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Profits and losses from changes in fair value, executive cash compensation and managerial power: Evidence from A-share listed companies in China

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ABSTRACT

According to optimal contracting theory, compensation contracts are effective in solving the agency problem between stockholders and managers. Executive compensation is naturally related to firm performance. However, contracts are not always perfect. Managers may exert influence on the formulation and implementation of compensation contracts by means of their managerial power. As fair value has been introduced into the new accounting standards in China, new concerns have arisen over the relationship between profits and losses from changes in fair value (CFV) and levels of executive compensation. In this study, we find that executive compensation is significantly related to CFV. However, this sensitivity is asymmetric in that increases to compensation due to profits from changes in fair value (PCFV) are higher than reductions to compensation due to losses from changes in fair value (LCFV). Furthermore, we find that managerial power determines the strength of this asymmetry.

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1. Introduction

In recent years, anecdotal evidence from China's securities markets suggests changing standards of executive compensation. In 2008, China Southern (Stock code: 600029) suffered a huge loss of 5 billion yuan, which

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included 124 million yuan in losses from changes in fair value (LCFV). At the same time, the level of compensation for executives¹ of China Southern jumped by 50%.² In 2010, CIMC (Stock code: 000039) earned a net profit of 3 billion yuan, an increase of 213%, of which 76.84 million yuan was profit from changes in the fair value (PCFV) of derivative financial instruments. The compensation to CIMC's executives soared nearly 10-fold.³ According to annual financial reports for 2008, Air China (Stock code: 601111) and China Eastern (Stock code: 600115) incurred losses of 7.9 million yuan and 4.2 million yuan, respectively, of which losses from crude oil swaps accounted for 78.4% in the case of Air China and 42.2% in the case of China Eastern. As a result, the total compensation of the three highest-paid executives in these companies decreased by only 50,000 yuan for Air China executives and 73,000 yuan for China Eastern executives. These cases indicate that executive compensation tends to (1) increase far more than growth in earnings from PCFV, (2) increase despite LCFV and (3) change little despite huge losses from CFV.

According to optimal contracting theory, compensation contracts are effective in solving the agency problem between stockholders and managers. Given that a compensation contract is effective, executive compensation should be directly related to corporate performance. Performance is always designed as the core element of executive compensation contracts. However, contrary to common expectations, levels of executive compensation have virtually nothing to do with corporate performance in practice and the core influence of performance on executive compensation tends to disappear. According to an investigation from the Information Centre of Guangdong Province, state-owned enterprises (SOEs) pay high salaries to executives as rewards for their individual contributions and millions of yuan flow into the executives' pockets regardless of their firms' continuous losses.⁴ In addition, scholars have found that perfect contracts do not exist and that the formulation, implementation and efficiency of contracts are controlled by managerial power (Hambrick and Finkelstein, 1995; Core et al., 1999; Bebchuk et al., 2002; Duffhues and Kabir, 2008; Cheng and Indjejikian, 2009). In accordance with rational assumptions about economic self-interest, it is not surprising that executives manipulate compensation contracts. The control of operating returns by executives is evident in theoretical explanations of managerial power and in studies providing empirical evidence (Cyert et al., 2002; Garvey and Milbourn, 2006; Gopalan et al., 2008; Morse et al., 2008; Fahlenbrach, 2009). China's economic system provides fertile soil for breeding managerial power. Numerous empirical studies provide evidence that managerial power does influence executive compensation in China's listed companies (Zhang and Shi, 2005; Lu, 2008; Lyu and Zhao, 2008; Quan et al., 2010).

In 2006, fair value was introduced into the new accounting standards in China and the structure of accounting performance has changed since CFV became an item of operating income. As a basis for compensation evaluation, CFV cannot be separated from the compensation evaluation system. Executives should be responsible for investment decisions that cause CFV. However, because of the asymmetric sensitivity of compensation to performance (Gaver and Gaver, 1998; Dorff, 2005; Garvey and Milbourn, 2006; Fang, 2009; Xu and Zeng, 2010), executive compensation displays its own characteristic of asymmetric sensitivity to CFV. Asymmetric sensitivity explains the different effects of CFV on executive compensation in the above-mentioned anecdotal cases. In dealing with this issue, the initial problem is to understand where the power of executives to control compensation comes from. What factors determine the strength of this asymmetric sensitivity in executive compensation? Does managerial power play a role in the asymmetric sensitivity of executive compensation to CFV?

Our sample consists of Chinese firms listed as A-share companies on the Shanghai and Shenzhen Securities Exchanges between 2007 and 2009. We analyze the effects of CFV on executive compensation from the viewpoint of contracting theory and attempt to explain the observed effects in reference to the theory of managerial power. We draw the following conclusions: (1) as a new item of performance in the income statement, CFV is positively related to executive compensation; (2) the sensitivity of executive compensation is asymmetric to CFV in that executive pay rises higher due to PCFV than it declines due to LCFV; and (3) the greater the managerial power, the more asymmetric the sensitivity of executive compensation is to CFV.

¹ In this paper, compensation refers only to monetary compensation reported in company annual financial statements.

² <http://www.yrdnet.com/News/Detail-9906.aspx>, April 15, 2009.

³ <http://finance.cn.yahoo.com/mark/stocknews>, March 23, 2011.

⁴ Haining Feng, Why is SASAC unable to control self-dealing in executive compensation? *China Economic Times*, July 17, 2008.

Our study makes the following contributions. First, we investigate the effects of both profits and losses from CFV on executive compensation. Previous studies have paid more attention to the sensitivity of executive compensation to PCFV (Hou and Jin, 2010; Xu and Zeng, 2010) and the sensitivity of executive compensation to LCFV is less commonly observed. We find a positive relationship between executive compensation and CFV, whether those changes involve profits or losses. This finding verifies the potential usefulness of contracts for controlling executive compensation in relation to CFV. In other words, the compensation contract is a valid tool to some extent. Second, we provide evidence to confirm the asymmetric sensitivity of executive compensation to CFV. Third, we investigate both the asymmetric sensitivity and the effects of managerial power on levels of executive compensation. This investigation makes contributions to two research streams. We use the theory of managerial power to explain the asymmetric sensitivity of executive compensation to CFV and we find new empirical evidence concerning the effects that managerial power has on compensation, while providing a reasonable explanation for compensation stickiness.

The rest of this paper is organized as follows. Section 2 presents the institutional background and literature review. Section 3 provides the theoretical analysis and develops testable hypotheses. Section 4 outlines the research design, including the sample selection, data sources, variable definitions and descriptive statistics. Section 5 provides the empirical results and Section 6 draws conclusions.

2. Institutional background and literature review

2.1. Institutional background

2.1.1. SOE reform and executive compensation

Since the market-oriented enterprise reform in 1978, operating performance has been taken into consideration by decision makers when designing executive compensation contracts. Along with the SOE shareholding system reform, the launching of the split share structure reform and the development of capital markets, the structure of executive compensation in SOEs underwent several major institutional transitions. In 1984, *The CPC Central Committee's Decision on the Reform of the Economic System* proposed the principle of distribution according to work. In 1986, *Certain Provisions of the State Council on Deepening the Reform of Enterprises to Enhance the Vitality of Enterprises* advanced a proposal that the personal salaries of managerial operators could be one to three times higher than those of staff and workers. In 1992, the Ministry of Labor and the Economic and Trade Office of the State Council issued a new rule named *To Improve Income Allocation of SOE Operators*, which for the first time required that managers' salaries be linked to their work performance. In 1995, the State-owned Assets Administration Bureau (which is in charge of assessing, maintaining and increasing the value of state-owned assets) claimed that managers' salaries must be connected to their performance assessments. In 2003, the State-owned Assets Supervision and Administration Commission (SASAC) issued the *Interim Measures for the Performance Evaluation of the Person in Charge of the Central Enterprises*, which both encouraged and constrained enterprise supervisors in the design of incentive contracts and assessments of operating performance. In 2004, the SASAC further issued the *Interim Measures for the Compensation Management of Central Enterprise Principle*, specifying that compensation should follow a central enterprise principle and be comprised of basic pay, long-term incentive pay and performance pay, with performance pay determined by operating performance. In 2009, the Ministry of Human Resources and Social Security issued its *Guidance to Further Regulate the Compensation Management of Central Enterprise Principle*. This policy further regulated the incentive mechanism in pay levels, pay structures, post-consumption, management and oversight, and organization and implementation. The evolving development of the executive compensation system shows that policy governing executive pay has been designed increasingly in relation to operating performance. However, it cannot be ignored that the gradually liberalized standards for executive compensation are progressively controlled by managers themselves, resulting in astronomical salaries due to state ownership and insider control.

2.1.2. Introduction of fair value into new accounting standards and CFV as a new item of income

The new enterprise accounting standard system was issued by the Ministry of Finance on February 15, 2006 and was implemented for listed companies starting January 1, 2007. As the new accounting standard

recognizes the measurement attribute of fair value, CFV was added into company income statements as a new item for reporting profits or losses originating from changes in the fair value of assets or liabilities. According to the new standards, these changes in fair value should be reported as gains or losses in the current period's income statement. Except in the case of financial enterprises, profits and losses from changes in fair value must be reported on transactions involving the trading of financial assets or liabilities, derivative financial instruments and investment property. The introduction of fair value into the new accounting standards included setting-up a new item in the income statement, distinguishing investment gains or losses with different levels of risk, improving the relevance of accounting information and enabling better decision-making by investors or managers. However, whether these changes in accounting standards affect executive compensation is still an open question.

2.2. Literature review

Many scholars have explored the issues of CFV, executive compensation and managerial power. We categorize these studies into three topics.

2.2.1. CFV and executive compensation

From the perspective of contracting theory, Hou and Jin (2010) study the influence of CFV on executive compensation after the implementation of the new accounting standards. They find that both PCFV and LCFV tend to increase executive pay levels. Zhou et al. (2010) find that CEOs and chairmen are responsible for gains or losses from short-term investment property, but their salaries are insensitive to CFV. Also, CFOs are in charge of funding operations and their compensation is positively sensitive to CFV. Xu and Zeng (2010) document that PCFV has a positive effect on executive compensation and that the incentive effects are significantly higher than for other earnings items. LCFV, however, is not significantly sensitive to executive compensation. They confirm that an asymmetric sensitivity of compensation to performance does exist in A-share listed Chinese companies. In other words, irrational incentives to profit from PCFV contrast with motivations to avoid punishment for LCFV. Zhang et al. (2011) find that PCFV (or LCFV) entering the income statement and directly credited into capital surplus is positively related (or not relevant) to changes in executive compensation. They conclude that contracts for executive compensation in listed Chinese companies fail to properly deal with changes in fair value.

2.2.2. Sensitivity of executive compensation to performance and executive compensation stickiness

According to agency theory, compensation is naturally related to performance. However, scholars disagree over the nature of this relationship. Taussings and Baker (1925) were among the first to focus on this relationship and they find little relationship between compensation and performance. Figler and Lutz (1991) and Tosi et al. (2000) find a weak relationship between the two. The opposite conclusion is drawn by McGuire et al. (1962), Coughlan and Schmidt (1985), Jensen and Murphy (1990) and George and Hall (1998). Conyon (2006) argues that the sensitivity of executive compensation to performance has increased year by year in the United States. However, domestic research in China has not reached such a consensus on this matter. Zhang et al. (2003), Du and Wang (2007), Lu (2008) and Jiang (2008) all find evidence that performance and compensation are significantly related. Li (2000), Wei (2000) and Chen and Liu (2003), however, provide evidence of a non-significant relationship between compensation and performance.

The notion that executive compensation is sensitive to performance does not necessarily mean that changes in performance bring changes of the same magnitude in compensation. The influence of performance on compensation differs in situations of performance growth or decline. In other words, compensation is sticky. Jensen and Murphy (1990) and Sun and Liu (2004) find that executives are reluctant to reduce their pay for reasons of personal reputation and career advancement. Gaver and Gaver (1998) find that CEO pay is significantly related to rises in operating profits and non-recurring profits, but it does not fall due to operating losses or non-recurring losses. Dorff (2005) also finds that executive compensation is more sensitive to positive earnings performance than to financial losses, which means that compensation is only influenced by good performance. Fang (2009) provides further evidence of the asymmetries in the sensitivity of executive compensation

to performance in China. Xu and Zeng (2010) also find the phenomenon of *big reward, light penalty* in Chinese listed companies.

2.2.3. Managerial power and executive compensation

Since Bebchuk et al. (2002) presented their theory of managerial power, this understanding has played an important role in explaining executive compensation levels, the sensitivity of compensation to performance, the changing structure of compensation and the evaluation of operating performance (Lu and Wei, 2008). Otten (2008) selects 1393 compensation contracts from 451 companies distributed in 17 countries between 2001 and 2004. The results document that the theory of managerial power is universally applicable. A significant body of empirical research documents the effects of managerial power on executive compensation. Hambrick and Finkelstein (1995) find that CEO pay grows faster in enterprises controlled by management. Core et al. (1999) find that managerial power is stronger and CEO pay is higher in enterprises with large-sized boards and with outside directors who are mostly appointed by the CEO. Bebchuk et al. (2002) present evidence that the stronger the managerial power, the stronger the managers' ability to gain from rents and control their own salaries. Cyert et al. (2002) find that the pay of CEOs who serve as chairmen of the board is 20–40% higher than that of other CEOs. Duffhues and Kabir (2008) document that executives control their own pay through managerial power. Fahlenbrach (2009) finds that increases in the managerial power of CEOs significantly improve their pay. Cheng and Indjejikian (2009) find that CEOs exert a strong influence in formulating their compensation contracts and are capable of influencing their boards on compensation assessment.

In the context of China, many domestic scholars have studied the influence of managerial power on executive compensation in listed companies, taking account of China's particular institutional background. Pan and Tong (2005) find that top managers of Chinese public companies design their own compensation contracts and assess their own performance. Zhang and Shi (2005) find that the proportion of independent directors on the board, the establishment of a compensation committee and the duality of chairman and CEO roles all have significantly positive effects on executive pay levels. Lu (2008) finds that managerial power is positively related to executive pay. Lyu and Zhao (2008) find that SOE managers with strong executive powers design their own incentive portfolios and obtain higher pay largely through bonuses. In contrast, managers with weaker power are more concerned about their salaries and manipulate earnings (or fictitious profits) to satisfy the compensation assessment requirements. Quan et al. (2010) examine CEOs and find that managers with increasing power are inclined to obtain performance pay through earnings management, which means that the stronger the managerial power, the more sensitive compensation is to manipulated performance.

3. Theoretical analysis and hypothesis development

The separation of ownership and control in modern enterprises results in an agency problem. According to agency theory, the principal assigns tasks to the agent, whose objective function is different from that of the principal. This difference in functions leads agents to defend their interests against those of the principals. The determination of executive compensation is one such agency problem in which optimal contracting theory holds. Incentive contracts are an effective way to solve the agency problem. A favorably designed executive compensation contract is supposed to be an effective mechanism to make the goals of both managers and stockholders compatible and to reduce agency costs. A well-functioning contract can also prevent executives from pursuing goals detrimental to shareholders' goal of value maximization, as such deviation would be an example of the agency problem (Jensen and Meckling, 1976; Jensen and Murphy, 1990). Managerial compensation and corporate performance are connected through an effective contracting arrangement. The more sensitive executive compensation is to corporate performance, the more closely aligned executive interests are with the interests of stockholders. The best way of designing a contract is to pay according to performance (Jensen and Murphy, 1990). In an optimal contract, executive compensation is linearly related to performance (Holmstrom and Milgrom, 1991). Performance measured by audited earnings may reduce the noise caused by market volatility in determining executive compensation (Lambert and Larcker, 1987; Sloan, 1993), as earnings are more sensitive and accurate than market performance (Xu and Zeng, 2010). Earnings better reflect management's fiduciary obligation and operating efficiency (Natarajan, 1996) and thus should be the basis of performance evaluation.

The new enterprise accounting standards issued in 2006 improve the relevance of executive and accounting performance (Hou and Jin, 2010). These standards also enhance the effectiveness of measuring executive compensation against accounting performance. According to the new standards, CFV is directly introduced into operating income as an earnings item, which leads to a great change in the structure of accounting and makes CFV an important element affecting performance reports. The investment and management of financial assets and investment property are the main contributors to CFV. Despite being theoretically determined by the market, CFV is in fact decided by managers, who decide on the options of purchasing, holding or selling financial assets. It is undeniable that shareholder wealth is directly affected by CFV arising from past decisions by the managers. As optimal contracting theory claims, effective contracts must make the managers' financial results and their pay connected to the highest degree possible. Hence, we suggest that CFV is positively related to executive compensation and propose the first hypothesis.

H1. Executive compensation is positively related to CFV.

Although compensation contracts are theoretically based on optimal contracting theory and are an ideal method for solving the agency problem between stockholders and managers, in reality the contract is often far from perfect. Three preconditions are necessary to ensure that optimal contracting theory works well. These include effective negotiation by the board, efficient constraint by the market and effective execution of power by stockholders. In many cases, these preconditions are far from being realized (Bebchuk and Fried, 2003). In theory, executive compensation is sensitive to corporate performance, but the reality in the business world is quite different (Edmans et al., 2008). Once a flawed contract has been accepted, shareholders face the risk of rent appropriation by management (Grossman and Hart, 1983; Hart and Moore, 1990).

The theory of managerial power provides a new explanation for the gap between compensation contracts and actual compensation. This theory argues that management influences levels of compensation by interfering with compensation contract design and deriving rents from company profits. The more control managers have, the stronger their rent-grabbing capacity (Bebchuk and Fried, 2003). According to the theory of managerial power, increases in the sensitivity of compensation to performance do not result in a decrease in the agency cost between shareholders and management, because corporate performance contains much noise.⁵ Market noise is caused both by objective factors from the effects of the macro-economic environment or industry development on corporate performance and by subjective factors such as earnings manipulation by management (Quan et al., 2010). Performance-based compensation contracts induce earnings manipulation by managers, because the contracts push managers to make efforts toward the contract objective. Thus, while compensation contracts aim to remove one agency problem, they lead to a different agency problem.

As fair value is introduced into the new enterprise accounting standards, it becomes a new item in the compensation contract. According to the theory of managerial power, the assessment of fair value becomes a new method for managers to manipulate earnings and a new means for enhancing the contract's efficiency in serving managers' interests. The coexistence in China of deficiencies in property rights, deficiencies in securities market regulation, the desire for power by private owners, weak internal controls and fatherly love given to SOEs by the government (Lu, 2007a) make the valid oversight of management in Chinese listed companies almost impossible. Such absence of constraints on managerial power makes the rent-seeking motivation of managers stronger. In this way, managers can both hire and supervise themselves, becoming both designers and implementers of their compensation contracts (Wang and Wang, 2007). Executives can increasingly demand higher salaries based on the excuse of PCFV (Hou and Jin, 2010). When changes in fair value earn profits and operating performance is thereby improved, executives attribute the improvement to their own efforts and gain a louder voice in formulating their compensation plans. Likewise, executives use managerial power to excuse LCFV in a disguised or opportunistic way (Na, 2009). They attribute losses to external factors such as market changes to free themselves from obligations and do so with impunity. The sensitivity of executive compensation to corporate performance is asymmetric and is characterized by stickiness, which means that an increase in executive pay on account of performance growth is higher than a decrease in executive pay

⁵ Accounting performance is directly affected by managers' behavior, such as making changes in liability structure, inventory management or accounting standards (Murphy, 2000). Market performance is less vulnerable to control by managers, but noise floods the market (Wiseman and Gomez-Mejia, 1998).

on account of performance decline (Fang, 2009). Hence, we argue that the increase in executive pay due to PCFV is higher than the decrease in executive pay due to LCFV. The stronger the managerial power, the more asymmetric the sensitivity of executive pay is to CFV. The above analysis leads to the following two hypotheses:

H2. Increases in executive compensation due to PCFV are significantly higher than decreases in executive compensation due to LCFV.

H3. The stronger the managerial power, the more asymmetric the sensitivity of executive compensation is to CFV.

4. Methodology

4.1. Data and sample

Our initial sample consists of 4893 Chinese firms listed on the A-share stock markets in Shanghai and Shenzhen between 2007 and 2009. We drop observations from finance and insurance firms, and from firms with no changes in profits or losses due to changes in fair value. After merging the different sources of data and deleting observations with missing information, we obtain a final data set consisting of 1148 firm-year observations.

Data related to all variables was retrieved from the China Stock Market and Accounting Research (CSMAR) database offered by GTA Information Technology Co., Ltd.

The sample screening process and distribution are detailed in Table 1. Panel A of Table 1 reports the sample screening process and yearly distribution. It shows that the 1148 observations are evenly distributed across the

Table 1
Sample description.

	2007	2008	2009	Total
<i>Panel A: sample screening process and distribution by year</i>				
All A-share listed companies	1550	1625	1718	4893
Financial and insurance companies	36	32	39	107
Companies missing other data	1190	1199	1249	3638
Final observations	324	394	430	1148
<i>Panel B: industry distribution by year^a</i>				
Agriculture	10	13	15	38
Mining	3	8	12	23
Manufacturing	173	218	245	636
Electric power, gas and water production and supply	12	17	14	43
Construction	4	5	8	17
Transport and storage	17	16	16	49
Information technology	31	31	28	90
Wholesale and retail	20	22	30	72
Real estate	13	19	19	51
Social service	13	11	13	37
Media and culture	3	5	3	11
Residual category	25	29	27	81
Total	324	394	430	1148
<i>Panel C: distribution by CFV</i>				
Profits from changes in fair value	222	70	322	614
Losses from changes in fair value	102	324	108	534
Total	324	394	430	1148

^a Observations from the Finance and Insurance industry are omitted from the sample.

3 years, with 324 in 2007, 394 in 2008 and 430 in 2009. Panel B of Table 1 presents the industry distribution of the sample by year. Observations from the Manufacturing and Broadcasting and Media industries account for 55% and 1% of the total sample, respectively. The unbalanced distribution of our sample in different industries is consistent with the actual industrial distribution of China's listed companies. Panel C of Table 1 reports the distribution of positive and negative CFV. There are 614 observations with PCFV and 534 with LCFV, accounting for 53.84% and 46.52% of the total sample, respectively. Due to the severe financial crisis in 2008, the 324 observations with LCFV in that year account for 82.23% of the full sample, which is far higher than the 31.48% for LCFV in 2007 and the 25.12% in 2009.

4.2. Variable definitions

4.2.1. Dependent variable: executive compensation

Executive compensation is mainly composed of monetary compensation and stock option incentives. Due to the lagged implementation of equity incentive plans in China, few companies use these types of incentives and their effect on compensation is limited (Xin et al., 2007). Executive compensation is strictly regulated by the government and few managers in Chinese listed companies hold ownership of stock (Li, 2000). Hence, previous studies show that monetary compensation is generally the same as executive compensation. Considering the different definitions of the term *executive*, executive compensation is commonly measured by the monetary compensation of the top three managers (Lu, 2007b; Fang, 2009; Hou and Jin, 2010; Quan et al., 2010), by compensation of the top three directors (Lu, 2007b; Fang, 2009; Hou and Jin, 2010; Quan et al., 2010), by compensation of the top three directors, supervisors or managers (Xu and Zeng, 2010) or by compensation of the chairman of the board, CEO and CFO (Zhou et al., 2010).

We examine the influence of CFV on executive compensation. To undertake a thorough investigation of this relationship, we select the first three types of executive compensation discussed above as our dependent variables, which are respectively symbolized by *lntm* (monetary compensation of top three managers), *lndir* (monetary compensation of top three directors) and *lncomp* (monetary compensation of top three directors, supervisors and managers). The fourth type of executive compensation is classified into four variables: monetary compensation to the chairman of the board (*lnchair*), CEO (*lnceo*), CFO (*ln CFO*) and the total of all three (*lnchair_ CEO_CFO*). These variables are used in the robustness tests.

4.2.2. Independent variables

We use *fair_value*, measured as the amount of CFV in the income statement of the annual report, to proxy for profits and losses from changes in fair value.

Operating income (*oper_inco*) is calculated by deducting costs and expenses from revenue. The computation is as follows: operating income = operating revenue – operating costs – business tax and surcharges – sales expenses – administration expenses – interest expense – asset impairment losses.

Considering the close relationship between equity and CFV, both *fair_value* and *oper_inco* are adjusted by shareholders' equity at the beginning of each year (Zhou et al., 2010).

Managerial power (*power*) tends to take on the characteristics of relativity (Quan et al., 2010) and concealment (Lu, 2008), thus it is difficult to measure managerial power reliably and effectively with a single indicator. We select three main indicators of managerial power. First, duality of the chairman of the board and the CEO position is the most obvious manifestation of concentration in managerial power (Lu, 2008). Second, ownership concentration can effectively control excessive managerial power (Chen, 2010). When ownership is highly dispersed and controlled by various major shareholders, collusion can occur between major shareholders and managers (Huang, 2006). Once the power of shareholders and managers becomes a joint force, managerial power tends to peak (Lu, 2008). Third, executive tenure reflects managerial power from another perspective. With longer tenure, CEOs have a stronger ability to control companies. We thus use three indicators, *power1*, *power2* and *power3*, to proxy for the three types of one-dimensional managerial power discussed above. *Power1* is a proxy for duality (*power1* equals 1 if the chairman and CEO are the same person, and 0 otherwise). *Power2* is a proxy for ownership concentration (*power2* equals 1 if the holding ratio of the largest shareholder divided by the accumulated ratio of the top two to ten shareholders is less than 1, and 0 otherwise). *Power3* is a proxy for executive tenure (*power3* equals 1 if the tenure of the chairman of the board or CEO is greater than

the median, and 0 otherwise). *Power* is the comprehensive proxy of managerial power, quantified by the sum of *Power1*, *Power2* and *Power3*. *Power* equals 1 when the sum exceeds 2, and 0 otherwise.

4.2.3. Control variables

In accordance with prior studies (Leone and Zimmerman, 2006; Fang, 2009; Hou and Jin, 2010; Zhou et al., 2010), we also control for other variables that are related to executive compensation. These are the number of board members (*board*), the proportion of independent directors on the board (*inde_dir*), sales revenue (*lnsale*), sales growth (*salegrowth*), asset–liability ratio (*leverage*), adjusted annual stock return (*adj_return*), per capita income in the region where the corporation is registered (*lnaver_inco*), the nature of the company's property rights (*soe*), whether the company is cross-listed in other nations (*cross*), turnover of the chairman (*chair*), turnover of the CEO (*ceo*), the presence of a compensation committee (*comp_comm*), whether the company is in a regulated industry (*regulate*), whether the company is in a middle region (*middle*) and whether the company is in a western region (*west*).

More detailed information on the definitions of these variables is reported in Table 2.

Table 2
Variable definitions.

Variables	Definitions
<i>Panel A: dependent variables</i>	
<i>lncomp</i>	Natural logarithm of total compensation of top three directors, supervisors and managers, excluding allowances received by independent directors
<i>ln_dir</i>	Natural logarithm of total compensation of top three directors, excluding allowances received by independent directors
<i>ln_tm</i>	Natural logarithm of total compensation of top three managers, excluding allowances received by management
<i>Panel B: independent variables</i>	
<i>fair_value</i>	Profits and losses from changes in fair value, divided by stockholders' equity at the end of the previous year
<i>oper_inco</i>	Operating income, or the difference between operating revenue and operating expenses (which includes operating costs, business taxes and surcharges, sales expenses, administration expenses, interest expense, and asset impairment losses) divided by stockholders' equity at the end of the previous year
<i>power</i>	Dummy variable for managerial power. If $power1 + power2 + power3 \geq 2$, power is assigned the value of 1, and 0 otherwise. <i>Power1</i> is a dummy variable for duality. If the chairman and CEO are the same person, it is assigned the value of 1, and 0 otherwise. <i>Power2</i> is a dummy variable for ownership concentration. If the holding ratio of the largest shareholder divided by the accumulated ratio of the top two to ten shareholders is less than 1, it is assigned the value of 1, and 0 otherwise. <i>Power3</i> is a dummy variable for executive tenure. If the tenure of chairman or CEO is greater than the mean it is assigned the value of 1, and 0 otherwise
<i>Panel C: control variables</i>	
<i>board</i>	Number of board members
<i>inde_dir</i>	Proportion of independent directors on the board
<i>lnsale</i>	Natural logarithm of operating revenue
<i>salegrowth</i>	Growth in sales. Equals the absolute value of the difference between operating revenue for the present year and last year, divided by operating revenue for last year
<i>leverage</i>	Ratio of total liabilities to total assets
<i>adj_return</i>	Adjusted annual stock return. Equals the company's annual stock return less the market annual stock return
<i>lnaver_inco</i>	Per capita income in the region where the corporation is registered. Equals the natural logarithm of per capita disposable income of urban households
<i>soe</i>	Dummy variable assigned the value of 1 for state-owned enterprises, and 0 otherwise
<i>cross</i>	Dummy variable assigned the value of 1 for cross-listed companies, and 0 otherwise
<i>chair</i>	Dummy variable assigned the value of 1 for turnover of the chairman, and 0 otherwise
<i>ceo</i>	Dummy variable assigned the value of 1 for turnover of the CEO, and 0 otherwise
<i>comp_comm</i>	Dummy variable assigned the value of 1 if a compensation committee is constituted, and 0 otherwise
<i>regulate</i>	Dummy variable assigned the value of 1 for companies in regulated industries, and 0 otherwise
<i>middle</i>	Dummy variable for the middle region. If a corporation is registered in the middle region (Provinces of Shanxi, Jilin, Heilongjiang, Anhui, Jiangxi, Henan, Hubei or Hunan), it is assigned the value of 1, and 0 otherwise
<i>west</i>	Dummy variable for the western region. If a corporation is registered in the western regions (Chongqing, Inner Mongolia, Tibet, Xinjiang Uygur Autonomous Region, Ningxia Hui Autonomous Region, or the provinces of Guangxi, Sichuan, Guizhou, Yunnan, Shaanxi, Gansu or Qinghai), it is assigned the value of 1, and 0 otherwise
<i>dum</i>	Dummy variable assigned the value of 1 for profits from changes in fair value, and 0 otherwise

4.3. Descriptive statistics

Table 3 summarizes the descriptive statistics. As the table shows, there are no differences among the means (or medians) of *lncomp*, *lndir* and *lntm*. The amount of compensation ranges from 814,200 ($e^{13.610}$) to 1,077,300 ($e^{13.890}$) yuan, which shows an uneven distribution of executive compensation. Among the three types of measurements of executive pay, compensation of the top three directors is relatively low and compensation of the top three directors, supervisors and managers is relatively high. The mean (median) of *fair_value* is -0.001 (0) and the standard deviation is 0.059. The mean (median) of *oper_inco* is 0.133 (0.054) and the standard deviation is 2.053. The mean of *power* is 0.243, and the third quantile is 0, which means more than three quarters of the sample companies have lower degrees of managerial power.

As shown in Table 3, about 60% of the sample firms are owned by the state, 16% (17%) experienced turnover of the chairman or CEO, 97% of the firms have constituted a compensation committee, 19% of the firms are located in the middle region, 13% of the firms are located in the western region and 68% are in the eastern region. The mean and median of *adj_return* are 0.261 and 0.038 (the great difference between these returns may result from the severe financial crisis in 2008). The mean (median) ratio of total liabilities to total assets is 64.3% (51.9%), which indicates a reasonable capital structure for the sample companies. The number of board members ranges from 4 to 16 with a mean (median) of 9.230 (9) board members. The mean (median) of *inde_dir* is 0.366 (0.333), which is consistent with the regulations of the China Securities Regulatory Commission. The minimum of *inde_dir* is 0.222, which indicates that some companies in the sample do not meet the required threshold of one-third independent members. The standard deviation of *inde_dir* is 0.053, which implies a slight change in the ratio of independent directors on the board over the time of the survey.

