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FIRM OWNERSHIP, INSTITUTIONAL ENVIRONMENT, AND AUDIT COLLUSION: EMPIRICAL EVIDENCE FROM A TRANSITIONAL ECONOMY

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MPHIL

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By

WANG Rui

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ABSTRACT

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Empirical Evidence from A Transitional Economy

By

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Motivated by the renewed interest in, but insufficient empirical evidence of, collusion between auditors and corporate management, I examine this issue in the unique environment of China, which is characterized by a high level of government control over listed companies and auditors, strong competition for audit clients, and uneven economic and legal development across the country. In contrast to prior studies, I employ a two-stage regression approach to study the determinants of audit collusion in China. In the first stage, I develop an audit opinion prediction model of Big 4 auditors (viewed as "typical" auditors) that corrects for self-selection bias. I then apply this opinion prediction model to clients of non-Big 4 (local) auditors. I define audit collusion as the discrepancy between the *actual* opinions that clients of local auditors received and the opinions these clients would have received under similar circumstances had they hired typical auditors (i.e., Big 4 auditors): that is, the *predicted* opinions. In the second stage, I regress an audit collusion proxy on client and auditor characteristics and institutional variables to detect the determinants of audit collusion in China.

Audit collusion depends on the closeness of the relation among three parties – the company owner, the company manager, and the auditor. Prior studies suggest that state-owned enterprises (SOEs) and local auditors have the closest relationship and that their interests are mostly aligned. As audit qualification and client loss are costly for SOE managers and local auditors, respectively, both parties have strong incentives to abide by a self-enforcing collusive agreement. Therefore, I expect audit collusion to occur in SOEs that demonstrate poor firm performance (which could lead to qualified opinions), in listed companies that are characterized by a strong government presence and the audit reports of which are subject to government interference, and when market forces are not strong enough to deter collusive behavior.

Using a sample of 4,874 firm-year observations over the 2001-2006 period, I find statistically robust evidence to confirm my hypotheses. Specifically, I find that SOEs in poor financial condition and for which the government is the largest shareholder

tend to collude with their auditors. In addition, I find that the relation between non-SOEs (regardless of their financial condition) and audit collusion to be significantly negative, which suggests that the interests of non-SOEs are mostly aligned with the interests of individual investors. Consistent with prior studies, I also find that audit collusion usually occurs in regions in which the underlying institutional features of the market environment are not in place to punish auditors.

Prior research generally uses auditor switching to test for the existence of collusive auditor behavior by comparing observed pre- and post-switch audit opinions. As a result, relatively little attention has been paid to the possibility of audit collusion in the absence of auditor switching. Moreover, comparison of observed opinions before and after companies switch auditors is subject to potential self-selection bias, as post-switchers are not randomly assigned to audit firms. The present study overcomes these problems by considering all listed companies (regardless of auditor switching) and using the two-stage Heckman approach to control for self-selection bias. Further, in contrast to most prior research, which uses an analytical model to distinguish honest and dishonest auditor reporting, I empirically test collusion by comparing the difference between the actual opinions that client firms receive and the opinions they would have received had they used independent, higher quality auditors.

My results suggest that as long as the interests of the company and the auditor coincide and neither party has an incentive to break the collusive agreement, audit collusion can occur even when auditor switching does not take place. The finding that audit collusion exists in China suggests that government rules and regulations alone are not sufficient to create a healthy audit market. Rather, the government should improve the overall institutional environment through measures such as the reduction of government ownership of firms, withdrawal of the government from involvement in both the stock and audit markets, and development of a credit market and legal environment that deter collusive auditor behavior.

DECLAEATION

    I declare that this is an original work based primarily on my own research, and I warrant that all citations of previous research, published or unpublished, have been duly acknowledged.

WANG Rui

CERTIFICATE OF APPROVAL OF THESIS

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**Firm Ownership, Institutional Environment, and Audit Collusion:
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1. Introduction

Many researchers have tried to obtain empirical evidence of auditor independence. Most prior research has focused on opinion shopping or audit switching (Ellingsen and Frederic, 1986; Chow and Rice, 1982; Smith, 1986; Krishnan, 1994; Krishnan and Stephens, 1995; Lennox, 2000), as it is argued that collusive behavior between auditors and auditees can be detected only when companies switch auditors. However, this point of view is flawed, because the possibility that audit collusion may have occurred in the absence of auditor switching has been overlooked. This study aims to examine whether collusion exists, and if so, to discover the determinants of audit collusion in a transitional economy. I consider both switching and non-switching situations. Using China as my testing sample, I find that audit collusion exist in China's capital market. Specifically, I find that state-owned enterprises (SOEs) are more likely to engage in audit collusion, especially when they are in poor financial condition. Whereas state-owned share concentration leads to audit collusion, non-state-owned share concentration deters audit collusion because it aligns the interests of the largest shareholder with those of the other shareholders and mitigates the free-rider problem of small shareholders. Moreover, I find that audit collusion tends to occur in regions in which the institutional environment is weak.

In contrast to previous research methods, which are designed to test opinion shopping, I employ a two-stage logit regression to find empirical evidence of audit collusion in China's capital market. In the first stage, I develop an audit opinion prediction model of high-quality Big-4 auditors, and introduce a two-step probit/logit model to control for self-selection bias between auditees and auditors. Then I apply

this audit opinion prediction model from stage one to auditees of China's local auditors, and obtain an audit opinion for each firm in my sample. Audit collusion proxy is defined as the discrepancy between the actual opinions that clients received from their auditors and the opinions they would have received under similar circumstances from a Big-4 auditor (considered a "typical" auditor)[1]. In the second stage, I regress the difference in opinion on client and auditor characteristics and institutional variables to detect the determinants of audit collusion in China.

Following prior studies, which find that China's local auditors tend to issue favorable reports under political pressure (e.g., DeFond, Wong, and Li, 1999; Chan, Lin, and Mo, 2006), I expect that audit collusion exists in China's capital market. Specifically, I expect the ownership structure of listed firms, firm performance, and institutional factors to affect the reporting behavior of auditors, in particular, local auditors. I test my hypotheses by analyzing all companies listed on the Shanghai and Shenzhen stock exchanges during the 2001-2006 period. Consistent with my expectations, I find empirical evidence that audit collusion exists in China's capital market. I find that SOEs demonstrating poor financial performance tend to collude with their auditors, whereas non-SOEs, regardless of their financial performance, do not tend to collude with their auditors. I also find that state-owned share concentration leads to audit collusion, and that non-state-owned share concentration deters audit collusion to some extent. Similar to the results of prior studies (e.g., Wang, Wong, and Xia, 2005), my results show that audit collusion usually occurs in regions that have an undeveloped market with strong government interference and relatively poor legal enforcement.

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[1] This proxy follows the study by Dopuch, Holthausen, and Leftwich (1987), which indicates that audit qualification prediction model can serve as a benchmark to represent the probability that a "typical" auditor would issue a qualified opinion under similar circumstances. This benchmark would be useful in peer review committees, in debates about "opinion shopping", in quality control procedures within firms, and in court cases involving auditor negligence for not issuing qualified opinions.

This paper contributes to the existing literature on audit opinion prediction and audit collusion. First, I contribute to the audit collusion literature by providing empirical evidence of the relation between ownership structure and audit collusion. I find that SOEs have a self-enforcing side contract with their auditors, and that these firms are more likely to take part in audit collusion. State-owned share concentration leads to audit collusion, whereas non-state-owned share concentration mitigates the free-rider problem of other shareholders and therefore deters audit collusion. In addition, I test the effect of institutional environment on audit collusion. Consistent with the existing literature, I find that audit collusion is more likely to occur in regions that have a poor institutional environment. Second, I introduce a two-step probit/logit model to control for self-selection bias between auditees and auditors in the audit opinion prediction model, which is the first such model in the audit opinion prediction literature and proves to be a prediction model with high precision of classification. Further, I employ in my model a proxy for audit collusion, which is defined as the discrepancy between the actual opinions that clients received from their auditors and the opinions they would have received under similar circumstances from a "typical" auditor. This collusion proxy enables the empirical testing of audit collusion theories, unlike the case of traditional analytical models, and sheds light on the generation of other proxies for collusion in organizations.

The present study extends and complements the study of Chan, Lin, and Mo (2006) on audit quality in one important dimension. Whereas the main aim of the latter study was to examine whether auditor opinions are affected by government political and economic influences during the 1996-2002 period, the main aim of this study is to test for the existence and determinants of audit collusion during the 2001-2006 period. To the best of my knowledge, the present study is the first to provide empirical evidence

of audit collusion in a transitional economy. Chan, Lin, and Mo (2006) find that local auditors are more economically dependent on local clients and subject to greater political influence from local governments than are non-local auditors, and are inclined to issue favorable reports for local government-owned companies to mitigate probable economic losses. I find that only SOEs demonstrating poor financial performance collude with their auditors, whereas non-SOEs, regardless of their financial performance, have little incentive to collude with local auditors. I also provide a direct test to show the relationships among ownership structure, institutional environment, and audit collusion, and find that state-owned share concentration leads significantly to audit collusion, whereas non-state-owned share concentration deters audit collusion. Further, my results show that audit collusion usually occurs in regions that have an undeveloped market with strong government interference and relatively poor legal enforcement.

This study has policy implications for both regulators and practitioners. The finding that audit collusion exists in China suggests that government rules and regulations alone are not sufficient to create a healthy audit market. Rather, the government should improve the overall institutional environment through measures such as the reduction of government ownership of firms, withdrawal of the government from involvement in both the stock and audit markets, and development of the legal environment.

The remainder of the thesis proceeds as follows. The literature review and hypotheses development are presented in the second section. The third section includes the method and research design, which consists of the sample description and data collection, a two-stage regression model involving an audit opinion prediction model using capital market and firm-specific financial data, and a logit regression to

ascertain the determinants of audit collusion in China's capital market. The empirical

results and robustness tests are presented in the fourth section, and the conclusions are

given in the fifth section.

2. Literature Review and Hypotheses Development

2.1. Audit Collusion

Audit collusion is defined as the fraudulent behavior that occurs when an auditor accepts a favor from the client, loses his or her professional independence, provides an unfair and biased audit report, and issues the client an unwarranted favorable audit opinion to meet the client's special needs. In a traditional auditing model with adverse selection and unobservable effort, a principal, the owner of the resources, hires an auditor to monitor the agent who manages and acts on the principal's behalf in order to overcome information asymmetry. The agent usually has private information about the true operation and performance of the firm and can use it to seek rents from the principal for the agent's own benefit. Here, the auditor's task is to verify the agent's statement by issuing a fair and unbiased audit report. The transferred information that the principal receives is based on both the agent's claim and the auditor's verification of the agent's claim.

A collusive agreement between an agent and auditor must be self-enforcing, that is, neither the agent nor the auditor has an incentive to break the collusive agreement when the counterpart does not do so (Baiman, Evans, and Nagarajan, 1991). A fraudulent agent (the manager) has a strong incentive to bribe the auditor, but an honest auditor will refuse the bribe and report the manager's offer of a bribe. In this scenario, the fraudulent agent is punished, and the honest auditor receives only the audit fee offered by the principal. A dishonest auditor, however, will take the agent's bribe, help mask the agent's misbehavior, and issue a favorable report that supports the agent's claim. In this scenario, the interests of the auditor and those of the agent are in alignment. They make a side contract that is self-enforcing because both of the two will be better off compared with the first scenario: the agent will use information rent

extracted from the principal for the agent's private use, and the auditor will get the audit fee offered by the principal as well as the bribe the agent offered for colluding.

