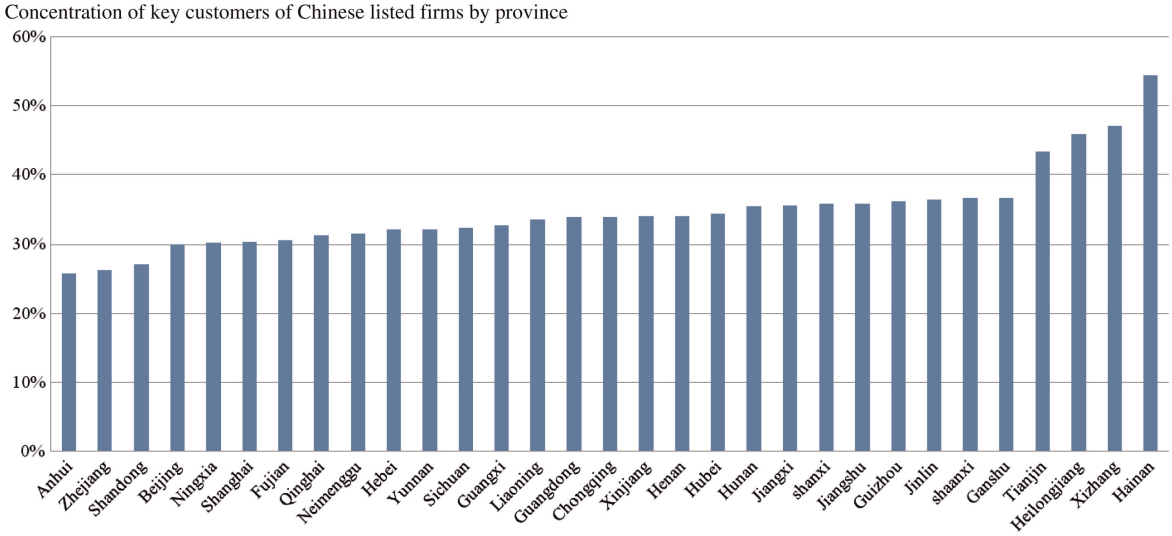


Fig. 2. (2.1) Concentration of key suppliers of Chinese listed firms by province. (2.2) Concentration of key customers of Chinese listed firms by province.

From Table 4, we find that when *S-network transactions* is the dependent variable, the coefficients of *Trust index* and *Market index*, −0.602 and −0.360, respectively, are significantly negative, with *t*-statistics of −2.62 and −2.51. Both are statisti-

Table 2
Descriptive statistics.

Variables	Observations	Mean	Standard deviation	Minimum	Maximum
S-network transactions	7401	39.264	23.588	4.100	98.680
C-network transactions	7401	31.818	23.523	1.750	100.000
Leverage	7401	0.515	0.245	0.091	1.837
Trust cost-pjzk	7401	21.320	23.994	0.000	86.409
Trust cost-Yf	7401	3.870	4.284	0.003	22.452
Sales expense	7401	6.016	6.922	0.000	40.426
Market index	7401	7.707	1.901	2.500	10.410
Trust index	7401	3.649	1.181	0.993	5.389
Per	7401	0.001	0.375	−2.754	0.477
Industry shock	7401	0.063	0.042	0.012	0.246
Size	7401	19.082	1.423	14.209	22.304
Tobin's Q	7401	1.385	0.592	0.811	4.365
Controller	7401	0.276	0.447	0.000	1.000
Shr1	7401	0.406	0.166	0.103	0.763
ROA	7401	0.040	0.084	−0.394	0.234
Age	7401	12.563	3.111	5.984	18.479
Related	7401	0.061	0.226	0.000	1.875
Loss	7401	0.079	0.269	0.000	1.000

Note. The sample firms are selected from the CSMAR financial statement database. There are 7401 A-share firm-years observations in non-financial industries with complete financial statement data necessary for analysis. A detailed definition of the variables can be found in Table 1.

Table 3
Correlation matrix.

	var1	*var2*	*var3*	*var4*	*var5*	*var6*	*var7*	*var8*
S-network transactions	1.000							
C-network transactions	0.383 0.000***	1.000						
Market index	−0.059 0.000***	−0.067 0.000***	1.000					
Trust index	−0.0666 0.000***	−0.0585 0.000***	0.902 0.000***	1.000				
Trust cost-pjzk	0.001 0.929	−0.080 0.000***	0.002 0.851	−0.030 0.000***	1.000			
Trust cost-yf	−0.025 0.034**	−0.079 0.000***	−0.073 0.000***	−0.070 0.000***	0.182 0.000***	1.000		
Sales	−0.124 0.000***	−0.224 0.000***	−0.063 0.000***	−0.059 0.006***	−0.091 0.000***	−0.073 0.000***	−0.019 0.104	1.000

Note. *** and ** indicate that coefficient estimates are significant at the 1%, 5% and 10% levels, respectively (two-tailed).

cally and economically significant, suggesting that when there is low social capital or high government intervention, firms will concentrate their suppliers and depend more on social network transactions. When *C-network transactions* is the dependent variable, the coefficient of *Trust index* is −0.151, but not significant ($t = -0.66$); *Market index* is −0.290 with a *t*-statistic of −2.01, which is statistically and economically significant. Overall, Hypothesis 1 is supported by the empirical results.

Table 5 presents the OLS regressions for Hypothesis 2. *Trust index* is significantly negative in each regression, which indicates that social capital can increase transaction costs. When the independent variable is *S-network transaction*, the coefficient for *Sales expense* as a dependent variable is significantly negative, as predicted, and all other coefficients and interaction variables are not significant, as predicted. When the independent variable is *C-network transaction*, the coefficients for *Trust cost-pjzk*, *Sales expense* and *Factor* as dependent variables are significantly negative as predicted; the interaction variables *Factor* and *Trust cost-pjzk* are significantly positive as predicted; the remaining coefficients and interaction variables are in the same direction as expected but are not significant, as predicted.

Table 6 presents the results for the 2SLS regressions. The results are stronger than for the OLS regressions. When the independent variable is *S-network transactions*, all variables are significant as predicted, except for the dependent variable *Sales expense*. When the independent variable is *C-network transactions*, all variables are significant as predicted, except for the dependent variable *Trust cost-yf*, and the interaction variable with *Sales expense* is in the opposite direction (the coefficient is −0.089 and statistically significant), as predicted. The empirical results in Tables 5 and 6 partially support our predictions.

Table 7 presents the results for Hypothesis 3. *Industry shock* is significantly positive (with coefficients of 0.350 and 0.402, both significant), suggesting that industry shock can influence the financial performance of firms. The interaction variable *Industry shock* ∗ *S-network transactions* and *Industry shock* ∗ *C-network transactions* are both significantly negative (−0.004

Table 4
Test for Hypothesis 1.

Variables	*Expectation*	(1) *S-network transactions*		(2) *C-network transactions*	
		Coefficient	*t*-Statistics	Coefficient	*t*-Statistics
(a) Test for Hypothesis 1a					
Trust_index	–	−0.602	−2.62**	−0.151	−0.66
Controller		3.260	5.19***	2.315	3.78***
ROA		3.601	0.95	−0.418	−0.11
Age		0.254	2.83***	0.104	1.24
Shr1		7.501	4.30***	7.782	4.70***
Loss		6.031	4.76***	7.355	5.82***
Tobin's Q		−0.004	−15.78***	0.005	18.53***
Related		2.526	1.86**	4.970	3.31***
Leverage		−9.186	−6.21***	−7.951	−5.44***
Size		−2.788	−12.09***	−2.477	−10.80***
Constant		83.484	17.61***	73.093	15.77***
YEAR		Control		Control	
Industry		Control		Control	
N		7401		7401	
ADJUST-R^2		0.1689		0.1946	
F		89.38		381.35	
(b) Test for Hypothesis 1b					
Market_index	–	−0.360	−2.51**	−0.290	−2.01**
Controller		3.296	5.24***	2.368	3.86***
ROA		3.717	0.98	−0.245	−0.06
Age		0.259	2.88***	0.131	1.56
Shr1		7.298	4.19***	7.774	4.70***
Loss		6.048	4.77***	7.381	5.84***
Tobin's Q		−0.004	−15.68***	0.005	18.51***
Related		2.527	1.86*	4.843	3.22***
Leverage		−9.148	−6.19***	−7.912	−5.41***
Size		−2.793	−12.12***	−2.422	−10.53***
Constant		84.082	17.75***	73.206	15.84***
YEAR		Control		Control	
Industry		Control		Control	
N		7401		7401	
ADJUST-R^2		0.1688		0.195	
F		88.63		389.73	

Note. The *t*-statistics are computed by White (1980) standard errors. ***, ** and * indicate that coefficient estimates are significant at the 1%, 5% and 10% levels, respectively (two-tailed).

and −0.006), which suggests that when firms face an industry shock, social network transactions can reduce the shock to avoid risk.

Next, we separate shocks into positive and negative shocks, using the method described in Xue and Ye (2009). When the present year's performance is less than the previous year's, it is classified as negative shock, and otherwise as a positive shock.[6] From Table 8(a) we can see that when the industry shock is positive, the interaction variables *Industry shock* * *S-network transactions* and *Industry shock* * *C-network transactions* are not significant (with *t*-values of −0.03 and 0.35). Table 8(b) shows that when the industry shock is negative, both interaction variables are significant; the coefficients are −0.006 with a *t*-value of −1.87 and −0.009 with a *t*-value of −2.78, respectively. We also compute *z*-statistics to compare the difference between the coefficients. The difference for *Industry shock* * *S-network transactions* is 2.28, which is marginally insignificant with a *p*-value of 0.1311. The difference for *Industry shock* * *S-network transactions* is 2.28, which is significant at the 5% level. Overall, the results support Hypothesis 3, which indicates that social network transactions can reduce industry shocks, especially negative shocks.

5. Robustness checks

Our results remain basically unchanged after conducting the robustness checks described below. We combine *S-network transactions* and *C-network transactions* to create a new variable and our empirical results remain unchanged. Following Zinglas and sapienza (2004), we use *voluntary blood donation* level across regions as a proxy for social capital accumulation instead of *Trust index*, and we also use ranking levels for *Trust index* and *Market index*, and our results remain constant.

Compared with other industries, customer and supplier concentration levels for manufacturing industries may be a better proxy for social network transactions, so we conduct an analysis on a sub-sample of manufacturing industry firms and our

[6] We also separate the shock according to whether the value of the shock is positive or negative and our results remain unchanged.

Table 5
Test for Hypothesis 2.

Variables	*Expectation*	*Trust cost-pjzk*		*Trust cost-Yf*		*Sales expense*		FACTOR	
		Coefficient	*t*-Statistics	Coefficient	*t*-Statistics	Coefficient	*t*-Statistics	Coefficient	*t*-Statistics
(a) The independent variable is S-network transactions									
Trust index	−	−2.224	−5.34***	−0.358	−4.41***	−0.326	−2.74***	−1.687	−5.20***
S-network transactions	−	−0.004	−0.11	0.001	0.14	−0.024	−2.22**	0.009	0.31
*S-network transactions * Trust index*	+	0.013	1.33	−0.001	−0.51	0.001	0.19	0.008	1.10
Controller		4.415	7.01***	0.836	7.04***	1.573	8.67***	0.068	1.34
Shr1		0.052	0.54	0.016	2.00**	−0.039	−0.77	−0.003	−12.20***
Tobin's Q		−0.002	−5.98***	−0.001	−9.68***	0.003	28.26***	3.521	22.26***
Size		4.701	23.11***	0.087	2.01**	−0.177	−2.86***	9.805	10.19***
Leverage		11.575	9.77***	1.583	6.75***	−0.808	−1.90*	2.984	6.15***
ROA		−5.132	−1.45	3.809	5.88***	−12.190	−8.62***	4.917	1.73
Constant		−76.457	−17.07***	1.989	2.13**	15.532	11.61***	−61.061	−17.60***
YEAR		Control		Control		Control		Control	
Industry		Control		Control		Control		Control	
N		7401		7401		7401		7401	
ADJUST-R^2		0.077		0.075		0.280		0.130	
F		18.41		17.84		123.53		43.27	
(b) The independent variable is C-network transactions									
Trust_index	−	−2.570	−6.88***	−0.409	−5.87***	−0.415	−3.73***	−1.927	−6.58***
C-network transactions	−	−0.119	−3.42***	−0.010	−1.52	−0.072	−7.96***	−0.057	−2.11**
*C-network transactions * Trust index*	+	0.026	2.84***	0.000	0.26	0.004	1.50	0.017	2.43**
Controller		4.554	7.22***	0.841	7.10***	1.610	8.67***	3.069	6.30***
Shr1		0.023	0.26	0.014	1.81*	−0.053	−1.17	0.052	1.09
Tobin's Q		−0.002	−5.45***	−0.001	−9.05***	0.003	32.25***	−0.003	−12.36***
Size		4.493	22.55***	0.070	1.64*	−0.284	−4.77***	3.412	21.97***
Leverage		11.181	9.58***	1.559	6.67***	−0.942	−2.25**	9.571	10.03***
ROA		−5.196	−1.48	3.804	5.90***	−12.250	−8.78***	4.897	1.72*
CONSTANT		−68.981	−16.11***	2.662	2.98***	18.899	14.16***	−56.869	−17.02***
YEAR		Control		Control		Control		Control	
Industry		Control		Control		Control		Control	
N		7401		7401		7401		7401	
ADJUST-R^2		0.150		0.077		0.308		0.128	
F		37.05		18.41		123.63		43.56	

Note. The *t*-statistics are computed by White (1980) standard errors. ***, ** and * indicate that coefficient estimates are significant at the 1%, 5% and 10% levels, respectively (two-tailed).

results remain robust. To overcome the cluster effect of panel data, and to overcome the censored distribution problem of transaction cost variables, we use the Fama–Macbeth method and panel data method with fixed effects and our main results remain basically unchanged.

6. Conclusions

How do firms cooperate with one another? Though commercial contracts are important, contracts are incomplete and their implementation is not well protected in emerging countries (La Porta et al., 2002). Implicit contracts that depend on social networks may play a more important part than commercial contracts, particularly in emerging countries. Using the concentration of key suppliers and customers of firms listed in China as a measure of social networks, this study investigates the effect of social network transactions on firms' commercial activities.

Based on a new institutional economy framework, we provide empirical results on social network transactions and find that social network dependence is endogenously determined by the external institutional background. When regions have a low level of social capital accumulation and a high incentive for government entrenchment, firms will depend more on social network transactions. Empirically, we find that key suppliers and customers will concentrate in regions with weak institutions. Dependence on social networks can reduce transaction costs by reducing information asymmetry and uncertainty. We find such evidence in a proxy for credit costs and sales expense, especially in those regions with low social capital, and our results remain robust after we use the 2SLS method for endogeneity concerns. By reducing contagion effects and protecting specific investments, we find that dependence on social network transactions can reduce industry shocks; however, our results are mainly driven by a reduction in negative industry shocks.

This evidence enhances our knowledge of the channels through which social networks can influence corporate commercial transactions, which is particularly important for businesses in emerging countries. Our study also extends recent

Table 6
Using the 2SLS method to reduce endogenous concerns.

Variables	Expectation	Trust cost-pjzk		Trust cost-Yf		Sales expense		Factor	
		Coefficient	t-Statistics	Coefficient	t-Statistics	Coefficient	t-Statistics	Coefficient	t-Statistics
(a) The independent variable is S-network transactions in a 2SLS regression									
Trust index	−	−63.673	−4.56***	−4.083	−2.99***	−2.372	−1.42	−0.461	−4.53***
S-network transactions	−	−6.256	−4.40***	−0.378	−2.72***	−0.232	−1.37	−0.045	−4.38***
*S-network transactions * Trust index*	+	1.541	4.44 ***	0.092	2.70***	0.051	1.24	0.011	4.41***
Shr1		−0.816	−1.47	−0.037	−0.67	−0.068	−1.03	−0.006	−1.37
Tobin's Q		−0.009	−1.88*	−0.001	−2.64**	0.003	4.80***	0.000	−2.61**
Size		2.242	3.02***	−0.062	−0.85	−0.258	−2.92***	0.017	3.14***
Leverage		5.900	1.95*	1.239	4.19***	−0.997	−2.76***	0.069	3.15***
Controller		3.705	2.65***	0.793	5.80***	1.549	9.27***	0.019	1.90**
ROA		−1.891	−0.23	4.005	4.93***	−12.082	−12.16***	0.110	1.82*
Constant		219.679	3.23***	19.937	3.00***	25.392	3.13***	1.594	3.22***
YEAR		Control		Control		Control		Control	
Industry		Control		Control		Control		Control	
N		7401		7401		7401		7401	
ADJUST-R^2		0.111		0.071		0.232		0.130	
F		5.99		12.07		76.69		7.63	
(b) The independent variable is C-network transactions in a 2SLS regression									
Trust_index	−	−35.272	−7.26***	−1.014	−1.88*	2.581	3.13***	−0.265	−7.22***
C-network transactions	−	−4.279	−6.95***	−0.087	−1.27	0.310	2.96***	−0.032	−6.93***
*C-network transactions*Trust index*	+	1.039	6.93***	0.019	1.15	−0.089	−3.50***	0.008	6.89***
Shr1		−1.157	−2.75***	−0.008	−0.17	0.055	0.77	−0.008	−2.63***
Tobin's Q		0.007	2.00**	−0.001	−1.46	0.003	4.31***	0.000	1.07
Size		3.121	7.53***	0.045	0.97	−0.158	−2.25***	0.023	7.28***
Leverage		7.915	3.80***	1.499	6.50***	−0.643	−1.82*	0.083	5.27***
Controller		4.320	4.20***	0.836	7.35***	1.631	9.35***	0.024	3.07***
ROA		−17.368	−2.72***	3.579	5.06***	−11.135	−10.27***	−0.005	−0.11
CONSTANT		94.291	3.73***	5.679	2.63***	3.941	0.92	0.739	3.87***
YEAR		Control		Control		Control		Control	
Industry		Control		Control		Control		Control	
N		7401		7401		7401		7401	
ADJUST-R^2		0.115		0.060		0.151		0.124	
F		11.2		17.2		75.29		13.33	

Note. The *t*-statistics are computed by White (1980) standard errors. ***, ** and * indicate that coefficient estimates are significant at the 1%, 5% and 10% levels, respectively (two-tailed).