In general, all variables are normally distributed with little difference between the mean and the median (excluding *oper_inco*, *salegrowth* and *adj_return*). In addition, according to the standard deviation and first and third quantile statistics, there is adequate variation in the variables during the sample period.

Descriptive statistics of the three executive compensation variables categorized by positive or negative CFV are shown in Table 4. As indicated in this table, compensation for all types of executives rises year by year and the growth in compensation in companies suffering LCFV is relatively higher than in companies earning PCFV. The three executive compensation variables show little difference in either their means or medians. In general, executive compensation does not change with changes in fair value. There is little difference in

Table 3
Descriptive statistics.

Variable	N	Mean	Std	Min	P25	P50	P75	Max
<i>lncomp</i>	1148	13.890	0.799	11.230	13.410	13.870	14.360	16.650
<i>lndir</i>	1148	13.610	0.931	4.754	13.050	13.610	14.200	16.600
<i>lntm</i>	1146	13.760	0.809	10.360	13.230	13.770	14.230	16.530
<i>fair_value</i>	1148	-0.001	0.059	-1.794	-0.001	0	0.002	0.243
<i>oper_inco</i>	1148	0.133	2.053	-3.908	-0.006	0.054	0.147	68.560
<i>power</i>	1148	0.243	0.429	0	0	0	0	1
<i>board</i>	1148	9.230	1.866	4	9	9	10	16
<i>inde_dir</i>	1148	0.366	0.053	0.222	0.333	0.333	0.385	0.714
<i>lnsale</i>	1148	21.290	1.640	9.310	20.340	21.140	22.140	28.000
<i>salegrowth</i>	1148	1.778	44.450	-0.995	-0.070	0.098	0.290	1497.000
<i>leverage</i>	1148	0.643	4.203	0.018	0.371	0.519	0.668	142.700
<i>adj_return</i>	1148	0.261	0.891	-1.592	-0.130	0.038	0.497	7.242
<i>lnaver_inco</i>	1148	9.876	0.299	9.293	9.619	9.912	10.130	10.390
<i>soe</i>	1148	0.602	0.490	0	0	1	1	1
<i>cross</i>	1148	0.063	0.243	0	0	0	0	1
<i>chair</i>	1148	0.163	0.369	0	0	0	0	1
<i>ceo</i>	1148	0.170	0.376	0	0	0	0	1
<i>comp_comm</i>	1148	0.968	0.177	0	1	1	1	1
<i>regulate</i>	1148	0.037	0.190	0	0	0	0	1
<i>middle</i>	1148	0.190	0.392	0	0	0	0	1
<i>west</i>	1148	0.134	0.341	0	0	0	0	1

Table 4
Executive compensation and CFV (in 10 thousands of yuan).

	2007	2008	2009	Total
<i>Compensation of the top three directors, supervisors and managers</i>				
Profits from changes in fair value				
Mean	141.98	145.85	161.97	152.90
Median	99.80	118.35	111.64	107.45
Std	159.28	104.53	171.51	160.84
Losses from changes in fair value				
Mean	117.70	155.01	179.84	152.90
Median	77.55	108.65	119.02	104.44
Std	179.56	191.08	164.83	184.60
<i>Compensation of the top three directors</i>				
Profits from changes in fair value				
Mean	111.36	118.74	135.09	124.65
Median	75.00	86.67	90.10	83.24
Std	133.36	100.32	161.54	146.06
Losses from changes in fair value				
Mean	98.26	124.32	138.19	122.15
Median	58.28	82.51	90.85	78.90
Std	169.23	161.12	133.26	157.76
<i>Compensation of the top three managers</i>				
Profits from changes in fair value				
Mean	119.64	130.38	136.09	129.49
Median	87.83	104.22	98.00	95.28
Std	118.92	95.92	127.06	121.02
Losses from changes in fair value				
Mean	104.84	133.26	165.28	134.31
Median	72.71	96.60	112.95	95.39
Std	155.06	153.41	158.65	155.67

compensation in relation to changes in fair value, either in the mean or the median. In 2007, the executive compensation in companies earning PCFV is a little higher and the executive compensation in companies suffering LCFV is also a little higher. It is obvious that executive compensation in companies suffering LCFV is not less than executive compensation in companies earning PCFV, which means that LCFV has no significant influence on executive compensation.

4.4. Correlation analysis

Table 5 presents the correlation matrix for our sample. Spearman correlation coefficients are reported in the upper right corner and Pearson correlation coefficients in the bottom left corner.

Table 5 shows that there is no significant correlation between executive compensation and CFV (*fair_value*). Operating income (*oper_inco*) is positively correlated with executive compensation, which implies that operating income is a reasonable indicator to evaluate performance. Managerial power (*power*) is significantly correlated with executive compensation, which indicates that the greater the managerial power, the higher the executive compensation. Other variables such as *board*, *inde_dir*, *lnsale*, *lnaver_inco*, *cross*, *comp_comm* (not significant in the Spearman coefficient), *middle* and *west* are significantly correlated with executive compensation. These significant correlations indicate that bigger boards, more independent directors, greater sales and higher per capita income, cross-listing and compensation committees all contribute to higher executive compensation. Table 5 also reports that executive compensation in firms located in the middle and western regions is lower than that of firms in eastern regions. In addition, the coefficients in Table 5 suggest that the correlations between independent variables are reasonable. We further compute variance inflation factors (VIFs) and find that there are no potential multicollinearity problems among the variables listed in Table 5.

Table 5
Correlation coefficient matrix.

	Incomp	Indir	Intrn	fair_value	oper_inco	power	board	inde_dir	inside	salegrowth	leverage	adj_return	haver_inco	soe	cross	chair	ceo	comp_comm	regulate	middle	west		
Incomp	1																						
Indir	0.855*	1																					
Intrn	0.960*	0.800*	1																				
fair_value	-0.001	0.046	-0.003	1																			
oper_inco	0.121*	0.114*	0.099*	-0.034	1																		
power	0.116*	0.111*	0.132*	0.005	-0.017	1																	
board	0.129*	0.150*	0.136*	-0.007	-0.005	-0.033	1																
inde_dir	0.095*	0.031	0.090*	-0.093*	-0.026	-0.017	-0.217*	1															
inside	0.438*	0.382*	0.470*	-0.066	0.030	-0.091*	0.314*	0.093*	1														
salegrowth	-0.006	-0.006	-0.012	0.014	0.001	-0.018	-0.067	0.015	-0.030	1													
leverage	-0.015	-0.009	-0.010*	-0.003	-0.000	-0.022	-0.064	0.019	-0.205*	-0.002	1												
adj_return	-0.039	-0.029	-0.046	0.055	-0.003	0.035	-0.037	-0.009	-0.018	0.160*	0.012	1											
haver_inco	0.296*	0.210*	0.317*	-0.052	-0.039	0.015	0.008	0.038	0.161*	0.003	-0.027	-0.061	1										
soe	0.027	-0.033	0.089*	-0.043	0.010	-0.174*	0.196*	0.005	0.275*	-0.033	-0.033	-0.022	-0.037	1									
cross	0.246*	0.201*	0.258*	-0.125*	-0.002	-0.038	0.188*	0.152*	0.448*	-0.009	-0.002	-0.025	0.088*	0.174*	1								
chair	-0.054	-0.090*	-0.037	-0.005	0.061	0.014	0.027	-0.018	-0.021	0.080*	-0.009	0.051	0.021	0.074	0.012	1							
ceo	-0.014	-0.024	-0.022	0.000	0.070	-0.040	0.054	-0.026	0.044	-0.013	-0.014	0.018	0.018	0.022	0.007	0.215*	1						
comp_comm	0.086*	0.078*	0.083*	-0.028	0.016	-0.069	0.015	0.052	0.098*	0.007	0.005	-0.099*	0.035	0.043	0.047	-0.026	0.030	1					
regulate	-0.052	-0.065	-0.038	0.006	-0.010	0.027	0.091*	-0.001	-0.016	-0.007	-0.004	-0.006	-0.044	0.076*	0.006	0.012	-0.040	0.010	1				
middle	-0.150*	-0.122*	-0.154*	0.001	0.058	-0.031	-0.003	-0.000	-0.053	-0.015	-0.015	0.025	-0.535*	0.067	-0.043	-0.043	-0.012	0.013	0.150*	1			
west	-0.229*	-0.178*	-0.244*	0.026	-0.007	-0.038	0.020	-0.029	-0.090*	-0.013	0.080*	0.055	-0.463*	0.043	-0.049	-0.008	-0.022	-0.000	-0.064	-0.191*	1		
regulate																							
middle																							
regulate																							
comp_comm																							
ceo																							
chair																							
leverage																							
salegrowth																							
adj_return																							
haver_inco																							
soe																							
cross																							
chair																							
ceo																							
comp_comm																							
regulate																							
middle																							
west																							

Note: The upper right corner reports Spearman correlation coefficients and the bottom left corner reports Pearson correlation coefficients.
* Significant at the 1% level.

5. Empirical analysis

5.1. Hypothesis 1

Hypothesis 1 predicts that executive compensation is positively related to CFV. Following Dechow et al. (2010), we use the following regression model.

Model (1):

$$\begin{aligned} \text{comp} = & \alpha_0 + \alpha_1 \text{fair_value} + \alpha_2 \text{oper_inco} + \alpha_3 \text{power} + \alpha_4 \text{board} + \alpha_5 \text{inde_dir} + \alpha_6 \text{insale} + \alpha_7 \text{salegrowth} \\ & + \alpha_8 \text{leverage} + \alpha_9 \text{adj_return} + \alpha_{10} \ln \text{ave_inco} + \alpha_{11} \text{soe} + \alpha_{12} \text{cross} + \alpha_{13} \text{chair} + \alpha_{14} \text{ceo} \\ & + \alpha_{15} \text{comp_comm} + \alpha_{16} \text{regulate} + \alpha_{17} \text{middle} + \alpha_{18} \text{west} + \varepsilon \end{aligned}$$

In this model, *comp* refers to the terms *lntm*, *lncomp* and *lndir*, and the regression coefficient of *fair_value* is our primary concern. If α_1 is significantly positive, then executive compensation is positively related to CFV. That is to say, CFV has a positive effect on executive compensation.

Table 6 reports the regression results from Model (1). The dependent variables in columns 1–3 are the compensation of the top three managers (*lntm*), the top three directors, supervisors, and managers (*lncomp*), and the top three directors (*lndir*), respectively. Table 6 shows that the coefficient on *fair_value* is significantly positive for *lntm*, *lncomp* and *lndir*, which indicates that all three types of executive compensation are significantly related to CFV ($\alpha_1 > 0$, *t*-values are 3.49, 4.14, and 7.96,⁶ respectively). Therefore, Hypothesis 1 is supported. Concerning *lntm*, the regression coefficient means that if CFV increases by one unit, compensation of top managers increases by 69.7%. The probable reason for these results is that the board or compensation committee considers the effects of CFV on executive compensation when designing the compensation plan. As past investment decisions do affect shareholders' wealth and the compensation contract may be based on accounting performance, executives may use CFV as an excuse to ask for higher salaries (Hou and Jin, 2010).

The results in Table 6 are not the same as the findings of Hou and Jin (2010) and of Xu and Zeng (2010). Hou and Jin (2010) find that a positive relationship between executive compensation and CFV exists only when profits are earned from changes in fair value and a negative relationship exists when losses are suffered from changes in fair value. Xu and Zeng (2010) argue that the positive relationship between executive compensation and CFV is significant only in companies with PCFV and no significant relationship exists in sample companies suffering LCFV. We argue that several reasons contribute to these differences in results. First, our sample period is from 2007 to 2009, rather than the 2007–2008 period used by Hou and Jin (2010) and Xu and Zeng (2010). Second, due to the global financial crisis in 2008, more than 80% of the sample firms suffered LCFV in 2008, as shown in Table 3. This crisis may have had a great influence on the regression results for companies suffering from LCFV. In 2009, the securities markets recovered gradually and CFV became more normal. After the experience of the financial crisis, the boards or the compensation committees may have started to include CFV in compensation evaluation systems. Thus, CFV is also significantly related to executive compensation when companies suffer LCFV.

Table 6 also reports that the coefficient on *oper_inco* is significantly positive at the 1% level, thus showing that executive compensation is sensitive to operating income. However, this sensitivity is lower than the sensitivity of executive compensation to CFV ($\alpha_1 = 0.697$, $\alpha_2 = 0.042$). There are two explanations for this. One is that income from operations and from investment are differentiated in the design of compensation contracts, with investment income from CFV showing a stronger relationship with the level of compensation.⁷ The other

⁶ The significant correlation between executive compensation and CFV is not found in Table 5. However, CFV has a significant influence on executive compensation after other variables are controlled for in Table 6. Thus, we infer that one or more control variables must significantly change the coefficient of *fair_value* in the multiple regression analysis. To identify the relevant variables, we enter the control variables one by one into the regression equation of Model (1) and find that a significant positive relationship between executive compensation and CFV emerges after *insale* and *cross* are added into the regression. The addition of other control variables fails to change the coefficient of *fair_value*.

⁷ If the company earns one more dollar through business operations, the manager may get one more cent. If the company earns one more dollar through investment (or trading financial assets), the manager may get ten more cents. Although the above explanation may be plausible in theory, further exploration is required to determine whether this reflects reality in practice.

Table 6
Regression of executive compensation on CFV.

	<i>lntm</i>	<i>lncomp</i>	<i>lndir</i>
	1	2	3
<i>fair_value</i>	0.697*** (3.49)	0.680*** (4.14)	1.303*** (7.96)
<i>oper_inco</i>	0.042*** (8.80)	0.049*** (9.87)	0.055*** (10.40)
<i>power</i>	0.322*** (6.96)	0.271*** (5.87)	0.281*** (5.12)
<i>board</i>	0.010 (0.84)	0.015 (1.14)	0.035** (2.27)
<i>inde_dir</i>	0.671* (1.84)	0.816** (2.19)	0.123 (0.27)
<i>lnsale</i>	0.204*** (13.06)	0.196*** (11.47)	0.212*** (9.60)
<i>salegrowth</i>	0.000 (0.74)	0.000 (1.38)	0.000 (0.98)
<i>leverage</i>	0.001 (0.40)	0.016*** (10.42)	0.018*** (9.20)
<i>adj_return</i>	-0.015 (-0.67)	-0.014 (-0.59)	-0.011 (-0.34)
<i>lnaver_inco</i>	0.328*** (3.01)	0.263** (2.53)	0.045 (0.37)
<i>soe</i>	0.029 (0.67)	-0.078* (-1.75)	-0.200*** (-3.88)
<i>comp_comm</i>	0.212* (1.89)	0.217* (1.96)	0.267** (2.10)
<i>cross</i>	0.158 (1.51)	0.160 (1.55)	0.149 (1.23)
<i>chair</i>	-0.085 (-1.45)	-0.102* (-1.81)	-0.198*** (-2.88)
<i>ceo</i>	-0.091 (-1.60)	-0.069 (-1.22)	-0.089 (-1.31)
<i>regulate</i>	-0.136 (-1.34)	-0.173* (-1.71)	-0.266** (-2.24)
<i>middle</i>	-0.194** (-2.58)	-0.201*** (-2.72)	-0.266*** (-3.26)
<i>west</i>	-0.402*** (-4.32)	-0.387*** (-4.37)	-0.438*** (-4.34)
Constant	5.642*** (5.19)	6.555*** (6.37)	8.226*** (6.94)
<i>N</i>	1146	1148	1148
Adj. <i>R</i> ²	0.337	0.308	0.245
<i>F</i>	84.544	29.687	26.310

Notes: *t* Statistics are in parentheses.

* Significant at the 10% level.

** Significant at the 5% level.

*** Significant at the 1% level.

explanation may be bias in the regression coefficient of *fair_value*, in other words, some variables are omitted in Model (1). Changes in fair value may reflect differences in profit models or other characteristics that affect the level of executive compensation.⁸ *Power* is significantly positively related to executive compensation at the 1% level, suggesting that the degree of managerial power plays an important role in determining executive compensation and the greater the managerial power, the higher the executive compensation.

⁸ We test this explanation using a fixed effects regression, and find that the regression coefficient of *fair_value* is no higher than that of *oper_inco*, thus indicating that Model (1) does omit some unobservable factors, which may have a certain influence on the levels of executive compensation.

The regression results of other variables are shown as follows. *Board* (only in column 3), *inde_dir* (columns 1 and 2), *lnsale*, *leverage* (columns 2 and 3) and *comp_comm* are all significantly positively related to executive compensation, which indicates that companies with bigger boards, more independent directors, higher sales, higher leverage, higher per capita income, and compensation committees all tend to set higher pay for executives. *Soe*, *chair* (columns 2 and 3), *regulate* (columns 2 and 3), *middle* and *west* are all significantly negatively related to executive compensation, which indicates that companies that are state owned, have experienced chairman turnover, are in regulated industries and are in the middle or western regions tend to pay less to executives. These findings are consistent with other studies (Fang, 2009; Hou and Jin, 2010; Zhou et al., 2010; Xu and Zeng, 2010).

5.2. Hypothesis 2

Hypothesis 2 predicts that the rise in executive compensation due to PCFV is significantly higher than the decrease in executive compensation due to LCFV. Following Fang (2009), Model (2) is given as

$$\begin{aligned} comp = & \beta_0 + \beta_1 fair_value + \beta_2 dum + \beta_3 dum * fair_value + \beta_4 oper_inco + \beta_5 power + \beta_6 board \\ & + \beta_7 inde_dir + \beta_8 lnsale + \beta_9 salegrowth + \beta_{10} leverage + \beta_{11} adj_return + \beta_{12} lnave + \beta_{13} soe \\ & + \beta_{14} cross + \beta_{15} chair + \beta_{16} ceo + \beta_{17} comp_comm + \beta_{18} regulate + \beta_{19} middle + \beta_{20} west + \varepsilon \end{aligned}$$

In this model, compensation (*comp*) refers to the terms *lntm*, *lncomp* and *lndir*. *Dum* is a dummy variable assigned the value of 1 for PCFV, and 0 otherwise. Our main interest is β_3 , the coefficient on the interaction term between *dum* and *fair_value*. If β_3 is significantly greater than 0, this means that the increase in executive compensation due to PCFV is greater than the decrease in executive compensation due to LCFV, then we can draw the conclusion that the sensitivity is asymmetric.

Table 7 reports the results concerning the asymmetry of executive compensation on CFV. The coefficient on *dum * fair_value* is significantly positive in columns 1 and 2 at the 1% and 10% levels, respectively, which means that the sensitivity of executive compensation to CFV is strongly asymmetric. A probable explanation is that executives with strong managerial power may ask for higher compensation due to PCFV and find excuses to explain LCFV in an opportunistic way, to reduce losses to their personal salaries (Hou and Jin, 2010). In column 3, the coefficient on *dum * fair_value* is negative but not significant, which demonstrates that the sensitivity of directors' compensation to CFV is not characterized by stickiness. A probable explanation is that most directors do not participate directly in the operation and management of companies, and have no ability to further their personal interests on account of CFV.

The regression results of other variables in Model (2) are consistent with those in Model (1).

5.3. Hypothesis 3

Hypothesis 3 predicts that the stronger the managerial power, the more asymmetric the sensitivity of executive compensation is to CFV. Based on Model (1) and Model (2), we build Model (3) to test H3.

Model (3):

$$\begin{aligned} comp = & \gamma_0 + \gamma_1 fair_value + \gamma_2 oper_inco + \gamma_3 dum * fair_value + \gamma_4 dum * fair_value + \gamma_5 power * dum \\ & + \gamma_6 fair_value * power + \gamma_7 power * dum * fair_value + \gamma_8 board + \gamma_9 inside_dir + \gamma_{10} lnsale \\ & + \gamma_{11} salegrowth + \gamma_{12} leverage + \gamma_{13} adj_return + \gamma_{14} lnave + \gamma_{15} soe + \gamma_{16} cross + \gamma_{17} chair + \gamma_{18} ceo \\ & + \gamma_{19} comp_comm + \gamma_{20} regulate + \gamma_{21} middle + \gamma_{22} west + \varepsilon \end{aligned}$$

In this model, *comp* refers to the terms *lntm*, *lncomp* and *lndir*. *Dum* is a dummy variable assigned the value of 1 for PCFV and 0 otherwise. *Power* represents the degree of managerial power, and equals 1 for strong managerial power and 0 otherwise. Our main interest is γ_7 , the regression coefficient on *power * dum * fair_value*. If γ_7 is significantly greater than 0, Hypothesis 3 is supported.

Table 7
Regression of the asymmetry of executive compensation on CFV.

	<i>lntm</i> 1	<i>lncomp</i> 2	<i>lndir</i> 3
<i>fair_value</i>	0.433*** (3.41)	0.482*** (3.96)	1.246*** (8.61)
<i>oper_inco</i>	0.041*** (9.18)	0.049*** (10.15)	0.055*** (10.44)
<i>dum</i>	-0.006 (-0.15)	0.015 (0.37)	0.040 (0.79)
<i>dum*fair_value</i>	2.852*** (2.65)	1.835* (1.76)	-0.029 (-0.02)
<i>power</i>	0.323*** (6.97)	0.272*** (5.88)	0.283*** (5.12)
<i>board</i>	0.011 (0.94)	0.015 (1.19)	0.034** (2.25)
<i>inde_dir</i>	0.628* (1.74)	0.783** (2.11)	0.111 (0.25)
<i>lnsale</i>	0.204*** (13.02)	0.196*** (11.43)	0.212*** (9.57)
<i>salegrowth</i>	0.000 (0.55)	0.000 (1.26)	0.000 (0.98)
<i>leverage</i>	0.001 (0.44)	0.016*** (10.28)	0.018*** (9.21)
<i>adj_return</i>	-0.018 (-0.82)	-0.017 (-0.73)	-0.013 (-0.40)
<i>lnaver_inco</i>	0.330*** (3.04)	0.261** (2.52)	0.038 (0.32)
<i>soe</i>	0.033 (0.76)	-0.075* (-1.67)	-0.199*** (-3.84)
<i>comp_com</i>	0.222** (2.02)	0.226** (2.06)	0.271** (2.14)
<i>cross</i>	0.140 (1.33)	0.148 (1.43)	0.150 (1.23)
<i>chair</i>	-0.089 (-1.52)	-0.105* (-1.86)	-0.199*** (-2.90)
<i>ceo</i>	-0.089 (-1.57)	-0.068 (-1.20)	-0.089 (-1.30)
<i>regulate</i>	-0.136 (-1.35)	-0.171* (-1.70)	-0.263** (-2.21)
<i>middle</i>	-0.186** (-2.47)	-0.197*** (-2.68)	-0.269*** (-3.31)
<i>west</i>	-0.403*** (-4.31)	-0.388*** (-4.36)	-0.440*** (-4.35)
Constant	5.621*** (5.17)	6.561*** (6.39)	8.265*** (6.96)
<i>N</i>	1146	1148	1148
Adj. <i>R</i> ²	0.339	0.309	0.244
<i>F</i>	71.035	27.216	24.734

Notes: *t* Statistics are in parentheses.

* Significant at the 10% level.

** Significant at the 5% level.

*** Significant at the 1% level.

Table 8 reports the results of Model (3). The variable in column 1 is *lntm*, for which the regression coefficient on *power * dum * fair_value* is positive and significant almost at the 10% level. This result indicates that managerial power does have a significant influence on the stickiness of executive compensation and the stronger the managerial power, the more asymmetric the sensitivity of executive compensation is to CFV. Hypoth-

Table 8
Regression on whether managerial power influences the stickiness of executive compensation.

	<i>lntm</i> 1	<i>lncmp</i> 2	<i>lndir</i> 3
<i>fair_value</i>	0.456*** (3.94)	0.507*** (4.49)	1.257*** (8.73)
<i>oper_inco</i>	0.041*** (8.99)	0.049*** (9.98)	0.055*** (10.35)
<i>power</i>	0.334*** (5.07)	0.257*** (3.90)	0.280*** (3.46)
<i>dum</i>	0.010 (0.21)	0.017 (0.37)	0.044 (0.72)
<i>dum*fair_value</i>	2.086* (1.78)	1.192 (1.05)	-0.395 (-0.31)
<i>power*dum</i>	-0.072 (-0.73)	-0.014 (-0.14)	-0.019 (-0.17)
<i>fair_value*power</i>	-0.789 (-0.63)	-0.787 (-0.66)	-0.345 (-0.29)
<i>power*dum*fair_value</i>	5.280+ (1.60)	4.471 (1.36)	2.474 (0.64)
<i>board</i>	0.011 (0.92)	0.015 (1.18)	0.034** (2.24)
<i>inde_dir</i>	0.610* (1.68)	0.784** (2.10)	0.107 (0.24)
<i>lnsale</i>	0.203*** (12.99)	0.196*** (11.41)	0.212*** (9.55)
<i>salegrowth</i>	0.000 (0.57)	0.000 (1.28)	0.000 (0.98)
<i>leverage</i>	0.001 (0.39)	0.016*** (10.26)	0.018*** (9.21)
<i>adj_return</i>	-0.017 (-0.78)	-0.016 (-0.67)	-0.012 (-0.38)
<i>lnaver_inco</i>	0.328*** (3.03)	0.259** (2.51)	0.037 (0.31)
<i>soe</i>	0.033 (0.75)	-0.075* (-1.68)	-0.199*** (-3.84)
<i>comp_com</i>	0.240** (2.20)	0.243** (2.21)	0.281** (2.17)
<i>cross</i>	0.144 (1.36)	0.152 (1.46)	0.152 (1.24)
<i>chair</i>	-0.085 (-1.45)	-0.103* (-1.80)	-0.197** (-2.85)
<i>ceo</i>	-0.088 (-1.55)	-0.066 (-1.17)	-0.088 (-1.29)
<i>regulate</i>	-0.136 (-1.35)	-0.168* (-1.66)	-0.262** (-2.19)
<i>middle</i>	-0.187** (-2.49)	-0.198*** (-2.70)	-0.270*** (-3.31)
<i>west</i>	-0.401*** (-4.32)	-0.388*** (-4.38)	-0.440*** (-4.35)
Constant	5.627*** (5.19)	6.566*** (6.40)	8.267*** (6.96)
<i>N</i>	1146	1148	1148
Adj. <i>R</i> ²	0.339	0.308	0.242
<i>F</i>	63.080	23.923	22.631

Notes: *t* Statistics are in parentheses.

* Significant at the 10% level.

** Significant at the 5% level.

*** Significant at the 1% level.

+ Significant almost at the 10% level (*p*-value is 0.111).

Table 9
Robustness test on the relationship between executive compensation and CFV.

	<i>lnchair</i>	<i>lnceo</i>	<i>lncfo</i>	<i>lnchair_ceo_cfo</i>
<i>fair_value</i>	−0.510 (−0.33)	2.170* (1.88)	0.910*** (3.30)	0.992*** (4.07)
<i>oper_inco</i>	0.057*** (10.10)	0.056*** (13.14)	−0.004 (−1.02)	0.057*** (16.85)
<i>power</i>	0.465*** (5.94)	0.293*** (4.95)	0.257*** (4.45)	0.377*** (6.21)
<i>board</i>	0.003 (0.14)	0.011 (0.69)	−0.025* (−1.75)	0.010 (0.60)
<i>inde_dir</i>	1.294 (1.64)	1.007** (2.12)	0.387 (0.81)	0.637 (1.08)
<i>lnsale</i>	0.220*** (4.72)	0.198*** (9.06)	0.187*** (9.12)	0.141*** (4.77)
<i>salegrowth</i>	0.001*** (3.35)	0.000 (0.77)	−0.003 (−1.30)	0.000** (2.53)
<i>leverage</i>	−0.419** (−2.11)	−0.274** (−2.01)	−0.281** (−2.21)	−0.320** (−2.49)
<i>adj_return</i>	−0.011 (−0.24)	0.016 (0.59)	−0.010 (−0.35)	−0.016 (−0.51)
<i>lnaver_inco</i>	0.269 (1.31)	0.318** (2.41)	0.521*** (3.62)	0.213 (1.50)
<i>soe</i>	−0.118 (−1.23)	−0.023 (−0.42)	0.179*** (3.34)	−0.088 (−1.19)
<i>comp_comm</i>	0.324 (1.47)	0.229 (1.35)	0.041 (0.25)	0.359** (2.27)
<i>cross</i>	0.380* (1.92)	0.181 (1.64)	0.236* (1.93)	0.276** (2.16)
<i>chair</i>	−0.275* (−1.74)	0.029 (0.40)	−0.105 (−1.27)	−0.278*** (−3.49)
<i>ceo</i>	0.144 (1.31)	−0.420*** (−5.53)	−0.144* (−1.92)	−0.111 (−1.57)
<i>regulate</i>	−0.034 (−0.20)	−0.067 (−0.54)	0.064 (0.49)	−0.007 (−0.06)
<i>middle</i>	−0.234 (−1.29)	−0.156* (−1.68)	−0.015 (−0.15)	−0.134 (−1.04)
<i>west</i>	−0.195 (−1.20)	−0.428*** (−4.13)	−0.267** (−2.44)	−0.303*** (−2.62)
Constant	4.742** (2.08)	4.855*** (3.59)	3.272** (2.20)	7.795*** (4.71)
<i>N</i>	800	843	810	1111
Adj. <i>R</i> ²	0.151	0.261	0.271	0.141
<i>F</i>	22.746	26.504	16.592	26.600

Note: *Lnchair* is the natural logarithm of the chairman's compensation (if the chairman and CEO are the same person, the chairman's value is used). *Lnceo* is the natural logarithm of CEO compensation (if the CEO and CFO are the same person, the CEO's value is used). *Lncfo* is the natural logarithm of CFO compensation. *Ln_chair_ceo_cfo* is the natural logarithm of the total compensation of the chairman, CEO and CFO. The *t* statistics are in parentheses.

* Significant at the 10% level.

** Significant at the 5% level.

*** Significant at the 1% level.

esis 3 is partially supported. The regression coefficients on the cross-multiple items in columns 2 and 3 are both positive, but not significant, which implies that the level of directors' compensation is influenced by managerial power, but the influence is not significant. A possible explanation is that managerial power originates from management, and if most directors have no position in management, the management lacks motivation to seek higher compensation for directors.

The regression results of other variables in Model (3) are consistent with those in Model (1).

Table 10
Robustness test on the asymmetry of executive compensation to CFV.