Kofman and Lawarree (1993) were the first to develop an analytical model to distinguish honest from dishonest auditors. Most prior studies of audit collusion have used analytical models of collusive behavior. However, very little empirical evidence on audit collusion exists, because the decision whether or not to collude reflects a state of mind and is not a permanent feature, and because the decision to collude can depend on the different incentives faced by the auditor. Some researchers link collusive behavior to auditor switching, as companies are free to select different auditors until they find one who is willing to sacrifice his or her professional ethics for commercial gain by participating in improper accounting practices (Ellingsen and Frederick, 1986). Empirical evidence of opinion shopping is at best mixed, as different research methods are employed. Chow and Rice (1982) find that companies are more likely to switch auditors after receiving qualified opinions than after receiving unqualified opinions, but they are no more likely to receive unqualified opinions in the year after switching than are other non-switching companies. Smith (1986) conducts a case analysis and reports that only five out of 139 companies are suspected of opinion shopping. Krishnan (1994) finds that switchers receive conservative treatment relative to non-switching clients. He points out that the receipt of conservative treatment, rather than the receipt of qualified opinions, motivates auditor switching. Krishnan and Stephens (1995) cannot find an example of successful opinion shopping, and attribute this to the conservative treatment of switchers by both predecessor and successor auditors. In contrast, Lennox (2000) finds empirical evidence of successful opinion shopping in the U.K. He predicts the opinions that companies would have received had they made opposite switching decisions. He finds that companies would have received

unfavorable reports more often under different switching decisions, and interprets his finding as evidence of successful opinion shopping.

The methods adopted in prior research are all based on the assumption that auditors' collusive behavior is unidentifiable from alternative sources, and that opinion shopping detection must focus on the relation between the audit opinion and auditor switching. However, this assumption is inadequate, as it does not consider the situation in which the threat to switch results in the issuance of favorable opinions. That is, favorable opinions are not necessarily a result of auditor switching. Non-switchers can receive favorable opinions by threatening to switch to a new auditor. The shocking audit scandal of Arthur Andersen and Enron was revealed in December 2001. The management and the auditor of these two giants in their respective industries took advantage of not only investors, but also the government and public as a whole, to illegally increase their personal wealth. Arthur Andersen had been Enron's auditor ever since Enron's foundation in 1985, and did not execute its duties independently because of the huge amount of audit and consulting fees that Enron provided. A similar case occurred in China. The CPA firm of Zhongtianqin (中天勤) was one of the leading accounting firms in China prior to 2000. As the auditor of Yinguangxia (银广夏) for seven consecutive years, Zhongtianqin assisted the client in fabricating financial reports but issued clean audit reports. These cases indicate that companies can get a favorable audit opinion without having to switch auditors.

More evidence comes from financial reporting enforcement. Financial reporting enforcement is an external monitoring process that is intended to strengthen investors' confidence in the accuracy of financial statements. China's regulatory authorities may take supervisory measures such as ordering a company to publish the errors that have been identified in order to serve the public interest. For example, from 1997 to 2005,

the Shanghai and Shenzhen stock exchanges required financial reporting of 101 and 124 listed firms, respectively, and the China Securities Regulatory Commission (CSRC) required financial reporting of another 308 listed firms. During the same period of time, there were only 138 voluntary auditor changes (Chan, Lin, and Zhang, 2007). Although I assume that some of these 138 firms engaged in opinion shopping, it is still a small proportion relative to the total number of firms that had questionable financial statements and thus were required to comply with regulatory norms by stock exchanges and the regulatory authority (101+124+308). This further illustrates that auditor switching may not be a good indicator of audit collusion. Therefore, prior empirical research on audit opinion shopping and audit collusion is incomplete. Although many noted papers have found evidence of opinion shopping, very few find evidence of collusive behavior between firms and auditors without auditor switching, because the possibility that threatening to switch auditors may result in the issuance of favorable audit opinions has been neglected.

2.2. Auditor-Client Self-Enforcing Side Contract and Audit Collusion

Although Chinese investors may perceive auditors to be more objective and more neutral than the managers of SOEs, auditors have been found to collude with managers in manipulating financial statements (Lei, 2005). To explain why Chinese auditors lose their independence, a thorough understanding of the development of CPA firms in China is necessary. In 1979, China undertook a revolutionary economic reform by decentralizing SOEs, and began to attract foreign direct investment. Since then, the Chinese government has realized the importance of external auditors for the healthy development of the stock markets, which were established in the early 1990s. To ensure audit quality, the central government granted permission to selected accounting firms to audit listed companies. Because of the lack of capital, most audit firms were

affiliated with local governments or government agencies. Government-affiliated audit firms once dominated the audit market with 75% of shares in terms of numbers of clients (DeFond et al., 1999). Sponsoring government agencies such as finance bureaus, tax bureaus, bureaus in charge of different industries, or other local government agencies often demanded that companies located within their administrative territory be audited by their sponsored audit firms (Yang et al., 2001). As a result, auditor judgment and the type of audit report issued were often affected by the sponsoring local government agencies (Tang, 1999; Zhong, 1998), which severely compromised auditor independence in China and led to a disaffiliation campaign in 1997. However, this campaign could not change the fact that most listed companies are primarily owned by local governments, and the majority of local audit firms was previously affiliated and had close connections with these governments (DeFond, Wong, and Li, 1999; Tang, 1999; Yang, Tang, Kilgore, and Hong, 2001). Although presently the audit firms appear to be independent and have no further connection with local governments, private relationships (called *guanxi* in Chinese) still exist among former colleagues and departments, and local governments can still exert influence on audit firms in their jurisdictions through regulations administered by their finance bureaus, audit bureaus, and local audit institutes (Tang, 1999; Zhong, 1998). These audit firms are also dependent on the political influence of local government to acquire more SOE clients, which is critical for an audit firm's survival in the fiercely competitive audit market. Hence, auditors who have greater economic dependence on local clients and are subject to more political influence from local governments are inclined to report favorably on SOEs to mitigate probable economic losses (Chan, Lin, and Mo, 2006). Chan and Mo (2002) point out that respect for and obedience to local authorities is important for maintaining good business relationships in China.

Auditors in China have an undeniable incentive to collude with their SOE clients, which are economically very important clients. An audit firm faces potential economic losses if it follows professional criteria and issues reports that are unfavorable to its SOE clients. Meanwhile, as the dominant shareholder of SOEs, the local government will be impressed by an auditor's willingness to collude in preparing false financial reports, and hence may refer more SOE clients to that audit firm. However, SOE managers do not have market-based incentives to demand high-quality auditors (DeFond, Wong and Li, 1999). In China, companies with modified reports must explain the nature and underlying reasons for the receipt of a modified report directly to the CSRC (Chen, Su, and Zhao, 2000). Therefore, SOE managers have a strong incentive to avoid modified audit opinions, which will probably bring them future political and economic costs.

In this two-party game, auditors are generally considered to be "subordinates" and SOEs to be "superiors" because of the power of SOEs to hire and fire auditors. In dealing with subordinates, superiors often adopt a take-it-or-leave-it attitude. Following the receipt of an unfavorable audit opinion in one year, some SOEs may continue changing auditors in the following years until they finally find an auditor who is willing to report leniently. Initial evidence shows that a successor auditor is more cooperative and more likely to express a clean opinion (Li and Wu, 2002). DeFond, Wong, and Li (1999) find that the top 10 audit firms, which are more professional and independent, lose their market shares as a result of issuing modified audit opinions. As illustrated above, SOEs exert strong political pressure on local auditors, and auditors have incentives to report favorably to obtain greater economic benefits and political protection. Hence, SOEs and local auditors have established collusive self-enforcing contracts. The severe shortage of qualified accountants and auditors in China further

hinders the development of professional auditing (Winkle et al., 1994; Graham, 1996). Without an independent audit profession, any information provided by the auditor as a third party assurance will be biased and hence unreliable.

In conclusion, SOEs exert strong political pressure on local auditors, and local auditors have incentives to issue favorable reports for their SOE clients. Both SOEs and local auditors are inclined to take part in audit collusion for their own benefit. However, it is reasonable to expect that only SOEs with inferior financial performance have strong incentives to collude with their auditors, whereas SOEs with superior financial performance lack incentives to do so. Schwartz and Menon (1985) find that failing firms have a greater tendency to switch auditors than do healthier firms, while Lennox (2000) finds that companies strategically appoint auditors who are less likely to issue going concern opinions and that failing companies successfully engage in opinion shopping. However, non-SOEs have little ability to exert political pressure on their auditors, and they will not take part in audit collusion. Hence, the first hypothesis is stated as follows.

Hypothesis 1: SOEs demonstrating inferior financial performance are more likely to take part in audit collusion, whereas non-SOEs and SOEs demonstrating superior financial performance are less likely to take part in audit collusion.

2.3. Share Concentration and Audit Collusion

Concentrated share holdings enable control rights to match cash flow rights. Given the amount of investment of large shareholders in a company, it is reasonable to expect that they have strong incentives to monitor and discipline management to maximize their benefits. The prior literature indicates that large shareholders tend to perform an active role in corporate governance. For example, Franks and Mayer (2000) find that in Germany, family-owned enterprises usually possess a large amount of shares

through a pyramid structure, which enables the ultimate shareholders to have control rights over the firm, but these large shareholders hold the shares only for the purpose of controlling the firm. In addition, a strong relationship between board turnover and poor firm performance has been found in German firms with concentrated ownership, and has also been well documented in firms in other Anglo-Saxon countries (Franks and Mayer, 2000). Yafeh and Yosha (2003) point out that large shareholders tend to constrain managers' excessive spending on projects that promote the managers' interests but are not in line with the interests of the majority shareholders. Because the free-rider problem associated with monitoring is mitigated under concentrated ownership, Yafeh and Yosha (2003) argue that large shareholders tend to reduce discretionary spending, such as advertisement expenditure. Moreover, large shareholders usually combine their general interest in profit maximization and control over the profit-making assets of the firm to have their interest respected (Shleifer and Vishny, 1997), and they are likely to desire a high-quality audit report and avoid collusive behavior for the benefit of both the company and themselves.

One fundamental problem is that large shareholders will use their control rights to maximize the company welfare only when the interests of large shareholders agree with the interests of other shareholders. Large shareholders will probably expropriate the interests of other shareholders if their personal goals are not consistent with those of the other shareholders. For instance, government-owned enterprises tend not to have profitability as their sole objective but rather have multiple objectives. Large shareholders may view the acquisition of political capital and the development of their personal relationship network as more important than profit. This phenomenon prevails in many transitional economies such as China, India, and Vietnam because of their relatively undeveloped economies and immature capital markets.

In China, local governments regard listed SOEs as very precious shell resources. First, the number of listed SOEs of a region is not only a symbol of the economic prosperity of that region, but also represents the political achievements of the local government. Therefore, politicians may care more about increasing the number of listed firms in their region, which can enhance their chance of promotion, rather than raising more capital (Li and Zhou, 2005). Being de-listed not only incurs economic losses in the region, but also brings disgrace to the local government (Chen, Su, and Zhao, 2000). Second, local governments often impose policy burdens on the listed firms such as infrastructure development to provide relief for the region's fiscal and unemployment problems (Lin, Cai, and Li, 1998). A common strategy that a local government often adopts is to use its authority to push the most profitable SOEs or their subsidiaries to be listed. Once the enterprise is listed, the government will exert political influence to maintain this valuable listed shell resource. The profit that listed SOEs generate in the capital market can be transferred to unlisted SOEs or related parties, a process usually referred to as "tunneling," to help avoid the bankruptcy of unlisted SOEs or related parties, since the collapse of an SOE can cause widespread unemployment and social disharmony. Third, to raise capital through a rights offering, listed companies are required to report a return on equity (ROE) greater than or equal to 10% for at least three consecutive years. Furthermore, a company will be de-listed if it reports a negative ROE for three consecutive years (Haw et al., 2005). As these accounting numbers can be easily manipulated through the opportunistic use of accounting accruals, local governments have strong incentives to direct management to report earnings that meet the requirements. To do so, the local governments need to select an auditor who will not challenge such reporting (Aharony et al., 2000; DeFond et al., 1999). The extant literature indicates that when the large shareholder is the

government, the interest that the large shareholder pursues is different from that of the other shareholders, which is the maximization of their wealth. As large shareholders of SOEs have incentives to expropriate other shareholders in order to meet their specific political goals, they are more like to collude with obedient auditors to cover this expropriation.