Table 7
Test for Hypothesis 3.

Variables	Expectation	Per		Per	
		Coefficient	*t*-Statistics	Coefficient	*t*-Statistics
Industryshock	+	0.350	1.68*	0.402	1.81*
*Industryshock * S-network transactions*	−	−0.004	−1.85*		
*Industryshock * C-network transactions*	−			−0.006	−2.82***
Size		0.081	15.75***	0.081	15.84***
Leverage		−0.703	−18.09***	−0.705	−18.05***
CONSTANT		−1.332	−11.37***	−1.332	−11.61***
YEAR		Control		Control	
Industry		Control		Control	
N		7401		7401	
ADJUST-R^2		0.267		0.267	
F		21.150		21.940	

Note. The *t*-statistics are computed by White (1980) standard errors. *** and * indicate that coefficient estimates are significant at the 1%, 5% and 10% levels, respectively (two-tailed).

research on the role of social networks. Whereas most extant studies focus on the information role that social networks provide, our study explores direct evidence on the formation of social networks and the economic consequences from the perspective of key suppliers and customers. However, due to the limited disclosure of social networks, especially the disclosure level of key managers, our results still lack detailed data on the identification of social networks, which may be a useful direction for future research.

Table 8
Separating shocks into positive and negative shocks.

Variables	*Expectation*	*Per*		*Per*	
		Coefficient	*t*-Statistics	Coefficient	*t*-Statistics
(a) Positive industry shocks					
Industryshock	+	−0.677	−1.10	−0.738	−1.31
Industryshock∗S-network transactions	−			0.001	0.35
Industryshock∗C-network transactions	−	0.000	−0.03		
Size		0.078	8.47***	0.079	8.36***
Leverage		−0.538	−8.22***	−0.538	−8.25***
CONSTANT					
YEAR		Control		Control	
Industry		Control		Control	
N		2203		2203	
ADJUST-R^2		0.275		0.275	
F		12.07		11.55	
(b) Negative industry shocks					
Industryshock	+	0.244	0.64	0.122	0.34
Industryshock ∗ S-network transactions	−			−0.006	−1.87*
Industryshock ∗ C-network transactions	−	−0.009	−2.78***		
Size		0.084	12.57***	0.085	12.69***
Leverage		−0.707	−14.34***	−0.706	−14.31***
CONSTANT					
YEAR		Control		Control	
Industry		Control		Control	
N		3942		3942	
ADJUST-R^2		0.284		0.284	
F		13.6		13.73	

Note. The *t*-statistics are computed by White (1980) standard errors. *** and * indicate that coefficient estimates are significant at the 1%, 5% and 10% levels, respectively (two-tailed).

Acknowledgements

This study was funded by Grants from the National Natural Science Foundation of China (No. 70802035) and supported by the MOE Project of Key Research Institute of Humanities and Social Science in University (No. 07JJD63007). The author is grateful to the 3rd China Journal of Accounting Research summer workshop and the invaluable advice from the anonymous reviewers and the chief editor. The author also thanks Professor Zengquan Li, Professor Hao Zhang, Professor Tianyu Zhang, Professor Shuang Xue, Professor Oliver Lee and Professor Xijia Su for their insightful comments. Any errors are the sole responsibility of the author.

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China Journal of Accounting Research 4 (2011) 135–154

Contents lists available at SciVerse ScienceDirect

China Journal of Accounting Research

journal homepage: www.elsevier.com/locate/cjar

Do modified audit opinions have economic consequences? Empirical evidence based on financial constraints ☆

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ARTICLE INFO

Article history:
Received 23 April 2010
Accepted 26 April 2011
Available online 27 August 2011

JEL classification:
M42
G32
L14

Keywords:
Modified audit opinions (MAOs)
Economic consequences
Financial constraints
Earnings management
Government intervention
Political connections

ABSTRACT

We present a framework and empirical evidence to explain why, on average, 11% of listed firms in China received modified audit opinions (MAOs) between 1992 and 2009. We argue that there are two reasons for this phenomenon: strong earnings management incentives lower firms' financial reporting quality and soft budget constraints weaken the information and governance roles of audit opinions. We find that firms' financial constraints eased after receiving MAOs, which suggests that MAOs have limited economic consequences. Further analysis shows that this phenomenon predominantly exists in government-controlled firms and firms that receive MAOs for the first time. We also find that MAOs have not influenced financial constraints after 2006. Finally, we find that MAOs did not affect borrowing cash flows from banks until 2005, suggesting that MAOs did not start affecting bank financing until that year. We also find that firms receive more related-party financing after receiving MAOs. Our results indicate that a limited effect on bank financing and increased related-party financing reduce the effect of MAOs on financial constraints.

1. Introduction

On average, 11% of the annual reports of Chinese listed firms received modified audit opinions (MAOs) between 1992 and 2009, which is much higher than in Britain (2.96%) and other East Asian economies (2.01%).[1] We provide a framework and empirical evidence to explain this phenomenon.

☆ This paper was supported by the National Natural Science Foundation of China (No. 71172143), and the Major Project of Key Research Institute of Humanities and Social Science of the Ministry of Education, People's Republic of China (No. 2009JJD790030). We appreciate helpful comments from an anonymous referee, Ge Rui and participants at CJAR Summer Research Workshop (2010, Hong Kong, China). All errors are our own.
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[1] Modified audit opinions (MAOs) include opinions that are unqualified with explanatory paragraphs, and qualified, disclaimed and adverse opinions.

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doi:10.1016/j.cjar.2011.06.004

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The three factors that affect the probability of receiving MAOs are the likelihood of substantial misrepresentation in annual reports, the competency of auditors and the independence of auditors. The first factor is mainly determined by the incentives of listed companies and the last two factors represent audit quality. The extant literature uses the proportion of firms that received MAOs to proxy for audit quality in China. They argue that an increase in audit risk leads to higher auditor independence and audit quality, which results in an increase in the proportion of firms that receive MAOs (DeFond et al., 2000; Wang and Chen, 2001). Although audit quality is important in determining the likelihood of receiving a MAO, a more important determinant is the probability of substantial misrepresentation in annual reports, which is overlooked in the extant literature.[2] We examine the economic consequences of receiving a MAO and explain why firms in China have a high occurrence of misrepresentation in annual reports.

We argue that the main reasons for the high proportion of MAOs in China are strong earnings management incentives and the limited costs of receiving MAOs. First, a substantial amount of research finds that security regulations (IPO, SEO and delisting regulations, etc.), related-party tunneling and corporate rent-seeking activities provide listed companies with strong incentives to engage in earnings management, which increases the probability of substantial misrepresentation in annual reports (Jiang, 1998; Lu, 1999; Sun and Wang, 1999; Aharony et al., 2000; Chen and Yuan, 2004; Fan and Wong, 2002; Liu and He, 2004; Li et al., 2006; Fan et al., 2008a,b; Luo and Zhen, 2008). Second, firms' investment and financing opportunities are mainly determined by political connections and government intervention (Sun et al., 2005; Xia and Fang, 2005; Luo and Tang, 2007; Fan et al., 2008b; Li et al., 2008; Luo and Zhen, 2008; Luo and Liu, 2009) and not by information asymmetry signaled by MAOs. Thus, receiving a MAO does not necessarily have a large negative effect on firm value. In summary, strong earnings management incentives increase the probability of substantial misrepresentation in annual reports, which results in more modified audit opinions. Also, because MAOs have little effect on investment and financing opportunities, firms choose to accept a high probability of receiving a MAO after considering the costs and benefits.

We focus on the effect of receiving MAOs on firms' financial constraints for two reasons. First, China is an emerging market in which firms have good investment opportunities. However, the capital market is still developing and capital is a scarce resource in China (Lin et al., 1999). We can learn what role accounting information plays in the process of value creation by examining the effect of MAOs on financial constraints, which affect firm investment and financing activities. Second, we can learn about one of the real effects of accounting information by studying the effect of MAOs on financial constraints.[3]

There are two competing views on the effect of MAOs on financial constraints. The first is the Information Asymmetry View (IAV). The audit report conveys important information about the information quality of annual reports; receiving a MAO signals a decrease in information quality and an increase in information asymmetry between firm insiders and outsiders, which increases firms' financial constraints. However, there is another possibility. In China, firms obtain outside financing through help from the government, by using political connections or by building their internal capital market to mitigate the difficulty in obtaining financing from outside sources. To avoid securities regulations or conceal the tunneling or rent-seeking activities of controlling shareholders, firms with relatively poor performance have strong incentives to manipulate earnings, which increase the chance of receiving MAOs. However, to help firms boost performance, governments and controlling shareholders have incentives to help firms acquire more financing, which can soften budget constraints and ease financing constraints. We call this the Soft Budget Constraint View (SCV). These two mechanisms may coexist and if the effect of SCV is larger than the effect of IAV, then firms' financing constraints may remain unchanged or even ease after receiving MAOs. Thus, MAOs do not necessarily create substantial negative effects on firms' investment and financing activities, which could explain the high proportion of firms that receive MAOs in China.

We find that firms' financial constraints ease after receiving MAOs, which means the effect of soft budget constraints is larger than the effect of information asymmetry. Further analysis shows that this phenomenon predominantly exists in government-controlled firms and firms that receive MAOs for the first time. We also find that MAOs do not influence financial constraints after 2006. Finally, we find that MAOs did not affect borrowing cash flows from banks before 2005, which means that MAOs did not start affecting bank financing until that year. We also find that firms obtain more related-party financing after receiving MAOs. Our results show that a limited effect on bank financing and increased related-party financing reduce the effect of MAOs on financial constraints.

Our paper makes two contributions. First, the extant literature explains the probability of receiving MAOs from the perspective of auditor independence. We argue that this is an incomplete view and provide a comprehensive framework to further our understanding of China's audit market based on the country's special institutional factors. This framework represents a specific development in research on the effect of institutions on accounting information (Ball et al., 2000; Ball, 2001). Second, we explain why MAOs have limited information and corporate governance roles from the perspectives of

[2] For example, if there is little misrepresentation in annual reports, then the observed proportion of firms that receive MAOs is near zero even if auditors are fully independent. However, if the probability of substantial misrepresentation increases, then the observed proportion of firms that receive MAOs will increase even if auditor independence remains unchanged.

[3] Receiving a MAO has many economic consequences, including the effect on firm liquidity, the cost of capital, management turnover, etc. These are possible future research questions that could help us further understand the economic consequences of receiving MAOs. We do not examine the effect of receiving MAOs on the cost of capital for two reasons. First, we need stock prices to calculate the cost of capital. However, price is an expectation measure and the market may anticipate the possibility of receiving MAOs and adjust the stock price in advance, which makes it difficult to identify the effect of MAOs on the cost of capital. Second, the stock market in China is not very efficient and the information content of price is low (Morck et al., 2000), which causes large estimation errors when using prices to calculate cost of capital measures.

Table 1
Modified audit opinions in China's stock market.

Year	Listed companies	Number that received audit opinions	Number that received MAOs	Proportion that received MAOs (%)
Panel A: Proportion of firms that received MAOs in China's stock market				
1992	50	45	2	4.4
1993	179	154	5	3.2
1994	291	269	6	2.2
1995	321	321	36	11.2
1996	531	529	46	8.7
1997	745	745	90	12.1
1998	852	851	147	17.3
1999	949	948	189	19.9
2000	1091	1091	178	16.3
2001	1164	1163	156	13.4
2002	1228	1228	165	13.4
2003	1293	1293	109	8.4
2004	1380	1380	151	10.9
2005	1375	1375	171	12.4
2006	1458	1458	150	10.3
2007	1572	1572	125	8.0
2008	1626	1626	113	6.9
2009	1774	1774	118	6.7
PRC	17879	17822	1957	11.0
UK		5441	161	2.96
8 East Asian economies		2834	57	2.01

Number of MAOs received	Number of firms	Number of MAOs received	Number of firms	Number of MAOs received	Number of firms	Total
Panel B: Statistics for the number of firms that received MAOs						
1	193	6	31	11	1	
2	134	7	20	12	2	
3	89	8	16	13	1	
4	63	9	16	16	1	
5	45	10	9			
Total	524		92		5	621

(1) Chinese sample includes A share and B share firms; all Chinese data comes from the CSMAR database and was compiled by the authors.
(2) The UK data comes from Lennox (2000), including 949 listed companies from 1988 to 1994.
(3) The data on Eight East Asian economies comes from Fan and Wong (2005), including listed companies from 1994 to 1996.

political connections and soft budget constraints. The findings may help regulators to understand the role of accounting information in allocating resources and in designing regulations that are more effective.

The remainder of the article proceeds as follows. Section 2 describes the phenomenon whereby a large proportion of firms in China receive MAOs, provides a simple framework to explain this phenomenon and develops our hypotheses. Section 3 presents the research design, which describes the sample and the research models and defines the variables. Section 4 presents the empirical results. Section 5 concludes the article.

2. Research question, theoretical analysis and research hypothesis

2.1. Research question

Table 1, Panel A reports the number of firms in the Chinese stock market that received MAOs between 1992 and 2009. We find the proportion of firms that received MAOs has been above 7% since 1995, reaching a peak of 19.9% in 1999.[4] On average, 11% of firms received MAOs in China from 1992 to 2009. We estimate that even after dropping unavoidable MAOs, the proportion of firms that received avoidable MAOs was 7.7%.[5]

According to Lennox (2000), the proportion of firms that received MAOs in Britain between 1988 and 1994 was 2.96%, which is eight percent lower than in China. Fan and Wong (2005) report the proportion of firms that received MAOs in eight East Asian economies from 1994 to 1996 was 2.01%, which is almost nine percent lower than in China. The proportion of firms that received MAOs in China is clearly much higher than in markets in developed countries (such as Britain) and in developing countries (eight East Asian countries). The proportion of firms that received MAOs cannot be compared due to

[4] The proportion of firms that received MAOs in 2003 decreased from 13.4% to 8.4%, which is explained by changes in audit standards (Wang and Tu, 2006).
[5] We do not have data on unavoidable MAOs, but, in line with Chen et al. (2005), we believe this percentage would not exceed 30% of MAOs; thus, the percentage of avoidable MAOs is 7.7 % (11% * 0.7 = 7.7%).

differences between developing countries and developed countries on dimensions such as capital market development, the quality of listed companies and the level of investor protection. Nevertheless, it is notable that although we share a similar investor protection environment and culture, a much higher proportion of firms received MAOs in China than in other East Asian economies.

Table 1, Panel B summarizes the number of firms that received MAOs from 1992 to 2009. It shows that 621 firms received MAOs during this period. This includes 428 firms that received two or more MAOs, 92 firms received between 6 and 10, and 5 firms received more than 10. The firm that received the most was SHENRUN GUFENG (Chen et al., 2009), which received 18 MAOs from 1993 to 2010. Given these statistics, it is reasonable to ask why so many firms received MAOs in China during this period.

2.2. Theoretical analysis

Eq. (1) shows that the probability of receiving MAOs is the joint probability of three factors. The first is the likelihood that there is substantial misrepresentation in annual reports. The second is the probability that auditors (A) find substantial misrepresentation in annual reports, conditional on there being substantial misrepresentation in annual reports. The third is the probability that auditors report substantial misrepresentation, conditional on them finding it. The second and third factors are called professional competence and auditor independence, and represent audit quality (Watts and Zimmerman, 1986).

$$\begin{aligned} &P(\text{receive MAOs}) = P(\text{Substantial misrepresentation in annual reports}) \\ &* P(\text{Auditors find the substantial misrepresentation Substantial misrepresentation in annual reports}) \\ &* P(\text{Auditors report the substantial misrepresentation Auditors find the substantial misrepresentation}) \end{aligned} \quad (1)$$

According to Eq. (1), we can explain the high proportion of firms that receive MAOs in China from two perspectives. The first explanation looks at the problem from the perspective of audit quality and assumes that improved audit quality increases the proportion of firms that receive MAOs. DeFond et al. (2000) and Wang and Chen (2001) take the proportion of firms that received MAOs as a proxy variable for auditor independence. They find that the introduction of new audit standards in 1995 and the disaffiliation program in 1997 improved auditor independence, which is proxied by increases in the proportion of firms that received MAOs. Improvement in auditor independence could explain the time-series increase in the proportion of firms that received MAOs, but cannot explain why the proportion is much higher than in European and Asian countries, because there is no evidence that professional competence and auditor independence is better in China than elsewhere. Thus, the explanation for the high proportion of firms receiving MAOs in China must lie in why there is a high probability of substantial misrepresentation.

We believe that strong earnings management incentives and the limited costs of receiving MAOs are the fundamental reasons why firms do not adjust annual reports according to auditors' suggestions, and this is why a high proportion of firms receive MAOs.

2.2.1. Strong earnings management incentives

Firms have incentives to manipulate earnings to obtain equity financing opportunities or avoid delisting regulation. First, firms may engage in financial packaging to raise more equity in the IPO process. The findings of Aharony et al. (2000) and Lin and Wei (2000) confirm that firms engage in earnings management in IPOs. Second, in 1996, the CSRC required firms that apply for SEOs to have ROE of at least 10% for three consecutive years. Haw et al. (2005) find that the number of firms whose ROE lies between 10% and 11% is three times higher in the period from 1996 to 1998 than from 1994 to 1995. Chen and Yuan (2004) examine the earnings quality of firms that applied for SEOs from 1996 to 1998. They find that applying firms have more non-operating income and investment income if their ROE is less than 10%. However, although regulators lower the probability of SEOs for these firms, some are given permission to issue new shares. Finally, to avoid intervention from regulators following two consecutive years of losses, firms have strong incentives to manipulate earnings. Sun and Wang (1999) and Wang et al. (2005) find some empirical evidence to support such a hypothesis.