	<i>lntm</i>		<i>lncomp</i>		<i>lndir</i>	
	<i>D</i> = 1	<i>D</i> = 0	<i>D</i> = 1	<i>D</i> = 0	<i>D</i> = 1	<i>D</i> = 0
<i>fair_value</i>	3.004*** (2.76)	0.308** (2.05)	2.045** (2.01)	0.429*** (2.79)	0.675 (0.54)	1.192*** (6.94)
<i>oper_inco</i>	0.150 (1.16)	0.041*** (13.23)	0.152 (1.11)	0.049*** (12.85)	0.223 (1.38)	0.055*** (14.32)
<i>power</i>	0.293*** (4.46)	0.331*** (5.10)	0.273*** (4.13)	0.261*** (3.97)	0.281*** (3.75)	0.292*** (3.31)
<i>board</i>	0.020 (1.27)	0.002 (0.09)	0.024 (1.39)	0.004 (0.23)	0.043** (2.07)	0.027 (1.17)
<i>inde_dir</i>	0.863* (1.73)	0.455 (0.84)	1.041** (2.01)	0.655 (1.19)	0.564 (0.91)	-0.167 (-0.25)
<i>lnsale</i>	0.195*** (8.89)	0.221*** (9.47)	0.191*** (8.31)	0.198*** (7.11)	0.209*** (7.87)	0.208*** (5.70)
<i>salegrowth</i>	0.000 (1.30)	-0.005*** (-3.18)	0.000** (2.03)	-0.005** (-2.28)	0.000** (2.00)	-0.009*** (-3.20)
<i>leverage</i>	0.001 (0.77)	-0.309** (-2.37)	0.017*** (8.52)	-0.011 (-0.06)	0.019*** (8.37)	0.037 (0.17)
<i>adj_return</i>	-0.040* (-1.68)	0.051 (1.00)	-0.033 (-1.26)	0.032 (0.64)	-0.012 (-0.37)	-0.010 (-0.11)
<i>lnaver_inco</i>	0.350** (2.54)	0.306* (1.81)	0.290** (2.18)	0.249 (1.53)	0.171 (1.17)	-0.076 (-0.38)
<i>soe</i>	0.045 (0.76)	0.016 (0.24)	-0.059 (-0.97)	-0.090 (-1.36)	-0.183*** (-2.63)	-0.195** (-2.40)
<i>comp_com</i>	0.120 (0.81)	0.335** (2.31)	0.170 (1.12)	0.282** (2.13)	0.251 (1.53)	0.228 (1.21)
<i>cross</i>	0.092 (0.80)	0.200 (1.14)	0.132 (1.14)	0.182 (1.08)	0.091 (0.61)	0.237 (1.24)
<i>chair</i>	0.015 (0.18)	-0.183** (-2.15)	-0.026 (-0.34)	-0.168* (-1.96)	-0.095 (-1.05)	-0.281*** (-2.70)
<i>ceo</i>	-0.203*** (-2.86)	-0.017 (-0.19)	-0.184*** (-2.63)	0.028 (0.30)	-0.214** (-2.54)	0.009 (0.09)
<i>regulate</i>	-0.193 (-1.11)	-0.068 (-0.56)	-0.250 (-1.43)	-0.088 (-0.73)	-0.290 (-1.45)	-0.229* (-1.65)
<i>middle</i>	-0.182* (-1.78)	-0.186* (-1.68)	-0.176* (-1.71)	-0.209* (-1.94)	-0.220* (-1.94)	-0.312*** (-2.65)
<i>west</i>	-0.544*** (-4.57)	-0.243* (-1.72)	-0.530*** (-4.77)	-0.237* (-1.73)	-0.563*** (-4.27)	-0.307** (-2.04)
Constant	5.550*** (3.96)	5.657*** (3.37)	6.282*** (4.69)	6.720*** (4.26)	6.841*** (4.49)	9.668*** (5.18)
<i>N</i>	614	532	614	534	614	534
Adj. <i>R</i> ²	0.355	0.332	0.319	0.298	0.276	0.213
<i>F</i> -test	169.124	24.797	19.388	20.962	15.313	25.777
<i>F</i> -test	322.14		110.67		9.07	
<i>p</i> -Value	0.0000		0.0000		0.0027	

Note: *D* is a dummy variable assigned the value of 1 for PCFV or assigned the value of 0 for LCFV.

t statistics are in parentheses.

* Significant at the 10% level.

** Significant at the 5% level.

*** Significant at the 1% level.

5.4. Robustness tests

5.4.1. Robustness test on the relationship between executive compensation and CFV

We use the compensation of the chairman (*lnchair*), CEO (*lnceo*), CFO (*ln CFO*) and the total of these three (*lnchair_ CEO_CFO*) as executive compensation variables to re-test Hypothesis 1. The results are shown in Table 9.

Table 11
Robustness test on whether managerial power influences the stickiness of executive compensation.

	<i>lntm</i>		<i>lncmp</i>		<i>lndir</i>	
	<i>power</i> = 1	<i>power</i> = 0	<i>power</i> = 1	<i>power</i> = 0	<i>power</i> = 1	<i>power</i> = 0
<i>fair_value</i>	−0.815 (−0.64)	0.403*** (3.39)	−0.581 (−0.47)	0.456*** (3.98)	0.779 (0.62)	1.219*** (8.29)
<i>oper_inco</i>	0.382* (1.66)	0.038*** (14.43)	0.392* (1.67)	0.047*** (16.18)	0.419 (1.34)	0.053*** (16.38)
<i>dum</i>	−0.036 (−0.42)	0.013 (0.27)	0.024 (0.28)	0.019 (0.40)	0.048 (0.50)	0.046 (0.74)
<i>dum*fair_value</i>	7.575*** (2.66)	2.131* (1.78)	6.039** (2.12)	1.173 (1.02)	2.244 (0.66)	−0.439 (−0.33)
<i>board</i>	0.019 (0.71)	0.010 (0.75)	0.045 (1.63)	0.009 (0.64)	0.061* (1.96)	0.028 (1.59)
<i>inde_dir</i>	2.971*** (4.17)	0.010 (0.03)	2.970*** (3.60)	0.241 (0.60)	1.559 (1.50)	−0.282 (−0.57)
<i>lnsale</i>	0.264*** (6.84)	0.182*** (10.32)	0.267*** (6.76)	0.175*** (9.04)	0.296*** (5.96)	0.185*** (7.29)
<i>salegrowth</i>	−0.009 (−1.56)	0.000 (0.67)	−0.009* (−1.66)	0.000 (1.10)	−0.017** (−2.46)	0.000 (1.01)
<i>leverage</i>	−0.333* (−1.77)	−0.001 (−0.59)	−0.485*** (−2.78)	0.014*** (8.29)	−0.439** (−2.19)	0.015*** (6.98)
<i>adj_return</i>	−0.021 (−0.52)	−0.014 (−0.51)	−0.032 (−0.78)	−0.007 (−0.25)	−0.007 (−0.15)	−0.015 (−0.36)
<i>lnaver_inco</i>	0.406** (2.00)	0.317** (2.55)	0.295 (1.45)	0.264** (2.21)	−0.033 (−0.14)	0.093 (0.66)
<i>soe</i>	0.091 (0.97)	0.045 (0.89)	0.012 (0.13)	−0.079 (−1.50)	−0.096 (−0.88)	−0.208*** (−3.38)
<i>comp_com</i>	0.304 (1.43)	0.194* (1.79)	0.313 (1.39)	0.190* (1.88)	0.349 (1.39)	0.239* (1.74)
<i>cross</i>	−0.304 (−1.56)	0.261** (2.23)	−0.268 (−1.32)	0.254** (2.20)	−0.200 (−0.97)	0.245* (1.76)
<i>chair</i>	0.065 (0.49)	−0.099 (−1.51)	0.066 (0.61)	−0.122* (−1.82)	−0.127 (−0.92)	−0.183** (−2.26)
<i>ceo</i>	−0.228** (−2.03)	−0.058 (−0.88)	−0.200* (−1.87)	−0.038 (−0.58)	−0.241* (−1.81)	−0.057 (−0.71)
<i>regulate</i>	−0.061 (−0.28)	−0.135 (−1.24)	−0.116 (−0.50)	−0.153 (−1.43)	−0.267 (−0.95)	−0.233* (−1.88)
<i>middle</i>	−0.173 (−1.14)	−0.195** (−2.26)	−0.137 (−0.91)	−0.217** (−2.57)	−0.209 (−1.25)	−0.283*** (−2.97)
<i>west</i>	−0.473** (−2.18)	−0.360*** (−3.52)	−0.405** (−2.28)	−0.353*** (−3.46)	−0.597*** (−2.82)	−0.356*** (−3.14)
Constant	3.035 (1.36)	6.441*** (5.27)	4.018* (1.78)	7.267*** (6.33)	6.815** (2.58)	8.525*** (6.36)
<i>N</i>	279	867	279	869	279	869
Adj. <i>R</i> ²	0.426	0.310	0.432	0.274	0.392	0.199
<i>F</i>	11.317	128.312	10.914	32.266	9.956	29.201
<i>F</i> -test	20.65		17.91		4.11	
<i>p</i> -Value	0.0000		0.0000		0.0428	

Note: *t* statistics are in parentheses.

* Significant at the 10% level.

** Significant at the 5% level.

*** Significant at the 1% level.

From the robustness test results reported in Table 9, we find that *lnceo*, *lncfo* and *lnchair_ceo_cfo* are significantly positively related to CFV. The results are consistent with the conclusions of Zhou et al. (2010).⁹

⁹ Zhou et al. (2010) find that the CEO and chairman are not responsible for CFV and their compensation has no significant relationship with CFV. The CFO, however, is in charge of capital operations, and this officer's compensation is significantly related to CFV.

5.4.2. Robustness test on the asymmetry of executive compensation to CFV

We divide the sample into two sub-groups: one group comprises companies earning PCFV ($D = 1$), and the other comprises companies suffering LCFV ($D = 0$). We then conduct an F -test to examine Hypothesis 2, by testing the difference in the coefficients of *fair_value* between the two groups. The robustness results shown in Table 10 remain unchanged compared with those of Table 7.

5.4.3. Robustness test on whether managerial power influences the stickiness of executive compensation

We further categorize the sample into two sub-groups according to managerial power, one group comprising companies with strong managerial power ($power = 1$) and the other group comprising companies with weak managerial power ($power = 0$). We conduct an F -test to verify Hypothesis 3 by testing the difference in the coefficient for $dum * fair_value$ between the two groups and find that the results remain unchanged (see Table 11).

5.4.4. Eliminating the effects of the financial crisis

In 2008, domestic companies suffered severely from the global financial crisis. Taking into consideration the noise caused by this crisis on the value relevance of financial reports, earnings management and accounting conservatism, we drop the observations from 2008 and test the three hypotheses again. The results remain largely unchanged.

5.4.5. Eliminating cross-listed companies

Zhang (2011) finds that the sensitivity of compensation in cross-listed companies is significantly higher than that in mainland-listed companies. Therefore, we remove 72 cross-listed companies from the sample and test the three hypotheses again. The results remain largely unchanged.

6. Conclusions and limitations

6.1. Conclusions

Examining A-share listed companies on the Shanghai Securities Exchange and Shenzhen Securities Exchange from 2007 to 2009, we test the sensitivity of executive compensation to CFV. We draw the following conclusions: (1) CFV is positively related to executive compensation, and (2) the sensitivity of executive compensation is asymmetric to CFV. That is, executive pay rises higher due to PCFV than it declines due to LCFV. Further examination reveals that the greater the degree of managerial power, the more asymmetric the sensitivity of executive compensation is to CFV. These findings suggest the following policy implications.

With the implementation of the new accounting standards, changes in accounting measurement attributes have influenced the levels of executive compensation. The effects of CFV on executive compensation should therefore be considered in the design of compensation contracts and changes in fair value that come from management effort, from opportunism or from changes in the market environment should be reasonably distinguished.

This study offers some insights into the motives and methods of compensation manipulation using CFV. It suggests that in the design of compensation contracts, more attention should be paid to the dangers of management opportunism. The role that CFV plays in the compensation contract should be cautiously balanced.

If corporate governance and internal control mechanisms are perfected and the power of management to manipulate compensation is suppressed, then compensation contracts based on performance will function better and a rational compensation system may truly come into being.

6.2. Limitations

Despite its potential contributions, our study also has several limitations, which suggest possible directions for further research.

We excluded observations in which CFV was reported as 0 in annual reports, which may have led to bias in sample selection, thus limiting the generalizability of our conclusions.

The measurement of managerial power in our study only includes duality, equity disparity and managers' tenure, which are probably insufficient to accurately measure the real conditions of managerial power in Chinese listed companies.

We ignore perks in the calculation of executive compensation. Perks are common and even a major component of compensation in listed Chinese companies, especially in SOEs. Chen et al. (2005) find that perks are a substitute for bonuses for SOE managers who are under compensation regulation. Excluding perks from executive compensation may influence the results.

The effect of earnings management on CFV is also beyond our consideration. Ye et al. (2009) find that managers commonly recognize a large proportion of corporate financial assets as available for sale to reduce the effect of CFV on their income statements. In that case, it becomes difficult to account for managements' real intentions in holding financial assets and this factor may have affected our results.

Our study provides evidence on the sensitivity of executive compensation to CFV. In practice, however, there are many other factors that may affect executive compensation. Better handling of these issues will involve a complex process of developing standards, dealing with competing interests in the process of making contracts and better implementation and re-evaluation of compensation contracts.

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References

- Bebchuk, L.A., Jesse, F., David, W., 2002. Managerial power and rent extraction in the design of executive compensation. *University of Chicago Law Review* 69, 751–846.
- Bebchuk, L.A., Fried, J.M., 2003. Executive compensation as an agency problem. *Journal of Economic Perspectives* 3, 71–92.
- Chen, D.H., Chen, X.Y., Wan, H.L., 2005. Regulation and non-pecuniary compensation in Chinese SOEs. *Economic Research Journal* 02, 92–101, in Chinese.
- Chen, J., 2010. Factors influencing top-management incentives of listed companies: empirical evidence from Chinese stock market. *Journal of Shanxi Finance and Economics University* 09, 70–79 (in Chinese).
- Chen, X.M., Liu, S.M., 2003. An empirical study on the structural difference among the compensation of managers in Chinese public companies. *Economic Research Journal* 08, 55–63 (in Chinese).
- Cheng, S., Indjejikian, R., 2009. Managerial influence and CEO performance incentives. *International Review of Law and Economics* 29 (2), 115–126.
- Conyon, M.J., 2006. Executive compensation and incentives. *The Academy of Management Perspective* 20 (1), 25–44.
- Core, J., Holthausen, R., Larker, D., 1999. Corporate governance, chief executive compensation and firm performance. *Journal of Financial Economics* 51, 371–406.
- Coughlan, A.T., Schmidt, R.M., 1985. Executive compensation, management turnover, and firm performance: an empirical investigation. *Journal of Accounting and Economics* 7 (1–3), 43–66.
- Cyert, R., Kang, S., Kumar, P., 2002. Corporate governance, takeover, and top-management compensation: theory and practice. *Management Science* 48 (4), 453–469.
- Dechow, P.M., Linda, A.M., Catherine, S., 2010. Fair value accounting and gains from asset securitizations: a convenient earnings management tool with compensation side-benefits. *Journal of Accounting and Economics* 49 (1–2), 2–25.
- Dorff, M.B., 2005. Does one hand wash the other? Testing the managerial power and optimal contracting theories of executive compensation. *Journal of Corporation Law* 30, 255–307.
- Du, X.Q., Wang, L.H., 2007. Empirical research on correlation between compensation schemes of management and the change of performance of public listed companies. *Accounting Research* 01, 53–65 (in Chinese).
- Duffhues, P., Kabir, R., 2008. Is the pay–performance relationship always positive? Evidence from the Netherlands. *Journal of Multinational Financial Management* 18 (1), 45–60.

- Edmans, A., Gabaix, X., Landier, A., 2008. A Multiplicative Model of Optimal CEO Incentives in Market Equilibrium. Working Paper, University of Pennsylvania.
- Fahlenbrach, R., 2009. Shareholder rights, boards, and CEO compensation. *Review of Finance* 13 (1), 81–113.
- Fang, J.X., 2009. Is top management compensation of Chinese public companies sticky? *Economic Research Journal* 03, 110–124 (in Chinese).
- Figler, R.A., Lutz, C.R., 1991. Do the excellent firms effectively match CEO compensation to corporate performance? *Journal of Managerial Issues* 111 (4), 445–457.
- Garvey, G.T., Milbourn, T.T., 2006. Asymmetric benchmarking in compensation: executive are rewarded for good luck but not penalized for bad. *Journal of Financial Economics* 82 (1), 197–225.
- Gaver, J., Gaver, K., 1998. The relation between nonrecurring accounting transactions and CEO cash compensation. *The Accounting Review* 73, 235–253.
- George, P.B., Hall, B.J., 1998. CEO Incentives and Firm Size. NBER Working Paper No. 6868.
- Gopalan, R., Milbourn, T., Song, F., 2008. Strategic Flexibility and the Optimality of Pay for Luck. Working Paper. Washington University in St. Louis.
- Grossman, S., Hart, O., 1983. Implicit contracts under asymmetric information. *Quarterly Journal of Economics* 98, 123–156.
- Hambrick, D.C., Finkelstein, S., 1995. The effects of ownership structure on conditions at the top: the case of CEO pay raises. *Strategic Management Journal* 16, 175–193.
- Hart, O., Moore, J., 1990. Property rights and the nature of the firm. *Journal of Political Economy* 98, 1119–1158.
- Holmstrom, B., Milgrom, P., 1991. Multitask principal-agent analyses: incentive contracts, asset ownership, and job design. *Journal of Law, Economics, and Organization* 7, 24–52.
- Hou, Q.C., Jin, Q.L., 2010. New Accounting Standard, Corporate Accounting Performance and Executive Compensation. Working Paper (in Chinese).
- Huang, Z.Z., 2006. Share-holding ratio, tunneling strategy and totally circulating. *Nankai Business Review* 09, 58–65 (in Chinese).
- Jensen, M.C., Murphy, K.J., 1990. Performance pay and top management incentives. *Journal of Political Economy* 98 (2), 225–264.
- Jensen, M.C., Meckling, W.H., 1976. Theory of the firm: managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* 3 (4), 305–360.
- Jiang, W., 2008. Agent cost of liability and executive compensation: empirical analysis on listed companies in China. *Economic Science* 04, 110–123 (in Chinese).
- Lambert, R., Larcker, D.F., 1987. An analysis of the use of accounting and market measures of performance in executive compensation contracts. *Journal of Accounting Research* 25, 85–125.
- Leone, J.W., Zimmerman, J., 2006. Asymmetric sensitivity of CEO cash compensation to stock returns. *Journal of Accounting and Economics* 42, 167–192.
- Li, Z.Q., 2000. Incentive mechanism and enterprise performance: an empirical study based on listed companies. *Accounting Research* 01, 24–30 (in Chinese).
- Lu, R., 2007a. Analysis of the agent problem of compensation incentives in the perspective of managerial power. *Modern Management Science* 07, 40–42 (in Chinese).
- Lu, R., 2007b. Managerial power, compensation gap and performance. *South China Journal of Economics* 07, 60–70 (in Chinese).
- Lu, R., 2008. Managerial power, compensation and sensitivity of performance: empirical evidence from listed companies in China. *Contemporary Finance and Economics* 7, 107–112 (in Chinese).
- Lu, R., Wei, M.H., 2008. Research developments in managerial power approach of compensation determination. *Economic Management* 01, 90–93 (in Chinese).
- Lyu, C.J., Zhao, Y.H., 2008. A study on the effect of the incentive given to managers of state-owned enterprises. *Management World* 11, 99–109 (in Chinese).
- McGuire, J.W., Chiu, J.S.Y., Elbing, A.O., 1962. Executive incomes, sales and profits. *The American Economic Review* 52 (4), 753–761.
- Morse, A., Nanda, V.K., Seru, A., 2008. Are Incentive Contracts Rigged by Powerful CEOs? Working Paper SSRN No. 687504.
- Murphy, K.J., 2000. Performance standards in incentive contracts. *Journal of Accounting & Economics* 30 (3), 245–278.
- Na, C.H., 2009. Managerial Power, Discretionary Investment and Executive Compensation: Empirical Study based on Chinese Listed Companies. Jinan University (in Chinese).
- Natarajan, R., 1996. Stewardship value of earnings components: additional evidence on the determinants of executive compensation. *The Accounting Review* 71, 1–22.
- Otten, J.A., 2008. Theories on Executive Pay: A Literature Overview and Critical Assessment. MPRA Working Paper No. 6969.
- Pan, F., Tong, W.H., 2005. The Incentive Contract of Top Managers: Existing Condition Analysis – Evidence from China. *China Accounting Society of China Annual Academic Symposiums, 2005* (in Chinese).
- Quan, X.F., Wu, S.N., Wen, F., 2010. Managerial power, private income and compensation rigging. *Economic Research Journal* 11, 73–86 (in Chinese).
- Sloan, R., 1993. Accounting earnings and top executive compensation. *Journal of Accounting and Economics* 16, 55–100.
- Sun, Z., Liu, H., 2004. The expense “Stickiness” behavior of Chinese listed companies. *Economic Research Journal* 12, 26–34 (in Chinese).
- Taussings, F.W., Baker, W.S., 1925. American corporations and their executives: a statistical inquiry. *Quarterly Journal of Economics* 3, 1–51.
- Tosi, H.L., Werner, S., Katz, J.P., Gomez-Mejia, L.R., 2000. How much does performance matter? A meta-analysis of CEO pay studies. *Journal of Management* 26 (2), 301–339.

- Wang, K.M., Wang, Z.C., 2007. Executive controlling power, compensation, and earnings management: empirical study on listed companies in China. *Management World* 07, 111–119 (in Chinese).
- Wei, G., 2000. Incentives for top-management and performance of listed companies. *Economic Research Journal* 03, 32–39 (in Chinese).
- Wiseman, R.M., Gomez-Mejia, L.R., 1998. A behavioral agency model of managerial risk taking. *The Academy of Management Review* 23 (1), 133–153.
- Xin, Q.Q., Lin, B., Wang, Y.C., 2007. Government control, executive compensation and capital investment. *Economic Research Journal* 08, 110–112 (in Chinese).
- Xu, J.C., Zeng, X.Y., 2010. The CEOs compensations contract and fair value accounting in China. *Accounting Research* 03, 12–19 (in Chinese).
- Ye, J.F., Zhou, L., Li, D.M., Guo, L., 2009. Management motivation, accounting policy options and earnings management: an empirical study on the classification of financial assets for listed companies under the new accounting standards. *Accounting Research* 03, 25–30 (in Chinese).
- Zhang, B.W., Shi, J.T., 2005. Board characteristic, top managers compensation and pay-performance sensitivity in Chinese listed companies: an empirical analysis. *Policy-making Reference* 04, 32–39 (in Chinese).
- Zhang, J.R., Zhang, F.D., Zhou, H.F., 2011. A study on the different effects of two types of the changes in fair value on executive's compensations: empirical evidence from Chinese A-share listed firms in 2007–2008. *Accounting Research* 10, 63–68 (in Chinese).
- Zhang, J.R., Zhao, J.W., Zhang, J., 2003. Empirical study on the relevance of top management incentive and operating performance of listed companies. *Accounting Research* 09, 29–34 (in Chinese).
- Zhang, L., 2011. Study on the Correlation between Executive Pay and Corporate Performance of Cross-listed Companies and Non-cross-listed Companies. Nanjing Normal University (in Chinese).
- Zhou, H.F., Xin, Q.Q., Zhang, J.R., 2010. Fair value measurement and executive compensation contract. *Economic Science* 05, 102–110 (in Chinese).



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Product market competition, ultimate controlling structure and related party transactions

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ABSTRACT

Previous studies have shown that product market competition has an important effect on corporate strategies and internal governance mechanisms. Using a sample of China's listed firms from 2004 to 2009, we explore the relationship between product market competition and normal related party transactions and find a significant positive relationship. In addition, we investigate the substitutive effect of product market competition and the cash flow rights owned by ultimate controlling shareholders on the extent of normal related party transactions. In particular, our results suggest a positive relationship between the ultimate controlling shareholders' cash flow rights and normal related party transactions that is strongest in noncompetitive industries and weakens as product market competition increases.

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1. Introduction

Product market competition plays a pivotal role in influencing corporate strategies and internal governance mechanisms. Shleifer and Vishny (1997) argue that “product market competition is probably the most

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powerful force towards economic efficiency in the world.” Competition increases the probability that firms with high costs will go bankrupt (Schmidt, 1997) and fear of bankruptcy is a strong incentive for managers to exert the effort required to remain competitive (Hart, 1983). Further analysis shows that product market competition is a substitute for internal governance that reduces agency costs (Karuna, 2010; Giroud and Mueller, 2011).

The role of related party transactions (*RPTs*) within business groups is widely discussed in the literature. Efficiency-enhancing theory suggests that imperfect emerging markets increase transaction costs that can be largely reduced through *RPTs* between the members of a business group (Khanna and Palepu, 1997, 2000). In contrast, agency theory argues that *RPTs* can be used in the expropriation of listed companies. In particular, business groups could use abnormal *RPTs* to tunnel resources from listed firms (Liu et al., 2008; Chang and Hong, 2000).

Following these studies, particularly the methodology of Jian and Wong (2010), we classify *RPTs* as normal or abnormal. Normal *RPTs* can decrease the transaction costs of listed firms, whereas abnormal *RPTs* can be used as a way of tunneling or propping business groups’ specific purposes. According to the efficiency-enhancing view, normal *RPTs* help firms to reduce transaction costs and increase value. This implies that product market competition leads to a greater need for normal *RPTs* to reduce transaction costs. Given that controlling shareholders with substantially more cash flow rights have strong incentives to maximize firm profits through normal *RPTs* (Shleifer and Vishny, 1986), we expect to observe a substitution effect between product market competition and controlling shareholders’ cash flow rights.

Our empirical evidence is consistent with these predictions. Using a sample of China’s A-share listed firms from 2004 to 2009, we show that product market competition has a significant positive effect on normal *RPTs*. That is, firms from more competitive industries tend to reduce transaction costs by increasing normal *RPTs*. We also find that product market competition and ultimate controlling shareholder’s cash flow rights have a substitutive effect on normal *RPTs*. Specifically, we note a positive relationship between ultimate controlling shareholders’ cash flow rights and normal *RPTs*. Moreover, this relationship is strongest in noncompetitive industries and weakens as product market competition increases.

Our study contributes to the literature in the following ways. First, it adds to the rapidly expanding work on the effects of product market competition. For example, Aghion et al. (2006) investigate the relationship between product market competition and vertical integration. Our results suggest that product market competition also affects firms’ transactions, i.e. firms from more competitive industries are more likely to have normal *RPTs* that reduce transaction costs. Second, our study has an important implication for research on ultimate controlling shareholders. Previous studies have mainly investigated the tunneling of ultimate controlling shareholders based on agency theory, ignoring the alignment of interests between controlling shareholders and other investors. Our results provide evidence that the cash flow rights of ultimate controlling shareholders have a positive effect on firms. Finally, we shed light on the relationship between external and internal corporate governance. Previous studies have shown that product market competition can either complement or substitute for some internal corporate governance mechanisms (Karuna, 2010; Giroud and Mueller, 2011). Our findings support the substitution effect by showing that the influence of ownership structure on the occurrence of normal *RPTs* is weakened by product market competitiveness.

The remainder of this paper is organized as follows. Section 2 develops the hypotheses and discusses the related empirical predictions. Section 3 discusses methodological and empirical issues. Section 4 presents our empirical results and Section 5 concludes the paper.

2. Literature review and hypothesis development

2.1. Product market competition and *RPTs*

Previous studies have shown that product market competition is pivotal in influencing firm profitability and corporate strategy. While earlier literature speculates that insufficient competition leads to managerial slack, Hart (1983) formalizes the idea that product market competition reduces managerial slack. In contrast, Raith (2003) argues that competition induces firm exit, which creates higher cost reduction incentives for the remaining firms. Following this, numerous studies have examined the economic consequences of competition

in product markets. For example, Schmidt (1997) shows that increasing competition not only increases firms' liquidation probability and managerial incentives, but also reduces their profit. Nickell (1996) finds that increased product market competition is associated with higher productivity growth in a sample of UK manufacturing firms.

Our study investigates the effect of product market competition on *RPTs*, which are common in Chinese listed companies due to the special institutional setting in China. A large number of Chinese listed firms have been restructured from existing SOEs through "carve-outs" and they retain a huge amount of transactions with members in their business groups. The role of *RPTs* and their determinants have been widely discussed in previous studies. According to the "efficiency-enhancing view," the absence of institutions makes it costly for emerging market firms to acquire necessary inputs such as finance, technology and management talent. In this context, a firm may be most profitably pursued as part of a large, diversified business group that can act as an intermediary between individual firms and imperfect markets (Khanna and Palepu, 1997, 2000). Zheng et al. (2007) suggest that the efficiency effect dominates internal markets and increases firm value.¹ Ma and Wang (2009) use the results of a case study conducted at Shanghai Fu-Shing Inc. to determine that *RPTs* can be an effective means of efficient resource allocation.

However, *RPTs* can also be used as a means for controlling shareholders to satisfy particular needs. The "tunneling" view argues that the operation of *RPTs* in business groups provides a convenient channel through which controlling shareholders can transfer resources at the expense of minority shareholders in listed firms (Chang and Hong, 2000; Cheung et al., 2006). Using a sample of China's listed firms, Jian and Wong (2010) reveal that abnormal *RPTs* are used by controlling shareholders to obtain private benefits. In sum, *RPTs* can be classified as normal or abnormal. Normal *RPTs* decrease the transaction costs of listed firms, whereas abnormal *RPTs* act as a way of tunneling and propping up a business group's specific needs. Therefore, following Jian and Wong's (2010) approach, we exclude abnormal *RPTs* and examine the relationship between product market competition and normal *RPTs*.

Transaction cost theory suggests that product market competition increases uncertainty, thus increasing the likelihood of vertical integration (Williamson, 1975, 1985). Aghion et al. (2006) argue that more competition increases the likelihood of vertical integration in sharing innovation benefits. Firms can benefit from an increase in normal *RPTs* in at least two ways. First, firms in competitive industries have higher bankruptcy risk than those in noncompetitive industries. This implies that firms in competitive industries can increase normal *RPTs* to reduce transaction costs, which can partially mitigate their bankruptcy risk. Second, product market competition may foster innovation and growth, allowing firms in competitive industries to share their innovation surplus with other member firms in the business group through normal *RPTs*. Therefore, we anticipate that product market competition is positively related to normal *RPTs*.

Hypothesis 1. Product market competition is positively related to normal *RPTs*.

2.2. Product market competition, ultimate controlling structure and related party transactions

Controlling shareholders can play a role in effectively monitoring the activities of firm managers, alleviating the free-rider problem associated with dispersed shareholders (Shleifer and Vishny, 1986). Some researchers have examined the relationship between the cash flow rights of the ultimate controlling shareholder and corporate valuation (La Porta et al., 2002; Lins, 2003). Bertrand et al. (2002) investigate Indian business groups and find that their owners are often accused of expropriating from minority shareholders by tunneling resources from firms in which they have low cash flow rights to firms in which they have high cash flow rights. More recently, Lin et al. (2011) explore 3468 firm-year observations in 22 countries from 1996 to 2008 and find that the cost of debt financing is significantly lower for companies with large ultimate owner's cash flow rights. Some researchers who have focused on China's capital market have also found that firms in which the controlling shareholder has higher cash flow rights or lower separation between ownership and control exhibit higher operating performance. For instance, Tong and Wang (2007) find that controlling shareholders

¹ Zheng et al.'s (2007) conclusion is made when the ratio of internal product transactions to total assets is below 20% or above 50%.

pursue the advantages of shared benefits through *RPTs* when their proportion of shareholdings is more than 50%.

Recent studies have suggested that product market competition and internal corporate governance mechanisms are substitutes. For example, Karuna (2010) argues that product market competition can affect the strength of some internal governance mechanisms by influencing the costs and benefits of monitoring, given that competition acts as an important disciplinary mechanism in firm leadership. Giroud and Mueller (2011) examine the interaction between product market competition and corporate governance and find that weak governance firms have lower equity returns, inferior operating performance and lower firm value, but only in noncompetitive industries. More recently, Chhaochharia et al. (2012) use the Sarbanes Oxley Act as a natural experiment to explore the ways in which it shocked internal governance, examining the link between product market competition and internal governance mechanisms. Consistent with the notion that product market competition is a substitute for internal governance, they also find that firms in noncompetitive industries experienced a larger improvement in operational efficiency after the approval of SOX than firms in competitive industries.

Given the abovementioned literature, we focus on how product market competition and the ultimate controlling structure influence normal *RPTs*. Product market competition acts as an important disciplinary mechanism, influencing the overall costs of monitoring. Firms in competitive industries have incentives to use normal *RPTs* to reduce transaction costs. This implies that the influence of controlling shareholders is smaller in firms in competitive industries. In contrast, the association between ultimate controlling shareholders' cash flow rights and normal *RPTs* offers a stronger incentive for firms in noncompetitive industries to lower transaction costs. Our second hypothesis is as follows:

Hypothesis 2. The influence of the ultimate controlling shareholder's cash flow rights on normal *RPTs* is stronger in firms in noncompetitive industries than in firms in competitive industries.