Hence, I expect that share concentration leads to audit collusion when the interests of large shareholders do not coincide with the interests of other shareholders. Specifically, if large shareholders are private investors (e.g., institutional shareholders), their goal is to maximize profit in the most efficient way, and thus they need high-quality auditors to verify financial data in order to reduce information asymmetry. Share concentration in the hands of private, institutional investors is likely to deter audit collusion. However, if the large shareholders are local governments, they will have multiple goals that have little to do with profit maximization. Large shareholders of SOEs require obedient auditors who will abandon their professional ethics and issue favorable audit opinions in order to mask the expropriation of other shareholders by the large shareholders. Therefore, I hypothesize that share concentration of SOEs in the hands of local governments will result in audit collusion. The more shares are owned by the government, the more likely the SOEs will take part in audit collusion. Therefore, the following hypothesis regarding share concentration and audit collusion is proposed.

Hypothesis 2: Share concentration in SOEs leads to audit collusion, whereas share concentration in non-SOEs deters audit collusion.

2.4. Institutional Environment and Audit Collusion

A few studies point out that financial reporting quality is influenced by the political environment (Bushman et al., 2004; Leuz and Oberholzer-Gee, 2006; Ball et

al., 2000), and that SOEs tend to choose low-quality auditors in regions characterized by a poor institutional environment for ease of collusion (Wang, Wong, and Xia, 2005). Three aspects of institutional environment are considered here: the degree of government involvement in the economy, the capital market development in a specific administrative region, and the degree of shareholder protection, or legal enforcement. Little direct evidence has been found of the relation between audit collusion and institutional environment. That is, few papers have explored whether audit collusion is more likely to occur in regions with a poor institutional environment, whether SOEs behave differently from non-SOEs in the same institutional environment in terms of audit collusion, or whether a good institutional environment deters the formation of a collusive self-enforcing contract between SOEs and tractable auditors.

Since the launch of the economic decentralization reform in 1978, China's central government has relaxed its absolute control over the allocation of economic resources to local governments, and granted local governments more autonomy to promote economic growth in their administrative region. Because of the different endeavors of local governments and different locations that create different opportunities for economic development, a great heterogeneity across provinces in terms of marketization and institutional quality exists in China's capital market (Wang, Wong, and Xia, 2005). Therefore, China provides a unique setting for testing the effect of the institutional environment on audit collusion within one country. Following prior studies, I expect that collusion is associated with a weak institutional environment, and that audit collusion is more likely to occur in regions in which the local governments have a high degree of involvement in the economy, the credit market is underdeveloped, and legal protection of minority shareholder interests is relatively low. As mentioned earlier, unlike non-state owners, local governments have incentives to

use SOEs as platforms to fulfill their political goals, such as upgrading their administrative ranking, reducing the regional unemployment rate, and tunneling profits to help other SOEs in the same region avoid bankruptcy. Local auditors are influenced by political pressure from local governments and economically dependent on their SOE clients. As a result, they often have to issue favorable reports for their SOE clients in order to survive in the highly competitive audit market. This kind of self-enforcing side contract is very common among China's auditors and SOEs. Wang, Wong, and Xia (2005) find that auditors are more lenient only towards SOEs, and not towards non-state-owned firms. They argue that local governments may use political power to undermine the independence of auditors and force auditors to take part in collusion. Hence, I expect that as non-SOEs have no ability to exert political pressure on their auditors, auditors will not collude with their non-SOE clients regardless of the kind of institutional environment in which their clients operate. Therefore, the third hypothesis is as follows.

Hypothesis 3: Audit collusion is more likely to occur in regions with a poor institutional environment than in regions with a good institutional environment, and SOEs are less likely to collude with their auditors in regions with a good institutional environment than with those in regions with a poor institutional environment.

3. Research Method

3.1. Data Collection

The China Securities Markets and Accounting Research (CSMAR) database is the primary source of financial information on the listed companies that issued A shares in the Shanghai and Shenzhen stock exchanges. Stock market data and audit opinion type are acquired from the Wind database. Information related to audit firms such as firm location and auditor identity are collected from the official Web site of the Chinese Institute of Certified Public Accountants (CICPA). [2] Corporate governance information of listed companies is obtained from the China Center for Economic Research (CCER) database. To be retained in my sample, firms must have complete financial and audit information for hypothesis testing. Financial institutions and insurance companies are excluded from the sample because their business and financial reporting requirements are different from those of other listed companies. The observations of firms that are located in Tibet are also excluded because three regional institutional indices are not available for Tibet. In addition, I trim off the outliers that fall outside three standard deviations from the mean to get rid of extreme values. Panel A of Table 1 shows that my sample consists of 5,268 firm-year observations of Chinese listed companies over the 2001-2006 period.

[Insert Table 1 here]

Although the number of firms that are included in the sample increases annually, the proportion of Big 4 auditees to non-Big 4 auditees is roughly the same for each year. SOEs account for a very large portion of my sample, reaching the highest percentage of all firms in 2001 (84.62%) and the lowest percentage in 2006 (67.60%),

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[2] The official Web site for the CICPA is www.cicpa.org.cn

which is consistent with the fact that most listed companies in China's capital market are ultimately controlled by the government. Panel B presents the client composition of two types of auditors during the sample period. The table shows that 84% of Big 4 clients and 75% of non-Big 4 clients are owned by the government. Again, SOEs account for a great proportion of auditors' clients, and auditors in China have a heavy economic dependence on their SOE clients. Panel C of Table 1 shows the descriptive statistics on the frequencies of clean versus modified audit opinions that Big 4 and non-Big 4 auditors issued during the sample period. DeFond, Wong, and Li (1999) point out that large auditors have the greatest propensity to issue modified reports. However, panel C indicates that, on average, Big 4 auditors issued significantly fewer modified auditor opinions than did non-Big 4 auditors (6.09% vs. 9.66%, respectively). One possible explanation for this discrepancy is that Big 4 auditors usually serve large clients that are in better financial condition and have better internal control, and as a result, their clients are less likely to be issued qualified opinions. This discrepancy in the number of modified opinions also indicates that auditees are not randomly assigned to their auditors and that they select auditors according to firm characteristics, such as financial condition, corporate governance, and institutional factors. The variable definitions and descriptive statistics are reported in Table 2 in panel A and panel B, respectively.

[Insert Table 2 here]

Table 3 reports the descriptive information of client firm characteristics divided by class of auditor. ANOVA F-statistics for equality of means and the Wilcoxon test of differences in medians are employed. The last column shows that most of the variables

that denote firm characteristics are significantly different between Big 4 and non-Big 4 groups. For example, firms with a higher current ratio, higher return of equity, and lower receivables and inventory ratios tend to select Big 4 auditors, whereas firms that received a modified audit opinion in previous years or are currently experiencing losses tend to choose non-Big 4 auditors. In addition, firms located in regions with a poor institutional environment are more likely to select non-Big 4 auditors, whereas firms that have an internal audit committee are more likely to hire Big 4 auditors. These comparisons between Big 4 and non-Big 4 auditees indicate that auditors are not randomly allocated to listed firms; rather, firms probably self-select auditors according to their firm characteristics.

[Insert Table 3 here]

3.2. Model Specifications

3.2.1. Stage One: Audit Opinion Prediction Model

Researchers use different methods to predict audit uncertainty qualifications. Beaver (1966) employs a univariate approach using a paired classification technique to predict failure on the basis of financial ratios. Altman (1968) uses multi-discriminant analysis to predict failure. Castagna and Matolcsy (1981) develop a quadratic discriminant analysis technique to examine the predictive ability of selected financial ratios to discriminate between failed and surviving companies. Mutchler (1985) and Bell and Tabor (1991) use financial variables to develop auditors' going-concern evaluations of firms. Dopuch, Holthausen, and Leftwich (1987) introduce capital market variables to the prediction model and estimate the type of audit opinion based on both financial and market variables. Chen, Marshall, Zhang, and Ganesh (2006)

predict the financial distress of companies in China. They argue that the logit model is the optimal prediction model with the best classification ability.

These approaches, although straightforward, rely on at least three implicit assumptions. First, the opinion prediction model assumes that Big 4 and non-Big 4 auditors use the same audit structure when issuing audit opinions. This assumption can be restrictive, as it does not allow for interactive effects between auditor type and firm characteristics and ignores differences in the demand for Big 4 auditors. Studies indicate that Big 4 and non-Big 4 auditors report differently in China's capital market. Political pressure from the local government has little influence on Big 4 auditors. DeFond, Wong, and Li (1999) point out that Big 4 auditors usually serve the clients that demand higher quality audit reports. Hence, Big 4 auditors issue independent reports in China's auditing market. Chan, Lin, and Mo (2006) find that local auditors, who have greater economic dependence on local clients and are subject to more political pressure from local governments than non-local auditors, are inclined to report favorably on local government-owned enterprises to mitigate probable economic losses. Second, the underlying assumption of the traditional audit opinion prediction model is that auditors' decision rules do not vary with the institutional environment. Fan and Wang (2003) provide evidence that institutional development is not uniform across the China. Leuz and Oberholzer-Gee (2006) show that accounting standards are not the only determinant of reporting behavior, and that economic and political variables profoundly affect financial reporting practice. Hence, it is reasonable to argue that auditors will adjust their decision rules based on the institutional environment of the region in which their clients operate. Finally, and most importantly, the model implicitly assumes that auditors are randomly allocated to client firms. However, as suggested by Copley et al. (1995) and Ireland and Lennox

(2002), auditor choice is likely to be endogenous. Because client firms are not randomly assigned to audit firms, it is probable that firms self-select Big 4 or non-Big 4 auditors based on firm characteristics, private information, and/or other unobservable characteristics.

Theoretical studies (Titman and Trueman, 1986; Datar et al., 1991) use signaling models to explore the self-selection of auditors by clients, and there is a common perception that clients self-select their auditors. From an econometric perspective, self-selection introduces a bias in the logit audit opinion prediction model. To address this point more specifically, consider the following equation:

Auditor choice equation: $Big4_i = \alpha Z_i + u_i$ (1)

Audit opinion prediction model: $Opinion_{0i} = \beta_0 X_i + v_{0i}$ if $Big4_i = 0$ (2)

$$Opinion_{1i} = \beta_1 X_i + v_{1i} \text{ if } Big4_i = 1, \quad (3)$$

where X_i and Z_i are vectors of the exogenous variables and the error terms, u_i, v_{0i}, and v_{1i} are assumed to be normally distributed with a mean of zero. The variance-covariance matrix is given by

$$Covariance(v_{0i}, v_{1i}, u_i) = \begin{bmatrix} \sigma_{00} & \sigma_{01} & \sigma_{0u} \\ \sigma_{01} & \sigma_{11} & \sigma_{1u} \\ \sigma_{0u} & \sigma_{1u} & \sigma_{uu} \end{bmatrix}.$$

Standard logit regressions of audit opinion prediction models are potentially misspecified. To show this, take the conditional expectations of the residuals in equations (2) and (3), respectively:

$$E(v_{0i}|Big4_i = 0) = -\sigma_{0u} \left[\frac{\phi(-\alpha Z_i)}{\Phi(-\alpha Z_i)} \right]$$

$$E(v_{1i}|Big4_i = 1) = -\sigma_{1u} \left[\frac{\phi(-\alpha Z_i)}{1 - \Phi(-\alpha Z_i)} \right],$$

where the functions ϕ and Φ are the standard normal probability density function and the cumulative distribution function, respectively; σ_{0u} and σ_{1u} are the covariance of the residuals from the non-Big 4 and Big 4 audit opinion prediction regressions, respectively, and the residuals from the auditor choice equation. In the above equations, if $\sigma_{0u} \neq 0$ or $\sigma_{1u} \neq 0$, then the conditional expectation is nonzero, causing the logit regression to be misspecified and the estimated coefficients to be biased. Although researchers can directly control for many client characteristics, characteristics that are not observable to them may affect both audit opinion issuance and auditor choice and thereby cause bias. Ireland and Lennox (2002) point out that the quality of internal accounting controls and management integrity are potentially important characteristics that are unobservable to researchers. Studies indicate that companies with strong internal control and superior management integrity are more likely to choose high-quality auditors (Thornton and Moore, 1993), and that they are more likely to get unqualified audit opinions. These unobservable client characteristics affect both auditor choice (u_i) and audit opinion issuance (v_i), and make $E(u_i v_i) \neq 0$, that is, $\sigma_{0u} \neq 0$ and $\sigma_{1u} \neq 0$. Therefore, standard logit regressions of audit opinion prediction models are potentially misspecified and the estimated coefficients are biased.