Firms may manipulate earnings to conceal the tunneling activities or rent-seeking activities of controlling shareholders (Fan and Wong, 2002). Leuz and Oberholzer-Gee (2006) use 130 Indonesian listed companies as their research sample and examine whether political connections have an effect on firms' overseas financing decisions and disclosure policies. They find that firms that had intimate connections with Suharto had little incentive to list overseas before the financial crisis, but this changed after Suharto stepped down. This suggests that firms that have political connections do not have incentives to improve disclosure quality. Plenty of research on the Chinese market finds it is common practice for controlling shareholders to expropriate wealth from minority shareholders and engage in rent-seeking activities (Li et al., 2004, 2006; Yue, 2006; He et al., 2008; Luo and Tang, 2009). Firms have an incentive to manipulate earnings to hide such behavior to avoid media pressure or litigation risk.

2.2.2. Limited economic consequences of receiving MAOs

Many researchers find that SOEs have soft budget constraints (La Porta et al., 2002; Lin and Li, 2004). Sun et al. (2006) find that state-controlled firms have implicit guarantees from local governments and can obtain more loans from banks. Liao (2007) finds that accounting information reduces information asymmetry in banks' lending decisions, but this relationship

disappears when firms are state controlled. Lu et al. (2008) find that new long-term debt is uncorrelated with accounting information quality, which implies that accounting information does not play an important role in banks' lending decisions. Thus, even if MAOs imply poor accounting information and greater information asymmetry, this may have little effect on firms' debt-raising ability under China's special institutional environment.

In countries or regions with weak property rights protection, firms have incentives to build political connections to secure better protection from government (Li et al., 2008), to gain more loans from banks and more subsidies from the government (Johnson and Mitton, 2003; Faccio, 2006; Li et al., 2008; Fan et al., 2008b). Firms with political connections can obtain more economic aid from the government when they get into financial distress (Johnson and Mitton, 2003; Faccio, 2006). Political connections therefore play a vital role in determining firms' investment and financing opportunities. Yu and Pan (2008) finds that firms with political connections obtain more bank loans and have a longer debt maturity structure. Wu et al. (2008) report similar results and find that the role of political connections is more important in areas with more government intervention. Luo and Zhen (2008) examine the role of political connections in privately controlled listed firms and find that privately controlled firms with political connections have fewer financial constraints and this relationship is stronger in areas with a low level of financial development. In summary, political connections provide privately controlled firms with more investment opportunities and more favorable financing conditions. Thus, for firms with political connections, the role of accounting information quality will diminish or have less influence on firms' investment and financing opportunities.

2.3. Hypotheses

The role of an auditor is to issue an opinion on whether a firm's annual reports fairly represent its financial position, operating results and cash flows in all material respects. Auditors issue a MAO if they find there is substantial misrepresentation in a firm's annual report. Receiving a MAO therefore reflects deterioration in accounting information quality or an increase in information asymmetry between outsiders and insiders. Low accounting information quality will increase investors' estimation risk and agency costs, and investors will then ask for higher returns to compensate for the increased risks and costs (Francis et al., 2005; Lambert et al., 2007; Leuz and Wysocki, 2008). The higher the outside financing costs, the larger the financial constraints a firm may face (Fazzari et al., 1988). According to this theory, we expect that MAOs will increase firms' financial constraints. We call this hypothesis the "Information Asymmetry View" (IAV).

Firms manipulate earnings to meet equity-financing requirements or avoid delisting regulations, or to conceal the tunneling or rent-seeking activities of controlling shareholders, which result in a higher probability of substantial misrepresentation in annual reports. Firms receive MAOs if they refuse to adjust their annual reports according to the auditor's suggestions. However, firms can continue to obtain bank loans even with low quality accounting information because of government intervention or political connections. If receiving a MAO does reduce the probability of equity financing and bank loans, then controlling shareholders will help the firm to get through difficult times (Li et al., 2005), and one way of doing so is to provide related-party loans. Therefore, receiving a MAO may result in a soft budget constraint that eases a firm's financial constraints. We call this hypothesis the "Soft Budget Constraint View" (SCV).

In sum, there are two possibilities after receiving MAOs. On the one hand, receiving MAOs means more information asymmetry, which results in increased financial constraints. On the other hand, the financial constraints of firms may decrease after receiving MAOs if they receive more subsidies from the government or assistance from controlling shareholders. If the soft budget constraint effect is larger than the information asymmetry effect, then the net effect of receiving MAOs is a decrease in financial constraints.

3. Research design

3.1. Sample selection and data sources

The initial sample of this paper is all A-share companies listed between 1998 and 2006. We need information on cash flows to carry out financial constraints tests, but this information was not disclosed in annual reports until 1998. All listed companies adopted the new accounting standards after the completion of the tradable share reform in 2007. Therefore, we choose 1998 as the initial year and 2006 as the final year of the sample in this paper.

In the initial sample, we delete financial industry firms and firms that either have negative fixed assets at the end of year or have missing data. Then, in the final sample, the number of observations per year is 575, 743, 839, 1003, 1077, 1159, 1231, 1309 and 1313 from 1998 to 2006, and the full sample contains 9249 firm-year observations.

To investigate whether the effect of MAOs on firms' financing constraints differ significantly over different time periods, we use the same data collection procedures to create two more samples, one with 695 observations spanning 1995–1997 and the other with 4456 observations spanning 2007–2009.

The data for "net cash flow from operating activities" and "purchases of fixed assets, intangible assets and other long-term assets" cannot be obtained directly from the statement of cash flows before 1998. We use the difference between net profit and total accruals as the estimated value of the "net cash flow from operating activities," and the annual change in the balance of fixed assets as the estimated value of "purchases of fixed assets, intangible assets and other long-term assets."

We collect all financial data on China's listed companies from the CSMAR database. The ultimate controller data is initially from the CCER database and supplemented with hand-collected data. We winsorize the top and bottom 1% of values for all continuous variables to mitigate the effect of extreme values on our empirical analysis.

3.2. Research model and variable definitions

Myers and Majluf (1984) and Bernanke and Gertler (1990) point out that information asymmetry and agency costs may cause external financing costs to be higher than internal financing costs. The difference between external and internal financing costs represents the financing constraints of the enterprise. Fazzari et al. (1988) demonstrate that financing constraints cause a positive relationship between corporate investment and internal generated cash flows, and the greater the financial constraints are, the stronger the positive relationship.

On the one hand, if receiving a MAO conveys more information asymmetry and agency costs between the firm and other contract parties, then the financial constraints of the enterprise will increase. On the other hand, a MAO may indicate that the firm will receive more support from the government or controlling shareholders, which will lead to the soft budget constraint problem and thus reduce financing constraints.

Following Zhu et al. (2006) and Luo and Zhen (2008), we use model (2) to test whether receiving MAOs affects the sensitivity of investment expenditure to cash flows from operating activities:

$$INVST_{it} = \beta_0 + \beta_1 OCF_{it} + \beta_2 MAO_{it-1} + \beta_3 MAO_{it-1} \times OCF_{it} + \beta_4 PRIV_{it} + \beta_5 PRIV_{it} \times OCF_{it} + \beta_6 GROWTH_{it} + \beta_7 SIZE_{it} + FixedEffects + \varepsilon_{it} \quad (2)$$

We use model (3) to test whether different types of MAOs affect the sensitivity of investment expenditure to cash flows from operating activities:

$$INVST_{it} = \beta_0 + \beta_1 OCF_{it} + \beta_2 UQAO\_EXPLAN_{it-1} + \beta_3 QUAO_{it-1} + \beta_4 DISC\_ADVS_{it-1} + \beta_5 UQAO\_EXPLAN_{it-1} \times OCF_{it} + \beta_6 QUAO_{it-1} \times OCF_{it} + \beta_7 DISC\_ADVS_{it-1} \times OCF_{it} + \beta_8 PRIV_{it} + \beta_9 PRIV_{it} \times OCF_{it} + \beta_{10} GROWTH_{it} + \beta_{11} SIZE_{it} + FixedEffects + \varepsilon_{it} \quad (3)$$

MAO_{it-1} is a dummy variable, which equals 1 if last year's audit opinion is modified, and 0 otherwise. We also divide MAOs into three categories. $UQAO\_EXPLAN_{it-1}$ is an unqualified opinion with explanatory paragraphs, which equals 1 if a firm received this opinion last year and 0 otherwise. $UQAO_{it-1}$ is a qualified opinion, which equals 1 if a firm received this opinion last year and 0 otherwise. $DISC\_ADVS_{it-1}$ is other modified opinions, which equals 1 if a firm received a disclaimed opinion or adverse opinion last year and 0 otherwise.

We define two variables based on whether firms received MAOs for the first time. $MAO_FT_{it-1}$is "receiving a MAO for the first time," which equals 1 if firms received a MAO for the first time last year and 0 otherwise; and MAO_FT_{it-1} is "receiving a MAO not for the first time," which equals 1 if firms received a MAO last year but it was not the first time they had received one since their IPO, and 0 otherwise.

$INVST_{it}$ is investment expenditure, which is measured as annual "purchases of fixed assets, intangible assets and other longterm assets" from the statement of cash flows, divided by this year's beginning balance of fixed assets. OCF_{it} is net cash flows generated from operating activities, which equals annual "net cash flows from operating activities" divided by this year's beginning balance of fixed assets. $PRIV_{it}$ is the type of ultimate controller, which equals 1 for non-government agencies or individuals and 0 otherwise; $GROWTH_{it}$ is growth opportunities, measured by annual revenue growth rate; $SIZE_{it}$ is firm size, which is measured by the natural logarithm of total assets at year end. All the variables used in this article are defined in Table 2.

Compared with firms that received a standard unqualified opinion, the IAV means that information becomes more asymmetrical when the company receives a MAO, which will increase firms' financing constraints. In other words, the positive correlation between investment expenditure and cash flows from operating activities will be strengthened, in which case the coefficient (β_3) on the interaction term ($MAO_{it-1} \times OCF_{it}$) in model (2) should be significantly positive. The "Soft Budget Constraint View" argues that companies that receive MAOs are more likely to receive government subsidies, obtain bank loans or be propped up by controlling shareholders. This view implies that the correlation between investment expenditure and net cash flows from operating activities may remain unchanged or even become significantly negative after firms receive MAOs, in which case the coefficient (β_3) on $MAO_{it-1} \times OCF_{it}$ in model (2) should be zero or negative.

3.3. Descriptive statistics and correlation analysis

The descriptive statistics for all of the variables used in this paper are presented in Table 3. The sample period is from 1998 to 2006, and the sample thus includes 9249 firm-year observations. In this sample, 12.2% of the firms received MAOs, of which 7.2% received an unqualified opinion with explanatory paragraphs, 3.8% a qualified opinion and 1.2% a disclaimed opinion or adverse opinion. Of those firm-year observations that received a MAO, 36% received a MAO for the first time and the other 64% not for the first time. In addition, the descriptive statistics show that 22.9% of firm-year observations have

Table 2
Variable definitions.

Variable	Variable name	Definition
ICF_{it}	Investment expenditure	Cash payments to acquire fixed assets, intangible assets and other long-term assets divided by the yearly beginning balance of fixed assets; the pre-1988 data uses the change in book value of fixed assets
$NICF_{it}$	Net investment expenditure	The net cash flow of the cash payment to acquire fixed assets, intangible assets and other long-term assets, minus the cash inflow of disposing of the aforementioned assets, divided by the yearly beginning balance of fixed assets
MAO_{it-1}	Modified audit opinions	Dummy variable, which equals 1 if the firm received a MAO last year, and 0 otherwise
$UQAO\_EXPLAN_{it-1}$	Unqualified opinion with explanatory paragraph	Dummy variable, which equals 1 if the firm received an unqualified opinion with explanatory paragraph last year, and 0 otherwise
$QUAO_{it-1}$	Qualified opinion	Dummy variable, which equals 1 if the firm received a qualified opinion last year, and 0 otherwise
$DISC\_ADVS_{it-1}$	Disclaimed and adverse opinions	Dummy variable, which equals 1 if the firm received a disclaimed or adverse opinion last year, and 0 otherwise
MAO_FT_{it-1}	First time MAOs	Dummy variable, which equals 1 if the firm received a modified opinion last year and it was the first time since the IPO, and 0 otherwise
MAO_NFT_{it-1}	Not first time MAOs	Dummy variable, which equals 1 if the firm received a modified opinion last year and it was not the first time since the IPO, and 0 otherwise
OCF_{it}	Net cash flows from operating activities	Annual net cash flows from operating activities divided by the yearly beginning balance of fixed assets. The difference between net profit and total accrual is used as a proxy for data before 1998
$PRIV_{it}$	Ultimate controller	Dummy variable, which equals 1 if the type of ultimate controller is a non-government agency or individual, and 0 otherwise
ROA_{it}	Return on assets	ROA equals net income minus financial expenses divided by year-end total assets
$GROWTH_{it}$	Growth rate	Annual revenue growth rate
TQ_{it}	Growth opportunities	TOBINQ = the sum of the market value of equity and net debt divided by year-end total assets, in which the market value of non-tradable equity is measured as net assets
LEV_{it}	Leverage	Ratio of debt to total year-end assets
$SIZE_{it}$	Size	The natural logarithm of the total year-end assets
IND_{it}	Industry dummies	There are 21 industries in our sample after deleting the financial industry. We generate 20 industry dummy variables
$YEAR_{it}$	Year dummies	Controls for the effect of macroeconomic conditions. There are 9 years of data, so we generate 8 dummy variables

Table 3
Descriptive statistics.

Variables	*N*	Mean	Median	SD	Min	P5	P95	Max
ICF	9249	0.336	0.167	0.537	0.0004	0.007	1.233	3.896
NICF	7729	0.301	0.152	0.495	−0.314	−0.005	1.133	3.649
MAO	9249	0.122	0	0.327	0	0	1	1
UQAO_EXPLAN	9249	0.072	0	0.258	0	0	1	1
QUAO	9249	0.038	0	0.191	0	0	0	1
DISC_ADVS	9249	0.012	0	0.108	0	0	0	1
MAO_FT	9249	0.044	0	0.206	0	0	0	1
MAO_NFT	9249	0.077	0	0.267	0	0	1	1
PRIV	9249	0.229	0	0.420	0	0	1	1
OCF	9249	0.197	0.165	1.251	−7.920	−0.621	1.173	8.292
ROA	9249	0.039	0.049	0.086	−0.400	−0.117	0.135	0.256
GROWTH	9249	0.214	0.134	0.564	−0.847	−0.406	0.984	3.807
TQ	9249	1.370	1.208	0.544	0.806	0.896	2.369	5.755
LEV	9249	0.500	0.485	0.253	0.074	0.163	0.825	1.990
SIZE	9249	21.095	21.013	0.949	18.783	19.652	22.758	24.407

Note: To mitigate the effects of extreme values on our empirical analysis, we winsorize the top and bottom 1% value of all continuous variables. Definitions and measurements of all variables are in Table 2.

non-government agencies or individual ultimate controllers, the average total return on assets is 3.9%, the average sales growth rate is 21.4% and the average debt to assets ratio is 50%.

In Table 4 we present the Pearson correlation coefficients for all the variables, in which ∗, ∗∗, ∗∗∗ denote a correlation between the two variables is significant at the 10%, 5%, and 1% levels respectively. The correlation results show that the ultimate controllers of firms that receive MAOs are more likely to be non-government agencies or individuals. In addition, the firms that received MAOs have lower profitability, lower growth rates, higher debt to assets ratios and smaller size. Finally, firms that received MAOs cut the amount of investment expenditure in the following year.

Table 4
Correlations.

	ICF	NICF	**MAO**	UQAO_EXPLAN	QUAO	DISC_ADVS	MAO_FT	MAO_NFT	OCF	PRIV	ROA	GROWTH	TQ	LEV
NICF	0.979***													
MAO	−**0.119*****	−**0.127*****												
UQAO_EXPLAN	−0.071***	−0.075***	**0.746*****											
QUAO	−0.072***	−0.078***	**0.533*****	−0.054***										
DISC_ADVS	−0.062***	−0.065***	**0.300*****	−0.030***	−0.022*									
MAO_FT	−0.049***	−0.053***	**0.585*****	0.464***	0.317***	0.103***								
MAO_NFT	−0.107***	−0.115***	**0.773*****	0.556***	0.409***	0.288***	−0.061***							
OCF	0.136***	0.128***	−**0.017**	−0.010	−0.011	−0.008	−0.007	−0.015						
PRIV	0.051***	0.039***	**0.070*****	0.040***	0.042***	0.041***	0.011	0.078***	−0.005					
ROA	0.164***	0.168***	−**0.289*****	−0.142***	−0.187***	−0.201***	−0.158***	−0.232***	0.125***	−0.083***				
GROWTH	0.150***	0.146***	−**0.071*****	−0.024**	−0.057***	−0.056***	−0.075***	−0.028**	0.096***	0.037***	0.259***			
TQ	0.057***	0.048***	**0.130*****	0.090***	0.046***	0.095***	0.035***	0.133***	0.014	0.048***	0.010	0.003		
LEV	−0.093***	−0.101***	**0.354*****	0.167***	0.198***	0.320***	0.097***	0.360***	−0.031***	0.114***	−0.459***	−0.020*	0.005	
SIZE	0.041***	0.056***	−**0.177*****	−0.121***	−0.079***	−0.107***	−0.067***	−0.166***	0.043***	−0.168***	0.231***	0.074***	−0.452***	−0.019

Note: The table reports Pearson correlation coefficients, *, **, *** denote significance at the 10%, 5%, and 1% levels respectively. Definitions and measurements of all variables are in Table 2.