3. Research design

3.1. Sample and data

The China Securities Regulatory Commission promulgated the "Regulation on the Content and Format of Information Disclosure of Firms with Public Equity Offerings No. 2" on December 13, 2004. Chinese listed companies have been required to disclose a block diagram of the title and control relationship between the company and the actual controller since 2004. To adjust for the potential measurement bias of the ultimate controlling structure, our sample period covers 2004–2009 in China's A-share market. After eliminating financial companies, securities companies and companies with unavailable data, we obtain a sample of 5954 observations. The ultimate controlling shareholder's cash flow rights variable is hand-collected and other financial variables are obtained from the China Securities Market and Accounting Research (CSMAR) database.

3.2. Variables

3.2.1. Product market competition variables

Following the literature, we measure product market competition using three variables: the number of market participants in an industry (*Num*), the concentration ratio (*CR4*) and the Herfindahl–Hirschman Index (*HHI*) (Curry and George, 1983; Haushalter et al., 2007; Karuna, 2007; Li, 2010). "*Num*" is defined as the total number of companies in an industry. The number of market participants in the industry has a direct bearing on issues of concentration and competition. "*CR4*" measures the proportion of industry share for the four largest firms. This measure is easy to interpret and indicates the market share (concentration) of the four largest companies composing the industry, the maximum being 100% (monopoly). "*HHI*" is defined as the sum of the squares of the percentage shares of each company in relation to the total size of the industry. A higher value of *HHI* indicates stronger product market competition.

3.2.2. Ultimate controlling shareholder's cash flow rights variables

The manually collected ultimate controlling structure variables include the cash flow rights proportion, voting rights held by the controlling shareholder and voting rights held by other top-10 shareholders. Following La Porta et al. (1999), the ultimate controlling shareholder's cash flow rights are computed as the product of that owner's cash-flow rights at each tier of the control chain (in some cases, more than one control chain linked an ultimate owner to a firm at the bottom of a pyramid). In addition, we consider relationships between the top 10 shareholders and their combined ownership positions. If the block diagram disclosed in the annual report does not publish information on known shareholder relationships, then we amend the block diagram and use it to calculate the ultimate controlling shareholder's cash flow rights variable (*CashR*).

Based on the above analysis, "*CashR*" is the product of the owner's cash-flow rights at each tier of the control chain. A higher *CashR* indicates better alignment of interests between ultimate controlling shareholders and other investors.

3.2.3. Normal related party transaction variables

RPT data is taken from the CSMAR related party transaction research database. There are many types of *RPTs* between listed firms and their business groups, including sales and purchases of goods and products, accounts receivable and accounts payable, the exchange of assets, loans or loan guarantees. We include related party sales and purchases as our measure of related party transactions, as sales and purchases are the most frequent type of *RPT* (e.g. Liu and Liu, 2007; Hong and Xue, 2008). Furthermore, *RPT* is separated into three categories: sales and purchases of goods and services (*RPT*), purchases of goods and services (*RPT_Purc*), and sales of goods and services (*RPT_Sale*). "*RPT*" is measured as the sum of related purchases and sales divided by total sales. "*RPT_Purc*" is measured as the sum of related purchases of goods and services divided by total sales. "*RPT_Sale*" is measured as the sum of related sales of goods and services divided by total sales.

We adopt Jian and Wong's (2010) approach to estimate normal *RPTs*. They use an OLS regression model to obtain the abnormal component of *RPTs* that are associated with industry classifications and firm characteristics such as leverage, size and growth. The residual term is the measure of abnormal related party transactions and the predicted term is normal related party transactions. This model is widely used in recent related party transaction research (e.g. Yeh et al., 2012). The following model is used:

$$RPT = \beta_0 + \beta_1 Lev + \beta_2 Size + \beta_3 MTB + Industry\ fixed\ effects + \varepsilon \quad (1)$$

We run three sets of year-by-year (2004–2009) regressions, one each for *RPT*, *RPT_Purc* and *RPT_Sale* as the dependent variables. The results are summarized in Appendix A. Furthermore, since our conclusions are largely dependent on the validity of the model, we examine the correlation between *RPTs* and firm performance. *RPT* is decomposed into normal and abnormal *RPTs* and the results show that normal *RPTs* are positively correlated with firm performance as measured by *ROA*, *ROE* or *ROS*. Abnormal *RPTs* are negatively correlated with firm performance. These results are summarized in Appendix B.

Referring to Jian and Wong (2010), our control variables include *Lev*, measured as total debt over total assets; *Size*, measured as the natural logarithm of total assets; and *MTB*, measured as the market value divided by the book value of total equity at year-end.

3.3. Research model

To test Hypothesis 1, the following model is used:

$$NRPT = \beta_0 + \beta_1 PMC + \beta_2 PROS + \varepsilon \quad (2)$$

PMC is represented by three variables: *Num*, *HHI* and *CR4*. The relationship between *PMC* and *RPT* may be non-monotonic. Therefore, we rank firms according to their *PMC* and then sort them into *PMC* quintiles. *PMC_H* is a dummy variable that is assigned a value of 1 when competition is in the highest quintile, and 0 otherwise. *PMC_L* is a dummy variable indicating when *PMC* lies in the lowest quintile of its empirical distribution. In response to Jian and Wong (2010), we add *PROS* as an important control variable that is measured as the return on sales of the firm 1 year before the related party transaction occurs.

Table 1
Variable definitions.

Variable	Definition
<i>Panel A: Product market competition variables</i>	
<i>PMC</i>	Product market competition represented by three variables: <i>Num</i> , <i>CR4</i> and <i>HHI</i>
<i>PMC_H</i>	One if <i>PMC</i> is in the highest quintile and zero otherwise
<i>PMC_L</i>	One if <i>PMC</i> is in the lowest quintile and zero otherwise
<i>Num</i>	Total number of companies in an industry, log of the number when regressed
<i>CR4</i>	$1 - \sum P_i$, P_i are the market shares of the four largest firms in an industry
<i>HHI</i>	$1 - \sum P_i^2$, P_i are the market shares of the firms
<i>Panel B: Ultimate controlling shareholder's cash flow rights variables</i>	
<i>CashR</i>	The product of the proportion of voting rights at different levels of the control chain
<i>Panel C: Normal related party transaction variables</i>	
<i>RPT</i>	Sum of related purchases and sales divided by total sales
<i>RPT_Purc</i>	Sum of related purchases of goods and services divided by total sales
<i>RPT_Sale</i>	Sum of related sales of goods and services divided by total sales
<i>NRPT</i>	Normal <i>RPT</i> following Jian and Wong (2010)
<i>NRPT_Purc</i>	Normal <i>RPT_Purc</i> following Jian and Wong (2010)
<i>NRPT_Sale</i>	Normal <i>RPT_Sale</i> following Jian and Wong (2010)
<i>Panel D: Control variables</i>	
<i>Lev</i>	Total debt over total assets
<i>Size</i>	Natural logarithm of total assets
<i>MTB</i>	Market value divided by book value of total equity at year-end
<i>PROS</i>	Net income of last year divided by total sales of last year

To explore the effect of the interaction between the ultimate controlling shareholder's cash flow rights (*CashR*) and product market competition (measured by *PMC*, or *PMC_H* and *PMC_L*), the following model is used. If product market competition and the ultimate controlling shareholder's cash flow rights are substitutes, then the coefficient of the interaction term will be negative.

$$NRPT = \beta_0 + \beta_1 CashR + \beta_2 PMC + \beta_3 CashR \times PMC + \beta_4 PROS + \varepsilon \quad (3)$$

In the presence of clustered errors, OLS estimates are still unbiased but standard errors may be incorrect, leading to incorrect inference in a surprisingly high proportion of finite samples (Petersen, 2009). Given this, we use standard errors clustered at the firm level for all of our regressions. The main variables are presented in Table 1.

4. Empirical analysis

4.1. Descriptive statistics of product market competition variables

All of the variables in the regressions are winsorized at the top and bottom 1 percentile across years to control for the potential influence of outliers. The final sample consists of 5954 firm-years, spanning the period from 2004 to 2009. We present the descriptive statistics of product market competition variables in Table 2 and use three different variables to measure the extent of product market competition. There is a significant difference in product market competition between industries. The variable *Num* shows that the most competitive industries are Equipment and Instrument Manufacturing (C7); Petroleum, Chemical, Plastics and Rubber Products Manufacturing (C4); and Metal and Non-metal (C6). The variable *CR4* shows that the most competitive industries are Equipment and Instrument Manufacturing (C7); Medicine and Biological Products (C8); and Textile, Apparel, Fur and Leather (C1). The variable *HHI* shows that Equipment and Instrument Manufacturing (C7), Medicine and Biological Products (C8) and Textile, Apparel, Fur and Leather (C1) are

Table 2
Sample description.

Industries	2004	2005	2006	2007	2008	2009	Total	Coverage (%)	Num	CR4	HHI
Farming, Forestry, Animal Husbandry and Fishing (A)	20	23	25	22	24	23	137	2.30	38	0.49	0.90
Mining (B)	17	21	19	21	30	32	140	2.35	28	0.08	0.61
Food and Beverage (C0)	41	42	42	43	46	45	259	4.35	59	0.59	0.94
Textile, Apparel, Fur and Leather (C1)	43	47	47	54	52	48	291	4.89	66	0.74	0.97
Paper and Allied Products; Printing (C3)	17	20	22	26	27	26	138	2.32	31	0.48	0.90
Petroleum, Chemical, Plastics and Rubber Products Manufacturing (C4)	111	118	111	122	132	125	719	12.08	162	0.72	0.96
Electronics (C5)	33	37	37	40	52	51	250	4.20	62	0.42	0.88
Metal and Non-metal (C6)	103	104	109	116	123	118	673	11.30	137	0.72	0.96
Machinery, Equipment and Instrument Manufacturing (C7)	157	175	176	179	189	197	1073	18.02	233	0.78	0.98
Medicine and Biological Products (C8)	49	60	63	67	65	63	367	6.16	97	0.74	0.97
Other Manufacturing (C9)	11	14	13	16	16	17	87	1.46	23	0.39	0.88
Utilities (D)	33	45	43	46	50	47	264	4.43	63	0.54	0.92
Construction (E)	18	21	21	20	25	27	132	2.22	32	0.31	0.81
Transportation and Warehousing (F)	36	41	39	46	46	49	257	4.32	63	0.46	0.90
Information Technology (G)	53	60	57	58	68	63	359	6.03	94	0.40	0.83
Wholesale and Retail Trades (H)	43	44	41	46	46	51	271	4.55	92	0.61	0.94
Real Estate (J)	25	22	19	23	39	39	167	2.80	67	0.60	0.93
Public Facilities and Other Services (K)	18	19	18	23	28	28	134	2.25	45	0.60	0.92
Communication and Cultural Industries (L)	5	5	4	4	7	8	33	0.55	20	0.27	0.82
Conglomerates (M)	28	32	29	35	39	40	203	3.41	72	0.72	0.96
Subtotal	861	950	935	1007	1104	1097	5954				

Table 3
Descriptive statistics.

Variables	N	Mean	Median	SD	Min	P25	P75	Max
<i>NRPT</i>	5954	0.170	0.176	0.071	0.029	0.110	0.223	0.350
<i>NPRT_Purc</i>	5207	0.098	0.098	0.039	0.021	0.068	0.124	0.198
<i>NPRT_Sale</i>	5013	0.098	0.100	0.042	0.010	0.067	0.125	0.237
<i>Num</i>	5954	115.524	68.336	20.000	63.000	94.000	154.000	269.000
<i>CR4</i>	5954	0.623	0.694	0.167	0.060	0.509	0.753	0.817
<i>HHI</i>	5954	0.929	0.957	0.070	0.583	0.915	0.969	0.982
<i>CashR</i>	5954	0.353	0.338	0.177	0.031	0.212	0.491	0.750
<i>PROS</i>	5954	0.050	0.048	0.166	-0.897	0.017	0.101	0.521

the top three competitive industries. In summary, the descriptive statistics are almost the same using our various proxy measures of product market competition.

4.2. Descriptive statistics of normal RPT variables

We use Jian and Wong's (2010) model to estimate normal *RPTs*, normal related party purchases and normal related party sales. We use an OLS regression model to remove any abnormal *RPT* components that are not associated with industry classifications and the identified firm characteristics. The range and number of significant coefficients for the 6 years of regressions are reported in Appendix A. The *RPT* models have an adjusted *R*-square ranging from 0.041 to 0.079. The related party purchase models have an adjusted *R*-square ranging from 0.029 to 0.069. The related party sales models have an adjusted *R*-square ranging from 0.026 to 0.080.

Table 3 shows the variables' descriptive statistics. The mean (median) value of *NRPT* is 0.170 (0.176). After distinguishing the direction of *RPTs*, the results suggest that the mean (median) value of *NPRT_Purc* is 0.098

Table 4
Correlation analysis.

	<i>NRPT</i>	<i>Num</i>	<i>CR4</i>	<i>HHI</i>	<i>CashR</i>	<i>PROS</i>
<i>Panel A: NRPT</i>						
<i>NRPT</i>	1					
<i>Num</i>	0.447***	1				
<i>CR4</i>	0.270***	0.746***	1			
<i>HHI</i>	0.170***	0.608***	0.918***	1		
<i>CashR</i>	0.131***	-0.046***	-0.069***	-0.070***	1	
<i>PROS</i>	0.076***	-0.073***	-0.081***	-0.069***	0.113***	1
<i>Panel B: NRPT_Purc</i>						
<i>NRPT_Purc</i>	1					
<i>Num</i>	0.327***	1				
<i>CR4</i>	0.239***	0.758***	1			
<i>HHI</i>	0.099***	0.544***	0.804***	1		
<i>CashR</i>	0.185***	-0.057***	-0.077***	-0.076***	1	
<i>PROS</i>	0.117***	-0.082***	-0.092***	-0.064***	0.111***	1
<i>Panel C: NRPT_Sale</i>						
<i>NRPT_Sale</i>	1					
<i>Num</i>	0.343***	1				
<i>CR4</i>	0.127***	0.749***	1			
<i>HHI</i>	0.019*	0.543***	0.809***	1		
<i>CashR</i>	0.080***	-0.025*	-0.060***	-0.077***	1	
<i>PROS</i>	0.074***	-0.075***	-0.077***	-0.064***	0.112***	1

** Statistically significant at the 5% level (two-tailed).

* Statistically significant at the 10% level (two-tailed).

*** Statistically significant at the 1% level (two-tailed).

(0.098), and the mean (median) value of *NRPT_Sale* is 0.098 (0.100). The variable *Num* measures the total number of companies in an industry and has a value ranging from 63 to 269.

4.3. Correlation analysis

Person's correlation coefficients for the main variables in our analysis are reported in Table 4. Panel A shows that the correlations between *NRPT* and *PMC* (measured by *Num*, *CR4* and *HHI*) are positive and significant at the 1% level. As expected, we find a positive correlation between *NRPT* and *CashR*, and *NRPT* is also positively correlated with *PROS*. The correlation analysis is consistent when we change the dependent variable *NRPT* into *NRPT_Purc* and *NRPT_Sale*.

4.4. Regression analysis

Table 5 reports the regression results for product market competition and normal related party transactions. As expected, the results in columns 1, 3 and 5 reveal that product market competition has a statistically significant positive effect on normal *RPTs*. In column 2, we use two dummy variables instead of the variable *Num*. The coefficients (*t*-values) of *Num_L* and *Num_H* are -0.014 (-3.86) and 0.057 (18.98). The results in columns 4 and 6 are similar to the results in column 2. In summary, these results indicate that product market competition is significantly positively related to normal *RPTs*.

Table 6 reports regression results when we replace the dependent variable *NRPT* with *NRPT_Purc* and *NRPT_Sale*. The empirical results are consistent with those in Table 5, which suggests that the extent of related party purchases and related sales increases with the level of competition. For example, the coefficients (*t*-values) of *Num*, *CR4* and *HHI* in columns (1) to (3) are 0.021 (17.55), 0.059 (9.25) and 0.042 (3.29), respec-

Table 5
Regression results for *PMC* and *NRPT*.

	Dependent variable: <i>NRPT</i>					
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Num</i>	0.050*** (25.37)					
<i>Num_L</i>		-0.014*** (-3.86)				
<i>Num_H</i>		0.057*** (18.98)				
<i>CR4</i>			0.119*** (11.41)			
<i>CR4_L</i>				-0.042*** (-12.29)		
<i>CR4_H</i>				0.025*** (9.17)		
<i>HHI</i>					0.180*** (6.51)	
<i>HHI_L</i>						-0.035*** (-11.06)
<i>HHI_H</i>						0.025*** (7.66)
<i>PROS</i>	0.051*** (6.34)	0.038*** (4.89)	0.046*** (5.53)	0.044*** (5.97)	0.042*** (4.83)	0.032*** (4.28)
<i>Intercept</i>	-0.062*** (-6.36)	0.161*** (63.06)	0.094*** (13.87)	0.173*** (70.19)	0.000 (0.01)	0.152*** (32.29)
<i>N</i>	5954	5954	5954	5954	5954	5954
<i>Adj. R-sq.</i>	0.203	0.119	0.081	0.098	0.036	0.091
<i>N_clust</i>	1362	1362	1362	1362	1362	1362
<i>F</i>	362.388	215.464	83.814	158.730	33.334	57.597

* Statistically significant at the 10% level (two-tailed).

** Statistically significant at the 5% level (two-tailed).

*** Statistically significant at the 1% level (two-tailed).

Table 6
Regression results for *PMC* and *NRPT_Purc* (*NRPT_Sale*).

	Dependent variable: <i>NRPT_Purc</i>			Dependent variable: <i>NRPT_Sale</i>		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Num</i>	0.021*** (17.55)			0.023*** (15.93)		
<i>CR4</i>		0.059*** (9.25)			0.032*** (5.72)	
<i>HHI</i>			0.042*** (3.29)			0.010 (1.23)
<i>PROS</i>	0.040*** (8.51)	0.039*** (8.22)	0.034*** (7.02)	0.029*** (4.80)	0.025*** (4.03)	0.023*** (3.63)
<i>Intercept</i>	0.001 (0.17)	0.059*** (14.52)	0.057*** (4.87)	-0.007 (-0.96)	0.077*** (20.12)	0.088*** (12.08)
<i>N</i>	5207	5207	5207	5013	5013	5013
<i>Adj. R-sq.</i>	0.127	0.078	0.027	0.11	0.021	0.006
<i>N_clust</i>	1260	1260	1260	1243	1243	1243
<i>F</i>	190.449	75.048	29.33	149.313	25.986	7.272

* Statistically significant at the 10% level (two-tailed).

** Statistically significant at the 5% level (two-tailed).

*** Statistically significant at the 1% level (two-tailed).

Table 7
Regression results for *PMC*, *CashR* and *NRPT*.

	Dependent variable: <i>NRPT</i>		
	(1)	(2)	(3)
<i>Panel A</i>			
<i>CashR</i>	0.131 ^{***} (2.62)	0.121 ^{***} (3.44)	0.311 ^{***} (7.19)
<i>Num</i>	0.057 ^{***} (14.02)		
<i>Num</i> × <i>CashR</i>	−0.017 (−1.59)		
<i>CR4</i>		0.160 ^{***} (7.65)	
<i>CR4</i> × <i>CashR</i>		−0.104 [*] (−1.89)	
<i>HHI</i>			0.335 ^{***} (8.52)
<i>HHI</i> × <i>CashR</i>			−0.279 ^{***} (−5.96)
<i>PROS</i>	0.039 ^{***} (5.57)	0.035 ^{***} (4.59)	0.031 ^{***} (3.96)
Intercept	−0.111 ^{***} (−5.65)	0.048 ^{***} (3.58)	−0.162 ^{***} (−4.43)
<i>N</i>	5954	5954	5954
Adj. <i>R</i> -sq.	0.231	0.103	0.064
<i>N</i> _clust	1362	1362	1362
<i>F</i>	200.332	58.061	31.714
<i>Panel B</i>			
<i>CashR</i>	0.065 ^{***} (4.85)	0.063 ^{***} (4.98)	0.057 ^{***} (4.59)
<i>Num</i> _L	−0.010 (−1.42)		
<i>Num</i> _H	0.075 ^{***} (12.70)		
<i>CashR</i> × <i>Num</i> _L	−0.015 (−0.79)		
<i>CashR</i> × <i>Num</i> _H	−0.055 ^{***} (−3.26)		
<i>CR4</i> _L		−0.033 ^{***} (−4.78)	
<i>CR4</i> _H		0.038 ^{***} (6.67)	
<i>CashR</i> × <i>CR4</i> _L		−0.027 (−1.46)	
<i>CashR</i> × <i>CR4</i> _H		−0.037 ^{**} (−2.29)	
<i>HHI</i> _L			−0.029 ^{***} (−4.50)
<i>HHI</i> _H			0.033 ^{***} (4.86)
<i>CashR</i> × <i>HHI</i> _L			−0.016 (−0.94)
<i>CashR</i> × <i>HHI</i> _H			−0.023 (−1.24)
<i>PROS</i>	0.032 ^{***} (4.11)	0.038 ^{***} (5.27)	0.032 ^{***} (4.28)
Intercept	0.139 ^{***} (28.65)	0.151 ^{***} (32.00)	0.152 ^{***} (32.29)
<i>N</i>	5954	5954	5954

Adj. <i>R</i> -sq.	0.138	0.115	0.091
<i>N</i> _clust	1362	1362	1362
<i>F</i>	120.492	89.916	57.597

* Statistically significant at the 10% level (two-tailed).

** Statistically significant at the 5% level (two-tailed).

*** Statistically significant at the 1% level (two-tailed).

Table 8

Regression results for *PMC*, *CashR* and *NRPT_Purc* (*NRPT_Sale*).

	Dependent variable: <i>NRPT_Purc</i>			Dependent variable: <i>NRPT_Sale</i>		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>CashR</i>	0.067** (2.24)	0.081*** (3.93)	0.188*** (3.14)	0.117*** (3.42)	0.045** (2.50)	0.110*** (3.31)
<i>Num</i>	0.023*** (9.39)			0.031*** (11.06)		
<i>Num</i> × <i>CashR</i>	−0.006 (−0.87)			−0.022*** (−3.12)		
<i>CR4</i>		0.084*** (6.81)			0.050*** (4.33)	
<i>CR4</i> × <i>CashR</i>		−0.063* (−1.92)			−0.042 (−1.54)	
<i>HHI</i>			0.114*** (3.44)			0.056*** (2.85)
<i>HHI</i> × <i>CashR</i>			−0.161** (−2.50)			−0.100*** (−2.73)
<i>PROS</i>	0.031*** (7.58)	0.030*** (7.01)	0.026*** (5.82)	0.023*** (4.37)	0.020*** (3.53)	0.018*** (3.12)
Intercept	−0.024** (−2.12)	0.028*** (3.65)	−0.024 (−0.76)	−0.052*** (−3.76)	0.059*** (7.70)	0.039** (2.16)
<i>N</i>	5207	5207	5207	5013	5013	5013
Adj. <i>R</i> -sq.	0.163	0.115	0.063	0.137	0.030	0.013
<i>N</i> _clust	1260	1260	1260	1243	1243	1243
<i>F</i>	116.729	63.219	26.592	85.194	16.642	7.745

* Statistically significant at the 10% level (two-tailed).

** Statistically significant at the 5% level (two-tailed).

*** Statistically significant at the 1% level (two-tailed).

tively. In summary, the results provide evidence for Hypothesis 1, which states that product market competition is significantly positively related to normal *RPTs*.

We then examine the interaction effect of product market competition and the ultimate controlling shareholder's cash flow rights on normal *RPTs*. Panel A of Table 7 presents the results of estimating Eq. (3). The continuous variables *Num*, *CR4* and *HHI* are used as the proxy variables for *PMC* in Panel A and the dummy variables are used in Panel B. The coefficients of *CashR* in columns (1) to (3) are 0.131, 0.121 and 0.311, respectively. They are all statistically significant at the 1% level. Similar to the results in Table 5, the coefficients of *Num*, *CR4* and *HHI* are significantly positive. The results show that both product market competition and the ultimate controlling shareholder's cash flow rights have significant positive effects on normal *RPTs*. The coefficients (*t*-values) of the interaction terms *Num* × *CashR*, *CR4* × *CashR* and *HHI* × *CashR* are −0.017 (−1.59), −0.104 (−1.89) and −0.279 (−5.96), respectively. These results are consistent with Hypothesis 2, suggesting that the ultimate controlling shareholder's cash flow rights have more influence on normal *RPTs* in firms in noncompetitive industries than in firms in competitive industries. This implies that product market competition is a substitute for internal corporate governance mechanisms. The results of Panel B further suggest that this substitution only occurs at higher levels of competition.

In Table 8, we replace the dependent variable *NRPT* with *NRPT_Purc* and *NRPT_Sale*. Consistent with the results in Table 7, the coefficients of the interaction terms are generally significantly negative.

These results indicate that product market competition and the ultimate controlling shareholder's cash flow rights have an interaction effect on normal *RPTs*, with the ultimate controlling shareholder's cash flow rights in noncompetitive industries being more likely to increase normal *RPTs*. Our results are consistent with Karuna (2010) and Giroud and Mueller (2011) in that product market competition can act as a substitute for internal corporate governance mechanisms.

5. Conclusion

Based on a sample of A-share Chinese listed firms from 2004 to 2009, we examine the effect of product market competition and the ultimate controlling shareholder's cash flow rights on normal *RPTs*. Product market competition is not only pivotal in influencing corporate strategies, but can also be a substitute for internal governance mechanisms.

We adopt Jian and Wong's (2010) approach to estimate normal *RPTs*. Our empirical evidence shows that product market competition has a significant positive effect on normal *RPTs*. This implies that firms in competitive industries can increase normal *RPTs* to reduce transaction costs. Further investigation shows that product market competition and the ultimate controlling shareholder's cash flow rights have an interaction effect on normal *RPTs*, with the ultimate controlling shareholder's cash flow rights in noncompetitive industries being more likely to improve normal *RPTs*. This provides evidence that product market competition can act as a substitute for the ultimate controlling shareholder's cash flow rights on normal *RPTs*.

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Appendix A. Normal *RPT* regressions

	2004	2005	2006	2007	2008	2009
<i>Panel A: Normal RPT</i>						
<i>Lev</i>	-0.231*** (-4.24)	-0.146*** (-2.93)	-0.129*** (-2.71)	-0.116** (-2.38)	-0.121*** (-2.85)	-0.031 (-0.75)
<i>Size</i>	0.053*** (5.11)	0.026*** (2.73)	0.024*** (2.95)	0.024*** (3.08)	0.022*** (3.09)	0.011 (1.57)
<i>MTB</i>	0.032*** (2.81)	0.001 (0.12)	-0.004 (-0.59)	0.003 (0.88)	0.008 (1.22)	0.007** (2.17)
Intercept	-0.908*** (-4.11)	-0.344* (-1.68)	-0.321* (-1.81)	-0.340** (-2.03)	-0.320** (-2.13)	-0.152 (-0.99)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	950	978	999	1078	1148	1154
Adj. <i>R</i> -sq.	0.079	0.068	0.057	0.041	0.064	0.055
<i>F</i>	6.400	5.762	5.051	4.043	5.603	4.508
<i>Panel B: Normal related party purchases</i>						
<i>Lev</i>	-0.147*** (-4.36)	-0.070** (-2.11)	-0.098*** (-3.05)	-0.061* (-1.91)	-0.045 (-1.57)	-0.007 (-0.27)
<i>Size</i>	0.031*** (4.79)	0.013** (2.10)	0.020*** (3.53)	0.016*** (3.13)	0.013*** (2.72)	0.009* (1.85)
<i>MTB</i>	0.014**	-0.005	-0.002	0.001	0.004	0.003

	2004	2005	2006	2007	2008	2009
Intercept	(1.96) −0.504*** (−3.67)	(−0.57) −0.145 (−1.08)	(−0.33) −0.272** (−2.28)	(0.56) −0.235** (−2.12)	(0.83) −0.202** (−2.00)	(1.42) −0.143 (−1.40)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	829	852	866	944	1010	1003
Adj. <i>R</i> -sq.	0.069	0.043	0.043	0.029	0.046	0.037
<i>F</i>	5.745	3.698	3.808	3.042	4.009	3.156
<i>Panel C: Normal related party sales</i>						
<i>Lev</i>	−0.151*** (−3.48)	−0.123*** (−3.31)	−0.059* (−1.69)	−0.095*** (−2.67)	−0.086*** (−2.67)	−0.041 (−1.29)
<i>Size</i>	0.025*** (3.14)	0.009 (1.35)	−0.001 (−0.21)	0.007 (1.30)	0.001 (0.10)	−0.003 (−0.56)
<i>MTB</i>	0.020* (1.91)	0.007 (0.87)	−0.003 (−0.51)	0.005* (1.75)	0.005 (1.07)	0.006** (2.20)
Intercept	−0.347** (−2.04)	−0.069 (−0.46)	0.138 (1.07)	−0.037 (−0.31)	0.079 (0.70)	0.117 (1.02)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	782	808	836	915	979	977
Adj. <i>R</i> -sq.	0.029	0.080	0.057	0.026	0.035	0.050
<i>F</i>	2.813	5.990	4.616	2.769	3.241	3.878

* Statistically significant at the 10% level (two-tailed).

** Statistically significant at the 5% level (two-tailed).

*** Statistically significant at the 1% level (two-tailed).

Appendix B. Correlation analysis

	<i>NRPT</i>	<i>ROA</i>	<i>ROE</i>	<i>ROS</i>
<i>Panel A: Normal RPTs and firm performance</i>				
<i>NRPT</i>	1.000			
<i>ROA</i>	0.142***	1.000		
<i>ROE</i>	0.068***	0.367***	1.000	
<i>ROS</i>	0.030***	0.408***	0.154***	1.000
	<i>AbRPT</i>	<i>ROA</i>	<i>ROE</i>	<i>ROS</i>
<i>Panel B: Abnormal RPTs and firm performance</i>				
<i>AbRPT</i>	1.000			
<i>ROA</i>	−0.046***	1.000		
<i>ROE</i>	−0.075***	0.367***	1.000	
<i>ROS</i>	−0.061***	0.408***	0.154***	1.000

* Statistically significant at the 10% level (two-tailed).

** Statistically significant at the 5% level (two-tailed).

*** Statistically significant at the 1% level (two-tailed).

References

- Aghion, P., Griffith, R., Howitt, P., 2006. Vertical integration and competition. *American Economic Review Papers and Proceedings* 96 (2), 97–102.