Heckman (1979) derives a two-step method to correct for selectivity bias in linear regression models with normal errors, and Dubin and Rivers (1989) apply the same basic conceptual framework to logit and probit models, and develop a two-stage binary probit method to control for self-selection bias in discrete-choice models. Following prior studies, I introduce the probit/logit two-stage method to control for selection effects. First, I estimate a probit auditor selection model and use the results to generate the inverse Mills ratios. Next, I include the inverse Mills ratios in audit

opinion prediction models for the clients of Big 4 and non-Big 4 auditors to correct for selectivity bias. The estimated coefficients of audit opinion prediction models will be biased if the inverse Mills ratios are omitted from the regression. The self-selection model is given as follows.

Auditor Choice:

$$Probit(Big4_i) = \alpha_0 + \sum_{k=1}^{m} \delta_m Financial\_Variables_{im} + \sum_{k=1}^{n} \phi_n Capital\_Market\_Variables_{in}$$
$$+ \alpha_1 In\_Audit_i + \alpha_2 Prior_i + \alpha_3 Institution_i + u_i$$

$$(4)$$

Audit Opinion Prediction:

$$Logit(Opinion_i) = \beta_0 + \sum_{k=1}^{m} \gamma_m Financial\_Variables_{im} + \sum_{k=1}^{n} \lambda_n Capital\_Market\_Variables_{in}$$
$$+ \beta_1 Prior_i + \beta_2 Institution_i + v_i$$

$$(5)$$

The descriptive statistics and definitions of these variables given above are presented in Table 2. Consistent with previous research, I expect that client firm characteristics, firm private information, and institutional factors affect both auditor choice and audit opinion issuance.

(i) Variables Included in Both the Auditor Choice and Opinion Prediction Model

Financial variables, that is, total assets, current ratio, leverage, return on equity (ROE), and current year loss, are included to reflect the financial condition of the firms. The literature indicates that these variables are successful in predicting firm financial distress (Dopuch, Holthausen, and Leftwich, 1987). I expect that firms with larger assets and a higher current ratio and ROE are in good financial condition. Similarly, I expect low-leverage firms to be less close to bankruptcy and hence they are less likely to be issued qualified opinions. The ratios of receivables and inventory to total assets are considered as they may capture an auditor's potential exposure to litigation risk. St. Pierre and Anderson (1984) survey accounting and auditing disputes in 130 lawsuits

against auditors and find a high frequency of suits involving inventory and receivables. These variables suggest that a qualified audit opinion is more likely if a firm is in poor financial condition. Therefore, I expect firms in good financial condition with lower litigation risk to be more likely to receive a clean audit opinion and hence they may self-select Big 4 auditors to signal the market.

Prior studies find that the type of audit opinion is highly persistent (Lennox, 2000), that is, if a firm is issued a qualified opinion by its auditor in one year, it is more likely to receive a qualified audit opinion in the following year. Usually, auditor change and interactions with the previous audit opinion significantly influence the successor auditor's opinion. In the logit model, a dummy variable representing the prior year's audit opinion is included to measure the auditor's concern with the firm's overall performance. I expect that when a firm is issued a modified opinion in one year, it is more likely to be issued a qualified opinion in the following year. To avoid receiving another qualified opinion, the firm is likely to switch from a high-quality auditor to a low-quality auditor. Since 1992, some listed companies in China have been authorized to issue B shares, which are denominated in foreign currencies to foreign investors. These companies are required to prepare an additional set of financial statements for foreign investors according to International Accounting Standards (IAS). Companies with foreign ownership are generally larger and there is greater demand for quality financial reports from foreign owners; these companies also have incentives to hire high-quality auditors (DeFond, Wong, and Li, 1999). Hence, a B-share variable is used to control for the confounding effect of differential demand for quality financial information (Chan, Lin, and Mo, 2006).

Stock market variables are included as potential determinants of auditor choice and audit qualification decision (Dopuch, Holthausen, and Leftwich, 1987) for two

reasons. First, market return measures capture information above and beyond that reported in financial statements. Good news, such as unrealized gains, potential investment opportunities, or a successful outcome from R&D, and bad news, such as possible litigation involvement and loss of market share due to outdated technology, cannot be reflected in financial statements, but can be forecasted by analysts and sophisticated investors and reflected in stock prices. Market return measures may be correlated with the auditor's information set, or the auditor may use market return measures to infer information incorporated in market prices. Ohlson (1980) argues that stock market variables improve the predictive ability of financial distress prediction models. Beaver (1968) suggests that changes in stock price are more timely predictors of bankruptcy than are univariate financial statement variables. Chen et al. (2006) introduced capital market value in the financial distress prediction model in China. Following these literature, I use a firm-specific beta calculated from the capital asset pricing model (CAPM) model to proxy market return and expect it to be positively related with choosing a Big 4 auditor and getting a clean audit opinion. I expect that the higher the firm market return, the more likely is the firm to choose a Big 4 auditor, and the more likely the firm will get a clean audit report. Second, stock price fluctuation can capture information about the firm's future performance; however, conflicting interpretations coexist of the expected sign of fluctuation. Lawsuits against auditors usually take place after the value of the equity falls precipitously because plaintiffs need only to establish reliance on financial statements that did not disclose major uncertainties. The greater the fluctuation of a firm's returns, the higher is the probability of a large decline in stock price. Nevertheless, a huge positive fluctuation can also demonstrate soaring performance, and firms with huge positive fluctuations have incentives to self-select Big 4 auditors to verify their financial reports and send a

positive signal to the capital market. Therefore, a variable, *Fluctuations*, which equals the standard deviation of stock prices, is included in the logit model to capture the uncertainty of earnings. The expected coefficient of Fluctuations is mixed.

The difficulty of the audit engagement may be due to the complexity of the specific client, but it may also be a function of the complexity of the client industry (St. Pierre and Anderson, 1984). Specific industry audit guides attest to the fact that industries are differentially complex. Warren (1980) finds that the incidence of qualified opinions is a function of the industry group. In the audit opinion prediction model, I introduce the deviation between firm returns and industry average returns to control for different environments due to different industries. I use the CSRC industry classification system, which comprises twelve categories, to measure industry effect. The finance and insurance industry is excluded in the logit regression because there are great differences in operating and reporting between the finance and insurance industry and other industries. I also control for year effects for both auditor choice and audit opinion issuance to account for changes in the macroeconomic environment.

In contrast to prior studies, I introduce three institutional indices to measure institutional heterogeneity across different administrative regions across China[3] (Wang, Wong, and Xia, 2005). The government involvement index is based on government spending as a percentage of the gross domestic product (GDP), the size of SOEs in a province, and the number of government administrative regulations. The market index is a measurement of credit market development, which is calculated by the percentage of deposits taken by non-state financial institutions and the percentage of short-term loans to the non-state sector. Finally, the legal environment index is

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[3] These three indices, which consist of credit market index, government market involvement index and legal environment index, are based on the China's marketization data in 2002 by Fan and Wang (2003). The regression in the model uses provincial rankings for institution heterogeneity. The latest version of China's marketization report is based on data in 2005. Nevertheless, Fan and Wang indicate that there are no significantly marketization changes in terms of provincial rankings.

measured by the number of lawyers as a percentage of the population in the region. The number of lawyers is a proxy for a region's legal environment. These indices are shown in Appendix 1. Rank transformation of the sum of the three institutional indices is adopted in both the auditor choice and audit opinion prediction models. Following the literature, in which differences in institutional environment are associated with variation in financial reporting quality, and specifically, economies with more market-oriented characteristics, including stronger professional accounting bodies and higher expected litigation costs, are associated with better reporting quality (Ball, Robin, and Wu, 2003), I expect a good institutional environment to result in demand for higher quality auditors.

(ii) Variables Included Only in the Auditor Choice Model

The self-selection model can be estimated only if it satisfies the identification condition, which requires that vectors X_i and Z_i have elements that are not in common. The variable *In_Audit,* which is a dummy variable indicating whether the listed firm has an internal audit committee, fulfills this role.

I expect that the existence of an internal audit committee is positively related with choosing a Big 4 auditor for at least two reasons. First, firms that choose to establish an internal audit committee are inclined to have better management integrity and internal control systems. A good internal control environment can act as a guarantee of high-quality financial information. It is reasonable to assume that firms with an internal audit committee have the ability and motivation to produce higher quality financial reports. Second, if the audit committee carries out its duties well, firms have the confidence to invite high-quality auditors to verify their financial reports. This voluntary selection of Big 4 auditors will send a positive signal to the capital market, and distinguish the firms from other firms.

(iii) Variables Included Only in the Audit Opinion Prediction Model

The inverse Mills ratio is included in the audit opinion prediction model. This controls for the fact that I do not observe the audit opinion companies would have received if they had chosen audit firms of alternative size. To be specific, the coefficient of the inverse Mills ratio of the Big 4 group tells us the audit opinion the companies would have received if they had chosen non-Big 4 auditors rather than Big 4 auditors.

I expect that Big 4 auditees are firms that perform very well and desire high-quality audit reports. If they get clean audit opinions from Big 4 auditors, it is reasonable to expect that they would also get clean opinions from non-Big 4 auditors. In addition, firms that receive modified opinions from Big 4 auditors would probably get clean opinions from non-Big 4 auditors, because non-Big 4 auditors may be less competent and less independent. Therefore, the coefficient of the inverse Mills ratio for the Big 4 group should be negative, as Big 4 auditees would have received a greater number of clean audit opinions if they had chosen non-Big 4 auditors. I expect the direction of adjustment of the inverse Mills ratio is negative in the second step of the Heckman logit regression for audit prediction by Big 4 auditors.

3.2.2. Generating a Proxy for Audit Collusion

Previous studies of audit collusion, such as those of Tirole (1986), Kofman and Lawarree (1996), and Peyrache and Quesada (2005), usually focus on the analytical results from the agency problem and incentive theory perspectives. Several studies (Ellingsen and Frederic, 1986; Chow and Rice, 1982; Smith, 1986; Krishnan, 1994; Krishnan and Stephens, 1995; Lennox, 2000) employ an empirical regression model to find evidence of the existence of collusive firms and auditors. However, these studies usually focus on opinion shopping, and use auditor switching and subsequent opinions

as proxies for collusion. Empirical studies have found little evidence of success in opinion shopping because auditors tend to treat switchers more conservatively than non-switchers in their opinion decisions (Krishnan, 1994). Although some studies find empirical evidence of opinion shopping (Lennox, 2000), these studies focus on collusive behavior in the case of auditor switching, and overlook the possibility of audit collusion without switching. In this paper, I introduce a proxy for audit collusion in terms of the difference between the predicted opinion and actual opinion of non-Big 4 auditors in China, and expect this variable can capture the existence of audit collusion in both auditor switching and non-switching circumstances.

I assume that Big 4 auditors are more professional and carry out their verification duties independently for two reasons. First, DeAngelo (1981) defines audit quality as the joint probability of detecting and reporting material financial statement errors, and points out that larger audit firms have incentives to supply a higher level of audit quality. She argues that large auditors have more clients, and their good reputation enables these auditors to remain active in the competitive audit market and consistently make profit from their clients. It is not a real bargain if the auditor sacrifices independence and reports favorably for specific clients, as such an auditor will lose more clients because of its ruined reputation. DeAngelo suggests that auditor size can be used as a proxy for audit quality. Second, Big 4 firms appear to be brand name producers in the audit market (Francis and Wilson, 1988). Renown is the most important goal of these international audit firms rather than the limited rents they could generate from occasional audit collusion. Furthermore, Fan and Wong (2005) find that Big 5 auditors do have a corporate governance role in emerging markets, and Big 5 auditors generally play a more important governance functions in countries where legal institutions are weak than in countries where legal institutions are strong

(Choi and Wong, 2007). Consistent with the literature, I expect that Big 4 auditors hold high reputations and are high-quality audit suppliers in China's capital market.