4. Empirical results

4.1. Multivariate regression results

Table 5 reports the regression results for model (2). We are concerned with the coefficient (β_3) on the interaction term ($MAO_{it-1} \times OCF_{it}$). If receiving a MAO means greater information asymmetry and increased agency costs, then the firm's financing constraints should be strengthened and β_3 should be significantly positive. However, if receiving a MAO signals an increase in the firm's operational or financial risks, then the firm has incentives to seek government support or controlling shareholders' assistance, which may lead to soft budget constraints. It would then be easier for enterprises to obtain subsidies from the government or to obtain loans from banks or related parties. In this case, the financing constraints of the firm may be unchanged or even reduced, and β_3 should be zero or significantly negative. Column (1) of Table 5 presents the OLS regression results for model (2). The results show that the estimated coefficient (β_3) on $MAO_{it-1} \times OCF_{it}$ is −0.083, and the *t*-statistic is −2.22 and significant at the 5% level. This shows that financial constraints decreased after firms received MAOs when controlling for other factors, such as the ultimate controller, growth opportunities, size, year and industry effects. These results show that the role of soft budget constraints is more critical than the role of information asymmetry.

With the regression in column (1) of Table 5, we control for year and industry fixed effects, but cannot guarantee that there are no other unobservable fixed effects that could affect financing constraints. To control for omitted variable bias, in column (2) we use panel data to estimate model (2). Because the *p*-value is clearly different from zero in a Hausman Test, we choose the fixed effects model. In column (2), the coefficient on $MAO_{it-1} \times OCF_{it}$ is still −0.083 and the significance level does not qualitatively change after controlling for unobservable fixed effects, which indicates that the OLS regression results are not caused by unobservable fixed effects. We divide MAOs into three types and investigate whether the relationship we find is driven by the type of MAO. Column (3) presents the OLS regression results for model (3), and column (4) presents the regression results for the fixed effects panel data model. Both results are qualitatively consistent. In column (3), the estimated coefficient for the interaction term on qualified opinions and cash flows from operating activities ($QUAO_{it-1} \times OCF_{it}$) is −0.148, and the *t*-statistic is −2.35 and significant at the 5% level. The coefficient on the interaction term on cash flows

Table 5
Modified audit opinions and financial constraints.

Dependent variable: Investment (ICF)	(1) OLS	(2) FE	(3) OLS	(4) FE
CONSTANT	0.017	0.093	0.039	0.000
	(0.13)	(0.53)	(0.31)	<0.000
OCF	0.054***	0.053***	0.054***	0.053***
	(3.53)	(2.97)	(3.54)	(2.97)
MAO	−0.195***	−0.157***		
	(−12.97)	(−10.15)		
***MAO*OCF**	**−0.083****	**−0.083****		
	(−2.22)	**(−2.26)**		
UQAO_EXPLAN			−0.177***	−0.142***
			(−9.66)	(−7.42)
QUAO			−0.206***	−0.170***
			(−8.81)	(−6.98)
DISC_ADVS			−0.274***	−0.220***
			(−16.35)	(−10.65)
***UQAO_EXPLAN*OCF**			**−0.048**	**−0.047**
			(−1.14)	**(−1.22)**
***QUAO*OCF**			**−0.148****	**−;0.150****
			(−2.35)	**(−2.37)**
***DISC_ADVS*OCF**			**−0.032**	**−0.037**
			(−0.60)	(−0.74)
PRIV	0.067***	0.073***	0.068***	0.073***
	(4.42)	(3.62)	(4.49)	(3.64)
*PRIV*OCF*	0.010	−0.001	0.010	0.000
	(0.38)	(−0.02)	(0.40)	(0.02)
GROWTH	0.108***	0.096***	0.106***	0.094***
	(7.15)	(6.89)	(6.91)	(6.62)
SIZE	0.020***	0.012	0.019***	0.011
	(3.46)	(1.50)	(3.33)	(1.36)
YEAR	CONTROL	CONTROL	CONTROL	CONTROL
IND	CONTROL		CONTROL	
N	9249	9249	9249	9249
R^2	0.074	0.059	0.075	0.060

Note: The table reports OLS and fixed effects coefficient estimates and *t* statistics (in parentheses) based on robust standard errors that are heteroskedasticity-consistent. *, **, *** denote significance at the 10%, 5%, and 1% levels respectively. Definitions and measurements of all variables are in Table 2. Columns (2) and (4) are the results of the fixed effects panel data model. The sample period is 1998–2006.

from operating activities and unqualified opinions with explanatory paragraphs is negative, which is similar to the coefficient on the interaction term on the other modified opinions and cash flows from operating activities; however, neither significantly differs from zero. The results indicate that the findings we reported above are mainly driven by firms that received qualified opinions.

4.2. Robustness tests

4.2.1. Net cash outflows of investing activities

We implement three additional tests to verify the reliability of the conclusion that firms' financial constraints decrease after receiving MAOs. First, in Table 5, we use cash payments to acquire fixed assets, intangible assets and other long-term assets, divided by the yearly beginning balance of fixed assets to measure firms' investment expenditure (ICF). We also use net cash outflows of investment activities (NICF) as another measure of investment expenditure. NICF is defined as the cash payments to acquire fixed assets, intangible assets and other long-term assets, minus the cash inflow of disposing of the aforementioned assets, divided by the yearly beginning balance of fixed assets. Table 6 reports the regression results using NICF as the dependent variable, and we find no significant differences from the results in Table 5.

4.2.2. Tobin's Q as a measure of investment opportunities

Xu et al. (2006) argue that the use of Tobin's Q as a proxy for investment opportunities may introduce measurement error for three reasons: (1) the efficiency of the Chinese stock market needs to be improved; (2) the high volatility and high turnover of the Chinese stock market has led to potential bias in price-based indicators; and (3) dealer participation and market speculation affect the market returns of private holding companies. As a result, we use the rate of sales growth to measure firms' investment opportunities, following Luo and Zhen (2008). To investigate the reliability of our results, we introduce Tobin's Q as a proxy for firms' investment opportunities, which has been widely used in the extant literature (Fazzari

Table 6
Modified audit opinions and financial constraints (dependent variable is net cash outflow of investment activities).

Dependent variable: Investment (NICF)	(1) OLS	(2) FE	(3) OLS	(4) FE
CONSTANT	−0.207	−0.247	−0.185	−0.226
	(−1.60)	(−1.52)	(−1.45)	(−1.39)
OCF	0.050***	0.047**	0.050***	0.047**
	(3.03)	(2.57)	(3.01)	(2.55)
MAO	−0.169***	−0.137***		
	(−9.96)	(−7.76)		
MAO*OCF	**−0.089***	**−0.088***		
	(−1.92)	**(−1.87)**		
UQAO_EXPLAN			−0.147***	−0.122***
			(−6.86)	(−5.31)
QUAO			−0.189***	−0.150***
			(−7.62)	(−6.18)
DISC_ADVS			−0.249***	−0.205***
			(−12.39)	(−9.16)
UQAO_EXPLAN*OCF			**−0.052**	**−0.051**
			(−1.01)	**(−1.00)**
QUAO*OCF			**−0.161****	**−0.157****
			(−2.07)	**(−1.96)**
DISC_ADVS*OCF			**−0.055**	**−0.059**
			(−1.04)	**(−1.19)**
PRIV	0.063***	0.066***	0.064***	0.066***
	(4.00)	(3.33)	(4.06)	(3.34)
*PRIV*OCF*	0.029	0.023	0.031	0.025
	(0.91)	(0.61)	(0.96)	(0.68)
GROWTH	0.113***	0.099***	0.112***	0.097***
	(6.34)	(5.85)	(6.17)	(5.67)
SIZE	0.028***	0.027***	0.027***	0.026***
	(4.84)	(3.54)	(4.74)	(3.42)
YEAR	CONTROL	CONTROL	CONTROL	CONTROL
IND	CONTROL		CONTROL	
N	7729	7729	7729	7729
R^2	0.080	0.065	0.082	0.067

Note: The table reports OLS and fixed effects coefficient estimates and *t* statistics (in parentheses) based on robust standard errors that are heteroskedasticity-consistent. *, **, *** denote significance at the 10%, 5%, and 1% levels respectively. Definitions and measurements of all variables are in Table 2. Columns (2) and (4) are the results of the fixed effects panel data model. The sample period is 1998–2006. The sample includes only 7729 observations due to missing data in NICF.

Table 7
Modified audit opinions and financial constraints (using Tobin's Q to proxy for investment opportunities).

Dependent variable: Investment (ICF)	(1) OLS	(2) FE	(3) OLS	(4) FE
CONSTANT	−0.579***	<0.000	−0.561***	−0.489**
	(−3.76)	0.000	(−3.69)	(−2.34)
OCF	0.058***	0.056***	0.058***	0.056***
	(3.72)	(3.14)	(3.71)	(3.14)
MAO	−0.209***	−0.166***		
	(−13.84)	(−10.66)		
MAO_OCF	**−0.077***	**−0.076****		
	(−1.94)	**(−1.99)**		
UQAO_EXPLAN			−0.184***	−0.146***
			(−9.83)	(−7.47)
QUAO			−0.221***	−0.178***
			(−9.46)	(−7.15)
DISC_ADVS			−0.348***	−0.281***
			(−19.95)	(−12.93)
UQAO_EXPLAN_OCF			**−0.040**	**−0.040**
			(−0.88)	**(−0.94)**
QUAO_OCF			**−0.148****	**−0.149****
			(−2.37)	**(−2.36)**
DISC_ADVS_OCF			**0.087*****	**0.067****
			(2.62)	**(2.00)**
PRIV	0.073***	0.081***	0.073***	0.081***
	(4.71)	(3.96)	(4.77)	(3.96)
PRIV_OCF	0.009	−0.002	0.009	−0.001
	(0.34)	(−0.07)	(0.36)	(−0.02)
TQ	0.082***	0.075***	0.084***	0.077***
	(6.43)	(4.64)	(6.57)	(4.67)
SIZE	0.043***	0.036***	0.042***	0.035***
	(6.62)	(3.93)	(6.55)	(3.78)
YEAR	CONTROL	CONTROL	CONTROL	CONTROL
IND	CONTROL		CONTROL	
N	9249	9249	9249	9249
R^2	0.066	0.051	0.068	0.053

Note: The table reports OLS and fixed effect coefficient estimates and *t* statistics (in parentheses) based on robust standard errors that are heteroskedasticity-consistent. *, **, *** denote significance at the 10%, 5%, and 1% level respectively. Definitions and measurements of all variables are in Table 2. Columns (2) and (4) are the results of the fixed effects panel data model. The sample period is 1998–2006. Tobin's Q is used here is an alternative measure of growth opportunities.

et al., 1988; Fan et al., 2008a; Zhu et al., 2006). Table 7 reports the regression results including Tobin's Q, and the main results are not significantly different from those reported in Table 5.

4.2.3. Financial distress

Our finding that firms' financial constraints decrease after receiving MAOs does not control for the possibility that the relationship may be caused by financial distress. We use two methods to exclude the potential effects of financial distress. First, we delete observations with negative equity to test whether the results in Table 5 are mainly caused by financially distressed companies. The regression results are reported in Table 8. We find that after excluding insolvent firms there are no significant differences between the main results reported in Tables 8 and 5, which confirms that the financial constraints of firms not in financial distress are significantly lower after receiving MAOs.

Second, following Fan et al. (2009), we use three methods to define whether a firm is in financial distress. The first is the *Z*-score method. We calculate a *Z*-score for every firm-year observation and determine that a firm is in financial distress if its *Z*-score is less than 1.81.[6] The second is the financial leverage method. We define a firm as being in financial distress if its leverage ratio is greater than one. The third is the interest coverage ratio method. We define a firm as in financial distress if the firm's EBIT is lower than its financial expenses. We then define a dummy variable, Distressed, coded 1 if the company is in financial distress and 0 otherwise. Table 9 reports the regression results after controlling for financial distress. The results indicate that firms' financial constraints still significantly ease after receiving MAOs even after controlling for financial distress. We retest all of the regressions including these controls for financial distress and all of the reported conclusions remain substantially unchanged, which confirms that the results are not caused by financial difficulties.

[6] Fan et al. (2009) use the following formula to calculate the company's *Z*-score: $Z = A * 3.3 + B * 0.99 + C * 0.6 + D * 1.2 + E * 1.4$, where *A* = EBIT/total assets, *B* = sales/total assets, *C* = market value of equity/total liabilities, *D* = working capital/total assets, *E* = retained earnings/total assets. Book value per share and market price per share are used to calculate the market value of equity (MVE) of non-tradable shares. Using a different method to calculate MVE does not affect the main results of this paper.

Table 8
Modified audit opinions and financial constraints (excluding insolvent firms).

Dependent variable: Investment (ICF)	(1) OLS	(2) FE	(3) OLS	(4) FE
CONSTANT	0.220	0.000	0.232*	0.159
	(1.61)	<0.000	(1.72)	(0.88)
OCF	0.054***	0.053***	0.054***	0.053***
	(3.51)	(2.95)	(3.52)	(2.97)
MAO	−0.183***	−0.148***		
	(−11.11)	(−9.02)		
MAO_OCF	**−0.085****	**−0.083****		
	(−2.13)	**(−2.10)**		
UQAO_EXPLAN			−0.170***	−0.139***
			(−8.82)	(−6.91)
QUAO			−0.193***	−0.155***
			(−7.12)	(−5.56)
DISC_ADVS			−0.274***	−0.223***
			(−12.07)	(−8.65)
UQAO_EXPLAN_OCF			**−0.047**	**−0.044**
			(−1.02)	**(−1.02)**
QUAO_OCF			**−0.149****	**−0.150****
			(−2.29)	**(−2.28)**
DISC_ADVS_OCF			**−0.069**	**−0.069**
			(−1.23)	**(−1.23)**
PRIV	0.069***	0.074***	0.070***	0.074***
	(4.38)	(3.55)	(4.47)	(3.59)
PRIV_OCF	0.010	−0.001	0.010	−0.000
	(0.38)	(−0.03)	(0.38)	(−0.01)
GROWTH	0.110***	0.097***	0.108***	0.095***
	(6.96)	(6.65)	(6.69)	(6.35)
SIZE	0.017***	0.010	0.016***	0.009
	(2.86)	(1.16)	(2.80)	(1.07)
YEAR	CONTROL	CONTROL	CONTROL	CONTROL
IND	CONTROL		CONTROL	
N	9042	9042	9042	9042
R^2	0.069	0.054	0.071	0.055

Note: The table reports OLS and fixed effect coefficient estimates and *t* statistics (in parentheses) based on robust standard errors that are heteroskedasticity-consistent. *, **, *** denote significance at the 10%, 5%, and 1% levels respectively. Definitions and measurements of all variables are in Table 2. Columns (2) and (4) are the results of the fixed effects panel data model. The sample period is 1998–2006. We exclude all observations that have negative shareholder equity.

In sum, the results reported in Tables 5–9 show that financial constraints were significantly reduced after firms received MAOs, and this finding is mainly driven by firms that received qualified opinions. The aforementioned empirical results show that increased information asymmetry as a result of receiving MAOs did not increase firms' financial constraints, as they either remained unchanged or decreased. This supports the view that the role of soft budget constraints is more important than information asymmetry.

4.3. Additional tests

4.3.1. Modified audit opinions and financial constraints: distinguishing between two kinds of ultimate controllers

Many studies indicate that government-controlled listed companies are able to invest in more industries and projects, and find it easier to access finance and obtain government assistance in a crisis (Lin et al., 1999; Lin and Li, 2004; Sun et al., 2005, 2006; Liu et al., 2007). To overcome this competitive disadvantage, private enterprises have strong motivations to establish political connections, which can also help firms to reduce investment barriers, gain access to better financing opportunities and obtain more tax benefits (Johnson and Mitton, 2003; Faccio et al., 2006; Li et al., 2008; Wu et al., 2008, 2009; Luo and Tang, 2009; Luo and Liu, 2009; Luo and Huang, 2008). We classify the sample into two groups according to their ultimate controllers to investigate whether the type of ultimate controller changes the conclusions.

Table 10 reports the regression results based on the two types of ultimate controllers. Columns (1) and (2) present the OLS regression results. PRIV = 0 includes all listed companies whose ultimate controllers are government agencies, and PRIV = 1 includes all listed companies whose ultimate controllers are non-government agencies or individuals. In the government-controlled group, the coefficient on $MAO_{it-1} \times OCF_{it}$ is −0.096, and the *t*-statistic is −1.85 and significant at the 10% level. In the non-government-controlled group, the coefficient on $MAO_{it-1} \times OCF_{it}$ is −0.065 and the *t*-statistic is −1.17, which is not significantly different from zero. To control for possible unobservable fixed effects, we use a fixed effects panel data model to run the regression using the two subsamples. Our results are not substantively different. The results in Table 10 show

Table 9
Modified audit opinions and financial constraints (controlling for financial distress) ($INVST_{it} = \beta_0 + \beta_1 OCF_{it} + \beta_2 MAO_{it-1} + \beta_3 MAO_{it-1} \times OCF_{it} + \beta_4 DIS_{it} + \beta_5 DIS_{it} \times OCF_{it} + \beta_6 PRIV_{it} + \beta_7 PRIV_{it} \times OCF_{it} + \beta_8 GROWTH_{it} + \beta_9 SIZE_{it} + FixedEffects + \varepsilon_{it}$).