- Bertrand, M., Mehta, P., Mullainathan, S., 2002. Ferreting out tunneling: an application to Indian business groups. *Quarterly Journal of Economics* 117, 121–148.
- Chang, S.J., Hong, J., 2000. Economic performance of group-affiliated companies in Korea: intragroup resources sharing and internal business transaction. *Academy of Management Journal* 43 (3), 429–448.
- Cheung, Y.L., Rau, P.R., Stouraitis, A., 2006. Tunneling, propping, and expropriation: evidence from connected party transactions in Hong Kong. *Journal of Financial Economics* 82 (2), 287–322.
- Chhaochharia, Y., Grinstein, Y., Grullon, G., Michaely, R., 2012. Product Market Competition and Internal Governance: Evidence from the Sarbanes Oxley Act. Working Paper.
- Curry, B., George, K.D., 1983. Industrial concentration: a survey. *The Journal of Industrial Economics* 31 (3), 203–256.
- Giroud, X., Mueller, H., 2011. Corporate governance, product market competition, and equity prices. *Journal of Finance* 66 (2), 563–600.
- Hart, Oliver D., 1983. The market mechanism as an incentive scheme. *Bell Journal of Economics* 14, 366–382.
- Haushalter, D., Klasa, S., Maxwell, W.F., 2007. The influence of product market dynamics on a firm's cash holdings and hedging behavior. *Journal of Financial Economics* 84, 797–825.
- Hong, J.Q., Xue, H., 2008. Effect of counter-balance toward the largest shareholder on the amount of related party transactions and the consistence of related party sales. *Nankai Business Review* 1, 24–30 (in Chinese).
- Jian, M., Wong, T.J., 2010. Propping through related party transactions. *Review of Accounting Studies* 15 (1), 70–105.
- Karuna, C., 2007. Industry product market competition and managerial incentives. *Journal of Accounting and Economics* 43, 275–298.
- Karuna, C., 2010. Industry Product Market Competition and Internal Corporate Governance. Working Paper.
- Khanna, T., Palepu, K., 1997. Why focused strategy may be wrong in emerging markets. *Harvard Business Review* 75 (4), 41–51.
- Khanna, T., Palepu, K., 2000. Is group affiliation profitable in emerging markets? An analysis of diversified Indian business groups. *Journal of Finance* 55 (2), 867–892.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., 1999. Corporate ownership around the world. *Journal of Finance* 54, 471–517.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R., 2002. Investor protection and corporate valuation. *Journal of Finance* 57, 1147–1170.
- Li, X., 2010. The impacts of product market competition on the quantity and quality of voluntary disclosures. *Review of Accounting Studies* 15 (3), 663–711.
- Lin, C., Ma, Y., Malatesta, P., Xuan, Y., 2011. Ownership structure and the cost of corporate borrowing. *Journal of Financial Economics* 100, 1–23.
- Lins, K., 2003. Equity ownership and firm value in emerging markets. *Journal of Financial and Quantitative Analysis* 38, 159–184.
- Liu, J.M., Liu, X., 2007. The empirical research on the relationship between related party transactions and internal corporate governance of listed companies. *China Soft Science* 1, 79–89 (in Chinese).
- Liu, J.H., Wei, M.H., Zheng, G.J., 2008. The interested-party investment controlled by controlling shareholders: enhancing efficiency or transferring resources. *Management World* 3, 133–141 (in Chinese).
- Ma, J.C., Wang, L., 2009. The game of tunneling and propping from cluster controller: evidence from Fu-Shing business group. *Management World* 12, 150–163 (in Chinese).
- Nickell, S., 1996. Competition and corporate performance. *Journal of Political Economy* 104, 724–746.
- Petersen, M.A., 2009. Estimating standard errors in finance panel data sets: comparing approaches. *Review of Financial Studies* 22, 435–480.
- Raith, Michael, 2003. Competition, risk, and managerial incentives. *American Economic Review* 93, 1425–1436.
- Schmidt, Klaus M., 1997. Managerial incentives and product market competition. *Review of Economic Studies* 64, 191–213.
- Shleifer, A., Vishny, R.W., 1986. Large shareholders and corporate control. *Journal of Political Economy* 94, 461–488.
- Shleifer, A., Vishny, R.W., 1997. A survey of corporate governance. *The Journal of Finance* 52 (2), 737–783.
- Tong, Y., Wang, H.C., 2007. Related party transactions, benefits of control and earnings quality. *Accounting Research* 4, 75–82 (in Chinese).
- Williamson, O., 1975. *Markets and Hierarchies*. Free Press, New York.
- Williamson, O., 1985. *The Economic Institutions of Capitalism*. Free Press, New York.
- Yeh, Y.H., Shu, P.G., Su, Y.H., 2012. Related-party transactions and corporate governance: the evidence from the Taiwan stock market. *Pacific-Basin Finance Journal* 20, 755–776.
- Zheng, G.J., Wei, M.H., Kong, D.M., 2007. The larger shareholder's internal market and value of a listed firm: an empirical test of the efficiency and tunneling theories. *China Accounting and Finance Review* 9 (4), 1–41 (in Chinese).



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Is refinancing solely motivated by misappropriation?

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ABSTRACT

Misappropriation has become the accepted explanation for the refinancing behavior of Chinese listed companies, although the evidence in support of such an explanation is worthy of further discussion. We argue that if a planned refinancing exercise does not become a reality, post-refinancing performance depends on the initial motivation for refinancing, i.e. misappropriation or the maximization of firm value. The success and failure samples provided by the approval system of the Chinese securities market provide us with a natural laboratory in which to distinguish between these two possible motivations for the refinancing behavior of Chinese listed firms. The results show the post-refinancing performance of firms in the success sample to be significantly better than the performance in the failure sample, with the difference even more significant when larger agency costs or more financial constraints exist. These findings indicate that Chinese listed companies do not engage in refinancing for misappropriation purposes alone. Rather, refinancing is more likely to be a rational choice made in full consideration of the costs and benefits. This paper provides new ideas for reexamining the motivations for the refinancing behavior of China's listed firms. It also has one major policy implication. That is, relaxing and/or simplifying the country's refinancing regulations could help to improve the efficiency of resource allocation in the Chinese securities market.

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1. Introduction

The literature provides impressive evidence to show that no matter whether a company issues new shares (Loughran and Ritter, 1995) or convertible preferred stocks (Abhyankar and Ho, 2006), or uses convertible bonds (Lee and Loughran, 1998; Lewis et al., 2001), its post-refinancing performance is significantly inferior to that of firms that undergo no refinancing. In China, researchers have drawn a similar conclusion based on the underperformance of refinanced companies in a share-rationing scenario (Du and Wang, 2006). In China's special institutional environment, which is characterized by large shareholder control, and the particular path by which companies gain listing status, researchers have further deduced that misappropriation is the major motivation for the refinancing behavior of Chinese listed firms (Li and Song, 2003).

Such a conclusion has very important social consequences. Misappropriation has become the accepted explanation for the refinancing behavior of Chinese listed companies. However, drawing this conclusion based merely on the underperformance of post-refinancing behavior is somewhat crude and worthy of further discussion. Admittedly, misappropriation-oriented refinancing behavior results in a large amount of idle funds, which increases the probability that a company will make inefficient investments and engage in tunneling, thereby leading to underperformance after refinancing. However, it is worth noting that non-misappropriation-oriented refinancing behavior can also lead to underperformance. For example, according to pecking order theory, in the face of financing demands, companies will initially use internal funds and then consider external financing (Myers and Majluf, 1984). Spiegel and Tookes (2008) report that companies will first choose internal or private financing to engage in innovative projects with high profit potential and leave less innovative and less profitable projects for public refinancing. Put differently, prior to refinancing, a company's profitability has reached the peak of its particular commercial stage. As a result, even if companies devote all outside funds to projects with a positive net present value, their profitability is bound to decrease after refinancing (Clementi, 2002; Spiegel and Tookes, 2008).

Therefore, new research ideas are needed to help us to distinguish between possible motivations for the refinancing behavior of Chinese listed companies. It is noted in this paper that if planned refinancing does not become a reality, post-refinancing performance depends on the initial motivation for refinancing, i.e. misappropriation or the maximization of firm value. If a company refinances for misappropriation purposes alone, it is clearly not pursuing shareholder wealth maximization. Thus, if other conditions remain unchanged, then the company's performance would surely have been better if refinancing had not taken place. If, in contrast, the purpose of refinancing is to maximize firm value, then the company's performance would surely weaken if it did not undertake refinancing.

Unfortunately, there are no companies in which a planned refinancing exercise both succeeds and fails, meaning that it is impossible to know precisely what performance a company would exhibit if it did or did not refinance. However, the refinancing approval system in China offers us a unique research opportunity. Under the terms of the system, a company cannot proceed with refinancing, even if it is qualified to do so and a general meeting of shareholders has voted in favor, until it has gained approval from the China Securities Regulatory Commission (CSRC). However, companies must wait a long time for the CSRC's approval (Cheung et al., 2009). During the long waiting period, many companies abandon their refinancing plans for such exogenous reasons as changes in national financing policies, the implementation environment for the planned fund-raising project and the target market environment. Thus, the CSRC approval system works as an exogenous force dividing qualified companies with refinancing intentions into two samples: a success sample and a failure sample. The firms in the two samples are similar in a number of important respects, such as performance, motivation and refinancing methods. In other words, failed companies are the same as successful companies apart from their failure to gain the CSRC's approval for refinancing.

This setting provides us with a natural laboratory in which to distinguish Chinese listed companies' motivations for refinancing behavior. Because the expectations for a firm's post-refinancing performance are highly dependent on its motivation for refinancing, we can judge whether that motivation is misappropriation by comparing the subsequent performance of successful and failed companies. More specifically, if the post-refinancing performance of successful companies is significantly inferior to that of failed companies, then non-refinancing improves their performance and we can infer that their main purpose in refinancing was to

engage in misappropriation. If, in contrast, the post-refinancing performance of the success sample is significantly better than that of the failure sample, then non-refinancing weakens firm performance. If this is indeed the case, then the implication is that Chinese listed firms do not engage in refinancing behavior for misappropriation purposes alone. Rather, such behavior is more likely to be a rational choice made in full consideration of the costs and benefits.

Using data from the Chinese A-share market during the 1998–2011 period, we show that Chinese listed companies' refinancing behavior cannot be explained by misappropriation alone. We find that in the 3 years following a refinancing exercise, the performance of firms in the success sample is significantly better than that of firms in the failure sample. The results remain robust to the use of various performance indicators, controlling for the potential influence of corporate governance and the possible omission of variables, shortening the comparison period and removing the possible influence of earnings management. In addition, a further test shows that companies with lower agency costs and larger financing constraints display greater post-refinancing performance differences. These results indicate that on the whole, Chinese listed firms do not engage in refinancing behavior solely for misappropriation purposes. Rather, refinancing appears to be a rational decision made in full consideration of the costs and benefits.

This paper's contributions lie in two major areas. First, the paper offers new research ideas that allow fresh judgment of the proposition that the refinancing behavior of Chinese listed companies can be explained by misappropriation alone. We argue that post-refinancing performance is highly dependent on the initial motivation for refinancing. The natural laboratory provided by China's refinancing approval system allows us to obtain evidence to show that the country's listed firms do not engage in refinancing behavior solely for reasons of misappropriation. We believe that the findings of this paper offer a new perspective on, and a deeper and more comprehensive understanding of, companies' refinancing behavior. We also resolve some of the endogenous self-selection problems suffered by earlier refinancing studies (Stulz, 1990; Li and Zhao, 2006).

Second, the paper offers solutions to the "refinancing puzzle" that has long been the subject of heated debate in finance research (Loughran and Ritter, 1995; Allen and Soucik, 2008). Traditional explanations, such as the window of opportunity, free cash flow and earnings management hypotheses, are all based on shareholder–manager/principal-agent theory, which are grounded in Berle and Means (1932) well-known supposition that the separation of control and management rights is strongly enforced in modern companies, a supposition that Holderness (2009) has questioned. New theoretical research shows that the refinancing puzzle is probably the result of rational decisions made by devoted managers (Clementi, 2002; Spiegel and Tookes, 2008) and empirical research carried out in the United States has provided evidence in support of this argument (Chemmanur et al., 2010). In this paper, we show that the refinancing behavior of Chinese listed companies is likely to be a rational choice made in full consideration of the costs and benefits, thus offering further support for the foregoing argument backed up by empirical evidence from the world's largest emerging market and transitional economy.

The remainder of this paper is organized as follows. Section 2 describes the research design and Section 3 reports and analyzes the empirical results. Section 4 considers and tests alternative explanations. Section 5 examines the relationship between agency costs and financial constraints and cross-sectional differences in performance to provide further evidence for our inferences. Section 6 offers concluding remarks, including a discussion of the paper's policy implications.

2. Research design

2.1. Sample selection and data sources

Our original sample includes all companies on the Chinese A-share market that intended to refinance and whose refinancing projects had received a vote of approval in general meetings of shareholders during the 1998–2008 period. As our regression analysis requires the use of data for the three-year period after refinancing, our research period covers the 13 years from 1998 to 2011. The following screening procedures were performed sequentially. We first removed companies belonging to the financial industry. Then, to eliminate the potential effects of two adjacent refinancing projects, we also removed companies that formulated a second

refinancing plan within 3 years of an initial successful or failed refinancing plan. To construct a panel data set, we further required that there be no necessary data missing for each observation for the 3 years following a successful or failed refinancing attempt. The final sample used in the regression analysis includes 454 firms, 296 in the refinancing success sample and 158 in the failed sample, over 3 years, for a total of 1362 firm-year observations. To minimize the influence of outliers, we winsorized all continuous variables at the top and bottom 1% levels.

Information on the sample companies' refinancing plans and implementation was obtained from the WIND database, and all other data was obtained from the China Securities Market and Accounting Research (CSMAR) database. In the case of any questionable data, we relied on the China Center for Economic Research (CCER), WIND and CSMAR databases for cross-checking.

2.2. Models and variable definitions

We adopt 3 years post-refinancing as our comparison benchmark and use the following basic regression model, Model (1), to investigate the differences in performance between the success and failure samples.

$$\text{Perf} = \alpha_0 + \alpha_1 * \text{Suc} + \alpha_j * \sum \text{Control}_{i,t} + \text{fixed effects} + \zeta \quad (1)$$

where Perf stands for firm performance, which we measure by net income on sales, assets and equity. To minimize the influence of extraordinary item manipulation, we also adopt return on sales, assets and equity as indicators of firm performance. The key explanatory variable in Model (1), Suc, is a dummy used to divide the sample. It takes a value of 1 if the firm belongs to the success sample, and 0 otherwise. Our main concern is the sign and statistical significance of Suc's estimation coefficient, α_1 . In line with our discussion in the introduction, if α_1 is significantly negative, the implication is that companies refinance primarily for misappropriation. If α_1 is significantly positive, company refinancing behavior is unlikely to be for misappropriation purposes alone, but instead a rational choice made in full consideration of the costs and benefits.

In addition, factors such as firm size, risk and growth are likely to affect both a company's performance and its refinancing behavior. We thus control for these factors, following Chen et al. (2007). Size is measured by the natural logarithm of a company's total assets, growth by the growth rate of sales revenue and risk by the annual beta coefficient calculated by the Shanghai and Shenzhen stock exchanges. Finally, we also control for fixed year and industry effects and, in line with Petersen (2009) suggestion, take advantage of a modified cluster approach to control for the possible time effects resulting from the cross-sectional correlation of the observations from different years in the same sample. The definitions of the main variables in Model (1) are presented in Table 1.

Table 1
Variable definitions.

Variable name	Definition
ROS	Net income on sales
adj_ROS	Return on sales
ROA	Net income on assets
adj_ROA	Return on assets
ROE	Net income on equity
adj_ROE	Return on equity
Suc	=1 if the firm belongs to the success sample, and 0 otherwise
Size	Natural logarithm of total assets at the end of the year
Risk	Annual beta coefficient calculated by the Shanghai and Shenzhen stock exchanges
Grow	Growth rate of sales revenue

3. Empirical results

3.1. Descriptive statistics

Table 2 presents the descriptive statistics. Panel A reports the descriptive features of the main variables. The differences between the mean and median values are small for all variables, which indicates that the outlier problem was largely resolved through winsorization. Judging from the standard deviations, the greatest variation is in size and growth, with the six performance indicators varying slightly, which indicate that although the sample companies display considerable differences in size and growth, they share important similarities in terms of performance. Panel B is the correlation coefficient matrix. Both the Pearson and Spearman correlation coefficients show the six performance indicators to have a significant positive correlation with Suc. It can thus be preliminarily concluded that the performance of the success sample firms is significantly better than that of those in the failure sample in the 3 years after refinancing, which indicates that misappropriation is not the sole reason for refinancing.

3.2. Regression analysis

Table 3 reports the regression results for the basic model, Model (1). Net income on sales, net income on assets, net income on equity, return on sales, return on assets and return on equity are used as the dependent variables describing firm performance in regressions (1)–(6). Although we adopt six different proxies for performance, the ordinary least squares (OLSs) results are almost the same, which indicates that our analysis is relatively robust. In Table 3, Suc, the dummy variable used to divide the sample, is significantly positive, which again shows that the performance of the successful firms is superior to that of their failed counterparts in the 3 years after refinancing. Hence, our regression results show that companies' refinancing behavior is not

Table 2
Descriptive statistics.

Variable	N	Mean	Median	Standard deviation			
<i>Panel A: Descriptive features</i>							
ROS	1362	0.0667	0.0578	0.1800			
adj_ROS	1362	0.0734	0.0649	0.1770			
ROA	1362	0.0311	0.0297	0.0552			
adj_ROA	1362	0.0362	0.0336	0.0605			
ROE	1362	0.0584	0.0620	0.1300			
adj_ROE	1362	0.0711	0.0704	0.1320			
Suc	1362	0.6520	1.0000	0.4760			
Size	1362	21.5500	21.4300	0.9800			
Risk	1362	0.9990	1.0300	0.2190			
Grow	1362	0.2870	0.1510	0.7690			
	ROS	adj_ROS	ROA	adj_ROA	ROE	adj_ROE	Suc
<i>Panel B: Correlation coefficient matrix</i>							
ROS		0.9258***	0.7895***	0.6941***	0.6149***	0.5850***	0.1369***
adj_ROS	0.9375***		0.7544***	0.7828***	0.6349***	0.6180***	0.1418***
ROA	0.7910***	0.7584***		0.9290***	0.7654***	0.7531***	0.1315***
adj_ROA	0.7316***	0.8060***	0.9398***		0.7528***	0.7777***	0.1405***
ROE	0.6674***	0.6597***	0.8838***	0.8492***		0.8579***	0.0826***
adj_ROE	0.6287***	0.6865***	0.8411***	0.8876***	0.9254***		0.0698**
Suc	0.1690***	0.1692***	0.1362***	0.1392***	0.0604**	0.0496*	

In the correlation coefficient matrix, the upper triangular matrix presents Pearson correlation coefficients and the lower triangular matrix presents Spearman correlation coefficients.

* Significance at 10% level.

** Significance at 5% level.

*** Significance at 1% level.

Table 3
Performance comparison of successful and failed refinancing companies.

	(1) ROS	(2) adj_ROS	(3) ROA	(4) adj_ROA	(5) ROE	(6) adj_ROE
Suc	0.0586*** (0.000)	0.0507*** (0.000)	0.0162*** (0.000)	0.0163*** (0.001)	0.0243*** (0.009)	0.0206** (0.047)
Size	0.0114 (0.106)	0.0220*** (0.003)	0.0054** (0.024)	0.0089*** (0.001)	0.0214*** (0.000)	0.0221*** (0.000)
Grow	0.0380*** (0.000)	0.0322*** (0.000)	0.0111*** (0.000)	0.0124*** (0.000)	0.0277*** (0.000)	0.0276*** (0.000)
Risk	-0.1055*** (0.000)	-0.1019*** (0.000)	-0.0635*** (0.000)	-0.0661*** (0.000)	-0.0997*** (0.000)	-0.1319*** (0.000)
Constant	-0.1052 (0.455)	-0.3498** (0.022)	-0.0385 (0.431)	-0.1232** (0.029)	-0.3400*** (0.002)	-0.3550*** (0.001)
Year	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Industry	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
N	1362	1362	1362	1362	1362	1362
adj. R ²	0.127	0.129	0.155	0.164	0.140	0.165

All of the continuous variables are winsorized at the top and bottom 1% levels, and both White's heteroskedasticity-robust procedure and the cluster correction method are used. No collinearity problems are observed.

* Significance at 10% level.

** Significance at 5% level.

*** Significance at 1% level.

motivated by misappropriation alone, but is more likely to be a rational choice made in full consideration of the costs and benefits.

Although the results in Table 3 show the performance of the success sample to be significantly better than that of the failure sample in the three-year period following refinancing, this superior performance may merely be the result of the more established corporate governance enjoyed by the firms in this sample. To eliminate this possibility, we also take the effects of corporate governance into consideration. We add the ownership properties of the ultimate controlling shareholder, ownership concentration, board independence and chairman-CEO duality as variables in Model (1), and repeat the analysis. Table 4 presents the regression results. It shows that after controlling for these corporate governance variables, there is no substantive change in the results of the previous tests. Suc remains significantly positive in all six regressions.

In the Tables 3 and 4 tests, net income on sales, net income on assets, net income on equity, return on sales, return on assets and return on equity, which we adopt to describe firm performance, are all traditional measures with a common defect. That is, they neglect the cost of equity capital and thus they may fail to measure exactly how much value a company creates for its shareholders. The economic value added (EVA) method addresses this defect to some extent. Because the EVA method calculates gains with all capital costs eliminated, it is more likely than other methods to reflect how much value a company creates for its shareholders. In fact, since Stern et al. (1995) first proposed the EVA method, it has become the most popular mixed-performance measurement tool (Richard et al., 2009). Accordingly, we also use EVA as a performance proxy to implement our robustness test. EVA equals a company's net operating income before interest and after taxes minus the product of its debt plus its market value and weighted average cost of capital (WACC). In calculating a firm's WACC, we use the capital asset pricing model (CAPM) to obtain its cost of equity capital. Finally, we use the absolute value of EVA thus calculated divided by a company's total assets, annual sales revenue and equity, thereby obtaining the EVA on assets (eva_{oa}), sales (eva_{os}) and equity (eva_{oe}).

We then use eva_{oa}, eva_{os} and eva_{oe} as dependent variables to conduct robustness tests, the results of which are presented in Table 5. Regressions (1), (2) and (3) repeat the tests of the basic regression model, Model (1), and regressions (4), (5) and (6) control for the effects of corporate governance. As we can see from Table 5, when we use EVA to measure firm performance, the key explanatory variable, Suc, is still significantly greater

Table 4
Controlling the influence of corporate Governance.

	(1) ROS	(2) adj_ROS	(3) ROA	(4) adj_ROA	(5) ROE	(6) adj_ROE
Suc	0.0611*** (0.000)	0.0497*** (0.001)	0.0171*** (0.000)	0.0165*** (0.002)	0.0261*** (0.005)	0.0201* (0.055)
Size	0.0088 (0.258)	0.0223*** (0.006)	0.0045* (0.077)	0.0085*** (0.003)	0.0198*** (0.000)	0.0225*** (0.000)
Grow	0.0329*** (0.001)	0.0267*** (0.000)	0.0089*** (0.000)	0.0100*** (0.000)	0.0223*** (0.000)	0.0217*** (0.000)
Risk	-0.1099*** (0.000)	-0.0992*** (0.001)	-0.0676*** (0.000)	-0.0664*** (0.000)	-0.1013*** (0.000)	-0.1357*** (0.000)
Owner	-0.0232 (0.126)	-0.0246* (0.097)	-0.0142*** (0.002)	-0.0167*** (0.001)	-0.0291*** (0.004)	-0.0393*** (0.000)
Con1	0.0829* (0.052)	0.0939** (0.031)	0.0384*** (0.004)	0.0471*** (0.002)	0.0833*** (0.002)	0.0915*** (0.001)
Did	-0.0764 (0.519)	-0.1299 (0.289)	-0.0403 (0.252)	-0.0509 (0.185)	-0.0263 (0.722)	-0.0794 (0.300)
Dual	0.0139 (0.499)	0.0227 (0.292)	0.0040 (0.526)	0.0063 (0.408)	-0.0027 (0.836)	0.0013 (0.922)
Constant	-0.0349 (0.835)	-0.3945** (0.028)	-0.0122 (0.820)	-0.1316** (0.033)	-0.2784** (0.029)	-0.3385*** (0.008)
Year	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Industry	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
N	1041	1041	1041	1041	1041	1041
adj. R ²	0.149	0.155	0.179	0.190	0.150	0.187

In this table, owner stands for the ownership properties of the ultimate controlling shareholder. It takes a value of 1 if the sample firm belongs to a state-owned enterprise (SOE), and 0 otherwise. Con1 stands for ownership concentration and is measured by the ownership percentage held by the top shareholder. Did represents board independence and is equal to the proportion of independent directors on the board. Dual depicts chairman-CEO duality and takes a value of 1 if the chairman and CEO are the same person, and 0 otherwise. All continuous variables are winsorized at the top and bottom 1% levels, and both White's heteroskedasticity-robust procedure and the cluster correction method are used. Collinearity problems are not a concern. Because corporate governance data is missing for some firms, the number of observations in the regressions decreases to 1041.

* Significance at 10% level.

** Significance at 5% level.

*** Significance at 1% level.

than zero in all six regressions, which indicates that the efficiency of the successful firms' value-creation is also superior to that of their failed counterparts in the post-refinancing period.

Although we control for the influence of corporate governance in the tests reported in Tables 4 and 5, the omitted variable problem may still exist. To reduce these concerns, we also use the panel regression method to reduce estimation and testing problems (Bhattacharya et al., 2003). Table 6 presents the panel regression results. Because there was no change in the value of Suc, the key explanatory variable, during the research period, we use random effects in the panel regressions. It can be seen from Table 6 that the estimation coefficient of Suc remains significantly positive in all six regressions. This finding indicates that the omitted variable problem has little influence on the regression results and further proves our conclusion that the post-refinancing performance of the success sample is significantly better than that of the failure sample.

Finally, we also change the criteria for the comparison period. In the previous tests, we compare the sample companies' performance in the 3 years following a successful or failed refinancing attempt. If this comparison period is too long, the test results may contain too much noise. To alleviate such fears, we reduce the comparison period to 2 years and 1 year after refinancing and re-implement the Model (1) test. Table 7 reports the results. Regressions (1)–(3) are based on a two-year comparison period, and regressions (4)–(6) on a one-year comparison. Table 7 shows that a reduction in the comparison period has no effect on the results. Suc remains significantly positive in all six regressions, which indicates that our conclusion concerning the superior performance of the success sample is not dependent on the length of the comparison period.

Table 5
EVA as a measure of firm performance.

	(1) evaoa	(2) evaos	(3) evaoe	(4) evaoa	(5) evaos	(6) evaoe
Suc	0.0157*** (0.001)	0.0596*** (0.000)	0.0196** (0.038)	0.0167*** (0.000)	0.0625*** (0.000)	0.0216** (0.025)
Size	0.0064** (0.010)	0.0142* (0.056)	0.0218*** (0.000)	0.0054** (0.035)	0.0114 (0.159)	0.0206*** (0.001)
Grow	0.0113*** (0.000)	0.0400*** (0.000)	0.0294*** (0.000)	0.0090*** (0.000)	0.0347*** (0.001)	0.0239*** (0.000)
Risk	-0.0622*** (0.000)	-0.1018*** (0.001)	-0.1006*** (0.000)	-0.0662*** (0.000)	-0.1053*** (0.002)	-0.1021*** (0.000)
Owner				-0.0136*** (0.004)	-0.0200 (0.200)	-0.0297*** (0.004)
Con1				0.0365*** (0.008)	0.0776* (0.091)	0.0710*** (0.010)
Did				-0.0454 (0.217)	-0.0864 (0.489)	0.0055 (0.949)
Dual				0.0024 (0.733)	0.0059 (0.802)	-0.0037 (0.789)
Constant	-0.0601 (0.236)	-0.1697 (0.258)	-0.3491*** (0.003)	-0.0369 (0.505)	-0.1079 (0.544)	-0.2923** (0.033)
Year	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Industry	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
N	1362	1362	1362	1041	1041	1041
adj. R ²	0.144	0.123	0.127	0.162	0.139	0.131

All of the continuous variables are winsorized at the top and bottom 1% levels, and both White's heteroskedasticity-robust procedure and the cluster correction method are used. Collinearity problems are not a concern. Because corporate governance data is missing for some firms, the number of observations in regressions (4)–(6) decreases to 1041.

* Significance at 10% level.

** Significance at 5% level.

*** Significance at 1% level.

4. Alternative explanations

4.1. Pre-refinancing performance differences

The requirements of the CSRC approval system stipulate that a listed company may refinance only if its performance reaches a certain threshold. Hence, whether the companies in our sample succeeded or failed in their refinancing approval application, their performance must have reached or exceeded that threshold during the refinancing application period, thereby ensuring their comparability for the purposes of this study. However, if it were instead the case that the firms in the success sample exhibited superior performance to those in the failure sample prior to the refinancing application, then our conclusions would be invalid. To alleviate fears over this alternative explanation, we also carry out tests to screen the firms. On the basis of our original observations, we create panel data to compare the firms' performance in the 3 years before refinancing and rerun the basic regression, Model (1), ensuring that no data are missing for this period. The final sample for this regression contains 3 years of data on 112 successful firms and 111 failed firms, for a total of 669 firm-year observations.

Table 8 reports the results of this robustness test. The dependent variables used in regressions (1)–(6) to describe firm performance are net income on sales, net income on assets, net income on equity, return on sales, return on assets and return on equity, as in the previous tests. Table 8 shows that Suc, the dummy variable used to divide the sample, is not statistically significant in any of the six regressions, which is consistent with our assumption that prior to refinancing, the two types of companies exhibited no significant performance differences. Hence, our previous conclusions are valid.

Table 6
Panel Regressions.

	(1) ROS	(2) adj_ROS	(3) ROA	(4) adj_ROA	(5) ROE	(6) adj_ROE
Suc	0.0622*** (0.000)	0.0472*** (0.001)	0.0169*** (0.000)	0.0151*** (0.003)	0.0257*** (0.006)	0.0194** (0.044)
Size	0.0069 (0.351)	0.0231*** (0.002)	0.0033 (0.166)	0.0083*** (0.001)	0.0196*** (0.000)	0.0217*** (0.000)
Grow	0.0224*** (0.000)	0.0193*** (0.001)	0.0084*** (0.000)	0.0102*** (0.000)	0.0229*** (0.000)	0.0225*** (0.000)
Risk	-0.1099*** (0.000)	-0.0931*** (0.000)	-0.0593*** (0.000)	-0.0536*** (0.000)	-0.0982*** (0.000)	-0.1302*** (0.000)
Owner	-0.0209 (0.129)	-0.0229* (0.094)	-0.0115*** (0.008)	-0.0140*** (0.003)	-0.0280*** (0.003)	-0.0365*** (0.000)
Con1	0.0744* (0.077)	0.1082*** (0.010)	0.0362*** (0.007)	0.0527*** (0.000)	0.0883*** (0.002)	0.0949*** (0.001)
Did	-0.0291 (0.785)	-0.1043 (0.318)	-0.0117 (0.725)	-0.0288 (0.424)	-0.0202 (0.791)	-0.0583 (0.451)
Dual	0.0097 (0.576)	0.0179 (0.291)	0.0022 (0.679)	0.0048 (0.409)	-0.0038 (0.759)	-0.0018 (0.887)
Constant	0.0112 (0.947)	-0.4011** (0.017)	0.0020 (0.971)	-0.1392** (0.018)	-0.2764** (0.014)	-0.3344*** (0.004)
Year	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Industry	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
N	1041	1041	1041	1041	1041	1041
adj. R ²	0.1743	0.1792	0.2007	0.2085	0.1784	0.2139

All continuous variables are winsorized at the top and bottom 1% levels, and both White's heteroskedasticity-robust procedure and the cluster correction method are used. Collinearity problems are not a concern. Because some of the corporate governance data is missing, the number of observations in the regressions decreases to 1041.

* Significance at 10% level.

** Significance at 5% level.

*** Significance at 1% level.

4.2. Pre-refinancing earnings management

Another alternative explanation for our findings is that Chinese regulators are able to discriminate companies characterized by a high level of earnings management from those that legitimately want to refinance (Chen and Yuan, 2004). Accordingly, they can force the former to abandon their refinancing plans. If this is the case, companies with a high level of earnings management are more likely to be included in the failure sample. In addition, the reversal effects of earnings management are certain to lead to a greater decline in performance among these firms, and thus the performance of firms in the success sample would be significantly better in comparison.

To determine the veracity of this alternative explanation, we also investigate the differences in earnings management between the two types of companies in the 3 years prior to refinancing. We use the same sample as that in Section 4.1 and measure earnings management using the basic Jones model and modified KS model, as suggested by Xia (2003). Table 9 presents the results. Regressions (1) and (2) report the OLS results with EMJS and EMKS serving as the dependent variables, referring to earnings management calculated using the basic Jones model and modified KS model, respectively. Regressions (3) and (4) are the Logit regression results. The dependent variable used in these regressions is a dummy variable adopted to show whether a company has adjusted its earnings upward. EMJS_d or EMKS_d equals 1 if EMJS or EMKS is greater than zero, and 0 otherwise. The results show that Suc lacks statistical significance in all four regressions, indicating that there was no significant difference in earnings management between the two types of firms in the pre-refinancing period. Compared with their successful counterparts, the failed firms exhibit neither greater upward adjustments in earnings nor any greater ability to engage in such adjustments. Hence, this alternative

Table 7
Reduction in comparison period.