The audit quality of China's local auditors, however, is mixed. On the one hand, some researchers (DeFond, Wong, and Li, 1999) ague that China's top 10 auditors (in terms of audit fee revenues) provide high-quality audits. Government authorities and bureaucrats make great efforts to regulate the top 10 auditors in order to create a healthy capital market and build domestic auditors' brand names for competition with international Big 4 auditors. On the other hand, Chan, Lin, and Mo (2006) argue that China's local auditors usually have greater economic dependence on local clients and are subject to more political influence from local governments than non-local auditors. Therefore, local auditors are inclined to report favorably on local government-owned enterprises to mitigate probable economic losses. To generate a proxy for audit collusion, I put the firm characteristics of non-Big 4 auditees into the logit audit opinion prediction model estimated using Big 4 auditees' data, and estimate a series of audit opinions for non-Big 4 auditees. This step tells us what the audit opinion of these non-Big 4 auditees would have been if they had been audited by a typical independent auditor.

Specifically, if the predicted audit opinion is the same as the actual opinion that the listed firm received for that fiscal year, it is assumed that no audit collusion exists and the proxy for audit collusion equals zero. If the predicted audit opinion is clean and the actual audit opinion is modified, it is still assumed that no audit collusion exists because the auditors already reported independently. However, if the predicted opinion is modified and actual audit opinion is clean, the audit collusion proxy is set to equal one to denote the existence of audit collusion between the auditor and auditee.

3.2.3. Stage Two － Audit Collusion Determinant Testing Model

In the second stage of the regression, I try to test my hypotheses and identify the determinants of audit collusion. I include four kinds of variables in the regression, including SOE indicators and their interaction terms, corporate governance characteristics, financial information, and institutional factors. The inverse Mills ratios are included to control for the self-selection problem between auditees and auditors. I also control for year effects to explain changes in the macroeconomic environment.

(i) SOE Indicators

The government is the ultimate owner of SOEs, and these firms can bring the government benefits other than profits. The number of listed SOEs in a specific region is regarded as not only a political achievement by the local government's leaders, but also a symbol of economic prosperity that determines the officers' opportunities for promotion to higher positions. In addition, SOEs bear many burdens of the local government, by over-hiring employees to reduce the unemployment rate in that region, tunneling profits to other SOEs in the same area to prevent these firms from going bankrupt, or financing infrastructure construction in the region. The local government has strong incentive to use every means to keep SOEs listed in order to fulfill all of these objectives. However, auditors who previously were affiliated with local governments, and are still under political pressure by government and financial bureaus, have a heavy economic dependence on their SOE clients, which constitute a great proportion of their total clientele. I introduce *SOE* as an indicator to capture the collusive behavior between auditors and their SOE clients, and expect the coefficient to be positive if SOEs take part in audit collusion. Here, SOE is defined as a firm the ultimate owner of which is the government. I use one minus dummy variable SOE to represent the firms that have non-government shareholders as their ultimate shareholders. Because these firms cannot exert political influence over auditors, I

expect that these non-SOEs do not take part in audit collusion and the predicted sign is negative.

I also employ some interaction terms to test my hypotheses. I calculate a proxy, *Pfmc*, for firm financial status from all financial variables to verify the relation between financial condition and audit collusion. Pfmc is a rank transformation calculated from the rankings of all financial variables. I rank each financial variable from good to bad, sum up all the financial variable rankings, and get a final number for each firm observation in the sample. Then, I rank these numbers upward, assign the first half of these firms a value of 0 for their pfmc variable, which means the firm is in good financial condition, and assign the other half of the firms a value of 1 for their pfmc variable. Similarly, the interactions between a non-SOE and its financial status indicators are introduced. Consistent with my hypotheses, I expect that only SOEs in poor financial condition are likely to be involved in audit collusion, and if so, the coefficient for the interaction of SOE and loss should be positive. In contrast, other firms, including SOEs in good financial condition, and non-SOEs in either good or poor financial condition, will not take part in collusive behavior, and all coefficients for these three interactions are expected to be significantly negative.

I also include the interactions between the SOE indicator and percentage that the largest shareholder holds in listed firms to test the differential effects that share concentration will have on audit collusion in firms of different types of ownership. The largest shareholders in SOEs do not have the same interests as non-state shareholders; hence, they are likely to expropriate other shareholders. I hypothesize that share concentration in SOEs will lead to audit collusion, and that concentrated non-state ownership will deter audit collusion. Therefore, the expected sign for the interaction of SOE and the share percentage of the largest shareholder should be positive, and the

coefficient of the interaction of non-SOE and largest shareholder ownership percentage is expected to be negative.

(ii) Corporate Governance and Financial Characteristics

In contrast to prior studies, I introduce a new variable, *Age*, which equals the average age of top-level managers of a listed firm. I use this variable to proxy the working experience of managers, and expect that the more experienced senior managers are, the less likely they will take part in audit collusion. The underlying reason is twofold. First, experienced managers are more sophisticated in controlling and organizing listed firms, and good management guarantees that firms operate in a more effective and efficient way. A well-managed firm is more likely to be a profit entity and hence has less motivation to take part in audit collusion. Second, experienced managers have a better understanding of the detrimental consequences that audit collusion will bring to their firms and the legal obligations they will incur if such collusive behavior is exposed to the public. Sophisticated managers will be more cautious when considering audit collusion as a way to mask their poor performance. Hence, experienced managers are less likely to be involved in audit collusion compared with inexperienced managers. The prior literature indicates that firms usually receive a favorable audit opinion after switching auditors. Therefore, the coefficient on the variable *Switch* is expected to be positive. *Independent Ratio* denotes the ratio of independent board of directors to the total number of directors, and I expect that a more independent board of directors will lead to less audit collusion. The relation between the independent ratio and audit collusion should be negative. A dummy variable *Delisting* is included to capture the profitability regulations the firms are required to meet. CSRC mandates that any listed firm with losses for three successive years can be delisted at discretion of regulators. I define variable Delisting

equals to one if this listed firm already has two consecutive losses in previous years, and intend to use this dummy variable to reflect the firm's exposure to delisting punishment. The relation between delisting threat and the participant of auditing collusion is mixed. On one hand, Haw et al. (2005) find that listed firms in China manipulate their earnings in order to meet security regulations. From this aspect, firms that engage in earnings management might collude with their auditors to mask their misbehavior, and a positive relation between delisting dummy and audit collusion is suggested. On the other hand, Chen et al. (2001) point out that profitability requirements exacerbate managers' propensity to engage in earnings management, however, this tendency of manipulation positively associated with receiving modified audit opinions. Therefore, auditors may treat their clients that could be delisted in the next fiscal year more conservatively, and hence, are less likely to collude with such clients.

Consistent with my hypotheses, I expect that firms with superior financial performance will be disinclined to take part in audit collusion. Specifically, firms with larger assets and a higher current ratio and ROE, and lower leverage, receivables, and inventory are less likely to be involved in audit collusion. Because the performance of firms is highly consistent, I also expect that firms that received a modified audit opinion in the previous year will have demonstrated poor performance in the current year, and have a strong incentive to collude with their auditors. Similarly, firm capital market performance should have a positive relationship with audit collusion. DeFond et al. (1999) introduced a time-listed variable and argue that older clients are more susceptible to financial distress. Therefore, keeping other conditions constant, companies after being listed for some years are more likely to engage in earnings management to meet the regulatory profitability requirements and thus receive a

qualified opinion than are newly listed firms (Chen et al., 2000). I expect audit collusion has a positive relationship with time listed.

(iii) Institutional Factors and Inverse Mills Ratios

The prior literature indicates that institutional factors affect auditor decisions. The three indices borrowed from Fan and Wang are designed to capture the influence of institutional factors on audit collusion. I use rank transformation of these three factors to form one institutional variable because these three indices are highly correlated and the rankings are stable, and reveal the relative institutional status of each administrative region. Market rank denotes the development of a capital market. The more developed a capital market is, the more sensitively its investors react to financial information, hence it is more difficult for listed firms to collude with their auditors because of investor monitoring. A government index is used to measure the degree of government involvement. Strong government interference means more political pressure on auditors, and more audit collusion. In addition, a sound legal system and very strong enforcement will lead to higher litigation risk for both parties that are involved in audit collusion, so it is reasonable to assume that audit collusion occurs less frequently in a good legal environment than in a bad legal environment. Therefore, I expect a poor institutional environment leads to audit collusion.

The coefficient of the inverse Mills ratio indicates what the situation would be like if the other group were selected. Big 4 auditors are expected to be less involved in audit collusion than their counterparts. The inverse Mills ratio denotes what the situation would be if I tested audit collusion using Big 4 auditees. As I elaborated above, it is easy to conceive that Big 4 auditees are less likely to take part in audit collusion, so all the coefficients of the inverse Mills ratios are expected to be negative.

4. Results

4.1. Audit Opinion Prediction Model

Table 4 presents the results for the first-step probit regression of self-selecting Big 4 auditors. The table shows that firms with an internal audit committee have a strong preference to select Big 4 auditors. Firms that are large in terms of assets and have a higher current ratio tend to choose Big 4 auditors, whereas firms that have greater long-term debt and more inventory try to avoid high-quality auditors for their financial reports. B share has a positive relation with self-selected Big 4 auditors as expected. Stock price fluctuation positively contributes to self-selected high-quality auditors. One possible explanation is that listed firms with high stock price variations might be going through a period of expansion that could lead to greater future trade volume. These growing firms tend to self-select large auditors to verify their financial statements in order to send a positive signal to the capital market. Institutional factors may affect the behavior patterns of financial report issuers; therefore, listed firms in a poor institutional environment are inclined to avoid high-quality auditors for ease of audit collusion, and the sign for institutional index ranking transformation is significantly negative, as I expected.

[Insert Table 4 here]

Table 5 represents the statistical output of the second-step opinion prediction logit model with and without the inverse Mills ratios for Big 4 auditors. When running the logit regression without the inverse Mills ratios, some of the coefficients (e.g., current ratio and leverage) have signs opposite to my expectations, whereas others (e.g., current year loss dummy, prior year opinion type, and institutional environment) show

significant relationships with audit opinions. However, when I add the inverse Mills ratio to the logit regression model, all of the coefficients are adjusted, with the direction of some coefficients changed (e.g., current ratio and leverage). After controlling for self-selection bias, the significance of some variables is also greatly enhanced. Correlation matrix of independent variables including inverse Mils ratio indicates that there is no multicollinearity problem. For instance, firms with a larger amount of assets, less inventory, and better performance in the stock market are less likely to receive modified audit opinions. In addition, the coefficient for the institutional environment variable changes from 0.0965 at the 10% level of significance to 0.3645 at the 1% level of significance, and the pseudo R-squared for the overall model increases by nearly 5% and shows a relatively higher goodness of fit. The significantly negative coefficient of the inverse Mills ratio captures the audit opinion companies would have received if they had chosen non-Big 4 auditors. Because Big 4 auditors are more independent and their clients are in better financial condition, their clients would have received more clean opinions if they had chosen firms in the alternative group of auditors.

[Insert Table 5 here]

The adjusted opinion prediction model suggests that Big 4 auditors consider client size, profitability, and potential litigation risk as key factors when issuing audit opinions. That is, Big 4 auditors tend to issue modified audit opinions if their clients received a modified opinion in the previous year. It is interesting to note that the coefficient of ROE is not significant at all, which suggests that Big 4 auditors do not value firm book earning highly. Firms that issue B shares are less likely to receive

qualified opinions, and firms with good performance in the stock market and with a market performance superior to that of other firms in the same industry tend to receive clean audit opinions. Finally, firms located in regions with a weak institutional environment tend to receive modified audit opinions.