Dependent variable: Investment (ICF)	(1) Z-score1	(2) Z-score2	(3) Leverage	(4) Interest coverage
CONS	−0.088	−0.100	0.078	0.184
	(−0.69)	(−0.78)	(0.60)	(1.43)
OCF	0.058***	0.055***	0.055***	0.057***
	(3.09)	(3.29)	(3.53)	(3.68)
MAO	**−0.164*** **	**−0.165*** **	**−0.178*** **	**−0.155*** **
	(−10.39)	**(−10.51)**	**(−11.28)**	**(−9.61)**
MAO_OCF	**−0.081****	**−0.082****	**−0.085****	**−0.077***
	(−2.18)	**(−2.22)**	**(−2.14)**	**(−1.93)**
DIS1	−0.083***			
	(−6.80)			
DIS1*OCF	**−0.016**			
	(−0.66)			
DIS2		−0.084***		
		(−7.04)		
DIS1*OCF		**−0.010**		
		(−0.38)		
DIS3			−0.120***	
			(−7.20)	
DIS3*OCF			**0.018**	
			(0.48)	
DIS4				−0.153***
				(−11.94)
DIS4*OCF				**−0.097***
				(−1.95)
N	9249	9249	9249	9248
R^2	0.080	0.078	0.075	0.085

Note: The table reports OLS coefficient estimates and t statistics (in parentheses) based on robust standard errors that are heteroskedasticity-consistent. *, **, *** denote significance at the 10%, 5%, and 1% levels respectively. Definitions and measurements of all variables are in Table 2. DIS is a financial distress dummy variable. DIS1 and DIS2 are calculated based on *Z*-zcores. DIS equals 1 if the *Z*-score is less than 1.81, zero otherwise. *Z*-score1 uses the book value per share to calculate the value of untradable shares, whereas *Z*-score2 uses the market value per share to calculate the value of untradable shares. DIS3 equals 1 if leverage is larger than 1, zero otherwise. DIS4 equals 1 if EBIT is less than financial expenses, zero otherwise. The sample period is 1998–2006. We omit regression results on other control variables.

Table 10
Modified audit opinions and financial constraints (distinguishing between two types of ultimate controllers).

Dependent variable:	OLS		FE	
Investment (ICF)	PRIV = 0 (1)	PRIV = 1 (2)	PRIV = 0 (3)	PRIV = 1 (4)
CONSTANT	0.338**	−0.342	0.000	−0.166
	(2.30)	(−1.05)	0.000	(−0.42)
OCF	0.055***	0.062***	0.051***	0.055**
	(3.50)	(2.69)	(2.89)	(2.04)
MAO	−0.180***	−0.202***	−0.143***	−0.174***
	(−10.42)	(−6.16)	(−8.38)	(−5.00)
MAO*OCF	**−0.096***	**−0.065**	**−0.086***	**−0.076**
	(−1.85)	**(−1.17)**	**(−1.70)**	**(−1.49)**
GROWTH	0.125***	0.081***	0.107***	0.075***
	(6.72)	(3.12)	(6.31)	(3.14)
SIZE	0.012*	0.042***	0.013	0.032*
	(1.88)	(2.82)	(1.43)	(1.68)
YEAR	CONTROL	CONTROL	CONTROL	CONTROL
IND	CONTROL	CONTROL		
N	7130	2119	7130	2119
R^2	0.074	0.101	0.055	0.073

Note: The table reports OLS and fixed effect coefficient estimates and *t* statistics (in parentheses) based on robust standard errors that are heteroskedasticity-consistent. *, **, *** denote significance at the 10%, 5%, and 1% levels respectively. Definitions and measurements of all variables are in Table 2. PRIV = 0 contains all observations for which the ultimate controller is a government agency. PRIV = 1 contains all observations for which the ultimate controller is a non-government agency or individual. Columns (3) and (4) are the results of the fixed effects panel data model. The sample period is 1998–2006.

that the financial constraints of government-controlled companies significantly decreased after receiving MAOs, indicating that soft budget constraints have a greater effect in government-controlled companies.

4.3.2. Modified audit opinions and financial constraints: whether firms received modified opinions for the first time

Table 1 shows that 621 firms were issued modified audit opinions, 428 of which received more than one. It is easy for the market to form expectations if a firm has been issued with MAOs on several occasions. Therefore, firms that receive MAOs for the first time should affect the market more than firms that have received one previously. In accordance with the IAV, if MAOs increase corporate financing constraints, then the results are more likely to show in firms that receive MAOs for the first time. We adopt model (4) to test whether the relationship between financial constraints and MAOs received for the first time differs from that between financial constraints and MAOs received not for the first time. $MAO\_FT_{it-1} \times OCF_{it}$ tests the effect of receiving MAOs for the first time on financial constraints, and $MAO\_NFT_{it-1} \times OCF_{it}$ tests the effect of receiving MAOs not for the first time on financial constraints.

$$INVST_{it} = \beta_0 + \beta_1 OCF_{it} + \beta_2 MAO\_FT_{it-1} + \beta_3 MAO\_NFT_{it-1} + \beta_4 MAO\_FT_{it-1} \times OCF_{it} + \beta_5 MAO\_NFT_{it-1} \times OCF_{it} + \beta_6 PRIV_{it} + \beta_7 PRIV_{it} \times OCF_{it} + \beta_8 GROWTH_{it} + \beta_9 SIZE_{it} + FixedEffects + \varepsilon_{it} \quad (4)$$

Column (1) of Table 11 reports the OLS regression results. The coefficient on $MAO\_FT_{it-1} \times OCF_{it}$ is −0.134, the *t*-statistic is −2.06 and is significant at the 5% level. In addition, the coefficient on $MAO\_NFT_{it-1} \times OCF_{it}$ is −0.056, and is not significantly different from zero. Column (2) presents the regression results using the fixed effects panel data model, which are not substantially different from the OLS results. The two regression results show that MAOs affect financial constraints when firms receive them for the first time, and financial constraints do not significantly change when firms receive MAOs not for the first time. Columns (3) and (4) test whether these results are dependent on the type of ultimate controller. The results indicate that firms whose financial constraints reduced after receiving MAOs for the first time were mainly government-controlled listed companies, whereas the financial constraints for non-government-controlled firms did not change significantly after receiving MAOs.

4.4. Alternative explanations

4.4.1. Whether auditors are over-conservative

In addition to the hypothesis regarding the lack of economic consequences arising from MAOs, the high proportion of firms receiving MAOs in China could also be explained by the hypothesis that auditors choose over-conservative audit

Table 11
Modified audit opinions and financial constraints (whether modified audit opinion is received for the first time and the distinction between two types of ultimate controllers).

Dependent variable: Investment (ICF)	(1) OLS	(2) FE	(3) PRIV = 0	(4) PRIV = 1
CONSTANT	0.034	0.000	0.346**	−0.322
	(0.26)	<0.000	(2.38)	(−0.98)
OCF	0.054***	0.052***	0. 055***	0.062***
	(3.52)	(2.95)	(3.50)	(2.69)
MAO_FT	−0.142***	−0.129***	−0. 118***	−0.177***
	(−5.89)	(−5.60)	(−4.27)	(−4.15)
MAO_NFT	−0.225***	−0.174***	−0. 220***	−0.213***
	(−13.66)	(−9.45)	(−13.98)v	(−5.75)
MAO_FT*OCF	**−0.134****	**−0.135****	**−0.230****	**−0.043**
	(−2.06)	**(−2.05)**	**(−2.24)**	**(−1.23)**
MAO_NFT*OCF	(**−0.056**)	**−0.055**	**−0.037**	**−0.080**
	(−1.34)	**(−1.45)**	**(−1.01)**	**(−0.96)**
PRIV	0.068***	0.073***		
	(4.45)	(3.63)		
*PRIV*OCF*	0.010	0.000		
	(0.40)	(0.01)		
GROWTH	0.110***	0.098***	0. 126***	0.081***
	(7.24)	(6.94)	(6.78)	(3.21)
SIZE	0.019***	0.012	0.011*	0.041***
	(3.32)	(1.42)	(1.81)	(2.73)
YEAR	CONTROL	CONTROL	CONTROL	CONTROL
IND	CONTROL		CONTROL	CONTROL
N	9249	9249	7130	2119
R^2	0.075	0.060	0.078	0.101

Note: The table reports OLS and fixed effect coefficient estimates and t statistics (in parentheses) based on robust standard errors that are heteroskedasticity-consistent. *, **, *** denote significance at the 10%, 5%, and 1% levels respectively. Definitions and measurements of all variables are in Table 2. PRIV = 0 contains all observations for which the ultimate controller is a government agency. PRIV = 1 contains all observations for which the ultimate controller is a non-government agency or individual. Column (2) is the results of the fixed effects panel data model. The sample period is 1998–2006.

Table 12
Modified audit opinions and financial constraints (time series tests).

Dependent variable:	1995–1997		1998–2006		2007–2009	
Investment (ICF)	(1) OLS	(2) FE	(3) OLS	(4) FE	(5) OLS	(6) FE
CONSTANT	1.336	−0.466	0.017	0.093	−0.517**	0.000
	(0.72)	(−0.79)	(0.13)	(0.53)	(−2.53)	(<0.000)
OCF	0.086	0.094	0.054***	0.053***	0.035**	0.028*
	(1.54)	(1.62)	(3.53)	(2.97)	(2.05)	(1.75)
MAO	0.100	0.054	−0.195***	−0.157***	−0.189***	−0.141***
	(0.83)	(0.45)	(−12.97)	(−10.15)	(−6.06)	(−3.55)
MAO*OCF	**−0.336*****	**−0.318*****	**−0.083****	**−0.083****	**0.020**	**−0.004**
	(−3.21)	**(−2.94)**	**(−2.22)**	**(−2.26)**	**(0.41)**	**(−0.07)**
PRIV	0.241*	0.217*	0.067***	0.073***	0.123***	0.154***
	(1.77)	(1.83)	(4.42)	(3.62)	(5.70)	(5.71)
*PRIV*OCF*	−0.074	−0.088	0.010	−0.001	−0.023	−0.025
	(−0.69)	(−0.91)	(0.38)	(−0.02)	(−0.85)	(−1.05)
GROWTH	0.461***	0.461***	0.108***	0.096***	0.190***	0.164***
	(4.53)	(4.47)	(7.15)	(6.89)	(6.14)	(5.59)
SIZE	0.035	0.030	0.020***	0.012	0.039***	0.047***
	(1.11)	(1.06)	(3.46)	(1.50)	(4.49)	(4.11)
N	695	695	9249	9249	4456	4456
R^2	0.182	0.148	0.074	0.059	0.093	0.073

Note: The table reports OLS and fixed effect coefficient estimates and *t* statistics (in parentheses) based on robust standard errors that are heteroskedasticity-consistent. *, **, *** denote significance at the 10%, 5%, and 1% levels respectively. Definitions and measurements of all variables are in Table 2. PRIV = 0 contains all observations for which the ultimate controller is a government agency. PRIV = 1 contains all observations for which the ultimate controller is a non-government agency or individual. Columns (2), (4) and (6) are the results of the fixed effects panel data model. Columns (1) and (2) use observations from 1995 to 1997. Columns (3) and (4) use observations from 1998 to 2006. Columns (5) and (6) use observations from 2007 to 2009.

opinions due to high risk.[7] Li and Wu (2002) find the audit risk of auditors increased significantly after 1997. Greater audit risk led auditors to choose more conservative audit opinions to reduce their own risk. Over-conservative audit opinions reduce their usefulness and MAOs may not increase information asymmetry or financial constraints. If the over-conservative auditor hypothesis is true, then firms that received MAOs are likely to have greater information asymmetry and thus have stronger financial constraints in the period when the auditors do not have an incentive to be over conservative. Specifically, the over-conservative auditor hypothesis expects that in the low audit risk period (1995–1997), the financial constraints of the firms receiving MAOs will be significantly greater than in the high audit risk period (1998–2006). We use model (2) to test this alternative hypothesis.

We divide the sample into three stages, the first from 1995 to 1997, the second from 1998 to 2006 and the third from 2007 to 2009. According to the over-conservative auditor hypothesis, the coefficient on $MAO_{it-1} \times OCF_{it}$ should be significantly positive for 1995–1997, and not significant after 1998. We use the difference between net profit and total accruals as the proxy for net cash flows from operating activities because the statement of cash flows were not reported until 1998, so the data on net cash flows from operating activities and cash outflow for investment in 1995–1997 cannot be obtained. Following Francis et al. (2005), we use model (5) to calculate the total accruals ($TACC_{it-1}$), in which ΔCA_{it} is the change in current assets, $\Delta CASH_{it}$ is the change in the cash account, ΔCL_{it} is the change in current liabilities, ΔSTD_{it} is the change in short-term liabilities and Δ *DE* PN_{it} is depreciation expense in the current period. Additionally, we use the change in the annual balance of fixed assets as a proxy for firms' investment from 1995 to 1997.

$$TACC_{it} = \Delta CA_{it} - \Delta CASH_{it} - \Delta CL_{it} + \Delta STD_{it} - DEPN_{it} \quad (5)$$

Columns (1) and (2) of Table 12 present the regression results for the OLS and fixed effects panel data models and there are no significant differences between the two results, which indicates that there is no obvious missing variable bias in the OLS regression. The OLS results show that the coefficient on $MAO_{it-1} \times OCF_{it}$ is −0.336, and the *t*-statistic is −3.21 and significant at the 1% level. The results indicate that rather than increasing, financial constraints significantly decreased when firms received MAOs between 1995 and 1997.

The time-series test in Table 12 indicates an important trend whereby the highest decrease in the financial constraints of firms receiving MAOs occurred between 1995 and 1997 and the lowest between 1998 and 2006. Since 2007, the financial constraints of firms that received MAOs have not significantly changed. The time-series trend in the financial constraints of firms receiving MAOs does not support the prediction of the over-conservative auditor hypothesis or the information asymmetry hypothesis, but is consistent with the prediction of the soft budget constraints hypothesis. With the deepening of China's economic reforms, the budget constraints on enterprises (especially state-owned enterprises) have become

[7] Thanks to Doctor Ge Rui of Sun Yat-Sen University for putting forward this alternative explanation, and for suggesting we use the pre-1988 data to test this hypothesis.

Table 13
Modified audit opinions and debt financing ($BCF_{it} = \beta_0 + \beta_1 MAO_{it-1} + \beta_2 PRIV_{it} + \beta_3 ICF_{it} + \beta_4 GROWTH_{it} + \beta_5 ROA_{it-1} + \beta_6 LEV_{it-1} + \beta_7 SIZE_{it} + INDFE + \varepsilon_{it}$).

BCF	(1) 1998	(2) 1999	(3) 2000	(4) 2001	(5) 2002	(6) 2003	(7) 2004	(8) 2005	(9) 2006	(10) 2007	(11) 2008	(12) 2009
CONSTANT	−0.165	−0.035	−0.281	−0.341*	−0.172	−0.327*	−0.258	−0.554***	−0.602***	−0.782***	−0.794***	−1.300***
	(−0.76)	(−0.17)	(−1.30)	(−1.75)	(−0.99)	(−1.68)	(−1.44)	(−3.58)	(−3.96)	(−3.45)	(−6.25)	(−6.76)
MAO	**−0.024**	**−0.012**	**−0.038**	**−0.001**	**−0.020**	**−0.047***	**−0.030**	**−0.049****	**−0.090*****	**−0.149*****	**−0.156*****	**−0.175*****
	(−0.89)	**(−0.54)**	**(−1.63)**	**(−0.03)**	**(−0.79)**	**(−1.94)**	**(−0.88)**	**(−2.14)**	**(−3.96)**	**(−5.91)**	**(−5.28)**	**(−5.18)**
PRIV	0.018	−0.007	0.021	0.069***	0.053***	0.021	0.011	0.021	0.028**	0.024*	0.018	0.027**
	(0.60)	(−0.28)	(0.82)	(2.74)	(2.64)	(1.20)	(0.80)	(1.55)	(2.22)	(1.84)	(1.41)	(2.05)
ICF	0.021	0.032**	0.090***	0.035**	0.021	0.080***	0.133***	0.076***	0.057***	0.067***	0.033***	0.062***
	(1.26)	(2.17)	(4.46)	(2.35)	(1.59)	(4.24)	(6.61)	(4.30)	(4.46)	(3.79)	(2.94)	(4.29)
GROWTH	0.080**	0.032**	0.058***	0.059***	0.031**	0.047***	0.020	0.027*	0.007	0.035**	0.061***	0.069***
	(2.40)	(2.07)	(2.80)	(3.27)	(1.98)	(2.71)	(1.63)	(1.83)	(0.64)	(2.50)	(3.40)	(3.72)
ROA	0.288*	0.562***	0.498***	1.075***	0.792***	0.172	0.486***	0.392***	0.474***	0.090	−0.153**	−0.130
	(1.92)	(3.84)	(3.63)	(5.84)	(6.28)	(1.45)	(4.12)	(4.09)	(5.77)	(1.04)	(−2.19)	(−1.31)
LEV	0.367***	0.313***	0.256***	0.304***	0.294***	0.231***	0.232***	0.260***	0.246***	0.151***	0.162***	0.227***
	(5.30)	(5.78)	(4.16)	(5.41)	(5.27)	(4.16)	(5.46)	(5.79)	(6.55)	(5.35)	(5.92)	(6.79)
SIZE	0.010	0.002	0.015	0.016*	0.013	0.023**	0.020**	0.032***	0.037***	0.057***	0.048***	0.047***
	(0.99)	(0.17)	(1.43)	(1.72)	(1.60)	(2.47)	(2.38)	(4.22)	(5.18)	(8.69)	(8.22)	(7.67)
INDFE	CONTROL	CONTROL	CONTROL	CONTROL	CONTROL	CONTROL	CONTROL	CONTROL	CONTROL	CONTROL	CONTROL	CONTROL
N	518	675	753	885	1001	1069	1115	1188	1173	1390	1507	1546
R^2	0.172	0.150	0.184	0.168	0.163	0.122	0.144	0.157	0.174	0.205	0.195	0.215

Note: The table reports OLS coefficient estimates and *t* statistics (in parentheses) based on robust standard errors that are heteroskedasticity-consistent. *, **, *** denote significance at the 10%, 5%, and 1% levels respectively. Definitions and measurements of all variables are in Table 2. BCF is borrowing cash flows from the Statements of Cash Flows.