	Two years after successful or failed refinancing			One year after successful or failed refinancing		
	(1) ROS	(2) ROA	(3) ROE	(4) ROS	(5) ROA	(6) ROE
Suc	0.0636*** (0.000)	0.0188*** (0.000)	0.0363*** (0.002)	0.0863*** (0.000)	0.0251*** (0.000)	0.0487*** (0.008)
Size	0.0096 (0.278)	0.0050* (0.073)	0.0234*** (0.000)	-0.0003 (0.979)	0.0032 (0.375)	0.0239** (0.023)
Grow	0.0490*** (0.000)	0.0147*** (0.000)	0.0348*** (0.000)	0.0579*** (0.000)	0.0139*** (0.000)	0.0337*** (0.000)
Risk	-0.0855*** (0.005)	-0.0540*** (0.000)	-0.0624*** (0.003)	-0.0622 (0.116)	-0.0499*** (0.000)	-0.0270 (0.418)
Constant	-0.0849 (0.637)	-0.0400 (0.485)	-0.4218*** (0.003)	-0.0141 (0.958)	-0.0230 (0.775)	-0.4974** (0.031)
Year	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Industry	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
<i>N</i>	908	908	908	454	454	454
adj. <i>R</i> ²	0.148	0.160	0.129	0.167	0.157	0.123

All continuous variables are winsorized at the top and bottom 1% levels, and both White's heteroskedasticity-robust procedure and the cluster correction method are used. No collinearity problems are observed.

* Significance at 10% level.

** Significance at 5% level.

*** Significance at 1% level.

Table 8
Pre-refinancing performance differences.

	(1) ROS	(2) adj_ROS	(3) ROA	(4) adj_ROA	(5) ROE	(6) adj_ROE
Suc	0.0062 (0.786)	0.0160 (0.434)	0.0028 (0.815)	0.0085 (0.366)	0.0360 (0.202)	0.0336 (0.163)
Size	0.0299 (0.113)	0.0255* (0.094)	0.0157 (0.213)	0.0124 (0.165)	0.0305* (0.082)	0.0386*** (0.010)
Grow	0.0112 (0.243)	0.0073 (0.377)	0.0104* (0.086)	0.0084* (0.071)	0.0258** (0.049)	0.0233** (0.031)
Risk	-0.1255** (0.011)	-0.1182*** (0.004)	-0.0684** (0.021)	-0.0662*** (0.002)	-0.1519** (0.020)	-0.1401** (0.010)
Constant	-0.3139 (0.388)	-0.2512 (0.408)	-0.1832 (0.422)	-0.1291 (0.435)	-0.3864 (0.270)	-0.5824* (0.051)
Year	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Industry	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
<i>N</i>	669	669	669	669	669	669
adj. <i>R</i> ²	0.115	0.166	0.050	0.099	0.004	0.026

All continuous variables are winsorized at the top and bottom 1% levels, and both White's heteroskedasticity-robust procedure and the cluster correction method are used. No collinearity problems are observed.

* Significance at 10% level.

** Significance at 5% level.

*** Significance at 1% level.

hypothesis does not provide a good explanation for our empirical results. In other words, the paper's conclusions are not substantively troubled by this explanation.

Table 9
Pre-refinancing earnings management.

	(1) EMJS	(2) EMKS	(3) EMJS_d	(4) EMKS_d
Suc	−0.0006 (0.951)	0.0190 (0.216)	0.1401 (0.491)	0.1847 (0.392)
Size	−0.0010 (0.875)	−0.0023 (0.794)	0.0118 (0.923)	0.0432 (0.733)
Grow	−0.0040 (0.698)	−0.0092 (0.433)	−0.1516 (0.165)	−0.0864 (0.254)
Risk	−0.0115 (0.686)	−0.0111 (0.773)	0.2630 (0.529)	0.4997 (0.258)
Constant	0.1043 (0.465)	0.1190 (0.542)	1.2005 (0.650)	0.1401 (0.959)
Year	Controlled	Controlled	Controlled	Controlled
Industry	Controlled	Controlled	Controlled	Controlled
<i>N</i>	669	669	669	669
adj./Pseudo <i>R</i> ²	0.070	0.108	0.0569	0.0734

All continuous variables are winsorized at the top and bottom 1% levels, and both White's heteroskedasticity-robust procedure and the cluster correction method are used. Collinearity problems are not a concern.

* Significance at 10% level.

** Significance at 5% level.

*** Significance at 1% level.

5. Further tests: cross-sectional performance comparison

The results of the tests reported in the previous section validate our main finding that the post-refinancing performance of firms in the success sample is significantly better than that of those in the failure sample, thus supporting our conclusion that the refinancing behavior of Chinese listed companies is not motivated by misappropriation alone, but is most likely a rational choice made in full consideration of the costs and benefits. If this conclusion is indeed valid, then any cross-sectional differences in performance should be related to agency costs and financial constraints prior to the implementation of refinancing. A company with low agency costs is more likely to make use of an optimal financing opportunity and thus the benefits or losses associated with whether its refinancing behavior becomes a reality should be much greater. At the same time, the more financially constrained a firm is, the greater its financing demands. Hence, regardless of whether its refinancing initiative is successful, the associated benefits or losses will be much greater. Following this line of thought, we predict that if the refinancing behavior of Chinese listed companies is more inclined to be a rational choice made after balancing the costs and benefits than it is to be a bid for misappropriation, then lower agency costs or greater financial constraints should result in greater cross-sectional differences in performance.

To test this prediction and provide further support for our findings, we build the following regression model, Model (2), based on basic regression model (1) to determine the influence of agency costs and financial constraints on cross-sectional differences in performance.

$$\text{Perf} = \beta_0 + \beta_1 * \text{Suc} + \beta_2 * \text{acost}(\text{fc}) + \beta_3 * \text{Suc} * \text{acost}(\text{fc}) + \beta_j * \sum \text{Control}_{i,t} + \text{fixed effects} + \eta \quad (2)$$

where *acost* represents agency costs and *fc* represents financial constraints, both using data for the year prior to refinancing (whether a success or failure). We consider agency costs by the extent to which a company has been tunneled and, following Jiang et al. (2010), we calculate it as other receivables divided by tradable market capitalization at the end of the year. With regard to financial constraints, prior research has demonstrated that in China, the longer a company has been established, the greater the financial constraints that it faces, with private firms facing greater financial constraints than SOEs (Wang, 2009). We thus first adopt the age of the company and the ownership properties of the ultimate controlling shareholder as two single variables to depict the level of financial constraint a company faces prior to a refinancing initiative. At the same time, to overcome the inherent defects of these two single variables, we also calculate the widely used KZ index to

illustrate the financial constraints that a company undergoing refinancing faces (Lamont et al., 2001). We use the following equation to calculate the annual value of the KZ index for the sample firms.

$$KZ = -1.002(CF/K) + 0.283(Q) + 3.139(Debt/Capital) - 39.368(Div/K) - 1.315(Cash/K),$$

where CF represents annual net cash flow; K represents the value of fixed assets at the end of the year; Q is the Tobin's Q ratio; $Debt$ and $Capital$ stand for year-end total liabilities and total equity, respectively; D is the amount of cash dividends paid out; and $Cash$ is the sum of cash and short-term investments. After calculations according to this equation, the higher a company's annual KZ index, the greater the financial constraints it suffers in that year.

Table 10 reports the regression results for Model (2). What we are most concerned with is the sign and statistical significance of β_3 , which is the interaction between Suc and agency costs or financial constraints. The aim of regression (1) is to test the moderating effects of agency costs. As Table 10 shows, an increase in agency costs prior to refinancing leads to a dramatic decrease in the cross-sectional difference between companies with successful and failed refinancing attempts. The regression coefficient of the interaction term is significantly negative at the 5% level, which shows that among companies characterized by lower agency costs, the

Table 10
Cross-sectional differences in performance.

	(1) Perf	(2) Perf	(3) Perf	(4) Perf
Suc	0.0729*** (0.000)	-0.0385 (0.369)	0.0796*** (0.000)	0.0398*** (0.001)
acost	-0.0000 (0.852)			
Suc*acost	-0.0003** (0.028)			
Age		-0.0057** (0.049)		
Suc*age		0.0079** (0.036)		
Owner			0.0050 (0.787)	
Suc*owner			-0.0363* (0.098)	
KZ				-0.0159*** (0.000)
Suc*KZ				0.0068* (0.097)
Size	0.0136* (0.072)	0.0104 (0.134)	0.0132** (0.029)	0.0107* (0.075)
Grow	0.0331*** (0.001)	0.0370*** (0.000)	0.0375*** (0.000)	0.0329*** (0.001)
Risk	-0.1062*** (0.000)	-0.1153*** (0.000)	-0.1052*** (0.000)	-0.0993*** (0.000)
_cons	-0.1274 (0.388)	0.0006 (0.997)	-0.1395 (0.316)	-0.0560 (0.697)
Year	Controlled	Controlled	Controlled	Controlled
Industry	Controlled	Controlled	Controlled	Controlled
N	1332	1362	1362	1332
adj. R ²	0.133	0.133	0.130	0.143

All continuous variables are winsorized at the top and bottom 1% levels, and both White's heteroskedasticity-robust procedure and the cluster correction method are used. Collinearity problems are not a concern. The results in this table use ROS as the dependent variable. Because some data is missing, the number of observations in regressions (1)–(4) decreases to 1332. The use of other performance measures as the dependent variable leads to no substantial changes in our results.

* Significance at 10% level.

** Significance at 5% level.

*** Significance at 1% level.

cross-sectional difference between those with a successful and failed refinancing attempt are more notable. The aims of regressions (2), (3) and (4) are all to test the moderating effects of financial constraints. The results show that increases in age and the KZ index lead to a dramatic rise in the cross-sectional difference between successful and failed firms, whereas the results for SOEs are quite the opposite. There are more remarkable cross-sectional differences between successful and failed firms among those facing greater financial constraints prior to a refinancing application. To sum up, our investigation of the relationship between agency costs/financial constraints and cross-sectional performance differences conforms in full to our previous expectations. This exercise thus provides further empirical support for our supposition that the refinancing behavior of Chinese listed companies is not oriented only toward the benefits of misappropriation.

6. Conclusion

In this paper, we reinvestigate the long-standing assumption that the refinancing behavior of Chinese listed companies is misappropriation-oriented. We argue that firm performance may decline in the wake of refinancing, regardless of whether refinancing took place for the purpose of misappropriation. Hence, it is inappropriate to deduce from such underperformance that misappropriation was the sole purpose of the refinancing exercise. More importantly, it is noted in this paper that if the planned refinancing is not implemented, firms' post-refinancing performance depends on their initial motivation for refinancing, i.e. misappropriation or the maximization of firm value. Although there are no companies that both succeed and fail in refinancing, the Chinese approval system serves as an exogenous force to divide companies with refinancing plans into success and failure samples. Because both types of firms have already met the CSRC's threshold for refinancing eligibility, they share considerable similarities in terms of performance and motivation for and methods of refinancing. Hence, they serve as ideal references for one another. The CSRC approval system thus provides us with a natural laboratory in which to compare the post-refinancing performance of companies that were successful in and failed to achieve their refinancing plans and determine whether those plans were formulated for misappropriation purposes. Our reasoning is as follows. If the post-refinancing performance of the success sample is significantly inferior to that of the failure sample, then non-refinancing improves performance, and thus the planned refinancing must have been motivated by misappropriation alone. If, in contrast, non-refinancing leads to poor firm performance, then the company's motivation for refinancing is unlikely to have been misappropriation, but rather the maximization of firm value. In other words, the decision to refinance was a rational one made in full consideration of the costs and benefits.

Using data from the Chinese A-share market during the 1998–2011 period, this paper demonstrates that the refinancing behavior of Chinese listed companies cannot be explained by misappropriation alone. We find that in the 3 years after a refinancing intention is declared, firms that were successful in their refinancing bids exhibited significantly superior performance to those that failed. This finding remains robust to implementation of a series of tests carried out to ensure its reliability, namely, (1) the adoption of a variety of performance indicators, including EVA; (2) controlling for the effect of corporate governance; (3) using panel regression methodology; and (4) reducing the length of the comparison period. We also consider two alternative explanations for our findings. That is, our findings are the result of pre-refinancing performance differences or differences in pre-refinancing earnings management. The tests of these alternative explanations produce little substantive change in our research results, which indicates that our conclusions are robust. Finally, we also investigate the relationship between agency costs or financial constraints and cross-sectional performance differences. We discover greater performance differences between the success and failure samples for companies with lower agency costs or fewer financial constraints, thus providing further support for our proposition that the refinancing behavior of Chinese listed firms is, on the whole, the result of a rational choice made in full consideration of the costs and benefits, rather than a desire to engage in misappropriation.

The refinancing behavior of Chinese listed companies has long been thought to result from a desire to misappropriate funds, an assumption that has exerted a highly negative influence on the resource redistribution function of China's capital markets. It is unsurprising that refinancing behavior labeled as misappropriation would prompt tougher regulatory supervision and result in higher financing costs. The end result is a waste of regulatory resources and the cancelation of many investment projects that could have created positive firm value, undoubtedly leading to immeasurable economic losses. This paper thus has important policy

implications, as its findings suggest the need for a reassessment of whether the refinancing behavior of Chinese listed companies is motivated by misappropriation alone. We argue here, and our findings demonstrate, that we must distinguish legitimate refinancing from misappropriation and return to an impartial stance when evaluating the refinancing behavior of Chinese listed firms. On this basis, we also argue for loosening of the regulatory requirements governing refinancing in China. Simplification of the CRSC's approval process would further expand the development of China's refinancing markets and improve the efficiency of resource redistribution in its capital markets.

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References

- Abhyankar, A., Ho, K., 2006. Long-run abnormal performance following convertible preference share and convertible bond issues: new evidence from the United Kingdom. *International Review of Economics and Finance* 15, 97–119.
- Allen, D.E., Soucik, V., 2008. Long-run underperformance of seasoned equity offerings: fact or an illusion. *Mathematics and Computers in Simulation* 78, 146–154.
- Berle, A., Means, G., 1932. *The Modern Corporation and Private Property*. MacMillan, New York.
- Bhattacharya, U., Daouk, H., Welker, M., 2003. The world price of earnings opacity. *The Accounting Review* 78, 641–678.
- Chemmanur, T.J., He, S., Nandy, D.K., 2010. The going-public decision and the product market. *Review of Financial Studies* 23, 1855–1908.
- Chen, K.C., Yuan, H., 2004. Earnings management and capital resource allocation: evidence from China's accounting-based regulation of rights issues. *The Accounting Review* 79, 645–665.
- Chen, X., Harford, J., Kai, L., 2007. Monitoring: Which institutions matter? *Journal of Financial Economics* 86, 279–305.
- Cheung, Y.L., Ouyang, Z., Tan, W., 2009. How regulatory changes affect IPO underpricing in China. *China Economic Review* 20, 692–702.
- Clementi, G. L., 2002. IPOs and the growth of firms, SSRN, New York University, Working Paper.
- Du, M., Wang, L.C., 2006. Operating performance of China's listed firms following rights issues: causes and consequences. *Management World* 3, 114–121 (in Chinese).
- Holderness, C.G., 2009. The myth of diffuse ownership in the United States. *Review of Financial Studies* 22, 1377–1408.
- Jiang, G., Lee, C.M.C., Yue, H., 2010. Tunneling through inter-corporate loans: the China experience. *Journal of Financial Economics* 98, 1–20.
- Lamont, O., Polk, C., Saa-Requejo, J., 2001. Financial constraints and stock returns. *Review of Financial Studies* 14, 529–554.
- Lee, I., Loughran, T., 1998. Performance following convertible bond issuance. *Journal of Corporate Finance* 4, 185–207.
- Lewis, M., Rogalski, R.J., Seward, J.K., 2001. The long-run performance of firms that issue convertible debt: an empirical analysis of operating characteristics and analyst forecasts. *Journal of Corporate Finance* 7, 447–474.
- Li, Z.W., Song, Y.H., 2003. Analysis of factors affecting the rights offering decisions. *Economic Science* 3, 59–69 (in Chinese).
- Li, X., Zhao, X., 2006. Propensity score matching and abnormal performance after seasoned equity offerings. *Journal of Empirical Finance* 13, 351–370.
- Loughran, T., Ritter, J.R., 1995. The new issue puzzle. *Journal of Finance* 50, 23–51.
- Myers, S.C., Majluf, N.S., 1984. Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics* 13, 187–221.
- Petersen, M.A., 2009. Estimating standard errors in finance panel data sets: comparing approaches. *Review of Financial Studies* 22, 435–480.
- Richard, P.J., Devinney, T.M., Yip, G.S., Johnson, G., 2009. Measuring organizational performance: towards methodological best practice. *Journal of Management* 35, 718–804.
- Spiegel, M., Tookes, H. 2008. Dynamic competition, innovation and strategic financing, SSRN, Yale University, Working Paper.
- Stern, J.M., Stewart, G.B., Chew, D.R., 1995. The EVA financial management system. *Journal of Applied Corporate Finance* 8, 32–46.
- Stulz, R.M., 1990. Managerial discretion and optimal financing policies. *Journal of Financial Economics* 26, 3–27.
- Wang, Y.C., 2009. Financial constraints, cash holdings and over-investment. *Journal of Financial Research* 7, 121–133 (in Chinese).
- Xia, L.J., 2003. Application of earnings management measuring model in the Chinese stock market. *China Accounting and Finance Review* 5, 97–119.



Corporate governance and audit fees: Evidence from companies listed on the Shanghai Stock Exchange

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ABSTRACT

This study uses data from companies listed on the Shanghai Stock Exchange to investigate the relationship between corporate governance and audit fees. Full sample results reveal a significant negative relationship between corporate governance and audit fees, and subsample results further show that corporate governance's influence on audit fees is affected by corporate growth. The negative relationship between corporate governance and audit fees is economically and statistically significant in sample companies that grew moderately during the sample period, and mixed or insignificant in companies that experienced overly fast or negative growth.

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1. Introduction

China's special audit market has important theoretical and empirical implications for the determinants of audit fees (Zhu and Yu, 2004). Of the various determinants thus far proposed in the literature, corporate governance constitutes a relatively new research topic (Larcker and Richardson, 2004; Cai, 2007). Since the demise of Enron and WorldCom, however, the internal corporate governance of listed companies has become

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a topic of considerable research interest (Liu and Hu, 2006). Auditors themselves have also begun to attach greater importance to evaluations of internal corporate governance. On 15 February 2006, China's Ministry of Finance announced the issuance of new auditing standards. These standards implement a risk-oriented audit approach that attaches importance to the risks associated with a firm's governance structure. Auditing Standard No. 1211 states clearly that auditors must pay attention to the governance structure of the audited entity. However, it remains unclear whether corporate governance has any effect on audit fees and, if it does have such an effect, how it influences audit fees.

There are at least two arguments concerning the relationship between corporate governance and audit fees. The first is informed by substitution theory and the second by signaling theory, and the two lead to different conclusions. Substitution theory posits that the more perfect the internal corporate governance structure of a firm, and hence the lower the agency costs, the fewer risks the audit firm and auditor will encounter and thus the lower the audit fee that will be charged. In other words, an audit is seen as a form of external governance for which effective internal corporate governance may substitute to some degree. Signaling theory argues that managers signal high-level corporate governance to external stakeholders¹ by inviting a more rigorous external audit, which inevitably leads to higher audit fees, i.e., companies with strong corporate governance pay higher audit fees to accounting firms. The mixed empirical evidence reported to date leaves unanswered the question of which theory better explains corporate practice.

Most of the literature on the relationship between corporate governance and audit fees concentrates on one or more aspects of corporate governance, such as ownership, board of director or management characteristics, as proxy variables for corporate governance (Pan, 2008). Although the use of such proxies renders it easy to collect and treat data, it has a number of disadvantages. For example, it introduces the possibility of omitted variables in the models because all corporate governance characteristics are not included. In addition, different characteristics may interact with one another in a manner too complex to identify, thus producing possibly biased results. Finally, as the influence of single characteristics on the level of corporate governance is uncertain, it is doubtful whether a proper corporate governance proxy exists. For example, some scholars believe that CEO duality impairs corporate governance, whereas others take the opposite view. It is thus clear that identifying the relationship between audit fees and corporate governance on the basis of such a proxy is problematic, although a more comprehensive corporate governance variable would mitigate or eliminate such problems to a considerable extent.

The Shanghai Stock Exchange (SSE) introduced the SSE Corporate Governance Sector in 2007, thus offering a good opportunity for a comprehensive investigation of the relationship between corporate governance and audit fees. The listed companies within this sector are subject to greater public scrutiny of their corporate governance structures. After preliminary examination of listed companies' application qualifications, the appraisal working group of the Corporate Governance Sector publishes the application materials of those that qualify on its official website for public appraisal. The overall aim is to involve public investors in the appraisal process and encourage all market participants to pay greater attention to the issue of corporate governance. The SSE also invites professional research institutions to appraise the SSE Corporate Governance Sector and to judge the governance structures of the companies submitting applications. These research institutions include CITIC Securities Co., Ltd., Guotai Junan Securities Co., Ltd., Shenyin & Wanguo Securities Co., Ltd. and Haitong Securities Co., Ltd., among others. Experts and scholars have also been invited to form an Expert Consultative Committee for Appraisal of the Corporate Governance Sector, which meets regularly to discuss the method, process and results of the appraisal process, thus ensuring its objectivity and standardization. This rigorous appraisal process ensures that listed companies undergo comprehensive assessment of their corporate governance level prior to inclusion in the SSE Corporate Governance Sector. As noted, it also makes possible a comprehensive investigation of the relationship between corporate governance and audit fees.

This study uses inclusion in the SSE Corporate Governance Sector as a proxy for corporate governance to empirically investigate the relationship between corporate governance and audit fees after controlling for the

¹ It is obvious that companies will not pay higher audit fees to convey a signal to the market merely for signaling purposes. Rather, such motives as obtaining financing from the market, boosting firm value or reducing financing costs generally explain signaling behavior.

other main factors associated with audit fees. Compared to the proxies used in most of the recent literature, the proxy used here is more comprehensive, authoritative and easily understood, and it is also easily collected. If a relationship between corporate governance and audit fees is confirmed, listed firms may use such confirmation in the future to negotiate audit fees with accounting firms, which is one of the main innovations and contributions of this study.

The focus on risk under the risk-oriented audit approach is likely to lead to interactions between corporate growth and internal governance in listed companies. Companies experiencing overly fast or negative growth are characterized by greater risk (Lang et al., 1996) and their internal corporate governance may suffer an adverse change in stability, thus providing management with the motivation to manage reported earnings. Companies that grow steadily and moderately, in contrast, are often in the maturity stage.² They thus experience a lower degree of risk and their internal corporate governance is relatively stable. Cui et al. (2007) examine the relationship between corporate growth and financial risk and find the probability that a company experiences financial crisis increases dramatically when its growth rate exceeds what the authors call a reasonable growth rate. They also report a significant positive relationship between the probability of financial crisis and excessive growth rates and an insignificant relationship between the probability of financial crisis and the real growth rate of non-excessively growing companies (Cui et al., 2007). In reality, many companies appear to collapse suddenly. Enron and WorldCom in the United States and the Giant Group and Qinchi Alcohol in China are representative examples. In line with the foregoing discussion, this study examines subsamples grouped by corporate growth in addition to the full sample. The full sample reveals a significant negative relationship between corporate governance and audit fees, and the subsample results also show that corporate governance's influence on audit fees is affected by corporate growth. The negative relationship between corporate governance and audit fees is economically and statistically significant in sample companies that grew moderately during the sample period, whereas the relationship is mixed or insignificant for companies that experienced overly fast or negative growth.

The remainder of this paper is organized as follows. Section 2 reviews the literature on audit fees and corporate governance. Section 3 develops the research hypotheses, which are grounded in theoretical analysis. Section 4 describes the data and variables. The full sample and subsample regression results are provided in Sections 5 and 6, respectively. Section 7 reports the result of a sensitivity test and Section 8 concludes the paper.

2. Overview of prior research

2.1. Factors associated with audit fees

Audit fees have been a subject of interest in the auditing literature since the pioneering research of Simunic (1980). Simunic (1980) posits that audit fees are determined by the loss exposure of the auditee, the apportionment rate of loss between the audit firm and the auditee, and the production function and characteristics of the audit firm. He provides empirical evidence to show that the scale of the auditee is the main factor influencing audit fees, although the number of consolidated subsidiaries included in the auditee's financial statements, number of industries in which the auditee operates, ratio of the auditee's assets abroad to total assets at year-end, ratio of receivables to total assets at year-end, ratio of inventory to total assets at year-end and whether an auditee incurred a loss in the most recent 3 years or received a "subject to" qualified opinion also have a significant influence. Simunic finds the ratio of net income to total assets at year-end, auditor tenure and audit firm scale to have no significant influence on audit fees. Francis (1984) investigates the Australian audit market using a modified Simunic model and also finds the scale of listed companies' assets and a variable reflecting the complexity of business transactions or events (the number of consolidated subsidiaries) to be significantly related to audit fees. However, contrary to Simunic (1980), Francis also finds the scale of the audit firm to be significantly related to audit fees. Francis and Stokes (1986) investigate the 96 largest and 96 small-

² The typical lifecycle of an enterprise comprises four stages, i.e., start-up, growth, maturity and decline. Although a low rate of growth is a common characteristic of the start-up and maturity stages, this study considers it to be associated with the maturity stage alone, as Chinese legal regulations prohibit firms in the start-up stage from listing on the A-share market.

est publicly traded non-finance companies in the Australian Graduate School of Management Annual Report Data Files and find that Big 8 price premiums are observed for small auditees but not for large auditees. Gul (2001) takes the opinion that audit fees can be considered simply as a function of firm size, complexity and audit risk.

In December 2001, the China Securities Regulatory Commission promulgated “Standards Concerning the Contents and Formats of Information Disclosure by Companies Offering Securities to the Public No. 2-Contents and Formats of Annual Reports (Revised in 2001)” and “Question and Answer Document Concerning the Standards of Information Disclosure by Companies Offering Securities to the Public No. 6-Payments to Accounting Firms and Disclosure.” These documents state that listed companies are required to disclose their audit fees in their annual reports from 2001 onwards. The new regulations prompted a number of Chinese scholars to carry out empirical studies of audit fees using data from Chinese listed companies. Most of these studies adopt the model developed by Simunic (1980) and use financial variables (Liu and Hu, 2006). Wang (2002) was one of the first in China to investigate audit fees empirically. He reports the scale of the auditee and audit firm, audit complexity and audit risk, the industry in which the auditee operates and whether the auditee receives a qualified opinion to have an effect on audit fees. Wu (2003) cites auditee scale, whether an auditee has been audited by one of the Big 5, audit opinion, ratio of accounts receivable to total assets and the ratio of inventory to total assets as the main factors influencing audit fees. Han and Zhou (2003) find the auditee’s total assets, audit opinion, number of consolidated subsidiaries and debt ratio to be significantly related to audit fees. Liu et al. (2003) analyze 590 companies and conclude that the scale and location of a listed company and the complexity of its business transactions are the main factors influencing audit fees, whereas there are no significant relationships with the ratio of inventory to total assets, ratio of long-term debt to total assets, loss occurrence, audit tenure and audit firm scale. Zhu and Guo (2006) investigate the issues surrounding audit fee increases in companies with no changes in accounting firms and find company expansion and an increase in the debt ratio to be the two main explanatory factors. In addition, they also find a change in the ratio of cash to current debt, intention to opinion shop and earnings management to be significantly related to an audit fee increase, although a change in return on equity (ROE) and changes in the ratios of accounts receivable and inventory to total assets exhibit no relationship. Most of the empirical studies to date find auditee scale and complexity and whether a firm has been audited by one of the “Big N ” firms to have a significantly positive influence on audit fees (Simunic, 1980³; Francis and Stokes, 1986; Gul, 2001; Wu, 2003; Han and Zhou, 2003; Liu and Hu, 2006). With regard to the ratios of inventory to total assets and accounts receivable to total assets, domestic and overseas findings differ, with studies carried out overseas usually reporting a positive relationship between these ratios and audit fees (e.g., Simunic, 1980) and domestic studies finding no such relationship.

2.2. Corporate governance and audit fees

Although many studies have examined the factors influencing audit fees, the relationship between corporate governance and audit fees is only now beginning to receive extensive research attention. The preliminary evidence is inconsistent (Cai, 2007). Overseas studies generally begin with the hypothesis that audits are a form of external governance and investigate the influence of agency costs and board of director characteristics on audit pricing. For example, Gul et al. (1998) examine the association between the magnitude of earnings/accruals (as a proxy for agency costs) and audit pricing and find a positive relationship. They also find audit prices to be lower for family companies than other kinds of companies and report the number of independent directors to be negatively related to audit fees. Gul and Tsui (2001) testify to the influence of agency costs on audit pricing in the Australian audit market. Carcello et al. (2002) investigate the association between board of director characteristics and external audit fees using Fortune 1000 data, and find a significant positive relationship between audit fees and board independence, expertise and diligence. Hay et al. (2004) believe that the promulgation of the Sarbanes–Oxley Act, Section 404 of which demands that listed companies disclose internal control information, will increase opportunities to investigate the association between corporate governance and

³ Simunic (1980) does not investigate the influence of the Big N on audit fees.

audit fees directly, although our review of the overseas literature indicates no such increase. Chinese researchers, in contrast, have paid increased attention to the issue in recent years. Drawing on the ownership perspective, Zhang and Zhang (2005) find the audit fees of state-owned listed companies to be low relative to those of other types of firms and Gao and Gao (2008) report the stockholding ratio of managers to be significantly associated with audit fees. In contrast, Zhang and Xu (2005) show there to be no significant relationship between audit fees and the proportion of state-owned shares. Li and Wang (2006) examine the role played by board of director characteristics and find the audit fee rate to be significantly and negatively related to the number of independent directors on the board, but insignificantly related to the number of board meetings and the existence of an audit committee. Using a framework of internal corporate governance and data on A-share listed companies from 2001 to 2003, Liu and Hu (2006) analyze the relationship between audit pricing and agency costs, and find that a number of the corporate governance factors that may influence agency costs (i.e., the proportion of independent directors on the board, the stockholding ratio of senior managers and president–CEO duality) also have a significant influence on audit fees, subject to the existence of other variables. Cai (2007) investigates the influence of corporate governance structure on audit fees from the perspective of the audit service provider and provides evidence to show that accounting firms charge companies with a larger board of directors higher audit fees than they do non-state-owned companies featuring CEO duality or a moderate managerial share ratio.

The aforementioned research tests the relationship between corporate governance and audit fees empirically from different perspectives, although the theoretical basis of most is substitution theory, with signaling theory receiving little attention to date. Most of this research also considers corporate governance characteristics such as shareholdings, board of director and management variables as proxies for corporate governance (Pan, 2008). As noted in the introduction, there are several limitations to the use of such proxies. To address these limitations, this paper analyzes the relationship between corporate governance and audit fees from the perspectives of substitution theory and signaling theory, and uses inclusion in the SSE Corporate Governance Sector to proxy for corporate governance.