4.2. Audit Collusion Proxy Generation

In the process of audit collusion proxy generation, I apply the audit opinion prediction model by Big 4 auditors to non-Big 4 auditees, and then get the predicted audit opinions for each client of non-Big 4 auditors. I first apply the audit opinion prediction model to Big 4 auditees themselves to check the self-prediction accuracy of my model. Panel A of Table 6 indicates that the audit opinion prediction model for Big 4 auditees has about 98.26% self-prediction accuracy. According to my definition of the audit collusion proxy, only 1 of the 394 firms audited by Big 4 auditors has a sign for audit collusion, which accounts for approximately 0.25% of the total number of firms that are audited by Big 4 auditors. It is worthwhile to mention that among the Big 4 auditees, the actual opinions of seven firms are modified whereas their predicted opinions are clean. The predictive ability of my model might cause some misclassification; however, another plausible explanation exists. I interpret these seven audit cases as "conservative" cases, that is, the auditors involved in these cases are more conservative on average than other Big 4 auditors when issuing audit opinions.

[Insert Table 6 here]

Panel B of Table 6 shows that 190 firms that are audited by non-Big 4 auditors have modified predicted audit opinions, but have clean opinions as their actual audit

opinions. These firms account for 3.90% of the total number of non-Big 4 auditees in my sample. The audit collusion proxy for these 190 firms is equal to 1, and the rest of the firms that audited by non-Big 4 auditors show no evidence of audit collusion. Similarly, 252 cases (5.17%) are conservative cases. Three possible explanations are given. First, as I previously mentioned, some non-Big 4 auditors in China are as large as Big 4 auditors in terms of market share, and these auditors have the same incentives as Big 4 auditors to be independent; thus, they treat clients conservatively. Second, the CSRC mandates that any listed firm with two successive years of losses or with an asset value per share less than the face value will be specially treated (ST) on the stock exchange, and a listed firm with losses for three successive years is classified as a "particular transfer (PT)" firm, which can be delisted at the discretion of regulators. ST/PT firms account for 6.32% of firms in the collusion group, and for 4.33% of firms in the group that has a predicted opinion the same as the actual audit opinion (control group). However, ST/PT firms account for 21.42% of firms in the conservative group. These firms are subject to more regulations and litigation risk; therefore, it is rational for auditors to be more conservative when issuing audit opinions to ST/PT firms. Third, when the influence of the institutional environment is considered, the reason for auditor conservatism is more obvious. The mean of the institutional factor ranking for the collusive group is 15.684, for the control group 11.884, and for the conservative group 10.7302, and the mean differences between these three groups are significant at the 1% level. It can be seen from the results that audit collusion occurs in regions with a relatively poor institutional environment, and that conservative treatment of clients by auditors usually occurs in regions with a good institutional environment. The results also support my hypothesis that a good institutional environment can deter audit collusion.

Moreover, only 35 out of 190 collusive audit cases switched their auditors during the sample period. This finding reinforces my earlier point that auditor switching is not an adequate indicator of audit collusion, and the prior literature about opinion shopping cannot fully capture the collusive behavior between auditors and their clients.

I find empirical evidence of the existence of audit collusion in China's capital market even without using auditor switching as an indicator[4]. Some factors may influence the accuracy of the audit collusion proxy. First, employing the difference between the actual audit opinion and predicted audit opinion to generate an audit collusion proxy depends on the assumption that the accounting numbers that appear on the financial reports reflect the true performance of listed companies. However, fake transactions that are designed to boost earnings but are not detected by auditors cannot be captured in my proxy generation process. Second, because Big 4 auditors do not have a relatively high market share in China's audit market, the sample size of Big 4 auditees is not very large. However, my model appears very reliable, because it achieves high accuracy in self-prediction for Big 4 auditees.

4.3. Determinants of Audit Collusion

The logit regression results for audit collusion determinants are reported in Table 7 and Table 8. Consistent with my hypotheses, the coefficient for the SOE indicator is 0.5615, significant at the 5% level, which denotes a high relation between audit collusion and SOE ownership. The interaction between the SOE indicator and its financial performance proxy, pfmc, which is a rank transformation of all financial variables of listed firms, is also positively related with audit collusion. This result

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[4] The Audit Quality Announcement No. 4 issued by National Audit Office of Peoples' Republic of China on September, 26th, 2005 disclosed nine audit firms that had issued questionable audit reports towards their clients. My model successfully captures 6 of them. They are Vocation International (8 collusive cases), China Rightson Certificated Public Accountants (2 collusive cases), Sichuan Junhe Certificated Public Accountants (5 collusive cases), Shinewing Certificated Public Accountants (1 collusive cases), Hunan Carea Certificated Public Accountants (13 collusive cases), and Zhonghongxin Jianyuan Certificated Public Accountants (5 collusive cases).

shows that enterprises with the government as the ultimate shareholder and demonstrating poor financial performance are more inclined to collude with their auditors. However, the interactions that represent SOEs with superior financial performance, and non-SOEs with either good or poor financial performance, have negative relations with audit collusion[5]. These empirical results fully support hypothesis one, which posits that state-owned firms take part in audit collusion, especially when they have poor financial performance. SOEs in good financial condition do not need to collude with their auditors, whereas non-SOEs do not take part in audit collusion because they do not have to power to exert political pressure on their auditors. The coefficient for the product of SOEs and share percentage of the largest shareholder is significantly positive at the 5% level, and the coefficient for the interaction of non-SOEs and share percentage of the largest shareholder is significantly negative at the 5% level. These results suggest that share concentration in the hands of the government induces audit collusion, whereas share concentration in the hands of private individual investors aligns the interests of the largest shareholders and those of other shareholders, hence deterring audit collusion. Therefore, hypothesis two is supported.

[Insert Table 7 and Table 8 here]

Age, which denotes the average age of all senior managers, shows a negative relation with audit collusion. This finding suggests that the more experienced the top managers, the less likely they are to guide the firm to take part in audit collusion.

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[5] For Table 7, the interactions of SOE*Pfmc and SOE*(1-Pfmc) denote SOEs with inferior financial performance, and SOEs with superior financial performance, respectively. While, for Table 8, (1-SOE)*Pfmc and (1-SOE)*(1-Pfmc) denote non-SOEs with inferior financial performance, and non-SOEs with superior financial performance, respectively.

Auditor switching has a positive relation with audit collusion. However, neither of these two variables shows significant effects on audit collusion, which supports my assertions that audit collusion is not necessarily linked to auditor switching and that methods that use only auditor switching as an indicator for audit collusion are flawed. The regression results show that the greater the proportion of non-executive directors to the total number of directors on the board of directors, the less likely is the listed firm to take part in audit collusion. Again, although all the coefficients show a clear negative connection between the independent ratio and audit collusion, the relationship is not significant. Firms with a potential delisting risk show an insignificantly negative relation with audit collusion. There are two possible explanations: First, firms that have two consecutive losses in the previous two years, and already drew attention by CSRC. These firms are under a more strict supervision from regulators, and hence have fewer opportunities to collude with their auditors. Second, auditors treat firms that probably will be delisted in current fiscal year more conservatively in order to avoid litigation risks. Firms with superior overall performance, say a larger amount of assets, a higher current ratio, lower leverage, and with positive revenue, are not inclined to take part in audit collusion. It is worthwhile to point out that ROE has a very significantly positive relationship with audit collusion. I argue this result is based on the low quality of book earnings in China's capital market. In China, listed firms have to meet certain profit requirements in order to continue to be listed or make seasonal offerings, and these regulations create a strong incentive for listed firms to manipulate earnings. This finding also partially explains why Big 4 auditors do not value book earnings highly when they issue audit opinions. Moreover, higher litigation risk leads to audit collusion, as both receivables and inventory have significantly positive relations with audit collusion. The literature

indicates a high consistency between audit opinion in the current period and prior periods, so firms that have received modified audit opinions in the past tend to collude with their auditors in the current period to avoid receiving another modified audit opinion. Evidence shows a strong positive connection between the receipt of a modified opinion in the previous year and audit collusion in the current period.

Consistent with DeFond et al. (1999), I find that a long listing time results in audit collusion, as older clients are more likely to run out of IPO funds and face financial distress. Firms that issue B shares have a higher demand for quality auditors to verify their financial reports in order to signal the market and assure their foreign owners of their financial condition; therefore, these firms are less likely to take part in audit collusion. Firms with better performance in the stock market also do not tend to be involved in collusion. The coefficient of institutional environment, which is a rank transformation of the three institutional sub-indexes, is significantly positively correlated with audit collusion. This empirical result suggests that audit collusion is more likely to happen in regions with a poor institutional environment than in regions with a good institutional environment. Moreover, based on their institutional overall rankings, I classify the first half of regions as the good institutional environment group and the second half as the poor institutional environment group, and then I rerun the regression for each group and compare the coefficients of SOE and its interaction items between the two groups. No significant differences of the coefficients between the good institutional environment group and poor institutional environment group are found. Hence, there is a lack of evidence that SOEs are less likely to take part in audit collusion in regions with a good institutional environment than in those with a poor institutional environment. Hence, hypothesis three is only partially supported.

4.4. Limitations and Sensitivity Tests

I conduct some robustness checks of my main results. First, following Chan, Lin, and Mo (2005), I employ a more precise definition of SOEs. I redefine an SOE as a listed firm with the government as the ultimate owner, and the largest state-owned share has to be at least 20%. The results remain the same and indicate that SOEs are more likely to take part in audit collusion.

Second, the dummy variable *Loss* is used as an alternative indicator to denote a firm's financial situation. I use the interaction of SOE and loss to represent SOEs of inferior financial status. One minus loss represents SOEs with superior financial status. I get the same results. Third, instead of using rankings for institutional environment, I use the sum of the government involvement index, capital market development index, and legal enforcement index as the institutional characteristic for a specific administrative region. I obtain the same results, which indicates that audit collusion is more likely to occur in regions with a poor institutional environment.

This study has a number of limitations. First, I divide audit opinion into two categories, clean and modified, and I capture audit collusion only from modified types of opinion to clean opinion, but do not consider the severity of the opinions. For example, I do not distinguish between a qualified audit opinion and a qualified audit opinion with explanatory paragraphs, or between an adverse opinion and a disclaimer of opinion. Second, when using the audit opinion prediction model, I assume that all financial statement data are reliable and reflect the firms' true performance. However, some audit scandals indicate that firms will manipulate their financial figures to cover their poor performance. To the extent that firms' financial statements are not reliable, my estimation model will be subject to error. Third, unlike the case in some Western countries, in which Big 4 auditors have a very large market share, Big 4 auditors occupy a relatively small share of the audit market in China. My results would be more

convincing if the sample size of Big 4 auditees were larger.

5. Conclusion

This study examines the existence and determinants of audit collusion in a transitional economy. I develop the research hypotheses based on the relation between firm ownership, institutional environment, and audit collusion. I expect that audit collusion exists with or without auditor switching. SOEs are more likely to take part in audit collusion, especially when they are in poor financial condition. However, SOEs with good financial performance, and non-SOEs with either good or poor financial performance are not inclined to take part in audit collusion. I also expect that share concentration will have varying influence on audit collusion. That is, state-owned share concentration will lead to audit collusion, whereas non-state-owned share concentration will deter audit collusion because it mitigates the free-rider problem of monitoring small shareholders and aligns the interests of the largest shareholder with those of other shareholders. Furthermore, I expect audit collusion to occur more often in regions with a poor institutional environment.

Using data from China's capital market and employing a two-stage logit regression model with a two-step binary probit model to correct for self-selection bias, I find empirical evidence for audit collusion, and all of my hypotheses are supported. My results contribute to the audit collusion literature by providing for the first time empirical evidence of the relationships among firm ownership, institutional environment, and audit collusion. The implications of my findings for both researchers and practitioners are threefold.

First, my measure of audit collusion is unique. I define audit collusion as the discrepancy between the actual opinions that clients received from their auditors and the opinions they would have received under similar circumstances from a "typical" auditor. This method adds to the limited literature on audit collusion, and opens a new

horizon for future empirical research on collusion.

Second, I introduce a two-step binary probit self-selection model into my audit opinion prediction model. I also include institutional variables to capture the uneven economic and legal development across China. This method contributes to the development of audit opinion prediction and has very good classification ability, especially in a transitional economy in which a great discrepancy exists in the audit quality between Big 4 auditors and local auditors, and in which cross-sectional uneven development of institutional factors exists.

Finally, my results have implications for policy makers in transitional economies that are characterized by firms with highly concentrated government ownership and a relatively poor institutional infrastructure. Audit collusion is detrimental for capital market development, especially in emerging markets. To deter audit collusion, governments should improve the overall institutional environment through measures such as reduction of government ownership of firms, withdrawal of government involvement in both the stock and audit markets, and development of the legal environment.