Table 14
Modified audit opinions and changes in related-party loans ($\Delta RPB_{it} = \beta_0 + \beta_1 MAO_{it-1} + \beta_2 BIG4_{it} + \beta_3 PRIV_{it} + \beta_4 ICF_{it} + \beta_5 ROA_{it} + \beta_6 TobinQ_{it} + \beta_7 LEV_{it} + \beta_8 SIZE_{it} + FE + \varepsilon_{it}$).

Change of related-parties' Loans	(1) CRPB	(2) CNRPB
CONSTANT	0.036***	0.113***
	(3.00)	(5.19)
MAO	**0.004***	**0.022*****
	(1.93)	**(5.41)**
BIG4	0.005***	0.012***
	(4.67)	(5.48)
PRIV	−0.001	−0.006***
	(−0.56)	(−3.29)
ICF	0.002***	0.005***
	(2.75)	(3.75)
ROA	−0.090***	0.088***
	(−9.97)	(4.58)
Tobin Q	0.002**	0.001
	(2.37)	(0.63)
LEV	0.034***	0.055***
	(10.46)	(8.02)
SIZE	−0.002***	−0.007***
	(−4.32)	(−7.32)
Year FE	CONTROL	CONTROL
Ind FE	CONTROL	CONTROL
N	13691	13691
R^2	0.116	0.060

Note: The table reports OLS coefficient estimates and *t* statistics (in parentheses) based on robust standard errors that are heteroskedasticity-consistent. *, **, *** denote significance at the 10%, 5%, and 1% levels respectively. Definitions and measurements of all variables are in Table 2. CRPB and CNRPB are proxies for related-party loans. CRPB is the change of year-end other payables divided by year-end total assets. CNRPB is the change in the difference between other payables and other receivables divided by year-end total assets. The sample period is 1998–2009.

gradually harder and consequently there is less potential to obtain aid from government or controlling shareholders when firms experience operating problems or financial distress, which is indicated by the gradual increase in the financial constraints coefficient on $MAO_{it-1} \times OCF_{it}$.

4.4.2. Banks' private information

The probable reason that MAOs do not stimulate an increase in firms' financial constraints is that the financing sources of China's listed companies are mainly controlling shareholders or banks, who have a lot of private information and may not be influenced by public accounting information. In addition, the lending decisions of many banks are based on the availability of mortgages, so again the quality of firms' accounting information may not necessarily affect the bank's lending decisions. If the bank has access to substantial private information or its lending is based on mortgage availability, receiving MAOs will not increase the information asymmetry between firms and banks.

Following Sun et al. (2006) and Yu and Pan (2008), we use model (6) to test the effect of receiving MAOs on firms' borrowing ability.

$$BCF_{it} = \beta_0 + \beta_1 MAO_{it-1} + \beta_2 PRIV_{it} + \beta_3 ICF_{it} + \beta_4 GROWTH_{it} + \beta_5 ROA_{it-1} + \beta_6 LEV_{it-1} + \beta_7 SIZE_{it} + INDFE + \varepsilon_{it} \quad (6)$$

BCF is borrowing cash flows, which is obtained from the statement of cash flows, divided by the yearly beginning balance of total assets. MAO is modified audit opinions, which equals 1 if firms received a MAO last year and 0 otherwise. PRIV is the type of ultimate controller, which equals 1 if the ultimate controller is a non-government agency or individual and 0 otherwise. ICF is investment expenditure, which is defined as cash flows for investment expenditure divided by the yearly beginning balance of fixed assets. GROWTH is firms' growth rate, defined as this year's sales minus last year's sales, divided by last year's sales. ROA is the return on assets, defined as the total profit for last year plus the financial expenses for last year, divided by last year's beginning balance of total assets. LEV is financial leverage, defined as the ratio of debt to total year-end assets; SIZE is firm size, which equals the natural logarithm of the total year-end assets; and INDFE are industry fixed effects.

Table 13 reports the results of annual regressions of the effect of receiving MAOs on firms' bank loans. We find that receiving MAOs in the last year did not significantly decrease firms' borrowing cash flows between 1998 and 2004 (except 2003). However, receiving a MAO significantly reduced firms' borrowing cash flows between 2005 and 2009, suggesting that MAOs have affected bank decisions since 2005. The results indicate that MAOs have information content but did not significantly affect firms' borrowing in the earlier years, partly due to other factors (such as political connections and propping up by controlling shareholders) being more significant.

4.4.3. Analysis based on related-party loans

As reported above, before 2007 financial constraints significantly reduced after firms received MAOs, but since 2007 this has not been the case (see Table 12). This suggests that before 2007, firms receiving a MAO obtained more external financing than firms receiving a standard unqualified opinion. However, based on the analysis of the relationship between bank loans and MAOs, we find that firms' borrowing cash flows did not change after receiving MAOs before 2005, but significantly decreased after 2005 (see Table 13). Therefore, the decrease in financial constraints after firms received MAOs was not due to firms receiving more bank loans.

Based on theoretical analysis and the existing literature (Li, 2004; Jian and Wong, 2010; Jiang et al., 2010), one possible explanation for why financial constraints decreased after receiving MAOs is that firms were able to obtain funds for investment from controlling shareholders or related parties. Referring to Li et al. (2004) and Jiang et al. (2010), we use model (7) to test whether firms received more funding from related parties after receiving MAOs:

$$\Delta RPB_{it} = \beta_0 + \beta_1 MAO_{it-1} + \beta_2 BIG4_{it} + \beta_3 PRIV_{it} + \beta_4 ICF_{it} + \beta_5 ROA_{it} + \beta_6 TobinQ_{it} + \beta_7 LEV_{it} + \beta_8 SIZE_{it} + FE + \varepsilon_{it} \quad (7)$$

Following Li (2004), we use other payables (or other payables minus other receivables) as business loans obtained from other firms. ΔRPB denotes the change in related-party loans. We use CRPB and CNRPB as proxies for changes in related-party loans. CRPB equals the other payables at year-end divided by year-end total assets, minus the last year-end other payables balance divided by the last year-end total assets. CNRPB equals the difference between the year-end other payables minus other receivables, divided by the year-end total assets and the last year-end other payables minus other receivables, divided by the last year-end total assets. MAOs denotes modified audit opinions, which equals 1 if firms received MAOs last year and 0 otherwise. BIG4 is the auditor of the annual report, which equals 1 if the auditor is a big four auditor and 0 otherwise. PRIV is the type of ultimate controller, which equals 1 if the ultimate controller is a non-government agency or individual, and 0 otherwise. ICF denotes investment expenditure, which is defined as the cash outflows of investment expenditure divided by the last year's fixed assets. ROA is return on assets, defined as total profit plus financial expenses, divided by total assets. LEV is year-end debt to total assets ratio. SIZE is the natural logarithm of total year-end assets. FE includes year and industry fixed effects.

Table 14 reports the regression results relating MAOs to changes in related parties' loans. The results show that the coefficient on MAOs is significantly positive, which indicates that firms receiving a MAO obtained significantly more loans from related parties than firms receiving a standard unqualified opinion. The results show that a major reason for the significant decrease in the financial constraints of firms that received MAOs is that they were able to obtain more funds from related parties.

5. Conclusion

Unlike the analyses conducted from an audit independence perspective, we provide a simple analytical framework for understanding why a high proportion of firms in China receive MAOs. On the one hand, firms have strong incentives to manipulate earnings because regulators use accounting measures to regulate listed companies and because of related parties' tunneling and rent-seeking activities, and earnings management incentives increase the probability of substantial misrepresentation in annual reports. On the other hand, support from government and controlling shareholders increases the soft budget constraint problem. Although receiving MAOs increases information risks, the economic consequences are limited because the allocation of resources is mainly dependent on government intervention or controlling shareholders' activities. These two factors result in a high proportion of firms receiving MAOs in the Chinese stock market.

Our interpretation that too high a proportion of MAOs is not a good thing seems inconsistent with the extant literature, in which researchers believe that issuing more MAOs is an indication that auditors are more independent. Our analytical framework shows that both views are reasonable in certain contexts. Given the quality of firms' accounting information, a higher proportion of firms receiving MAOs denotes higher auditor independence, suggesting that MAOs are helpful for disclosing negative information and helping outsiders determine the quality of accounting information. However, given the level of auditor independence, more MAOs indicates stronger incentives to distort information. When audit quality has not significantly changed, too high a proportion of firms receiving MAOs means more noise in firms' public accounting information.

Auditors will issue a MAO when they believe that financial reports do not fairly reflect a firm's financial position, operating results and cash flows according to the accounting standards. A high proportion of firms receiving MAOs suggests that the accounting information quality of these firms is very poor, which increases the extent of adverse selection of outsiders and the moral hazard of insiders. This situation does not help financial report users to make accurate investment decisions. In addition, it will hinder the resource allocation ability of the stock market in general and the protection of outside investors' interests.

The situation has improved gradually. On the one hand, to protect the legitimate rights of investor and public interests, regulators have introduced many policies and measures to mitigate information asymmetry and agency problems, such as the supervision of related-party tunneling and related-party transactions, the tradable share reforms of 2005, the weakening of the role of accounting earnings in finance regulations, and so on. Listed companies' incentives to manipulate earnings have been reduced by these measures. On the other hand, firms' soft budget constraints have been gradually relieved by the development of financial systems and enhanced competition in the financial markets, along with the weakening of government intervention and political connections. All of these measures help to improve the role of accounting information (particularly audit opinions) in the investment and financing decisions of investors, and increase the economic consequences of receiving MAOs.[8]

The aforementioned reform measures have reduced the proportion of annual reports that receive MAOs because they reduce the incentive for earnings management and increase the economic consequences. This results in more decision-useful accounting information and better protection of investors' interests. In practice, the proportion of firms that received MAOs in 2007, 2008 and 2009 dropped to 8%, 6.9% and 6.7%, respectively. Thus, the weakening of earnings management incentives and the hardening of soft budget constraints have improved accounting information quality in China, with a corresponding decrease in the proportion of firms that received MAOs.

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[8] For example, "Administrative regulation for the securities issuance of listed companies", which came into effect on May 8, 2006, requires enterprises to meet the following clauses before issuing new shares: "The financial reports for the last three years were not issued with modified audit opinions. If the firm received an unqualified opinion with an emphasis paragraph, the items must not have materially adverse effects on the issuer or the adverse effects must have already been eliminated before share issuance."

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China Journal of Accounting Research 4 (2011) 155–165

Contents lists available at SciVerse ScienceDirect

China Journal of Accounting Research

journal homepage: www.elsevier.com/locate/cjar

Corporate fraud and bank loans: Evidence from china

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ARTICLE INFO

Article history:
Received 1 May 2010
Accepted 26 January 2011
Available online 27 August 2011

JEL Classification:
G32
G21
G38

Keywords:
Corporate fraud
Bank loans
Credit risk
Information risk
China

ABSTRACT

Receiving punishment from regulators for corporate fraud can affect financing contracts between a firm and its bank, as both the firm's credit risk and information risk increase after punishment. By focusing on Chinese firms' borrowing behavior after events of corporate fraud, we find that firms' bank loans after punishment are not only significantly lower, but are also less than those for non-fraudulent firms. In addition, loan interest rates after punishment are not only higher than before, but also higher than those for their non-fraudulent counterparts. In addition, we find that corporate fraud indirectly destabilizes the "performance-bank loan" relationship. Our results suggest that corporate fraud negatively affects a firm's ability to source debt financing, which provides new evidence about the economic consequences of fraud.

1. Introduction

This paper investigates the economic consequences of corporate fraud. This is of particular importance to investors and other market participants because of the rise in corporate fraud in recent years. For example, the acid waste incident involving Zijin Mining in July 2010 was disclosed 10 days after the event, which meant its investors lost the opportunity to sell their stocks in a timely fashion. Prior to this, the firm had already been investigated many times for poor information disclosure.[1] Another example is Wuliangye Yibin, whose stock price fell by over 4% when it was held responsible by the Chinese Security Regulatory Committee (CSRC) for three fraudulent events: non-disclosure of important investment projects and losses, non-disclosure of important securities investment losses and data error on disclosed revenue. Some analysts, however, believe that the three events are old news and had no real effect on Wuliangye.[2] There are many instances of corporate fraud in the Chinese capital market, but many firms have not been affected and have no incentive to correct their behavior. Hence, this

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[1] For example, Zijing Mining disclosed information on March 30, 2010: "For violation of the information disclosure regulation, we are being investigated by CSRC". According to the rectification report in December 29, 2009, the Fujian Securities Regulatory Commission required Zijing Mining to improve its corporate governance mechanisms, including information disclosure, financial institutions and accounting processes, among others.

[2] For more details, see the Finance and Economics website: CSRC disclose three faults of Wulianye. www.caijing.com.cn/2009-09-24/110259630.html.

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doi:10.1016/j.cjar.2011.07.001

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research asks: does fraud have negative effects on firms? Most prior research related to the economic consequences of corporate fraud analyze the reason, mechanism and characteristics of corporate fraud (Beasley, 1996; Chen et al., 2005a,b; Dechow et al., 1996; Johnson et al., 2009; Karpoff and Lott, 1993; Karpoff et al., 2008; Zhang and Ma, 2005) and the short-term market reaction (Chen et al., 2005a,b). Because of the limited refinancing ability of equity and debt markets in China, previous papers were unable to determine the long-term economic consequences of corporate fraud. As banks are the most important source of financing for listed companies in China, we can answer this question from the view of firms' borrowing behavior.

Disclosure of fraud and receiving punishment from regulators[3] influences the relationship between banks and firms by affecting credit risk and information risk. These events make banks anxious about a firm's future cash flows and earnings, which affects their lending behavior to the firm. By focusing on firms who were punished for fraud in the Chinese A-share market during the period 2000–2007, this paper investigates the effects of punishment on the size and interest rates of bank loans. The results show that, compared with the situation before punishment, firms receive less bank loans and higher interest rates after punishment. In addition, compared with other firms, punished firms also receive less bank loans and higher interest rates. Moreover, corporate fraud also affects bank loans by influencing the relationship between bank loans and corporate performance indirectly. Our results show that punishment for fraud affects a firm's ability to acquire financing.

This paper makes three contributions to the literature. First, it provides new evidence on the economic consequence of corporate fraud. Previous papers have focused on the causes, characteristics and short-term market reaction rather than the long-term economic consequences of corporate fraud. This paper, however, investigates the effect of corporate fraud on bank loans by investigating firms' credit and information risks, thus extending research on the economic consequences of corporate fraud. Second, due to the restrictions on equity financing in the Chinese capital market, bank loans are the main financing channel. This provides a good opportunity to examine banks' lending behavior after corporate fraud. Third, there is an upward trend in corporate fraud reported in recent years (Table 2). Hence, the results of this paper prove that Chinese regulators, such as the CSRC, are not a "toothless tiger" as punishment of firms affects their ability to source debt financing.

The rest of the paper proceeds as follows. Section 2 reviews the related literature. Section 3 presents our research hypotheses. Section 4 outlines our research design, and the empirical analysis is presented in Section 5. Section 6 concludes the paper.

2. Literature review

In the corporate fraud literature, researchers have focused on the characteristics and corporate governance mechanisms of the fraud firms, and also the short-term market reaction after a firm receives punishment. Beasley (1996) finds that more independent directors reduce the instances of corporate financial fraud, while the existence of an audit committee has no obvious effect. Dechow et al. (1996) find that firms whose chairman and CEO are the same person, having no controlling shareholders and having inside directors with shares are more likely to violate regulations. Johnson et al. (2009) use firms punished by the Securities and Exchange Commission (SEC) during the period 1991–2005 and investigate whether managerial incentives lead to fraudulent behavior. They find that managers in these firms have more restricted stocks, which means that managerial incentives are a major factor in committing fraud. Karpoff and Lott (1993) find that reputation loss is greater than the legal penalty in firms committing a crime, so in this situation the reputation mechanism is more important than the legal mechanism. Karpoff et al. (2008) examine firms who have financial restatement violations and find similar results as Karpoff and Lott (1993). However, Karpoff et al. (2005) find that firms who violate environmental regulations receive more legal and administrative penalties than reputation penalties.

In China, Chen et al. (2005a,b) use data during 2001–2002 to explore corporate governance and reputation mechanisms to discourage firms from committing fraud. They find that controlling shareholders can reduce the probability of fraud, while reputation mechanisms do not. Zhang and Ma (2005) find a positive relationship between corporate scandals and a firm's controlling shareholder type and the chairman's shareholding, but find no significant relationship between scandals and the number of board members, ratio of independent directors and institutional investors. Chen et al. (2006) find that ownership does not play an important role in corporate fraud. Wu and Gao (2002) examine how the market responds to punishment announcements from the CSRC during the period 1999–2000, and find that firms have a negative reaction after the punishment announcements. Chen et al. (2005a,b) find a similar result, and state that the CSRC is a "tiger with teeth".

There is less research related to the economic consequences of corporate fraud, and the evidence is mixed. Using US data during the period 1981–1992, Agrawal et al. (1999) find that the disclosure of corporate fraud has no effect on executive turnover and corporate governance. Sun and Zhang (2006) find that in firms who commit corporate fraud, only the CEO gets punished while others get promoted after the turnover. Zhu and Wu (2009) find that fraudulent behavior increases audit fees, and the probability of non-standard opinions is more likely than before, but the level of fraud has no effect.

In summary, the literature on corporate fraud pays more attention to the determinants, characteristics and short-term market reaction, and there is little and mixed evidence on the long-term economic consequences of corporate fraud. Using

[3] Hereafter referred to as "punishment for corporate fraud" and "violation of corporate regulations".

the Chinese stock market, we attempt to contribute to the literature by investigating bank loans after a firm receives punishment for fraud.