3. Theory and hypotheses

As a form of external governance, independent auditing can mitigate agency conflicts among stakeholders and reduce agency costs (Jensen and Meckling, 1976; Watts and Zimmerman, 1983; Fan and Wong, 2005). Companies with serious agency problems thus have an incentive to hire auditors with a strong reputation to send a signal to the market that they are attempting to reduce agency costs to improve firm value (Wang and Zhou, 2006; Wang, 2009). However, if a company suffers no serious agency problems, it is unnecessary for it to hire high-profile auditors. Analysis from the audit supplier's perspective using the equation, $\text{audit risk} = \text{material misstatement risk} * \text{detection risk}$, suggests that the greater the material misstatement risk assessed, the greater the likelihood of misstating a financial report, the lower the level of detection risk, the larger the amount of audit work and the higher the audit cost. Carcello et al. (2002) find better internal firm governance to result in less audit risk. Auditors assign a lower level of inherent risk and control risk⁴ to companies characterized by such governance. Hence, audit effort and audit costs decline as a result of lower audit fees. In contrast, auditors assess companies with poor internal governance as having higher levels of inherent risk and control risk. For these firms, auditors need to spend more time, perform more audit work and bear greater audit risk, and, accordingly, they collect higher audit fees. This discussion leads to the following hypothesis.

Hypothesis 1a. Audit fees are lower for companies with high-level corporate governance.

At the same time, the information economics perspective suggests the existence of information asymmetry between firms and external investors. Owing to the absence of a mechanism for imparting information, “bad money drives out good” is the prevailing sentiment in the market. Signaling provides the best way to mitigate

⁴ There are two risk-oriented audit approaches, traditional and modern. Inherent risk and control risk in the traditional audit risk approach have been replaced with material misstatement risk in the modern approach.

information asymmetry (Spence, 1973). The two basic methods of conveying a signal in the audit market are to choose reputable information intermediaries voluntarily to assure outside investors of the credibility of accounting information (Fan and Wong, 2005) and to purchase more audit services (Carcello et al., 2002). Both methods result in higher audit costs and fees. It is obvious that the only companies with the incentive to adopt these methods are those with better corporate governance. Such companies prefer the strict test of an external audit to signal their governance level to the market and improve firm value. Therefore, companies with high-level corporate governance may also experience higher audit fees, which leads to the following alternative hypothesis.

Hypothesis 1b. Audit fees are higher for companies with high-level corporate governance.

4. Data and variables

4.1. Data and sample

Considering that the SSE Corporate Governance Sector was introduced in 2007, with its constituents finally confirmed at the end of that year, this study's preliminary sample comprises all A-share companies listed on the SSE for the 2007–2008 period. The following selection procedure was executed. First, in line with similar studies (Liu and Hu, 2006; Cai, 2007), we removed observations of financial enterprises. Second, we removed observations with incomplete data. Third, we removed observations listed on or after November 2, 2007, which is the expiration date for voluntary applications from listed companies, according to the “Appraisal Measures of SSE Corporate Governance Sector.”⁵ Finally, to alleviate the influence of outliers, we removed all observations whose Tobin's Q value falls outside the range of the mean minus two times the standard deviation and the mean plus two times the standard deviation. The final sample contains 602 observations for 2007 (149 in the SSE Corporate Governance Sector) and 678 for 2008 (184 in the SSE Corporate Governance Sector). Table 1 summarizes the sample selection procedure.

Our primary data source was Beijing University's China Center for Economic Research (CCER) database. Some data, including the components of the SSE Corporate Governance Sector, H-share issuance, number of a company's subsidiaries and the number of industries in which a company operates, were collected manually from the Sina Finance website (www.finance.sina.com.cn), Juchao website (www.cninfo.com.cn) and the annual financial reports of the sample firms.

4.2. Model and variables

We modify and extend the Simunic (1980) model according to the Chinese institutional environment and construct the following multiple linear regression model.

$$\begin{aligned} Lnfee = & \beta_0 + \beta_1 Gov + \beta_2 TobinQ + \beta_3 Big4 + \beta_4 LnAssets + \beta_5 H_Sstock + \beta_6 Loss + \beta_7 Recint + \beta_8 Invint \\ & + \beta_9 Segment + \beta_{10} Subs_{rt} + e. \end{aligned} \quad (1)$$

The explained variable in Model 1 is $Lnfee$, which is defined as the natural logarithm of the current year's external audit fees. The explanatory variable is Gov , which represents corporate governance. Previous studies have adopted two types of variables to proxy for corporate governance: one or more aspects or characteristics of corporate governance and a variable encompassing the comprehensive aspects of such governance. For example, Larcker and Richardson (2004) use the structure of the board of directors, Carcello et al. (2002) the characteristics of the board of directors and Liu and Hu (2006) the type of final controller, ownership concentration, board independence, CEO duality and managerial shareholdings. All of these proxies are examples of the first type of variable. Studies using proxies of the second type are primarily concerned with the effectiveness of corporate governance, e.g., Beiner et al. (2003) and Drobetz et al. (2004). Pan (2008) is the only study of the relationship between audit fees and corporate governance to use the corporate governance index

⁵ Some observations belong to two or three of the elimination categories. For example, a company listed after November 2, 2007 is also a company with incomplete data.

Table 1
Summary of sample selection criteria.

Selection procedure	2007		2008	
	A-share companies listed on SSE	Companies included in SSE Corporate Governance Sector	A-share companies listed on SSE	Companies included in SSE Corporate Governance Sector
Total	851	199	864	231
Less: financial enterprises	19	10	20	13
Companies with incomplete data	219	40	144	30
Companies listed on or after November 2, 2007	5	–	10	2
Outliers	6	–	12	2
Final sample observations	602	149	678	184

developed by the Nankai University Research Center of Corporate Governance as a proxy for such governance. The current study also adopts a more comprehensive proxy of corporate governance, *Gov*. Different from Pan (2008), however, and for the reasons stated in the introduction, this study uses a dummy variable, i.e., inclusion in the SSE Corporate Governance Sector. *Gov* takes the value of 1 if a company is included in the sector, and otherwise 0. The control variables are as follows.

Previous research shows that firm size is a very important factor influencing audit fees (Simunic, 1980; Wang, 2002; Chen et al., 2005). Theoretically, the larger a company is, the greater its business and accounting activities and hence the greater the audit adjustment needed. In China, the administrative rules and regulations on audit fees issued by the Chinese Institute of Certified Public Accountants or local administrative departments state that accounting firms should charge audit fees that are based on the customer's assets (i.e., firm size). In line with existing analysis and usual practice (e.g., Simunic, 1980; Larcker and Richardson, 2004; Liu et al., 2003), we include *LnAssets* as a variable representing the natural logarithm of total assets at year-end to proxy for firm size. We expect a positive relationship between firm size and audit fees.

The two main measures of firm complexity used in previous research are the number of consolidated subsidiaries (*Subs_rt*) and the number of industries in which a company is involved in (*Segment*). Both are used to measure firm complexity in this study, with a square root transformation to the number of consolidated subsidiaries performed according to the procedure used by Chen and Zhou (2006), Liu and Hu (2006) and Li and Wang (2006). To ensure data comparability, we include only those subsidiaries directly established and held by the sample companies in counting the number of subsidiaries. The number of industries in which a firm is involved in is determined by the types of business (classified by industry) disclosed in its annual financial report. We consider such data to be missing if no corresponding data is disclosed in the annual report, and assign a 1 to *Segment* if only the main business data classified by product is disclosed. Positive relationships are expected between these variables and audit fees.

In line with Simunic (1980) and Larcker and Richardson (2004), we use the ratios of accounts receivable to total assets (*Recint*) and inventory to total assets (*Invint*) at the fiscal year-end to proxy for a company's asset risk. We also use a dummy variable (*Loss*) to indicate whether a company has suffered a loss in the most recent 3 years. This variable takes the value of 1 if a loss occurs, and 0 otherwise. We expect the coefficients of all three variables to be positive.

Some A-share companies are also listed overseas, e.g., on the New York Stock Exchange or Hong Kong Stock Exchange. Because the annual reports of these companies need to be audited by both domestic and overseas auditors, they pay both foreign and domestic audit fees, although many fail to disclose them separately. We thus include a dummy variable (*H_stock*) to control for this factor. We assign it a 1 if the company is listed on the Hong Kong Stock Exchange, and otherwise 0.

Most researchers to date have ignored corporate growth, so whether it is related to audit fees or not remains unknown. We argue here that both audit costs and risk vary with corporate growth, and, accordingly, audit fees also vary with growth. A high growth rate is generally accompanied by an increase in total assets, inventory and/or divisions, which results in greater audit effort and higher audit costs. In addition, a high growth rate also presents a challenge for management, which may struggle to maintain control. There are

Table 2
Definitions of variables in Model 1.

	Name	Definition
Explained variable	<i>Lnfee</i>	Natural logarithm of amount of current year's external audit fee
Explanatory variable	<i>Gov</i>	Dummy = 1 if included in SSE Corporate Governance Sector, otherwise 0
Control variables	<i>LnAssets</i>	Natural logarithm of total assets at the end of the year
	<i>Segment</i>	Number of industries in which a company is involved ^a
	<i>Subs_rt</i>	Square root of number of consolidated subsidiaries ^b
	<i>Recint</i>	Accounts receivable/total assets at the end of the year
	<i>Invint</i>	Inventory/total assets at the end of the year
	<i>Loss</i>	Dummy = 1 if auditee incurred loss in any of past three fiscal years, otherwise 0
	<i>H_Stock</i>	Dummy = 1 if auditee is an H-share company, otherwise 0
	<i>TobinQ</i>	Value of Tobin's <i>Q</i>
	<i>Big4</i>	Dummy = 1 if audited by Big 4 accounting firm, otherwise 0

^a Collected manually from financial statements.

^b Collected manually from financial statements.

numerous examples of companies experiencing a sudden decline after years of fast-paced growth (e.g., Sanjiu Medical & Pharmaceutical Co., Ltd., the Giant Group, and the Sanzhu Group). Such cases are often characterized by out-of-control operational and financial management. Hence, a high corporate growth rate may increase audit risk. To reduce such risk, auditors are likely to increase the number of audit tests, resulting in higher audit costs. Although the total assets of companies experiencing negative growth may be on the decline, their incentives to engage in earnings management may strengthen in the face of pressure to report a profit rather than a loss to retain listing status. Such companies may also undergo frequent management changes. Both factors increase the audit risk of companies with negative growth. Companies that enjoy steady, moderate growth, in contrast, are characterized by a lower degree of risk. It is thus possible that the relationship between audit fees and corporate growth may feature a U-shape rather than a linear shape. In the previous literature, Tobin's *Q* and the price-to-book ratio (P/B) are the variables most commonly used to measure corporate growth (Xiao and You, 2009). In this study, we use Tobin's *Q* (*TobinQ*).

The foregoing control variables primarily represent the characteristics of the demand for audit services. However, the characteristics of the audit service supplier are also critical influential factors in audit fee determination, as proved both theoretically and empirically. Francis (1984), Firth (1985), DeFond et al. (2000), Ireland and Lennox (2002) and Chen et al. (2007) find evidence of a Big *N* premium using stock market data from Australia, New Zealand, Britain, Hong Kong and China, respectively. Using data on 15 countries and districts, Choi et al. (2008) also identify a Big 4 premium after controlling for the litigation environment of the countries/districts under study. In line with previous research, we include *Big_4* in our model. We assign it a value of 1 if the accounting firm belongs to the Big 4,⁶ and otherwise 0. We expect *Big_4* to be positively related to audit fees.

In addition to these control variables, some scholars argue that profit capability, debt level and industry are also important factors influencing audit fees. Accordingly, we include return on assets (*ROA*) (to represent profit capability), *LEVERAGE* (a proxy for debt level) and industry variables based on the China Securities Regulatory Commission (CSRC) industry classification (with finance industry observations eliminated and manufacturing used as the benchmark) and run a regression using data for 2007 and 2008. The results show the coefficients of neither *ROA* nor *LEVERAGE* to be significant, which is consistent with Zhang and Xu (2005) and Liu et al. (2003). The coefficients for all of the industry variables, with the exception of the real estate industry (which has a significantly negative sign), are insignificant. As these additional control variables add little explanatory power to the model (the adjusted *R*² increases by less than 0.04) and exert little influence on the initial explanatory variables, we do not include them.

Table 2 lists the type, name and definitions of the variables included in Model 1.

⁶ The Big 4 in this study are Ernst & Young Hua Ming, Deloitte Huayong Certified Public Accountants Co., Ltd., PricewaterhouseCoopers Zhongtian and KPMG Huazhen.

Table 3
Descriptive statistics of variables in Model 1 (2007).

Variable	N	Mean	Std. Dev	Median	Min	Max	
<i>Continuous variables</i>							
<i>Lnfee</i>	602	13.31661	0.7950948	13.12236	11.91839	18.00517	
<i>TobinQ</i>	602	2.036617	1.036366	1.72355	0.5047	7.3216	
<i>LnAssets</i>	602	21.71051	1.197106	21.5589	18.49332	27.30113	
<i>Recint</i>	602	0.0821234	0.08855	0.0570468	0	0.9750174	
<i>Invint</i>	602	0.1689402	0.1492284	0.1353458	0.0001945	0.8766935	
<i>Segment</i>	602	2.458472	1.529228	2	1	9	
<i>Subs_rt</i>	602	2.759411	1.454904	2.645751	0	11.13553	
				Value = 1	Value = 0		
				Freq.	Percentage	Freq.	Percentage
<i>Dummy variables</i>							
<i>Gov</i>	602	0.2475083	0.4319234	149	24.75	453	75.25
<i>H_stock</i>	602	0.0481728	0.2143092	29	4.82	573	95.18
<i>Loss</i>	602	0.2292359	0.4206908	138	23.92	464	76.08
<i>Big4</i>	602	0.0913623	0.288363	55	9.14	547	90.86

Lnfee = natural logarithm of amount of current year's external audit fee.

Gov = 1 if sample company is included in SSE Corporate Governance Sector, and 0 otherwise.

TobinQ = value of Tobin's *Q*.

LnAssets = natural logarithm of total assets at the end of the year.

H_stock = 1 if auditee is an H-share company, and 0 otherwise.

Loss = 1 if auditee incurred a loss in any of the past three fiscal years, and 0 otherwise.

Recint = accounts receivable/total assets at the end of the year.

Invint = inventory/total assets at the end of the year.

Big4 = 1 if audited by a Big 4 accounting firm, and 0 otherwise.

Segment = number of industries in which a company is involved.

Subs_rt = square root of number of consolidated subsidiaries.

4.3. Descriptive statistics

Tables 3 and 4 present the results of the descriptive statistics for the 2007 and 2008 observations, respectively. The 2007 sample includes 602 observations, 149 of which (or 24.75% of the total) are included in the SSE Corporate Governance Sector. The 2008 sample includes 678 observations, 184 of which (or 27.14% of the total) are included in this sector. Although the number of observations included in the SSE Corporate Governance Sector in 2008 increased by 35 (or 23.5%) over 2007, the ratio of observations in the sector relative to the total sample is almost the same for the 2 years. There are 35 A- and H-share companies (4.57%) and 51 companies audited by the Big 4 (7.52%) in the 2008 sample, an increase of two and decrease of four, respectively, relative to the 2007 sample. The number of companies suffering a loss in the most recent 3 years reached 162 in 2008, an increase of 24 over 2007, although the proportion remained roughly the same in the 2 years. A minor increase in the mean of the natural logarithm of audit fees can be seen in 2008, although the mean and median are close in that year. The mean of the natural logarithm of total assets is similar. The mean and median of Tobin's *Q* in 2008 are remarkably lower than those in 2007, most likely because of the 2008 international financial crisis. In both years, the Tobin's *Q* mean is much higher than the median. Closer scrutiny of the sample suggests that this result stems from a number of restructured companies with extraordinarily high Tobin's *Q* values, but that also have changes in total assets, inventory and branches after restructuring, thus we do not eliminate these observations. Descriptive statistics also show that the average number of industries in which a company was involved in 2007 was 2.46, with a maximum of 9 and a minimum of 1, and the average number of consolidated subsidiaries in that year was 9.73, with a maximum of 124 and a minimum of 0.⁷ The figures for 2008 are almost the same.

⁷ These figures refer to the number of consolidated subsidiaries, whereas the figures in Tables 3 and 4 are the square roots of the number of consolidated subsidiaries.

5. Empirical results

5.1. Univariate analysis

Table 5 presents the results of univariate analysis of the audit fees and firm characteristics of the sample companies and the characteristics of their audit firms. This analysis compares companies included in the SSE Corporate Governance Sector (Governance Sector hereafter) with other firms (Non-governance Sector hereafter). It can be seen from Panel A that the mean difference in audit fees between the two groups of firms is highly significant (p -value = 0) in 2007 and 2008, thus providing preliminary evidence that audit fees are correlated with inclusion in the Governance Sector. However, it is possible that the difference is caused by factors other than corporate governance (e.g., the scale of total assets). Panel B presents the means of the firm characteristics of companies in the two groups. We can see that there are significant differences (1% level, two-tailed) between the groups in terms of firm size, listing on the Hong Kong Stock Exchange, loss occurrence and number of subsidiaries in both 2007 and 2008. Furthermore, the difference between the Governance and Non-governance Sectors is positive for all characteristics other than loss occurrence. The results also show that there is no statistically significant difference between the two groups in terms of corporate growth, the ratio of accounts receivable to total assets, the ratio of inventory to total assets and the number of industries in which a firm is involved. Panel C presents the means of the audit firm characteristics, from which it can be seen that the between-group difference is highly statistically significant. We can also see that the proportion of companies audited by one of the Big 4 is larger in the Governance than Non-governance Sector. We believe that these results show that companies audited by a Big 4 audit firm are much more likely to be included in the SSE Corporate Governance Sector. Our inference is as follows. If it is true that the Big 4 provide superior audit quality and can boost the corporate governance level of an auditee, then the results in Panel C show that related parties recognize companies with good corporate governance, although the SSE Corporate Governance Sector is appraised and promulgated on the basis of voluntary applications.

5.2. Multiple regression analysis

5.2.1. Corporate governance and audit fees

We now examine Model 1 using the 2007 and 2008 data. The results are presented in Table 6. The maximum variance inflation factor (VIF) values are 2.06 and 2.11 in 2007 and 2008, respectively, which indicates that multicollinearity is not a serious issue.⁸ The adjusted R^2 is 0.7700 in 2007 and 0.7766 in 2008, which indicates that the explanatory power of our model is high and in line with the level achieved in similar research worldwide.⁹ The regression results show the coefficient of *Gov* to be -0.0772639 (significant at the 5% level, two-sided) in 2007 and -0.0559151 (significant at the 10% level, one-sided) in 2008. These results confirm the negative influence of corporate governance on audit fees. Further analysis using the 2008 results shows that companies included in the Governance Sector enjoy a RMB64,467¹⁰ (or 5.44%) discount on audit fees over their Non-governance Sector counterparts,¹¹ thus supporting Hypothesis 1a.

5.2.2. Influence of other factors on audit fees

Our empirical results show firm size to be significantly and positively related to audit fees at the 1% level, which is consistent with the findings of Simunic (1980), Wu (2003), Han and Zhou (2003) and Zhu and Guo (2006). Consistent with Francis (1984) and Wu (2003), the coefficient of *Big_4* is significantly positive. In addition, both *H_stock* and *Loss* are significantly and positively associated with audit fees at the 1% level.

⁸ Multicollinearity is believed not to constitute a serious problem if the VIF value is less than 10. The VIF values in Table 6 are all lower than this critical point, and hence we conclude that there is no serious multicollinearity among the variables in our model.

⁹ According to Zhang and Liu (2006), the explanatory power of models in domestic audit fee research is generally low (the highest is 0.49, with most in the range of 0.3–0.4), whereas that of models in similar international research is high (most reach 0.7–0.8).

¹⁰ Based on the sample firms' mean audit fees in 2008, i.e., RMB1,185,059.

¹¹ The same conclusion can be drawn using the data for 2007. Holding other factors constant, companies included in the Governance Sector enjoy an RMB86,631 (or 7.44%) audit fee discount over their counterparts in the Non-governance Sector (based on the mean audit fees for 2007, i.e., 1,164,405).

Table 4
Descriptive statistics of variables in Model 1 (2008).

Variable	N	Mean	Std. Dev	Median	Min	Max	
<i>Continuous variables</i>							
<i>Lnfee</i>	678	13.36693	0.7904243	13.21767	11.51293	18.00517	
<i>TobinQ</i>	678	1.26587	0.4261108	1.14915	0.2157	3.2511	
<i>LnAssets</i>	678	21.77525	1.246619	21.60967	18.47492	27.346	
<i>Recint</i>	678	0.0777098	0.0781033	0.0549182	0	0.5255643	
<i>Invint</i>	678	0.1872533	0.189845	0.1420945	2.02e-14	2.460644	
<i>Segment</i>	678	2.570796	1.65401	2	1	10	
<i>Subs_rt</i>	678	2.771297	1.504253	2.645751	0	11.61895	
				Value = 1	Value = 0		
				Freq.	Percentage	Freq.	Percentage
<i>Dummy variables</i>							
<i>Gov</i>	678	0.2713864	0.4450033	184	27.14	494	72.86
<i>H_stock</i>	678	0.0457227	0.2090373	31	4.57	647	95.43
<i>Loss</i>	678	0.2389381	0.4267497	162	23.89	516	76.11
<i>Big4</i>	678	0.0752212	0.2639427	51	7.52	627	92.48

Lnfee = natural logarithm of amount of current year's external audit fee.

Gov = 1 if sample company is included in SSE Corporate Governance Sector, and 0 otherwise.

TobinQ = value of Tobin's *Q*.

LnAssets = natural logarithm of total assets at the end of the year.

H_stock = 1 if auditee is an H-share company, and 0 otherwise.

Loss = 1 if auditee incurred a loss in any of the past three fiscal years, and 0 otherwise.

Recint = accounts receivable/total assets at the end of the year.

Invint = inventory/total assets at the end of the year.

Big4 = 1 if audited by Big 4 accounting firm, and 0 otherwise.

Segment = number of industries in which a company is involved.

Subs_rt = square root of number of consolidated subsidiaries.

Further analysis shows the variation in the coefficients of these four variables over the 2 years to be small, which indicates the stability of their relationship with audit fees. We also find a strong relationship between firm complexity and audit fees, with the coefficient of *Subs_rt* statistically and economically significant at the 1% level. However, the regression results on the relationship between *Segment* and *Lnfee* show an inconsistency between 2007 and 2008. The coefficient of *Segment* is insignificant in 2007 and significant at the 1% level in 2008. Empirical results also show the ratios of accounts receivable to total assets and inventory to total assets to be economically and statistically associated with audit fees at a significant level. The coefficient of *Recint* is significant at the 10% level (two-sided) in 2007 and 2008 (one-sided), whereas that of *Invint* is significant at the 10% level (one-sided) in 2007 and at the 5% level (two-sided) in 2008. This evidence is inconsistent with the results of Liu et al. (2003) and Zhu and Guo (2006) and with those of Wu (2003), who reports a significant positive relationship between accounts receivable (and inventory) and audit fees. In our results, the sign of *Invint* is negative. Common sense suggests that the larger a company's inventory, the greater the audit risk and the higher the audit cost. Hence, the relationship between inventory and audit fees should be positive. The cause of the adverse result reported herein is left for future research. One possibility is that the assessed audit risk of inventory is low, thus prompting a simplified audit procedure.

6. Subsample regressions

It is our belief that corporate growth interacts with corporate governance in such a complex manner that it is difficult to identify the relationship between them using common methods, i.e., including an interaction term in the regression equation. Too high or too low a rate of corporate growth will affect firm value and result in an increase in firm risk. Moderate growth, in contrast, is sustainable growth and the governance structure of companies experiencing moderate growth is generally more stable. Accordingly, we divide the sample companies into three subsamples, companies with negative growth, moderate growth and overly fast growth, depending on their Tobin's *Q* value. If this value is less than 1, we include it in the first group. If it is greater

Table 6
Multiple regression results of corporate governance and audit fees in Model 1. Explained variable: *Lnfee*.

Variable	Expected Sign	2007	VIF	2008	VIF
<i>Intercept</i>	?	5.366365 (12.97) ^{***}		5.792809 (14.98) ^{***}	–
<i>Gov</i>	?	–0.0772639 (–1.97) ^{**}	1.19	–0.0559151 (–1.52)	1.24
<i>TobinQ</i>	?	0.0804095 (4.87) ^{***}	1.21	0.1232368 (3.21) ^{***}	1.24
<i>LnAssets</i>	+	0.3398957 (18.23) ^{***}	2.06	0.3210999 (18.77) ^{***}	2.11
<i>H_stock</i>	+	1.250754 (14.21) ^{***}	1.47	1.270307 (14.95) ^{***}	1.47
<i>Loss</i>	+	0.1324712 (3.31) ^{***}	1.17	0.1008036 (2.67) ^{***}	1.20
<i>Recint</i>	+	0.3269621 (1.81) [*]	1.05	0.3221629 (1.64)	1.09
<i>Invint</i>	+	–0.1542988 (–1.45)	1.05	–0.1875702 (–2.40) ^{**}	1.02
<i>Big4</i>	+	0.6413022 (9.52) ^{***}	1.56	0.6060236 (8.66) ^{***}	1.59
<i>Segment</i>	+	0.0132502 (1.24)	1.10	0.0249864 (2.68) ^{***}	1.11
<i>Subs_rt</i>	+	0.0883677 (7.49) ^{***}	1.22	0.0935901 (8.58) ^{***}	1.25
<i>N</i>		602	Average 1.31	678	Average 1.33
<i>F</i>		202.19 ^{***}		223.48 ^{***}	
<i>R</i> ²		0.7738		0.7701	
Adj <i>R</i> ²		0.7700		0.7667	

Lnfee = natural logarithm of amount of current year's external audit fee.

Gov = 1 if sample company is included in SSE Corporate Governance Sector, and 0 otherwise.

TobinQ = value of Tobin's *Q*.

LnAssets = natural logarithm of total assets at the end of the year.

H_stock = 1 if auditee is an H-share company, and 0 otherwise.

Loss = 1 if auditee incurred a loss in any of the past three fiscal years, and 0 otherwise.

Recint = accounts receivable/total assets at the end of the year.

Invint = inventory/total assets at the end of the year.

Big4 = 1 if audited by Big 4 accounting firm, and 0 otherwise.

Segment = number of industries in which a company is involved.

Subs_rt = square root of number of consolidated subsidiaries.

* Two-tailed significance at the 0.10 level.

** Two-tailed significance at the 0.05 level.

*** Two-tailed significance at the 0.01 level.

than the mean¹² of the total sample, we include it in the third group, and if it is greater than or equal to 1 and less than or equal to the mean of the total sample, we include it in the second group. The descriptive statistics for the three subsamples in 2007 and 2008 are presented in Tables 7 and 8.

To examine the relationship between corporate governance and audit fees in these subsamples, we eliminate the variable *TobinQ* in Model 1 and construct Model 2. The definitions of the variables in Model 2 are the same as those in Model 1.

$$Lnfee = \beta_0 + \beta_1 Gov + \beta_2 Big4 + \beta_3 LnAssets + \beta_4 H_{stock} + \beta_5 Loss + \beta_6 Recint + \beta_7 Invint + \beta_8 Segment + \beta_9 Subs_rt + e. \quad (2)$$

¹² The regression results are similar when we use a threshold other than the mean, such as the median.

Tables 9 and 10 present the Model 2 regression results using the subsamples for 2007 and 2008, respectively.¹³ The results show a significant negative relationship between corporate governance and audit fees in the moderate growth sample for both 2007 and 2008. The coefficients for both years are near 10%. This relationship is insignificant in the negative growth and overly fast growth subsamples. The sign of *Gov* is inconsistent between the two samples, possibly because corporate governance and corporate growth have opposing effects on audit fees. In other words, audit risk's positive effect on audit fees in negative and overly fast growth firms offsets the negative effect of corporate governance on audit fees to some extent. For this reason, we observe a mixed and insignificant result.

7. Sensitivity test

Because a company's inclusion in the SSE Corporate Governance Sector is the result of a self-selection (voluntary application) process,¹⁴ it is possible that some companies in the Non-governance Sector have good corporate governance, but simply have not submitted an application. If this is the case, the results will be biased. To determine whether our conclusions are robust, we perform a sensitivity test using the two-stage procedure developed by Heckman (1976).

In the first stage, we estimate a Probit choice equation and obtain inverse Mills ratios. In the second stage, we include the inverse Mills ratios as an explanatory variable in the primary model to control for the potential endogeneity induced by self-selection. A number of strict constraints are necessary in implementing the Heckman (1976) procedure successfully. For example, at least one exogenous independent variable that has no direct effect on the dependent variable in the second-stage regression should be included in the first-stage choice model. Lennox et al. (2012) find that many accounting studies fail to select proper variables when using selection models and thus obtain inconsistent results.¹⁵ Hence, we carefully select the explanatory variables in the first stage and include 11 factors considered to have an effect on corporate governance, such as *Auditcomm* (establishment of an audit committee), *Dual* (CEO duality), *DirScale* (board of director scale), *Fncctl* (final controller type) and *M_Stockholder* (frequency of stockholder meetings) in the choice model. Of these factors, at least *Fncctl* and *M_Stockholder* have no significant effect on audit fees¹⁶ and can thus play the role of an exogenous independent variable excluded in the second-stage regression. The first-stage choice equation is as follows (Model 3).

$$\begin{aligned}
 \text{Probit}(Gov = 1) & \\
 &= \beta_0 + \beta_1 \text{Auditcomm} + \beta_2 \text{Dual} + \beta_3 \text{First} + \beta_4 \text{Second} + \beta_5 \text{Auditopinion} + \beta_6 \text{M_Dir} \\
 &\quad + \beta_7 \text{M_Supervisor} + \beta_8 \text{M_Stockholder} + \beta_9 \text{DirScale} + \beta_{10} \text{IndDir} + \beta_{11} \text{Fncctl} + \beta_{12} \text{TobinQ} \\
 &\quad + \beta_{13} \text{Big4} + \beta_{14} \text{LnAssets} + \beta_{15} \text{H_stock} + \beta_{16} \text{Loss} + \beta_{17} \text{Recint} + \beta_{18} \text{nvint} + \beta_{19} \text{Segment} \\
 &\quad + \beta_{20} \text{Subs_rt} + e.
 \end{aligned} \tag{3}$$

¹³ We also use the P/B ratio as a criterion to regress Model 2. The results are consistent with those reported.

¹⁴ The Expert Consultative Committee for Corporate Governance Sector Appraisal was officially founded in September 2007. In the same month, the "Appraisal Measures of the SSE Corporate Governance Sector (Draft Version)" was published to solicit the opinions of all parties. The "Appraisal Measures of the SSE Corporate Governance Sector" were officially released on October 9, after which listed companies could voluntarily submit applications. By November 2, 2007, the SSE had received valid application materials from 255 companies, published these materials and solicited public comment. Then, on the basis of the appraisal results of the Expert Consultative Committee, the final Sector list included 199 companies.

¹⁵ Lennox et al. (2012) report the results of selection models to be sensitive to model shape and note that an absence of exclusion restrictions can lead to severe multicollinearity problems.

¹⁶ Few researchers report the type of final controller or frequency of stockholder meetings to have a significant influence on audit fees. We obtain results that are consistent with previous research using data for 2006, 2007 and 2008.

Table 7
Descriptive statistics of variables in subsample (2007).