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Appendix 1. Three Indices for Each Administrative Region

Region	Credit Market Index	Government Involvement Index	Legal Environment Index	Institutional Environment Overall Ranking
ANHUI	5.24	7.43	5.32	9
BEIJING	3.85	6.40	7.97	8
CHONGQIONG	6.33	7.61	3.83	11
FUJIAN	3.74	7.12	6.32	13
GANSU	4.70	5.94	3.98	20
GUANGDONG	6.37	7.99	7.29	4
GUANGXI	3.46	7.89	4.92	16
GUIZHOU	4.89	5.43	4.36	19
HAINAN	5.25	6.02	6.33	12
HEBEI	7.20	7.13	5.15	6
HEILONGJIANG	1.89	3.60	5.34	28
HENAN	5.80	5.54	4.93	15
HUBEI	4.21	5.11	5.05	22
HUNAN	5.90	5.73	2.62	23
JIANGSU	7.67	8.12	6.29	3
JIANGXI	4.69	6.15	4.78	17
JILIN	5.37	5.70	5.81	14
LIAONING	6.16	6.14	5.53	10
NEIMENGGU	3.42	3.27	4.93	26
NINGXIA	4.36	3.79	5.16	24
QINGHAI	0.35	3.04	4.69	30
SHAN'XI	5.88	5.30	3.21	21
SHANDONG	7.74	7.38	5.63	5
SHANGHAI	7.94	7.49	6.98	1
SHANXI	1.08	4.54	5.53	27
SICHUAN	0.70	7.43	4.69	25
TIANJIN	5.34	6.05	6.96	7
XINJIANG	0.90	3.16	4.10	29
YUNNAN	4.75	6.56	3.87	18
ZHEJIANG	7.68	8.37	6.24	2
Indices for Tibet, where there is no company in the sample, are not provided.				

Note: These three indices are based on the 2002 data from Fan and Wang (2003). The Credit Market Index, Government Decentralization Index, and Legal Environment Index measure the development of the local credit market, the degree of government involvement in the local economy, and the development of the local legal environment for each province or province-level region, respectively. Rank transformations according to these three indices are adopted in all regressions in this paper.

Table 1. Sample Description

Panel A: *Number of Firms by Year, Firm Ownership, and Auditor Size*

	SOE		Non-SOE		Big 4		Non-Big 4		Total
	Number	%	Number	%	Number	%	Number	%	
2001	627	84.6	114	15.4	40	5.4	701	94.6	741
2002	643	81.1	150	18.9	74	9.3	719	90.7	793
2003	674	77.1	200	22.9	75	8.6	799	91.4	874
2004	681	74.0	239	26.0	69	7.5	851	92.5	920
2005	717	73.2	263	26.8	69	7.0	911	93.0	980
2006	649	67.6	311	32.4	67	7.0	893	93.0	960
Total	3991	75.8	1277	24.2	394	7.5	4874	92.5	5268

Panel B: *Client Firm Ownership by Auditor Size and Year*

	Big 4 Auditors					Non-Big 4 Auditors				
	SOE	%	Non-SOE	%	Total	SOE	%	Non-SOE	%	Total
2001	33	82.5	7	17.5	40	594	84.7	107	15.3	701
2002	64	86.5	10	13.5	74	579	80.5	140	19.5	719
2003	65	86.7	10	13.3	75	609	76.2	190	23.8	799
2004	58	84.1	11	15.9	69	623	73.2	228	26.8	851
2005	57	82.6	12	17.4	69	660	72.4	251	27.6	911
2006	54	80.6	13	19.4	67	595	66.6	298	33.4	893
Total	331	84.0	63	16.0	394	3660	75.1	1214	24.9	4874

Panel C: *Audit Opinion by Auditor Size and Year*

	Big 4 Auditors					Non-Big 4 Auditors				
	Modified	%	Clean	%	Total	Modified	%	Clean	%	Total
2001	2	5.0	38	95.0	40	79	11.3	622	88.7	701
2002	7	9.5	67	90.5	74	80	11.1	639	88.9	719
2003	1	1.3	74	98.7	75	55	6.9	744	93.1	799
2004	6	8.7	63	91.3	69	81	9.5	770	90.5	851
2005	3	4.3	66	95.7	69	100	11.0	811	89.0	911
2006	5	7.5	62	92.5	67	76	8.5	817	91.5	893
Total	24	6.1	370	93.9	394	471	9.7	4403	90.3	4874

Notes: *SOE* denotes a listed firm the ultimate owner of which is the government.
Big 4 denotes firms that are audited by Big 4 auditing firms in that fiscal year; *Non-Big 4* denotes firms that are audited by accounting firms that are not Big 4 auditing firms.
Modified opinions include an unqualified opinion with explanation, a qualified opinion, a disclaimer of opinion, and an adverse opinion.
A clean opinion refers to a standard unqualified opinion.

Table 2. Variable Definitions

Panel A: *Descriptive Statistics*

	Mean	Std. Dev.	Min.	Median	Max.
Financial Variables:					
Assets	21.306	0.956	17.412	21.227	27.111
Current_Ratio	1.356	0.850	0.020	1.173	6.255
Leverage	0.233	0.368	0.000	0.103	3.348
ROE	-0.005	0.360	-4.986	0.056	3.338
Loss	0.131	0.337	0	0	1
Receivables	0.086	0.069	0.000	0.071	0.319
Inventory	0.142	0.108	0.000	0.121	0.548
Capital Market Variables:					
B_Share	0.067	0.249	0	0	1
Beta	1.045	0.250	0.165	1.071	1.865
Fluctuations	2.413	0.561	0.515	2.352	4.869
Firm_Avg∗	-0.017	0.111	-0.399	-0.027	0.389
Other Variables:					
Big_4	0.075	0.263	0	0	1
Opinion	0.094	0.292	0	0	1
Prior_Opinion	0.092	0.289	0	0	1
SOE	0.758	0.429	0	1	1
Age	45.727	3.390	35	46	58
Time	6.744	3.191	1.005	6.541	16.033
Switch	0.113	0.316	0	0	1
In_Audit	0.375	0.484	0	0	1
Indp_Ratio	0.432	0.229	0	0.5	3
Delisting	0.031	0.172	0	0	1
No_1_Share	41.676	16.833	3.23	40.14	85
Pfmc	0.500	0.500	0	0.500	1
Institution	11.573	8.979	1	9	30

∗Industry classification is based on the CSRC's (China Securities Regulatory Commission's) industry classification as follows:

  Mining industry;
  Communication and literature industry;
  Utilities industry;
  Real estate industry;
  Construction industry;
  Transportation industry;
  Agriculture, forestry, and fishing industry;
  Wholesale and retail industry;
  Social services industry;
  Information technology industry; and
  Manufacturing industry.

Panel B: *Variable Definitions*

Variable	Definition
Financial Variables:	
Assets	Natural log of total assets at the end of the fiscal year.
Current_Ratio	The ratio of current assets to current liabilities at the end of the fiscal year.
Leverage	The ratio of long-term debt to shareholders' equity at the end of the fiscal year.
ROE	The ratio of net income to shareholders' equity at the end of the fiscal year.
Loss	Dummy variable equal to 1 if the firm's net income in the current year is negative, and 0 otherwise.
Receivables	The ratio of receivables to total assets at the end of the fiscal year.
Inventory	The ratio of inventory to total assets at the end of the fiscal year.
Capital Market Variables:	
B_Share	Dummy variable equal to 1 if the firm issued B shares, and 0 otherwise.
Beta	Beta coefficient of the CAPM model.
Fluctuations	The standard deviation of daily stock prices during the fiscal year.
Firm_Avg$*$	Common stock returns (including dividends) minus an equally weighted industry return.
Other Variables:	
Big_4	Dummy variable equal to 1 if the firm is audited by a Big 4 auditor, and 0 otherwise.
Opinion	Dummy variable equal to 1 if the firm received a modified opinion for the current fiscal year, and 0 otherwise.
Prior_Opinion	Dummy variable equal to 1 if the firm received a modified opinion for the previous fiscal year, and 0 otherwise.
SOE	Dummy variable equal to 1 if the firm is ultimately controlled by the government, and 0 otherwise.
Age	Average age of all top level managers.
Time	Total listing time that a firm is listed in the Shanghai or Shenzhen Stock Exchange.
Switch	Dummy variable equal to 1 if the firm changes its auditor in the current fiscal year, and 0 otherwise.
In_Audit	Variable equal to 1 if the company has an internal audit committee, and 0 otherwise.
Indp_Ratio	Ratio of independent board directors to the total number of board directors.
Delisting	Dummy variable equal to 1 if the firm has a two year consecutive losses in the previous two fiscal years, and 0 otherwise.
No_1_Share	The percentage of shares owned by the firm's largest shareholder.
Pfmc	The overall financial performance of the listed firm, equal to 1 if the listed firm is in poor financial condition, and 0 otherwise.
Institution	Overall rankings of the local credit market, government interference, and legal enforcement for each administrative region.
Imills	Inverse Mills ratio in the Heckman two-step logit regression.

Table 3. Descriptive Statistics on Client Characteristics by Auditor Size

Firm Characteristics		Big 4	Non Big 4	P-Value
Financial Variables:				
Assets	*Mean*	22.360	21.221	0.0000***
	Median	22.135	21.173	0.0000***
	Std. Dev.	1.330	0.865	-
Current_Ratio	*Mean*	1.4302	1.3499	0.0712*
	Median	1.1904	1.1722	0.1234
	Std. Dev.	0.9448	0.8412	-
Leverage	*Mean*	0.2544	0.2311	0.2276
	Median	0.1044	0.1025	0.0693*
	Std. Dev.	0.3837	0.3671	-
ROE	*Mean*	0.0517	-0.0097	0.0011***
	Median	0.0774	0.0528	0.0000***
	Std. Dev.	0.3038	0.3642	-
Loss	*Mean*	0.0711	0.1356	0.0003***
	Median	0	0	0.0328**
	Std. Dev.	0.2573	0.3424	-
Receivables	*Mean*	0.0711	0.0874	0.0000***
	Median	0.0483	0.0731	0.0000***
	Std. Dev.	0.0680	0.0686	-
Inventory	*Mean*	0.1304	0.1432	0.0243**
	Median	0.1154	0.1209	0.0093***
	Std. Dev.	0.1096	0.1080	-
Capital Market Variables:				
B_Share	*Mean*	0.2538	0.0515	0.0000***
	Median	0	0	0.0000***
	Std. Dev.	0.4357	0.2210	-
Beta	*Mean*	1.0491	1.0442	0.7114
	Median	1.0707	1.0712	0.8344
	Std. Dev.	0.2230	0.2525	-
Fluctuations	*Mean*	2.3435	2.4187	0.0105**
	Median	2.2933	2.3572	0.0107**
	Std. Dev.	0.5223	0.5638	-
Firm_Avg	*Mean*	0.0105	-0.0193	0.0000***
	Median	-0.0099	-0.0289	0.0000***
	Std. Dev.	0.1201	0.1104	-
Other Variables:				
Opinion	*Mean*	0.0609	0.0966	0.0194**
	Median	0	0	0.2375
	Std. Dev.	0.2395	0.2955	-
Prior_Opinion	*Mean*	0.0406	0.0958	0.0003***
	Median	0	0	0.0679*
	Std. Dev.	0.1976	0.2944	-
SOE	*Mean*	0.8401	0.7509	0.0001***
	Median	1	1	0.0032***
	Std. Dev.	0.3670	0.4325	-
Age	*Mean*	47.1675	45.6110	0.0000***
	Median	47	46	0.0000***
	Std. Dev.	3.3058	3.3701	-