3. Background and hypothesis development

The last 20 years has seen the rapid development of the Chinese capital market with regulatory policies giving listed companies improved access to financing. As protection of minority investors has also received increased attention, regulators have also been punishing fraudulent firms more severely and frequently. Regulations on corporate fraud have been improved with the enactment of laws such as the "Security Law", "Stock Issuing and Trading Act" and "Accounting Law", and IPO rules released by the Shanghai and Shenzhen Security Exchanges. Regulators in the Chinese stock market include the CSRC, the Shanghai Stock Exchange and the Shenzhen Stock Exchange. Both the enactment and enforcement of the law increase the cost of fraud for listed firms. However, some investors regard the regulators as a "toothless tiger" and their credibility is being questioned due to many instances of corporate fraud in recent years that have heavily damaged the interests of investors. Furthermore, in academia, the effect of punishment on firms who commit corporate fraud is still under debate. Chen et al. (2005a,b) find that firms who commit corporate fraud encounter a significant negative market reaction, but it is still unclear whether the punishment entails only an insignificant administrative penalty and short-term market penalty, or whether it influences other aspects of firms' activities, such as financing through bank loans.

As the Chinese stock market is not as efficient as that of developed countries, stock market reactions may not be a good indicator of the economic consequences of corporate fraud. In the Chinese capital market, firms face various restrictions on seasoned equity offerings and right offerings, and rely heavily on bank loans. Hence, examining the effect of corporate fraud on bank loans makes our test direct and important. For a bank, the most important consideration before contracting with a firm is to ensure that the firm has the capability to repay its loan. To guarantee enough cash flow in the future, banks are concerned about a firm's operating and financial status. When the bank and the firm sign a lending contract, the bank will pay close attention to the firm's credit/default risk and information risk and will consider the amount and quality of the firm's future profits and cash flows.[4] Credit risk mainly measures the quantity of future cash flows, while information risk mainly measures the variance of future cash flows. Once a firm is punished by regulators, the risk for the bank becomes higher, and the bank must increase its monitoring effort, which finally influences both the amount and the interest rates of loans. To summarize, fraudulent corporate behavior increases a bank's credit risk and information risk and, thus, destabilizes the lending contract between the bank and the firm.

Specifically, an increase in credit risk can be generated by changing the bank's belief, litigation responsibility and reputation loss, which further influence the lending contract. First, a fraud event directly affects a firm's future real operating activities. As the most important creditor, the bank is concerned about a firm's profitability and disclosure of a punishment for corporate fraud suggests that most of the information the firm released in the past is questionable, so the bank will probably change its judgment or belief towards the firm's prior activities. To protect its interests, the bank may no longer offer the firm favorable terms of lending, and may also discount the available information about the firm's performance. As a result, the bank may offer fewer loans and require higher interest rates. Second, most disclosure of corporate fraud is related to illegal actions. Unlike criticism from regulators, a firm who commits corporate fraud may also face litigation. This can lead to more sanctions from regulators, criticism from the public and restrictions from suppliers and customers, which result in the deterioration of both the operating and investing environment and further influences the firm's future cash flows. All of these will affect lending from banks. Finally, Mailath and Samuelson (2006) prove the promotion effect of reputation in a long-term dynamic game. The lending contract is a game between a bank and a firm with stable expectations, and reputation saves on exchange costs. Corporate fraud behavior damages the good "bank-firm" relationship based on mutual reputation. As a result, the bank will approve fewer loans and require higher interest rates to avoid credit risk.

Besides credit risk, corporate fraud behavior can also influence a bank's information risk. When contracting, the bank will consider information asymmetry. Bharath et al. (2008) find that accounting quality can reduce information asymmetry in lending contracts. Yao and Xia (2009) find that banks can determine the quality of a firm's profits. However, corporate fraud behavior increases the uncertainty of a firm's information and suggests other problems, such as problems of corporate governance, operating activities or controlling shareholder's tunneling behavior. These make the bank more uncertain about the firm's whole information environment and increase information asymmetry. As a result, the bank needs to monitor the firm more stringently, which increases monitoring costs and will be reflected as increased interest rates and a reduced quantity of bank loans.

In summary, punishment for corporate fraud will change a bank's expectations of credit risk and information risk, and will further restrict the lending event by increasing interest rates and decreasing bank loans. These effects will not only be reflected as the difference in bank borrowing between before and after receiving punishment for corporate fraud, but also reflected in the comparison between fraud firms and their non-fraud counterparts. Hence, our hypotheses are as follows:

[4] Bharath et al. (2008) state that information risk is not the same as credit risk, as information risk originates from incompleteness and asymmetry of information, while credit risk is the probability of the firm violating an existing contract. Credit risk influences the mean of future cash flow, while information risk influences the variance of future cash flow.

H1 After a firm receives punishment for fraudulent behavior, bank loans decrease
H1a For firms punished by regulators for fraudulent behavior, the increase in new loans will be less than in the pre-punishment period
H1b Compared with non-fraudulent firms, the increase in loans will be less for fraudulent firms after receiving punishment
H2 After a firm receives punishment for fraudulent behavior, loan interest rates increase
H2a For firms punished by regulators for fraudulent behavior, the interest rates on its loans will be higher than in the pre-punishment period
H2b Compared with non-fraudulent firms, the interest rates on the loans of fraudulent firms will be higher after receiving punishment

When signing a contract with a firm, banks consider the financial status of the firm as one of the most important factors. Banks will use an effective monitoring system and its lending decision depends on the firm's financial status. This results in a stable and suitable relationship between a bank and a firm. In fact, Hu and Zhou (2006) find an obvious positive relationship between bank loans and a firm's financial status. Hu and Xie (2005) find that profit factors rather than liquidity factors influence short-term loans. Banks forecast future cash flows based on current performance to develop a stable "bank loan-performance" relationship. According to this, banks face both credit risk, which affects the quantity of future cash flows, and information risk, which affects the variance of future cash flows. Receiving punishment destabilizes the "bank loan-performance" relationship, and the bank doubts the firm's performance and regards the punishment as a loss of reputation for the firm. This results in a discount on future cash flows, and thus will break the stable "bank loan-performance" relationship. In China where corruption is not as regular as in other countries, to avoid the risk, the bank has to pay more attention to the firm's performance, which is often written explicitly in the lending contract. On one hand, disclosure of a punishment for corporate fraud directly affects lending behavior. On the other hand, the punishment destabilizes the "bank loan-performance" relationship and indirectly increases exchange costs. Basing on the above statements, we hypothesize that:

H3: Punishment for corporate fraud decreases firm's positive "bank loan-performance" relationship and increases firm's negative "interest rate-performance" relationship.

4. Research design

4.1. Models and variable definitions

From Table 1 we can see that the number of punishments for corporate fraud increases every year, which highlights the urgency and importance of this paper. The fraud types are classified as economic crime, illegal guarantee, illegal disclosure, false statement, delayed information disclosure, information missing or hidden and illegal tunneling. Among these, information missing or hidden, false statement and illegal disclosure constitute the majority of the sample (158, 142 and 110 observations). Illegal guarantee has the least number of observations (21).

In the empirical sections, we investigate two types of comparisons of corporate fraud. First, we compare the time before and after the disclosure of punishment for corporate fraud, and then compare the bank loans received by firms punished for fraudulent behavior with those who do not commit fraud. We use loan renewals[5] and interest rates to proxy for the firm's lending behavior, and the research models are as follows:

$$\begin{aligned}\mathrm{CL}_{t+1}(\mathrm{FFEE}_{t+1}) = {} & \alpha_0 + \alpha_1 \mathrm{FR}_t + \alpha_2 \mathrm{ROA}_t + \alpha_3 \mathrm{GROWTH}_t + \alpha_4 \mathrm{CFO}_t + \alpha_5 Z - score_t + \alpha_6 \mathrm{LEV}_t + \alpha_7 \mathrm{SIZE}_t + \alpha_8 \mathrm{ABSDA}_t \\ & + \alpha_9 \mathrm{DOPI}_t + \alpha_{10} \mathrm{CON}_t + \alpha_{11} \mathrm{SHR1}_t + \sum \mathrm{IND} + \sum \mathrm{YEAR} + \varepsilon_t \end{aligned} \quad (1)$$

$$\begin{aligned}\mathrm{CL}_{t+1}\mathrm{FFEE}_{t+1} = {} & \beta_0 + \beta_1 \mathrm{FR}_t + \beta_2 FR_t * \mathrm{ROA}_t + \beta_3 \mathrm{ROA}_t + \beta_4 \mathrm{GROWTH}_t + \beta_5 \mathrm{CFO}_t + \beta_6 Z - score_t + \beta_7 \mathrm{LEV}_t + \beta_8 \mathrm{SIZE}_t \\ & + \beta_9 \mathrm{ABSDA}_t + \beta_{10} \mathrm{DOPI}_t + \beta_{11} \mathrm{CON}_t + \beta_{12} \mathrm{SHR1}_t + \sum \mathrm{IND} + \sum \mathrm{YEAR} + \psi_t \end{aligned} \quad (2)$$

In model (1), we examine the direct influence of the disclosure of corporate fraud. In model (2), we use FR*ROA to investigate the indirect influence of fraud. CL is the change in bank loans in year t, considering the fact that in China there exists a "Short-term loans for long-term lending" phenomenon[6]; besides CTL (all bank loans), we also use CSL (short-term bank loans). FFEE is the interest rate, measured as "financing expense/(short-term loans + long-term loans + bonds payable)".[7] FR_1 is a dummy variable that takes a value of 1 if it is after punishment, and 0 otherwise; FR_2 is also a dummy variable that takes a value of 1 if the firm is punished in year t, and 0 otherwise. These dummy variables are used in the "before and after the punishment's disclosure" subsample and "whether or not punished in year t" subsample, respectively. We control for the firm's basic characteristics, such as performance, growth, cash flows, leverage, size, accounting information quality (earnings management and audit opinion), shareholdings of the first largest shareholder, ownership structure, and industry and year effects (Hu and Zhou, 2006; Jiang and Li, 2006). The definitions of the variables are presented in Table 2.

[5] To link bank loan changes to the corporate fraud behavior, we choose loans renewals excluding loans that firms already have (see Hu and Zhou, 2006).
[6] For more details, see Wang et al., 2009.
[7] We also use financial fees from the cash flow statement as a robustness test.

Table 1
Time and type of the fraud sample.[a]

Year	Observation	Punishment type	Observation
2000	31	Economic crime	58
2001	59	Illegal guarantee	21
2002	74	Illegal disclosure	110
2003	59	False statement	142
2004	106	Delayed information disclosure	97
2005	181	Information missing or hidden	158
2006	145	Illegal tunneling	45
2007	113	Others	139
Total	768	Total	768

[a] This table contains the situation in which a firm receives more than one punishment in 1 year.

Table 2
Variable definitions.

Variable	Symbol	Definition
Bank loan renewals	*CTL*	The difference between all bank loans in year $t+1$ and year t, divided by total assets in year t
	CSL	The difference between short-term loans in year $t+1$ and year t, divided by total assets in year t
Interest rate	*FFEE*	Financing expense divided by the sum of short-term loans, long-term loans and bonds payable in year $t+1$
Punishment for corporate fraud	*FR_1*	Dummy variable that takes a value of 1 if it is after punishment, and 0 otherwise[a]
	FR_2	Dummy variable that takes a value of 1 if the firm is punished in year t, and 0 otherwise
Performance	*ROA*	Return on total assets in year t
Growth	*GROWTH*	The ratio of the difference between the revenue in year t and year t–1 to the revenue in year t
Operating cash flow	*CFO*	Operating cash flow divided by total assets in year t
Financial risk	*Z-score*	We compute the *Z*-score using the method from Wu and Lu (2001)
Leverage	*LEV*	Leverage divided by total assets in year t
Size	*SIZE*	Natural logarithm of total assets in year t
Earnings management	*ABSDA*	Absolute value of discretional accruals, which is computed using the performance-matched Jones model (see Kothari et al., 2004)
Audit opinion	*DOPI*	Dummy variable that takes a value of 1 if the firm gets a non-standard opinion in year t, and 0 otherwise
Ownership	*CON*	Dummy variable that takes a value of 1 if the firm is controlled by the state, and 0 otherwise
Shareholding of the largest shareholder	*SHR1*	The ratio of the shareholding of the first largest shareholder divided by all shares outstanding in year t

[a] In fact, the results of tests of 1 year before and after the punishment remains the same.

4.2. Data selection

Our sample comprises non-financial companies listed on the Shanghai and Shenzhen Stock Exchanges during the period 2003–2007. Data was collected from the CSMAR database. Missing data substantially reduces the number of observations we can use and the final corporate fraud sample is 729 firm-years.[8] In the "whether or not punished in year *t*" subsample, using the matching method based on industry and size in the same year, we choose 729 observations for the non-punishment firm sample,[9] and examine their lending differences 1 year later. The former sample focuses on time-series comparison and the latter on cross-sectional comparison.[10] In a robustness test, we also use the full sample for comparison. All continuous variables are winsorized at upper and lower 1% levels to control for outliers.

5. Results

5.1. Descriptive statistics and univariate analysis

Table 3 shows the descriptive statistics. The mean of LEV is 69.2%, which means that the leverage of the fraud firms is much higher and bank loans are important for them. They should pay more attention to corporate fraud due to potentially high credit and information risks. The mean difference between CTL and CSL is small (−0.015 and −0.013, respectively), which means that there are a few long-term loans in Chinese listed firms.

In Fig. 1, we set year *t* as the year that a firm receives punishment due to corporate fraud, and compare the differences in bank loans 2 years before and 2 years after.

[8] If the firm is punished more than once in a year, we regard this as one observation in that year. There are 677 firms in the 729 firm-year observations; we include the situation that firms encounter several types of punishment in 1 year, so Table 2 has 768 observations.

[9] In a difference test of the two samples, the *t* value is 1.13, and *Z* value is 1.18. Both are not significant, which means our matched sample is successful.

[10] The cross-sectional comparison can reduce the errors influenced by firm's lending strategy and not because of the fraudulent behavior.

Table 3
Descriptive statistics.

Variable	N	Mean	Median	Max.	Min.	Std.
CTL	729	−0.015	−0.015	0.560	−0.329	0.141
CSL	729	−0.013	−0.009	0.383	−0.298	0.120
FFEE	729	0.081	0.070	0.482	−0.332	0.086
ROA	729	−0.093	−0.029	0.168	−0.470	0.162
GROWTH	729	0.069	−0.004	4.080	−0.825	0.712
CFO	729	−0.002	0.010	0.263	−0.210	0.105
Z-score	729	−0.892	−0.081	3.269	−8.659	2.521
LEV	729	0.692	0.621	1.990	0.087	0.404
SIZE	729	20.728	20.688	24.180	18.711	0.968
ABSDA	729	0.148	0.096	1.875	0.000	0.185
DOPI	729	0.483	0.000	1.000	0.000	0.500
CON	729	0.570	1.000	1.000	0.000	0.496
SHR1	729	0.354	0.298	0.765	0.096	0.152

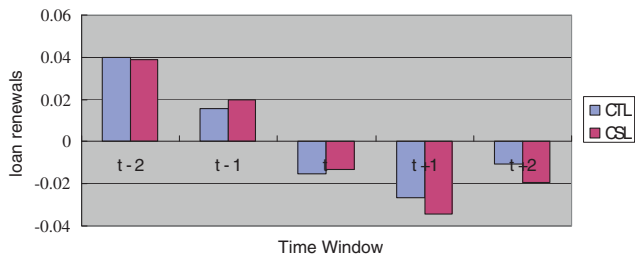

Fig. 1. Loan renewal changes before and after punishment for fraud.

From Fig. 1 we can see that bank loans drop from year $t-2$ to year $t+2$. Intuitively, the consequence of corporate fraud is obvious. In fact, bank loans start decreasing in year $t-1$, probably because the fraudulent behavior has been committed before year t, although the regulators punish the firm in that year (regulators such as the CSRC have a time lag between paying attention to a fraudulent firm to informal investigation, formal investigation and releasing punishment), or a bank obtains information on fraudulent behavior before public investors do. We must emphasize that the change in bank loans is negative in years $t+1$ and $t+2$, that is, after the punishment the firm's loans are lower than the year before and this trend is almost entirely due to the change in short-term loans. The results in Fig. 1 indicate that corporate fraud behavior significantly influences bank loans, which preliminary supports our H1a.

Next, using univariate analysis, we compare total loan renewals, short-term loan renewals and interest rates of the two subsamples – "before and after the punishment's disclosure" and "whether or not punished in year t". Results are shown in Table 4. For the first subsample, compared with the year before punishment disclosure, the mean CTL and CSL is less in the year after the disclosure of the punishment, and the interest rate increases. The median results are the same (significant at the 1% level). The tests in Table 4 suggest that corporate fraud reduces a firm's bank loans and increases its interest rate. Therefore, H1a and H2a are supported. Similar results are found for the subsample "whether or not punished in year t", and H1b and H2b are supported.

5.2. Regression analysis

We first examine the subsample "before and after the punishment's disclosure", and the regression results are shown in Table 5. The relationship between FR_1 and CTL/CSL are significantly negative at the 1% level, and these results hold after controlling for economic and accounting quality factors. These results show that after the firm's punishment disclosure, there is a decline in loans, which supports H1a. From the interest rate perspective, the relationships between FR_1 and FFEE are significantly positive at the 1% level, and these results also hold after controlling for economic and accounting quality factors. Hence, H2a is also supported.

We also find that ROA is positively related to CTL/STL and negatively related to FFEE, and all are significant at the 1% level. This suggests that the bank changes the loans based on the firm's performance. However, the stable "bank loan-performance" relationship can be influenced by punishment for a firm's fraudulent behavior, and this can be seen in Models 3, 6 and 9: the FR and ROA interaction term is significantly negative (Model 6), and the FR and FFEE interaction term is significantly positive (Model 9). In short, H3 is supported.