Variable	Negative growth (N = 20)					Moderate growth (N = 372)					Overly fast growth (N = 210)										
	Mean	Std. Dev	Median	Min	Max	Mean	Std. Dev	Median	Min	Max	Mean	Std. Dev	Median	Min	Max						
<i>Continuous variables</i>																					
<i>Lnfee</i>	13.72293	1.023866	13.49333	12.42922	15.95558	13.37225	0.875986	13.21767	11.91839	18.00517	13.17936	0.565867	13.12236	11.91839	15.75137						
<i>LnAssets</i>	22.74855	1.175557	22.72143	20.73494	24.98712	21.96001	1.181509	21.71716	19.91666	27.30113	21.16967	1.004719	21.11371	18.49332	24.15856						
<i>Recint</i>	0.047737	0.061352	0.021253	0.000511	0.213918	0.082786	0.091054	0.060145	0	0.975017	0.084225	0.085850	0.053721	0.000025	0.480798						
<i>Invint</i>	0.141426	0.139168	0.118763	0.002116	0.528862	0.173637	0.151263	0.139192	0.000195	0.876694	0.163240	0.146684	0.128984	0.000037	0.812561						
<i>Segment</i>	1.9	1.165287	1.5	1	5	2.424731	1.469265	2	1	9	2.571429	1.650618	2	1	8						
<i>Subs_rt</i>	2.654131	1.300035	2.645751	0	5.91608	2.797157	1.448523	2.64575	0	9.539392	2.702572	1.483857	2.44949	0	11.13553						
			Value = 1	Value = 0		Value = 1	Value = 0	Value = 1	Value = 0		Value = 1	Value = 0	Value = 1	Value = 0							
			Freq.	Percentage	Freq.	Percentage	Freq.	Percentage	Freq.	Percentage	Freq.	Percentage	Freq.	Percentage	Freq.	Percentage					
<i>Dummy variables</i>																					
<i>Gov</i>	0.15	0.366348	0	3	15	17	85	0.266129	0.442528	0	99	27	273	73	0.223810	0.417792	0	47	163	78	
<i>H_stock</i>	0.25	0.444262	0	5	25	15	75	0.053763	0.225854	0	20	5	352	95	0.019048	0.137019	0	4	2	206	98
<i>Loss</i>	0.2	0.410391	0	4	20	16	80	0.193548	0.395611	0	72	19	300	81	0.295238	0.457240	0	62	30	148	70
<i>Big4</i>	0.25	0.444262	0	5	25	15	75	0.104839	0.306758	0	39	10	333	90	0.052381	0.223326	0	11	5	199	95

Lnfee = natural logarithm of amount of current year's external audit fee.

Gov = 1 if sample company is included in SSE Corporate Governance Sector, and 0 otherwise.

TobinQ = value of Tobin's *Q*.

LnAssets = natural logarithm of total assets at the end of the year.

H_stock = 1 if auditee is an H-share company, and 0 otherwise.

Loss = 1 if auditee incurred a loss in any of the past three fiscal years, and 0 otherwise.

Recint = accounts receivable/total assets at the end of the year.

Invint = inventory/total assets at the end of the year.

Big4 = 1 if audited by Big 4 accounting firm, and 0 otherwise.

Segment = number of industries in which a company is involved.

Subs_rt = square root of number of consolidated subsidiaries.

Table 8
Descriptive statistics of variables in subsample (2008).

Variable	Negative Growth (N = 157)					Moderate Growth (N = 274)					Overly Fast Growth (N = 247)					
	Mean	Std. Dev	Median	Min	Max	Mean	Std. Dev	Median	Min	Max	Mean	Std. Dev	Median	Min	Max	
<i>Continuous variables</i>																
<i>Lnfee</i>	13.75278	1.102427	13.45884	12.25486	18.00517	13.32945	0.682444	13.21767	12.20607	16.70588	13.16326	0.541855	13.12236	11.51293	15.75243	
<i>LnAssets</i>	22.45753	1.382253	22.13158	19.87016	27.346	21.9469	1.109534	21.7087	18.73775	25.14214	21.15117	0.989002	21.10941	18.47492	24.85722	
<i>Recint</i>	0.059195	0.060625	0.039716	0	.3320666	0.077571	0.080662	.085952	0	0.525564	0.089632	0.082916	0.067365	0	0.399786	
<i>Invint</i>	0.168962	0.166717	0.126629	2.02e-14	.7681355	0.199915	0.191007	.1442456	3.36e-14	0.940148	0.184833	0.201679	0.147006	7.73e-14	2.460644	
<i>Segment</i>	2.624204	1.718728	2	1	10	2.49635	1.635791	2	1	9	2.619433	1.635762	2	1	8	
<i>Subs_rt</i>	2.829213	1.532347	2.645751	0	9.69536	2.858444	1.576183	2.645751	0	9.486833	2.657812	1.397386	2.44949	0	11.61895	
			Value = 1	Value = 0				Value = 1	Value = 0				Value = 1	Value = 0		
			Freq.	Percentage	Freq.	Percentage	Freq.	Percentage	Freq.	Percentage	Freq.	Percentage	Freq.	Percentage	Freq.	Percentage
<i>Dummy variables</i>																
<i>Gov</i>	0.286624	0.453631	0	45	29	112	71	0.277372	0.448521	0	76	28	198	72	191	77
<i>H_stock</i>	0.165605	0.372915	0	26	17	131	83	0.018248	0.134093	0	5	2	269	98	247	100
<i>Loss</i>	0.152866	0.361010	0	24	15	133	85	0.229927	0.421556	0	63	23	211	77	172	70
<i>Big4</i>	0.165605	0.372915	0	26	17	131	98	0.065693	0.248199	0	18	7	256	93	240	97

Lnfee = natural logarithm of amount of current year's external audit fee.

Gov = 1 if sample company is included in SSE Corporate Governance Sector, and 0 otherwise.

TobinQ = value of Tobin's *Q*.

LnAssets = natural logarithm of total assets at the end of the year.

H_stock = 1 if auditee is an H-share company, and 0 otherwise.

Loss = 1 if auditee incurred a loss in any of the past three fiscal years, and 0 otherwise.

Recint = accounts receivable/total assets at the end of the year.

Invint = inventory/total assets at the end of the year.

Big4 = 1 if audited by Big 4 accounting firm, and 0 otherwise.

Segment = number of industries in which a company is involved.

Subs_rt = square root of number of consolidated subsidiaries.

Table 9
Multiple regression results of corporate governance and audit fees in Model 2 (2007). Explained variable: *Lnfee*.

Variable	Expected sign	Negative growth	VIF	Moderate growth	VIF	Overly fast growth	VIF
<i>Intercept</i>	?	2.138893 (0.37)	–	4.86583 (9.86)***	–	7.902495 (12.34)***	–
<i>Gov</i>	?	0.1673906 (0.41)	1.92	–0.0980085 (–1.98)**	1.19	–0.0383723 (–0.61)	1.21
<i>LnAssets</i>	+	0.4615434 (1.83)*	7.48	0.3709851 (16.20)***	1.82	0.2307721 (7.55)***	1.65
<i>H_stock</i>	+	1.45432 (3.78)***	2.49	1.36174 (12.76)***	1.45	0.9150677 (4.81)***	1.19
<i>Loss</i>	+	0.572797 (1.27)	2.92	0.150768 (2.80)***	1.13	0.033121 (0.56)	1.26
<i>Recint</i>	+	1.33218 (0.45)	2.86	0.2718718 (1.19)	1.07	0.1819705 (0.63)	1.06
<i>Invint</i>	+	1.362542 (1.36)	1.66	–0.2010797 (–1.48)	1.06	–0.2201791 (–1.32)	1.04
<i>Big4</i>	+	dropped	–	0.6569943 (7.97)***	1.60	0.539355 (4.64)***	1.18
<i>Segment</i>	+	0.1629168 (1.28)	1.86	–0.0144943 (–1.00)	1.12	0.0198448 (1.29)	1.13
<i>Subs_rt</i>	+	0.0058437 (0.05)	1.83	0.0936485 (6.20)***	1.19	0.1162623 (5.98)***	1.45
<i>N</i>	Total 602	20	Average 2.88	372	Average 1.29	210	Average 1.24
<i>F</i>		9.80***		172.33***		39.91***	
<i>R</i> ²		0.8770		0.8108		0.6424	
Adj <i>R</i> ²		0.7875		0.8061		0.6263	

Lnfee = natural logarithm of amount of current year's external audit fee.

Gov = 1 if sample company is included in SSE Corporate Governance Sector, and 0 otherwise.

TobinQ = value of Tobin's *Q*.

LnAssets = natural logarithm of total assets at the end of the year.

H_stock = 1 if auditee is an H-share company, and 0 otherwise.

Loss = 1 if auditee incurred a loss in any of the past three fiscal years, and 0 otherwise.

Recint = accounts receivable/total assets at the end of the year.

Invint = inventory/total assets at the end of the year.

Big4 = 1 if audited by Big 4 accounting firm, and 0 otherwise.

Segment = number of industries in which a company is involved.

Subs_rt = square root of number of consolidated subsidiaries.

* Two-tailed significance at the 0.10 level.

** Two-tailed significance at the 0.05 level.

*** Two-tailed significance at the 0.01 level.

The definitions of the variables in Model 3 can be found in Table 11. It should be noted that because the SSE Corporate Governance Sector was launched in 2007, the data used in the choice equation is for 2006. We obtain 725 sample observations¹⁷ and the regression results are presented in Table 12.

The second step is to include the inverse Mills ratios (*Lambda*) in Model 1 and construct Model 4. The regression results are reported in Table 13.

$$Lnfee = \beta_0 + \beta_1 Gov + \beta_2 TobinQ + \beta_3 Big4 + \beta_4 LnAssets + \beta_5 H_Stock + \beta_6 Loss + \beta_7 Recint + \beta_8 Invint + \beta_9 Segment + \beta_{10} Subs_rt + \beta_{11} Lambda + e. \quad (4)$$

¹⁷ A total of 835 companies were listed on the SSE in 2006. According to the "Appraisal Measures of the SSE Corporate Governance Sector," necessary conditions for inclusion in the SSE Corporate Governance Sector are having been listed on the SSE for 12 months and no special treatment status. Hence, we eliminate 74 sample observations marked ST or *ST and 5 sample observations listed after October 9, 2006. In addition, we also eliminate 15 sample companies in the finance industry and 16 with incomplete data. The final sample thus includes 725 observations.

Table 10
Multiple regression results of corporate governance and audit fees in Model 2 (2008). Explained variable: *Lnfee*.

Variable	Expected sign	Negative growth	VIF	Moderate growth	VIF	Overly fast growth	VIF
<i>Intercept</i>	?	4.15681 (4.85) ^{***}	–	5.789669 (11.11) ^{***}	–	6.978095 (11.22) ^{***}	–
<i>Gov</i>	?	–0.1201422 (–1.41)	1.29	–0.1018529 (–1.98) ^{**}	1.21	0.036208 (0.59)	1.26
<i>LnAssets</i>	+	0.3973288 (10.21) ^{***}	2.30	0.3294044 (13.75) ^{***}	1.60	0.2736142 (9.22) ^{***}	1.61
<i>H_stock</i>	+	1.321769 (10.21) ^{***}	1.85	1.2595 (7.28) ^{***}	1.22	Dropped	–
<i>Loss</i>	+	0.1286156 (1.22)	1.14	0.0343346 (0.64)	1.18	0.1343597 (2.33) ^{**}	1.33
<i>Recint</i>	+	2.2625 (3.51) ^{***}	1.22	0.063834 (0.23)	1.11	0.05694 (0.20)	1.01
<i>Invint</i>	+	–0.3300925 (–1.50)	1.07	–0.2394448 (–2.13) ^{**}	1.05	–0.0421028 (–0.36)	1.01
<i>Big4</i>	+	0.3631917 (2.67) ^{***}	2.04	0.650547 (6.62) ^{***}	1.35	0.8505657 (5.71) ^{***}	1.15
<i>Segment</i>	+	0.0408373 (1.86) [*]	1.13	0.0125083 (0.92)	1.13	0.0318546 (2.13) ^{**}	1.12
<i>Subs_rt</i>	+	0.0808408 (3.14) ^{***}	1.24	0.0968029 (6.31) ^{***}	1.33	0.0925125 (4.90) ^{***}	1.30
<i>N</i>	Total 678	157	Average 1.48	274	Average 1.24	247	Average 1.23
<i>F</i>		91.00 ^{***}		87.99 ^{***}		38.95 ^{***}	
<i>R²</i>		0.8478		0.7500		0.5670	
Adj <i>R²</i>		0.8385		0.7415		0.5524	

Lnfee = natural logarithm of amount of current year's external audit fee.

Gov = 1 if sample company is included in SSE Corporate Governance Sector, and 0 otherwise.

TobinQ = value of Tobin's *Q*.

LnAssets = natural logarithm of total assets at the end of the year.

H_stock = 1 if auditee is an H-share company, and 0 otherwise.

Loss = 1 if auditee incurred a loss in any of the past three fiscal years, and 0 otherwise.

Recint = accounts receivable/total assets at the end of the year.

Invint = inventory/total assets at the end of the year.

Big4 = 1 if audited by Big 4 accounting firm, and 0 otherwise.

Segment = number of industries a company involved in.

Subs_rt = square root of number of consolidated subsidiaries.

* Two-tailed significance at the 0.10 level.

** Two-tailed significance at the 0.05 level.

*** Two-tailed significance at the 0.01 level.

As can be seen from Table 13, the coefficient and sign of *Gov* are larger than and consistent with the benchmark results, respectively. The coefficient in 2008 is approximately 70% greater than that of the benchmark. Although *Gov*'s significance level declines slightly in 2007, it remains significant at the 10% level (two-sided). Its significance level in 2008 reaches the 5% level (two-sided). The coefficients of most of the control variables vary within 10%, with the exception of those of *Recint* and *Invint*. The significance level of the control variables is the same in the 2 years, except for *Recint* in 2007 (which changes from significant at the 10% level to insignificant) and *Segment* in 2008 (from the 1% level to the 5% level). The *t*-statistics for *Lambda* are 0.51 and 1.28 in 2007 and 2008, respectively. The maximum VIF value is 2.44, which indicates that the model suffers no serious multicollinearity problems. Thus, the sensitivity test results demonstrate that our findings are robust to self-selection.

8. Conclusions and limitations

This paper reports the results of an empirical investigation of the relationship between corporate governance and audit fees using data disclosed in the annual financial reports of companies listed on the Shanghai

Table 11
Definitions of variables in Model 3.

	Name	Definition
Explained variable	<i>Gov</i>	Dummy = 1 if included in SSE Corporate Governance Sector, otherwise 0
Explanatory variables	<i>Auditcomm</i>	Dummy = 1 if audit committee is set up, otherwise 0
	<i>Dual</i>	Dummy = 1 if president and CEO are the same person, otherwise 0
	<i>First</i>	Shares held by first major shareholder/total shares at year-end
	<i>Second</i>	Shares held by second major shareholder/total shares at year-end
	<i>Auditopinion</i>	Numerical variable: 1 if a clean opinion, 2 if an unqualified opinion with emphasis of matter paragraph, 3 if a qualified opinion, 4 if a disclaimer of opinion
	<i>M_Dir</i>	Frequency of board of director meetings held in a fiscal year
	<i>M_Supervisor</i>	Frequency of board of supervisor meetings held in a fiscal year
	<i>M_Stockholder</i>	Frequency of stockholder meetings held in a fiscal year
	<i>DirScale</i>	Number of members of board of directors disclosed in annual report
	<i>IndDir</i>	Number of independent directors on the board of directors disclosed in annual report
	<i>Fncfl</i>	Dummy = 1 if owned by the state, otherwise 0
	<i>TobinQ</i>	Value of Tobin's <i>Q</i>
	<i>Big4</i>	Dummy = 1 if audited by Big 4 accounting firm, otherwise 0
	<i>LnAssets</i>	Natural logarithm of total assets at the end of the year
	<i>H_Stock</i>	Dummy = 1 if auditee is an H-share company, otherwise 0
<i>Loss</i>	Dummy = 1 if auditee incurred a loss in any of the past three fiscal years, otherwise 0	
<i>Recint</i>	Accounts receivable/total assets at the end of the year	
<i>Invint</i>	Inventory/total assets at the end of the year	
<i>Segment</i>	Number of industries in which a company is involved	
<i>Subs_rt</i>	Square root of number of consolidated subsidiaries	

Table 12
Probit regression results. Explained variable: *Gov*.

Variable	<i>Auditcomm</i>	<i>Dual</i>	<i>First</i>	<i>Second</i>	<i>Auditopinion</i>	<i>M_Dir</i>	<i>M_Supervisor</i>	<i>M_Stockholder</i>
Result	0.1164814 (1.04)	0.270078 (1.40)	0.5186868 (1.25)	-0.025993 (0.03)	-0.506515 (-1.95)**	-0.013953 (-0.75)	0.0543591 (1.48)	-0.012199 (-0.25)
Variable	<i>DirScale</i>	<i>IndDir</i>	<i>Fncfl</i>	<i>TobinQ</i>	<i>Big4</i>	<i>LnAssets</i>	<i>H_Stock</i>	<i>Loss</i>
Result	0.0181251 (0.49)	0.1075773 (1.41)	0.0592087 (0.44)	0.3857623 (2.55)**	0.1731616 (0.73)	0.2789833 (3.95)***	0.3502073 (0.84)	-1.072429 (-4.93)***
Variable	<i>Recint</i>	<i>Invint</i>	<i>Segment</i>	<i>Subs_rt</i>	<i>Intercept</i>	<i>N</i>	LR chi2	Pseudo R ²
Result	-0.536 (-0.96)	-0.085569 (-0.31)	-0.114073 (-2.76)***	0.040388 (1.05)	-7.272783 (-4.85)***	725	109.26***	0.1696

Figures in parentheses are Z-values.

* Two-tailed significance at the 0.10 level.

** Two-tailed significance at the 0.05 level.

*** Two-tailed significance at the 0.01 level.

Stock Exchange in the first and second years after the introduction of the SSE Corporate Governance Sector, i.e., 2007 and 2008. The results based on the full sample show this relationship to be significant and negative. In general, the audit fees of companies included in this sector are 5.44–7.44%¹⁸ lower than those of their Non-governance Sector counterparts. These results suggest that substitution theory provides a better explanation of the relationship between corporate governance and audit fees than signaling theory. Subsample data also shows corporate governance's influence on audit fees is affected by corporate growth. The negative relation-

¹⁸ The percentages are 5.44% in 2008 and 7.44% in 2007.

Table 13
Regression results of Model 4. Explained variable: *Lnfee*.

	2007			2008		
	Benchmark	Two-stage regression	VIF	Benchmark	Two-stage regression	VIF
<i>Intercept</i>	5.366365 (12.97) ^{***}	5.684087 (13.88) ^{***}	–	5.792809 (14.98) ^{***}	6.164501 (16.05) ^{***}	–
<i>Gov</i>	–0.0772639 (–1.97) ^{**}	–0.0903212 (–1.72) [*]	2.19	–0.0559151 (–1.52)	–0.0930575 (–2.01) ^{**}	2.00
<i>TobinQ</i>	0.0804095 (4.87) ^{***}	0.073934 (4.58) ^{***}	1.22	0.1232368 (3.21) ^{***}	0.1145037 (2.98) ^{***}	1.25
<i>LnAssets</i>	0.3398957 (18.23) ^{***}	0.3246977 (17.55) ^{***}	1.98	0.3210999 (18.77) ^{***}	0.3032975 (17.79) ^{***}	2.05
<i>H_stock</i>	1.250754 (14.21) ^{***}	1.124668 (12.51) ^{***}	1.40	1.270307 (14.95) ^{***}	1.094173 (12.32) ^{***}	1.42
<i>Loss</i>	0.1324712 (3.31) ^{***}	0.141715 (3.41) ^{***}	1.32	0.1008036 (2.67) ^{***}	0.1104056 (2.89) ^{***}	1.28
<i>Recint</i>	0.3269621 (1.81) [*]	0.2719119 (1.54)	1.06	0.3221629 (1.64)	0.2791031 (1.45)	1.09
<i>Invint</i>	–0.1542988 (–1.45)	–0.1257606 (–1.19)	1.04	–0.1875702 (–2.40) ^{**}	–0.1685315 (–2.18) ^{**}	1.02
<i>Big4</i>	0.6413022 (9.52) ^{***}	0.6755913 (10.15) ^{***}	1.51	0.6060236 (8.66) ^{***}	0.6677469 (9.43) ^{***}	1.58
<i>Segment</i>	0.0132502 (1.24)	0.0100982 (0.96)	1.10	0.0249864 (2.68) ^{***}	0.022193 (2.40) ^{**}	1.11
<i>Subs_rt</i>	0.0883677 (7.49) ^{***}	0.0935087 (8.03) ^{***}	1.22	0.0935901 (8.58) ^{***}	0.0961795 (8.79) ^{***}	1.27
<i>Lambda</i>		0.085819 (0.51)	2.44		0.0626612 (1.28)	2.09
<i>N</i>	602	592	Average 1.50	678	662	Average 1.47
<i>F</i>	202.19 ^{***}	159.50 ^{***}		223.48 ^{***}	171.28 ^{***}	
<i>R²</i>	0.7738	0.7516		0.7701	0.7435	
<i>Adj R²</i>	0.7700	0.7468		0.7667	0.7392	

Lnfee = natural logarithm of amount of current year's external audit fee.

Gov = 1 if sample company is included in SSE Corporate Governance Sector, and 0 otherwise.

TobinQ = value of Tobin's *Q*.

LnAssets = natural logarithm of total assets at the end of the year.

H_stock = 1 if auditee is an H-share company, and 0 otherwise.

Loss = 1 if auditee incurred a loss in any of the past three fiscal years, and 0 otherwise.

Recint = accounts receivable/total assets at the end of the year.

Invint = inventory/total assets at the end of the year.

Big4 = 1 if audited by Big 4 accounting firm, and 0 otherwise.

Segment = number of industries in which a company is involved.

Subs_rt = square root of number of consolidated subsidiaries.

Lambda = inverse Mills ratio.

Note: The difference in the number of observations between the two-stage regression (Model 4) and basic regression (Model 1) for 2007 is due to the observations in the latter including companies listed after 2006. The procedure used to calculate *Lambda* means the *Lambda* values for these observations are missing, which is why the difference occurs in 2008.

* Two-tailed significance at the 0.10 level.

** Two-tailed significance at the 0.05 level.

*** Two-tailed significance at the 0.01 level.

ship between corporate governance and audit fees is found to be economically and statistically significant in sample firms that experienced moderate growth during the sample period, relative to those that experienced overly fast or negative growth, for which the relationship is mixed and insignificant.

The SSE Corporate Governance Sector was introduced near the end of 2007. Although we find corporate governance to have an economically significant influence on audit fees, the degree of statistical significance is relatively low (10% level, one-sided in the full-sample regression for 2008). There are two main explanations

for this finding in addition to the effect of corporate growth. First, audit fees are characterized by inertia. When audit firms initially negotiate their fees with clients prior to provision of the first audit service, they perform a comprehensive evaluation of the company, determine the audit risk level, estimate the audit costs and finally determine the charging criteria. Although regulations require audit firms to perform such routine work as evaluating the audit risk level and determining the audit procedure and test scope every year, in practice they may keep audit fees fixed for many years, thus demonstrating inertia. Of the 536 sample companies in 2008 that exhibited comparability¹⁹ to those in 2007, 283 companies (or 48.29%) saw no change in audit fees. Second, it takes time for stakeholders to comprehend the signal conveyed by corporate governance. As noted in the introduction to this paper, there are two competing explanations concerning the relationship between corporate governance and audit fees, one informed by substitution theory and the other by signaling theory. If listed companies are rational economic beings, then they will prefer substitution theory to signaling theory, as its logic suggests that audit fees will decrease and firm value increase. Acceptance of signaling theory is more complicated. Signaling high-level corporate governance through a high-quality audit requires a large expenditure on auditing. Hence, a company's acceptance of signaling theory depends on the tradeoff between expenditure and the expected return.²⁰ The situation is the opposite for audit firms. They tend to prefer signaling theory, as it allows them to charge higher fees with no increase in audit risk, whereas the logic of substitution theory requires that they balance a decrease in fees and an increase in audit risk with a reduction in the number of audit tests. Both auditees and auditors clearly need time to consider the economic consequences of signaling good corporate governance and adopt audit plans that favor themselves when negotiating audit fees. Reaching consensus may take a considerable amount of time. Our empirical evidence is largely in accord with the first explanation, i.e., that audit fees are characterized by inertia, although its validity requires testing with data for and beyond 2009.

This study suffers two limitations. The first lies in the sample data. Because audit fees may be calculated in a variety of ways (e.g., they may or may not be inclusive of travel expenses and the fees for interim reports), we cannot infer whether the data on companies that do not disclose detailed audit fees are consistent with those of other companies. The second limitation lies in self-selection. Although we perform a sensitivity test using the two-stage procedure developed by Heckman (1976), we cannot completely rule out the influence of self-selection owing to the complexity of dealing with such a problem.

References

- Beiner, S., Drobetz, W., Schmid, F., Zimmermann, H., 2003. Is board size an independent corporate governance mechanism? *Kyklos* 57, 327–356.
- Cai, J., 2007. Corporate governance, audit risk and audit fees. *Auditing Research* (in Chinese) 3, 65–71.
- Carcello, J.V., Hermanson, D.R., Neal, T.L., Riley Jr., R.R., 2002. Board characteristics and audit fees. *Contemporary Accounting Research* 19 (3), 365–384.
- Chen, D.H., Zhou, C.Q., 2006. The effect of self-selection system on audit fees: empirical evidence from Chinese listed companies. *Journal of Finance and Economics* (in Chinese) 3, 44–55.
- Chen, C.J.P., Su, X.J., Wu, X., 2005. Abnormal audit fees and the improvement of unfavourable audit outcomes. *China Accounting and Finance Review* 7 (4), 1–54.
- Chen, C.J.P., Su, X.J., Wu, X., 2007. Market competitiveness and Big 5 pricing: evidence from China's binary market. *The International Journal of Accounting* 42 (1), 1–24.
- Choi, J.H., Kim, J.B., Liu, X., Simunic, D.A., 2008. Audit pricing, legal liability regimes, and Big 4 premiums: theory and cross-country evidence. *Contemporary Accounting Research* 25 (1), 55–99.
- Cui, X.G., Wang, L.Y., Xu, H., 2007. High-speed growth, financial crisis and risk forecasting. *Accounting Research* (in Chinese) 12, 55–62.
- DeFond, M.L., Francis, F.R., Wong, T.J., 2000. Auditor industry specialization and market segmentation: evidence from Hong Kong. *Auditing: A Journal of Practice and Theory* 19 (Spring), 49–66.
- Drobetz, W., Schillhofer, A., Zimmermann, H., 2004. Corporate governance and expected stock returns: evidence from Germany. *European Financial Management* 10, 267–293.

¹⁹ Here, comparability refers to the company disclosing its audit fees in both its 2007 and 2008 annual reports.

²⁰ The return may be an increase in firm value owing to an improvement in corporate governance. As consideration of this issue is not the main research objective of the study, we provide no evidence of the relationship between corporate governance and firm value.

- Fan, J.P.H., Wong, T.J., 2005. Do external auditors perform a corporate governance role in emerging markets? Evidence from East Asia. *Journal of Accounting Research* 43, 35–72.
- Firth, M., 1985. An analysis of audit fees and their determinants in New Zealand. *Auditing: A Journal of Practice and Theory* 4 (Spring), 23–37.
- Francis, J., 1984. The effect of audit firm size on audit prices: a study of the Australian market. *Journal of Accounting and Economics* 6, 133–151.
- Francis, J.R., Stokes, D.J., 1986. Audit prices, product differentiation, and scale economies: further evidence from the Australian market. *Journal of Accounting Research* 24, 383–393.
- Gao, M.M., Gao, Y., 2008. Corporate governance and audit pricing: empirical evidence from Chinese listed companies. *Productivity Research* 9 (147–148), 155.
- Gul, F.A., 2001. *Hong Kong Auditing: Economic Theory and Practice*. City University of Hong Kong Press.
- Gul, F.A., Tsui, J.S.L., 2001. Free cash flow, debt monitoring, and audit pricing: further evidence on the role of director equity ownership. *Auditing: A Journal of Practice and Theory* 20, 72–84.
- Gul, F.A., Tsui, J.S.L., Chen, C.J.P., 1998. Agency Costs and Audit Pricing: Evidence on Discretionary Accruals (Working Paper).
- Han, H.J., Zhou, S.C., 2003. Research on accountants' payments in the Chinese stock market: empirical analysis of Chinese listed companies' data. *Management World* 2, 15–22.
- Hay, D., Knechel, W.R., Wong, N., 2004. Audit Fee: A Meta-analysis of The Effect of Supply and Demand Attributes, University of Auckland (Working Paper).
- Heckman, J.J., 1976. The common structure of statistical models of truncation, sample selection and limited dependent variables and a simple estimator for such models. *Annals of Economic and Social Measurement* 5 (4), 475–492.
- Ireland, J.C., Lennox, C.S., 2002. The large audit firm fee premium: a case of selectivity bias? *Journal of Accounting, Auditing and Finance* 17, 73–91.
- Jensen, M., Meckling, W., 1976. Theory of the firm: managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* 3, 305–360.
- Lang, L., Ofek, E., Stulz, R.M., 1996. Leverage, investment, and firm growth. *Journal of Financial Economics* 40 (1), 3–29.
- Larcker, D.F., Richardson, S.A., 2004. Fees paid to audit firms, accrual choices, and corporate governance. *Journal of Accounting Research* 42 (3), 625–658.
- Lennox, C., Francis, J., Wang, Z., 2012. Selection models in accounting research. *The Accounting Review* 87 (2), 589–616.
- Li, B.X., Wang, P.X., 2006. Board characteristics and ratios of audit fee to asset. *China Accounting Review* 1, 105–118.
- Liu, M.H., Hu, B., 2006. Corporate governance, agency costs and audit pricing: an empirical analysis on Chinese A-stock market panel data from 2001 to 2003. *Research on Financial and Economic Issues* 2, 72–79.
- Liu, B., Ye, J.Z., Liao, Y.Y., 2003. An empirical study of the determinants of audit fees. *Auditing Research (in Chinese)* 1, 44–47.
- Pan, K.Q., 2008. Corporate governance, audit risk and audit pricing: empirical evidence based on CCGI^{NK}. *Nankai Business Review* 1, 106–112.
- Simunic, D., 1980. The pricing of audit services: theory and evidence. *Journal of Accounting Research* 18, 161–190.
- Spence, M., 1973. Job market signaling. *The Quarterly Journal of Economics* 87 (3), 355–374.
- Wang, Z.L., 2002. Determinants of Audit Fees and Audit Quality: Evidence from China's Listed Companies. Doctoral Paper, Shanghai University of Finance and Economics.
- Wang, Y., 2009. Control chain, agency conflicts and auditor choice. *Accounting Research (in Chinese)* 6, 65–72.
- Wang, P., Zhou, L.A., 2006. Auditor's choice by China's listed companies and its governance role. *China Accounting Review* 2, 88–98.
- Watts, R.L., Zimmerman, J.L., 1983. Agency problems, auditing, and the theory of the firm: some evidence. *Journal of Law and Economics* 26 (October), 613–633.
- Wu, L.N., 2003. The determinants of audit fees: evidence from the Chinese stock market's first-time disclosure of audit fees. *China Accounting Review (in Chinese)* 1, 113–128.
- Xiao, M., You, J., 2009. Private benefits of control, growth opportunities and investor protection. *China Journal of Accounting Research* 2, 123–145.
- Zhang, J.X., Liu, C.L., 2006. A study review on audit fees and its inspiration. *Contemporary Finance & Economics* 7, 123–128.
- Zhang, J.X., Xu, Y., 2005. The determinants of audit fees: evidence from China's listed companies in 2001–2003. *China Accounting Review (in Chinese)* 1, 99–116.
- Zhang, M., Zhang, Q.F., 2005. Ownership structure, auditor choice and audit pricing: evidences from Chinese securities market. *Accounting and Finance*, 1. <<http://www.sinoss.net/qikan/2011/0130/11784.html>>.
- Zhu, X.P., Guo, Z.Y., 2006. Research on the information content of an increase in audit fees without auditor switching. *Auditing Research (in Chinese)* 2, 64–68.
- Zhu, X.P., Yu, Q., 2004. The determinants of audit fees: an empirical analysis in China. *China Accounting Review* 2, 393–408.