Time	*Mean*	7.2393	6.7045	0.0014***
	Median	7.3868	6.5164	0.0017***
	Std. Dev.	3.3414	3.1752	-
Switch	*Mean*	0.1117	0.1126	0.9536
	Median	0	0	0.9746
	Std. Dev.	0.3154	0.3162	-
In_Audit	*Mean*	0.5152	0.3636	0.0000***
	Median	1	0	0.0000***
	Std. Dev.	0.5004	0.4811	-
Indp_Ratio	*Mean*	0.4386	0.4315	0.5507
	Median	0.5	0.5	0.6910
	Std. Dev.	0.2393	0.2284	-
Delisting	*Mean*	0.0152	0.0318	0.0660*
	Median	0	0	0.0661*
	Std. Dev.	0.1226	0.1755	-
No_1_Share	*Mean*	47.1966	41.2292	0.0000***
	Median	47.8055	39.3600	0.0000***
	Std. Dev.	16.0042	16.8207	-
Pfmc	*Mean*	0.3832	0.5094	0.0000***
	Median	0	1	0.0000***
	Std. Dev.	0.4868	0.5000	-
Institution	*Mean*	6.6345	11.9721	0.0000***
	Median	4	9	0.0000***
	Std. Dev.	6.7469	9.0191	-

Notes: The ANOVA F-statistics for equality of means and Wilcoxon-Mann-Whitney test of the differences between medians are employed in Table 3. The p-values are reported.
All p-values are one tailed. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Table 4. Heckman First-Step Probit Regression of Self-Selected Big 4 Auditors
(Dependent Variable: Big_4)

	Predicted Sign	**Coefficients**	**Z-Statistics**	**P-Value**
Explanatory Variables:				
Constant	?	-15.5546***	-17.6698	0.0000
In_Audit	+	0.2721***	4.2678	0.0000
Assets	+	0.6225***	16.7324	0.0000
Current_Ratio	+	0.1514***	4.4308	0.0000
Leverage	-	-0.2901***	-3.0556	0.0022
ROE	+	-0.1610	-1.3247	0.1853
Loss	-	-0.1117	-0.8386	0.4017
Receivables	-	-0.7006	-1.4857	0.1374
Inventory	-	-0.6416**	-2.2949	0.0217
Prior_Opinion	-	-0.2686**	-2.0055	0.0449
B_Share	+	0.7277***	8.5966	0.0000
Beta	+	0.0929	0.5616	0.5744
Fluctuations	?	0.3062***	3.2415	0.0012
Firm_Avg	+	0.3752	1.3171	0.1878
Institution	-	-0.0279***	-6.8189	0.0000
Pseudo R-squared				0.2566
Sample Size				5268

Note: All p-values are one tailed. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

The z-statistics are reported to test for differences in proportion.

The pseudo R-squared adopts the McFadden R-squared index to measure the goodness of fit of the model.

The dependent variable and all explanatory variables are defined as in Table 2.

The year and industry specifics are controlled but not reported for convenience.

Table 5. Heckman Second-Step Logit Regression of Opinion Prediction by Big 4 Auditors *(Dependent Variable: Opinion)*

	Predicted Sign	*Original*		*Adjusted by Imills*	
		Coefficient	*P-Value*	*Coefficient*	*P-Value*
Explanatory Variables:					
Constant	?	1.1934	0.9172	153.8574**	0.0190
Assets	-	-0.2395	0.6154	-6.0663**	0.0166
Current_Ratio	-	0.4903	0.1616	-0.9394	0.1568
Leverage	+	-1.7558	0.3045	0.6394	0.7551
ROE	-	-3.1686	0.2884	-2.3810	0.4711
Loss	+	4.5465***	0.0012	5.5913***	0.0012
Receivables	+	1.3053	0.7711	7.3084	0.1751
Inventory	+	3.7087	0.2212	12.5130**	0.0108
Prior_Opinion	+	5.8615***	0.0000	8.7556***	0.0000
B_Share	-	-0.0038	0.9964	-6.3280**	0.0199
Beta	-	-1.7164	0.3662	-1.9594	0.3697
Fluctuations	?	-1.3230	0.2753	-3.9822**	0.0351
Firm_Avg	-	-6.4604	0.1278	-8.9253**	0.0446
Institution	+	0.0965*	0.0544	0.3645***	0.0057
Imills	-			-11.7927**	0.0173
Pseudo R^2			0.6388		0.6810
Sample Size			394		394

Notes: All p-values are one tailed. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

The pseudo R-squared adopts the McFadden R-squared index to measure the goodness of fit of the model.

The explanatory variable *Imills* represents the inverse Mills ratio in the Heckman self-selection model. The dependent variable and all other explanatory variables are defined as in Table 2.

The year and industry specifics are controlled but not reported for convenience.

Table 6. Audit Collusion Proxy Generation

Panel A: *Opinion Prediction Model for Big 4 Auditor Self-Prediction Results*

Opinion Prediction Model for Big 4 Auditor Self-Prediction Results:								
Predicted Opinion			**Actual Opinion**			**Audit Collusion**		
Opinion	Number	Percentage	Opinion	Number	Percentage	Collusion	Number	Percentage
1	18	4.57%	1	17	4.61%	0	17	4.61%
			0	1	0.25%	1	1	0.25%
0	376	95.43%	1	7	1.78%	0	7	1.78%
			0	369	93.65%	0	369	93.65%

Panel B: *Apply Opinion Prediction Model for Big 4 Auditors to Non-Big 4 Auditees*

Apply Opinion Prediction Model for Big 4 Auditors to Non-Big 4 Auditees:								
Predicted Opinion			**Actual Opinion**			**Audit Collusion**		
Opinion	Number	Percentage	Opinion	Number	Percentage	Collusion	Number	Percentage
1	409	8.39%	1	219	4.49%	0	219	4.49%
			0	190	3.90%	1	190	3.90%
0	4465	91.61%	1	252	5.17%	0	252	5.17%
			0	4213	86.44%	0	4213	86.44%

Notes: The *Opinion* column represents a modified audit opinion when *Opinion* equals 1, and a clean audit opinion when *Opinion* equals 0.

Collusion is a dummy variable that equals 1 when the predicted opinion is 1 but the actual opinion is 0.

Table 7. Logit Regression Results for Audit Collusion and SOEs
(Dependent Variable: Collusion)

	Coefficient (P-Value) (Model 1)	Coefficient (P-Value) (Model 2)	Coefficient (P-Value) (Model 3)	Coefficient (P-Value) (Model 4)
Independent Variables:				
Constant	90.3570***	89.8370***	89.3681***	90.4827***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
SOE	0.5615**			
	(0.0175)			
SOE*Pfmc		0.4852**		
		(0.0211)		
SOE*(1-Pfmc)			-0.0221	
			(0.9336)	
SOE*No_1_Share				0.0112**
				(0.0110)
Age	-0.0246	-0.0182	-0.0058	-0.0244
	(0.4297)	(0.5518)	(0.8473)	(0.4330)
Switch	0.3736	0.3633	0.3895	0.3718
	(0.1349)	(0.1461)	(0.1175)	(0.1387)
Indp_Ratio	-0.1550	-0.1454	-0.2206	-0.1684
	(0.7393)	(0.7542)	(0.6358)	(0.7191)
Delisting	-0.6894	-0.6896	-0.7262	-0.7574
	(0.1543)	(0.1527)	(0.1344)	(0.1204)
Assets	-3.7039***	-3.6850***	-3.6736***	-3.7131***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Current_Ratio	-0.5104***	-0.4576***	-0.5180***	-0.5156***
	(0.0020)	(0.0059)	(0.0018)	(0.0019)
Leverage	0.9657***	0.8715**	1.0083***	1.0155***
	(0.0077)	(0.0187)	(0.0057)	(0.0049)
ROE	0.9742***	0.9831***	1.0086***	0.9825***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Loss	4.4527***	4.3474***	4.4289***	4.4645***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Receivables	5.9223***	5.1517***	5.8793***	5.8128***
	(0.0000)	(0.0005)	(0.0001)	(0.0001)
Inventory	9.3465***	9.0653***	9.3853***	9.3055***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Prior_Opinion	3.6036***	3.5912***	3.5613***	3.5883***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Time	0.0684*	0.0680*	0.0676*	0.0801**
	(0.0653)	(0.0679)	(0.0679)	(0.0335)
B_share	-3.3059***	-3.3157***	-3.2496***	-3.2884***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Beta	-0.6430	-0.5061	-0.6282	-0.6486
	(0.1655)	(0.2792)	(0.1779)	(0.1618)
Fluctuations	-2.1676***	-2.1758***	-2.1498***	-2.1645***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Firm_Avg	-3.7765***	-3.7517***	-3.7884***	-3.7704***
	(0.0000)	(0.0000)	(0.0000)	(0.0001)

Institution	0.2488***	0.2491***	0.2493***	0.2484***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Imills	-7.3007***	-7.2860***	-7.3081***	-7.2757***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Pseudo R^2	0.4391	0.4388	0.4355	0.4395
Sample Size	4874	4874	4874	4874

Notes: All p-values are one tailed. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

The p-values are reported in parentheses.

The pseudo R-squared adopts the McFadden R-squared index to measure the goodness of fit of the model.

The dependent variable and all other explanatory variables are defined as in Table 2.

The year and industry specifics are controlled but not reported for convenience.

Table 8. Logit Regression Results for Audit Collusion and Non-SOEs
(Dependent Variable: Collusion)

	Coefficient (P-Value) *(Model 1)*	Coefficient (P-Value) *(Model 2)*	Coefficient (P-Value) *(Model 3)*	*Coefficient (P-Value) (Model 4)*
Independent Variables:				
Constant	90.9185***	89.3491***	92.0677***	90.2895***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
1-SOE	-0.5615**			
	(0.0175)			
(1-SOE)*Pfmc		-0.2789		
		(0.2863)		
(1-SOE)*(1-Pfmc)			-0.9844**	
			(0.0220)	
(1-SOE)*No_1_Share				-0.0140**
				(0.0475)
Age	-0.0246	-0.0110	-0.0202	-0.0184
	(0.4297)	(0.7195)	(0.5115)	(0.5500)
Switch	0.3736	0.3902	0.3629	0.3785
	(0.1349)	(0.1170)	(0.1462)	(0.1297)
Indp_Ratio	-0.1550	-0.2034	-0.1786	-0.1854
	(0.7393)	(0.6624)	(0.7021)	(0.6895)
Delisting	-0.6894	-0.7045	-0.7380	-0.7215
	(0.1543)	(0.1462)	(0.1284)	(0.1365)
Assets	-3.7039***	-3.6639***	-3.7590***	-3.6883***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Current_Ratio	-0.5104***	-0.5294***	-0.4763***	-0.5161***
	(0.0020)	(0.0013)	(0.0038)	(0.0017)
Leverage	0.9657***	1.0064***	0.9592***	0.9806***
	(0.0077)	(0.0052)	(0.0085)	(0.0066)
ROE	0.9742***	0.9846***	1.0329***	0.9802***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Loss	4.4527***	4.4346***	4.4674***	4.4402***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Receivables	5.9223***	6.0171***	5.6090***	5.9067***
	(0.0000)	(0.0000)	(0.0001)	(0.0000)
Inventory	9.3465***	9.4329***	9.2180***	9.3575***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Prior_Opinion	3.6036***	3.5685***	3.6140***	3.5906***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Time	0.0684*	0.0680*	0.0687*	0.0648*
	(0.0653)	(0.0664)	(0.0722)	(0.0809)
B_share	-3.3059***	-3.2671***	-3.2888***	-3.2872***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Beta	-0.6430	-0.6784	-0.5131	-0.6657
	(0.1655)	(0.1434)	(0.2683)	(0.1504)
Fluctuations	-2.1676***	-2.1400***	-2.2134***	-2.1493***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Firm_Avg	-3.7765***	-3.8240***	-3.6673***	-3.7504***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)

Institution	0.2488***	0.2491***	0.2497***	0.2493***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Imills	-7.3007***	-7.2758***	-7.4092***	-7.2934***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Pseudo R^2	0.4391	0.4362	0.4392	0.4381
Sample Size	4874	4874	4874	4874

Notes: All p-values are one tailed. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

The p-values are reported in parentheses.

The pseudo R-squared adopts the McFadden R-squared index to measure the goodness of fit of the model.

The dependent variable and all other explanatory variables are defined as in Table 2.

The year and industry specifics are controlled but not reported for convenience.