Second, we examine the subsample "whether or not punished in year t", and the results are shown in Table 6. Consistent with Table 5, the coefficient on FR_2 is negative at the 1% level with CTL and CSL, but predominantly insignificant with FFEE.

Table 4
Univariate analysis.

Variable	Before and after the punishment			Whether or not punished		
	FR_1 = 0		FR_1 = 1	FR_2 = 0		FR_2 = 1
Observation	1163		1252	729		729
Panel A: CTL						
Mean	0.0273		−0.019	0.0283		−0.032
Diff (1–0)		−0.0463			−0.0603	
T value		−8.41***			−8.27***	
Median	0.0099		−0.0114	0.0059		−0.0151
Diff (1–0)		−0.0213			−0.021	
Z value		−9.42***			−8.35***	
Panel B: CSL						
Mean	0.0287		−0.027	0.0176		−0.039
Diff (1–0)		−0.0557			−0.0566	
T value		−11.91***			−9.41***	
Median	0.0126		−0.01	0.0071		−0.0114
Diff (1–0)		−0.0226			−0.0185	
Z value		−11.92***			−9.49***	
Panel D: FFEE						
Mean	0.0569		0.0827	0.0729		0.0876
Diff (1–0)		0.0258			0.0147	
T value		6.99**			2.57**	
Median	0.0576		0.071	0.0572		0.0716
Diff (1–0)		0.0134			0.0144	
Z value		10.18***			6.02***	

* Denote $p < 0.10$.
** Denote $p < 0.05$.
*** Denote $p < 0.01$.

Table 5
Results of "Before and After the Punishment" subsample.

	CTL			CSL			FFEE		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
FR_1	−0.044***	−0.019***	−0.021***	−0.054***	−0.031***	−0.034***	0.026***	0.011***	0.013***
	(−7.91)	(−3.32)	(−3.57)	(−11.45)	(−6.57)	(−6.83)	(6.94)	(2.7)	(3.29)
*FR_1*ROA*			−0.061			−0.067*			0.083***
			(−1.45)			(−1.87)			(2.84)
ROA		0.088***	0.133***		0.068***	0.117***		−0.048***	−0.108***
		(3.56)	(3.35)		(3.23)	(3.48)		(−2.69)	(−3.90)
GROWTH		0.010**	0.010**		0.012***	0.013***		0.005*	0.005*
		(2.33)	(2.35)		(3.44)	(3.47)		(1.84)	(1.85)
CFO		−0.05	−0.052*		−0.062**	−0.064**		0.107***	0.110***
		(−1.63)	(−1.70)		(−2.40)	(−2.48)		(4.95)	(5.06)
Z-score		−0.001	−0.001		−0.001	−0.001		0.001	0.001
		(−0.70)	(−0.68)		(−0.70)	(−0.67)		(0.93)	(0.91)
LEV		−0.056***	−0.056***		−0.046***	−0.046***		0.036***	0.036***
		(−5.73)	(−5.73)		(−5.60)	(−5.59)		(5.25)	(5.23)
SIZE		0.021***	0.021***		0.015***	0.014***		−0.003	−0.003
		(6.41)	(6.35)		(5.2)	(5.13)		(−1.21)	(−1.14)
ABSDA		0.032**	0.032**		0.004	0.004		0.014	0.013
		(2.25)	(2.25)		(0.32)	(0.32)		(1.21)	(1.1)
DOPI		−0.025***	−0.024***		−0.024***	−0.023***		0.014***	0.014***
		(−3.71)	(−3.60)		(−4.16)	(−4.03)		(3.06)	(2.92)
CON	0.012*	−0.006	−0.005	0.011**	−0.003	−0.003	−0.009**	−0.001	−0.001
	(1.91)	(−0.91)	(−0.83)	(2.14)	(−0.59)	(−0.50)	(−2.05)	(−0.13)	(−0.25)
SHR1	0.078***	0.036*	0.036*	0.056***	0.023	0.022	−0.001	0.014	0.014
	(4.02)	(1.96)	(1.93)	(3.41)	(1.45)	(1.42)	(−0.09)	(1.07)	(1.07)
Constant	−0.009	−0.391***	−0.387***	0.001	−0.251***	−0.246***	0.063***	0.083*	0.079
	(−1.20)	(−5.72)	(−5.65)	(0.1)	(−4.33)	(−4.24)	(12.11)	(1.71)	(1.63)
Year&IND	√	√	√	√	√	√	√	√	√
R^2	0.04	0.142	0.142	0.065	0.162	0.164	0.024	0.079	0.083
F-value	33.61	35.44	32.68	55.81	41.67	38.53	18.04	16.9	16.21
Obs.	2415	2415	2415	2415	2415	2415	2415	2415	2415

Notes: *t* values in brackets. The VIF coefficient is less than 10.
* Denote $p < 0.10$.
** Denote $p < 0.05$.
*** Denote $p < 0.01$.

Table 6
Results of "Whether or Not Punished" sample.

	CTL			CSL			FFEE		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
FR_2	−0.057***	−0.021***	−0.023***	−0.052***	−0.022***	−0.024***	0.015***	−0.001	0.003
	(−7.80)	(−2.87)	(−3.19)	(−8.82)	(−3.70)	(−4.06)	(2.67)	(−0.17)	(0.44)
FR_2∗*ROA*			−0.183***			−0.167***			0.260***
			(−3.23)			(−3.60)			(5.52)
ROA		0.080**	0.219***		0.041	0.168***		−0.064**	−0.257***
		(2.40)	(4.03)		(1.49)	(3.76)		(−2.27)	(−5.74)
GROWTH		0.017***	0.016***		0.008**	0.008*		−0.002	−0.001
		(3.35)	(3.25)		(1.99)	(1.87)		(−0.59)	(−0.35)
CFO		−0.115***	−0.105***		−0.094***	−0.085***		0.083**	0.060*
		(−3.05)	(−2.79)		(−3.05)	(−2.76)		(2.57)	(1.86)
Z-score		−0.002	−0.002		0.001	0.000		−0.000	0.000
		(−0.60)	(−0.75)		(0.39)	(0.22)		(−0.07)	(0.19)
LEV		−0.096***	−0.099***		−0.075***	−0.078***		−0.005	0.001
		(−7.56)	(−7.79)		(−7.19)	(−7.46)		(−0.44)	(0.06)
SIZE		0.029***	0.029***		0.018***	0.017***		−0.014***	−0.012***
		(7.33)	(7.18)		(5.50)	(5.34)		(−3.99)	(−3.62)
ABSDA		0.066***	0.072***		0.034**	0.039**		0.032**	0.023
		(3.59)	(3.87)		(2.25)	(2.57)		(2.07)	(1.51)
DOPI		−0.006	−0.007		−0.014*	−0.015*		0.028***	0.029***
		(−0.65)	(−0.72)		(−1.72)	(−1.81)		(3.43)	(3.58)
CON	0.005	−0.010	−0.005	0.003	−0.008	−0.005	0.010	0.022***	0.015**
	(0.57)	(−1.23)	(−0.69)	(0.52)	(−1.31)	(−0.71)	(1.57)	(3.39)	(2.34)
SHR1	0.074***	0.006	0.002	0.075***	0.025	0.020	−0.017	0.005	0.011
	(2.80)	(0.25)	(0.07)	(3.52)	(1.23)	(1.02)	(−0.84)	(0.24)	(0.57)
Constant	−0.038	−0.587***	−0.572***	−0.052*	−0.373***	−0.359***	0.088***	0.363***	0.333***
	(−1.04)	(−6.68)	(−6.52)	(−1.74)	(−5.17)	(−5.00)	(3.24)	(4.85)	(4.48)
Year and IND	√	√	√	√	√	√	√	√	√
R^2	0.105	0.270	0.276	0.125	0.271	0.278	0.064	0.125	0.147
F-value	7.76	17.33	17.21	9.39	17.43	17.43	4.00	6.01	6.97
Obs.	1458	1458	1458	1458	1458	1458	1458	1458	1458

Notes: *t* values in brackets. The VIF coefficient is less than 10.
* Denote $p < 0.10$.
** Denote $p < 0.05$.
*** Denote $p < 0.01$.

Moreover, FR_2∗ROA is negatively related to CTL/CSL and positively related to FFEE, which means that corporate fraud not only directly influences bank loans and interest rates, but also indirectly influences the "bank loan-performance" and "interest rate-performance" relationships. These results support H1b, H2b and H3.

5.3. Robustness tests

Considering that different firms have different borrowing strategies, we use dummy variables to measure bank loan renewals (Hu and Zhou, 2006); that is, when CTL/CSL is positive, then DCTL/DCSL is 1, and 0 otherwise. The results of the logistic model are shown in Table 7. Similar to the OLS results, for both the subsample "before and after the punishment's disclosure" and the subsample "whether or not punished in year *t*", the coefficients on FR and FR∗ROA are all negative at the 1% or 5% levels (except DCTL). Hence, all three hypotheses are further supported.

In addition, although a firm receives punishment in year *t*, its fraudulent behavior may be disclosed before that year, or the bank is more informed than the public. To control for this effect, we allocate the fraud year into the "after fraud" sample, and the results are shown in Table 8. FFEE and FR are significantly positively related, and CTL/CSL and FR are significantly negatively related. At the same time, to reduce errors when using the matching sample method, we add all non-fraud observations, and the results remain the same.

Meantime, we have also completed the following robustness tests (to be succinct, we do not present our results):

(1) In the subsample "before and after the punishment's disclosure", we only consider 1 year before and after the punishment's disclosure. As in the "bank-firm" lending relationship, financial information is more important than other factors for the bank, so we also select the observations suffering financial fraud. Because banks may decide their lending behavior based on financial information, such as cash flow, growth, operating risk, financial information quality and leverage, we use comprehensive analysis to synthesize ROA, GROWTH, CFO, *Z*-score, Lev, SIZE, ABSDA and DOPI to a comprehensive variable.

Table 7
Robustness test I.

	Before and after the punishment		Whether or not punished	
	DCTL	DCSL	DCTL	DCSL
FR	−0.105***	−0.154***	−0.115***	−0.170***
	(−4.61)	(−6.75)	(−4.19)	(−6.22)
*FR*ROA*	−0.487***	−0.568***	−0.312	−0.428**
	(−3.19)	(−3.73)	(−1.48)	(−2.03)
ROA	0.684***	0.696***	0.812***	0.774***
	(4.7)	(4.79)	(4.02)	(3.84)
GROWTH	0.004	0.018	0.001	0.014
	(0.27)	(1.19)	(0.05)	(0.74)
CFO	−0.042	−0.091	−0.455***	−0.506***
	(−0.38)	(−0.83)	(−3.24)	(−3.61)
Z-score	−0.021***	−0.018***	−0.037***	−0.030***
	(−3.27)	(−2.78)	(−3.87)	(−3.11)
LEV	−0.05	−0.022	−0.168***	−0.103**
	(−1.40)	(−0.61)	(−3.54)	(−2.18)
SIZE	0.094***	0.084***	0.119***	0.100***
	(7.74)	(6.91)	(8.04)	(6.78)
ABSDA	−0.012	0.003	0.027	0.150**
	(−0.23)	(0.06)	(0.39)	(2.19)
DOPI	−0.119***	−0.140***	−0.042	−0.091**
	(−4.89)	(−5.73)	(−1.14)	(−2.49)
CON	−0.061***	−0.031	−0.049*	−0.037
	(−2.72)	(−1.38)	(−1.70)	(−1.28)
SHR1	0.299***	0.139**	0.086	0.054
	(4.34)	(2.03)	(0.95)	(0.6)
Constant	−1.839***	−1.331***	−1.822***	−1.478***
	(−6.51)	(−4.70)	(−5.59)	(−4.53)
Year and IND	√	√	√	√
R^2	0.17	0.169	0.201	0.201
F-value	16.05	15.95	11.4	11.39
Obs.	2415	2415	1458	1458

Notes: *t* values in brackets. The VIF coefficient is less than 10.
* Denote $p < 0.10$.
** Denote $p < 0.05$.
*** Denote $p < 0.01$.

(2) Considering that it takes a long time between the formal investigation by regulators and the disclosure of punishment, we delete observations where the interval between committing fraud and punishment is longer than 1 year. In addition, we add an interval variable to control for this effect in the OLS model.
(3) We also use "cash outflow for financing expense" in the cash flow statement to proxy for interest costs, as this variable is different from financing expense in the income statement and does not include items such as exchange gains and losses.

The results remain the same for these robustness tests, which means our results are robust.[11]

6. Conclusions

Corporate fraud significantly damages the interests of investors and punishment from regulators plays an important role in investor protection. However, does punishment for fraud have a negative effect on firms? This question is important not only to determine whether regulators are a "toothless tiger" or not, but also to protect investors and to promote the healthy development of capital markets. However, academic research has failed to form a consensus on this issue.

In contrast to the existing research, which mainly discuss the reasons and short-term market reaction to corporate fraud, this paper takes punished firms for corporate fraud as its research subject and focuses on changes in bank loans to investigate the economic consequence of corporate fraud. We believe that punishment for corporate fraud influences the contractual relationship between banks and firms, and affects the credit risk and information risk of bank loans. As a result, banks will be anxious about a firm's future cash flows and earnings stability and, hence, will reduce the loans it will lend to the firm. Our empirical evidence shows that punishment for fraud reduces the amount of bank loans and increases the interest rate. Compared with non-fraudulent firms, fraudulent companies have lower bank loan renewals and higher interest rates. Moreover, corporate fraud influences bank loan policy by affecting the relationship between bank loans and performance.

[11] We thank the anonymous referee for these suggestions.

Table 8
Robustness test II.

	Before and after the punishment			Whether or not punished		
	CTL	CSL	FFEE	CTL	CSL	FFEE
FR	−0.011**	−0.021***	0.008**	−0.018***	−0.023***	0.014***
	(−2.02)	(−4.48)	(2.07)	(−3.43)	(−5.51)	(3.60)
FR∗ROA	−0.033	−0.049	0.051*	−0.101***	−0.091***	0.170***
	(−0.83)	(−1.45)	(1.85)	(−3.25)	(−3.74)	(7.41)
ROA	0.106***	0.092***	−0.082***	0.195***	0.142***	−0.112***
	(2.69)	(2.77)	(−3.00)	(9.78)	(9.13)	(−7.53)
GROWTH	0.010***	0.013***	0.007***	0.008***	0.008***	0.002
	(2.81)	(4.11)	(2.66)	(3.73)	(4.87)	(1.60)
CFO	−0.030	−0.046**	0.066***	−0.143***	−0.098***	0.013
	(−1.14)	(−2.06)	(3.53)	(−8.65)	(−7.63)	(1.03)
Z-score	−0.002	−0.002	−0.001	−0.006***	−0.003***	0.001
	(−1.04)	(−1.25)	(−1.38)	(−4.67)	(−2.68)	(0.65)
LEV	−0.044***	−0.040***	0.008	−0.088***	−0.067***	0.054***
	(−5.17)	(−5.55)	(1.37)	(−14.19)	(−13.88)	(11.57)
SIZE	0.021***	0.015***	−0.006***	0.025***	0.014***	−0.008***
	(7.11)	(6.02)	(−2.65)	(18.43)	(13.32)	(−7.79)
ABSDA	0.013	−0.007	0.025**	0.066***	0.036***	−0.003
	(0.95)	(−0.59)	(2.45)	(11.05)	(7.63)	(−0.74)
DOPI	−0.029***	−0.028***	0.018***	−0.020***	−0.017***	0.004
	(−4.94)	(−5.53)	(4.41)	(−4.54)	(−4.98)	(1.33)
CON	−0.012**	−0.009**	0.002	−0.009***	−0.006***	−0.004*
	(−2.22)	(−1.97)	(0.51)	(−3.04)	(−2.85)	(−1.78)
SHR1	0.040**	0.025*	0.001	−0.016**	−0.011*	−0.007
	(2.37)	(1.75)	(0.09)	(−1.99)	(−1.75)	(−1.14)
Constant	−0.533***	−0.382***	0.181***	−0.465***	−0.256***	0.221***
	(−7.67)	(−6.50)	(3.73)	(−15.43)	(−10.88)	(9.87)
Year and IND	√	√	√	√	√	√
R^2	0.166	0.188	0.104	0.141	0.130	0.085
F-value	19.93	23.11	10.67	55.78	50.63	29.02
Obs.	3144	3144	3144	10223	10223	10223

Notes: *t* values in brackets. The VIF coefficient is less than 10.
* Denote $p < 0.10$.
** Denote $p < 0.05$.
*** Denote $p < 0.01$.

These results imply that punishment from regulators indeed has a negative economic impact on the subsequent bank loans of fraudulent firms.

The findings of this paper warn listed firms of the consequences of fraudulent behavior. We advise regulators to widen the range of punishments, and appeal to the media, investors and market participants to provide stronger supervision and apply more pressure on fraudulent firms.

Acknowledgements

The authors thank Donghui Wu (executive editor), the anonymous referees, Deren Xie from Tsinghua University, Xiongshen Yang, Donghua Chen, Xiang Li at the "4th Doctorial Symposium of THU-SUFE-SZU-NJU", Minggui Yu, Qingyuan Li, Qiliang Liu at "Luojia Young Scholar Seminar on Economics and Management" in Wuhan University, Nutao Yu and participants at "2010 Annual Academic Conference of Accounting Society of China" for their helpful comments and suggestions. This study was supported by the National Natural Science Foundation of China (Project No. 70772017), Scholarship Award for Excellent Doctoral Student granted by Ministry of Education, grants from the Beijing Municipal Commission of Education "Joint Construction Project" and the "Project 211" (Phase-3) Fund of the Central University of Finance and Economics, China.

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