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An empirical study of the impact of changes in ownership structure on audit quality in an emerging stock market

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AN EMPIRICAL STUDY OF THE IMPACT OF CHANGES IN OWNERSHIP
STRUCTURE ON AUDIT QUALITY IN AN EMERGING STOCK MARKET

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MPHIL

LINGNAN UNIVERSITY

2003

AN EMPIRICAL STUDY OF THE IMPACT OF CHANGES IN OWNERSHIP
STRUCTURE ON AUDIT QUALITY IN AN EMERGING STOCK MARKET

by

ZHANG Fang

A thesis
submitted in partial fulfillment
of the requirements for the Degree of
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ABSTRACT

An Empirical Study of the Impact of Changes in Ownership Structure on Audit Quality in an Emerging Stock Market

by

ZHANG Fang

Master of Philosophy

This study uses agency theory to test whether the demand for quality audits by listed Chinese companies is associated with *changes* in ownership structure, which is characterized by the dominance of the state, institutional and individual shareholders. The empirical test results obtained in a concentrated ownership setting are supportive of agency theory. Specifically, I find that the decrease of state shares and the corresponding increase of institutional shares result in a demand for higher-quality audits in China's stock market. The results provide empirical support for the government's recent initiative in reducing state ownership in listed companies to improve firm performance and the supply of quality accounting information through independent auditing.

Key words: Agency theory; Audit quality; Corporate governance; Ownership structure

I declare that this thesis 《An Empirical Study of the Impact of Changes in Ownership Structure on Audit Quality in an Emerging Stock Market》 is the product of my own research and has not been published in any other publications.

Zhang Fang
5th November 2003

An Empirical Study of the Impact of Changes in Ownership Structure on Audit Quality in an Emerging Stock Market

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1 Introduction

The recent audit failures and accounting scandals in the capital markets of China (e.g., 銀廣夏) and the U.S. (e.g., Enron) have resulted in increasing concern over corporate governance and audit quality. This paper applies agency theory to explain whether a firm's demand for quality-differentiated audits in China is affected by its ownership structure, which is predominated by three major types of shareholders, namely the state, institutions and individual investors. Specifically, I hypothesize that the decrease of state shares, and the corresponding increase of institutional and tradable A-shares would lead to the demand for higher-quality audits in China's stock markets.

Agency theory suggests that a firm's ownership structure affects its demand for independent auditing (Jensen and Meckling, 1976; Fama, 1980; Watts and Zimmerman, 1986). When share ownership is dispersed and the majority of shareholders are composed of individual investors, there is an increased preference for credible financial information and thus for higher quality audits (DeFond, 1992; Francis and Wilson, 1988; Watts and Zimmerman, 1983). When shares are concentrated and controlled by market-oriented economic entities and institutions, as opposed to government agencies, institutional investors have strong incentives to actively monitor firm management through independent auditing to promote the best interest of different institutions they represent (Bushee, 1998; Pound, 1988; Shleifer and Vishny, 1986).

In China's stock markets, the government owns the majority of listed companies' shares. This dominance of share ownership by the government creates severe agency problems, which lead to poor firm performance (Qi et al., 2000; Xu

and Wang, 1999; Wang, 2003). The Chinese government has in recent years undertaken share ownership reform to reduce its holdings by selling off state shares to improve firm performance. This reform has brought changes in the ownership structures of Chinese listed companies.

This research investigates whether these changes in ownership structure affect the demand for quality-differentiated audits by listed companies in China. In this study, audit quality is proxied by auditor size, which is measured based on total clientele assets of an audit firm, and quality differentiated audits are captured by comparing the size of the new auditor with that of the old auditor in the year of auditor change. Thus, an auditor change from a smaller auditor to a larger auditor indicates a demand for a higher-quality auditor.

I test the hypothesis by analyzing 208 voluntary auditor switches over the 1997-2002 period. Consistent with the hypothesis, I find that the demand for quality audits increases in proportion to the increase in institutional shares and decreases in proportion to the increase in state shares. However, I find that diffused ownership by domestic investors is not associated with demand for higher audit quality. These results support the active monitoring role of institutional investors (Bushee, 1998; Pound, 1988; Shleifer and Vishny, 1986) and have important implications for policy makers. The results are robust after controlling for client size, leverage, industry, accruals, management change, return on equity and time effect, and for other alternative definitions of audit quality.

This paper contributes to literature on the role of auditing in the context of concentrated versus diffused ownership structures. Prior studies have typically examined the impact of ownership structure on audit quality in large mature markets (e.g., Chow, 1982; DeFond, 1992; Gul et al., 1999). These studies all use management ownership to proxy a firm's ownership structure in a diffused

ownership setting. However, the use of management ownership as a proxy for a firm's ownership structure is not applicable to China, because of relatively low managerial ownership and of different types of agency problems in China. In contrast to western economies, Chinese ownership structures are characterized by the dominance of government and institutional owners. There is little research that examines the association between corporate governance, measured by share ownership at the firm level, and the supply of quality accounting information via independent auditing in transitional economies. Given that China is on a course to build a credible accounting profession and efficient capital markets, the research results have policy implications for regulators in both China and other transitional economies. For example, the results provide empirical support, from the auditing perspective, for China's future sale of state shares in the listed companies. The reduction of state ownership in listed companies could improve corporate governance and encourage management to supply quality accounting information via independent auditing.

The remainder of the thesis is organized as follows. The next section presents the institutional background on China's stock markets. Section 3 develops the research hypothesis. Section 4 describes research methodology. Finally, section 5 discusses the empirical results and Section 6 concludes the paper.

2 Institutional Background

After nearly two decades of economic reform, the restructuring of state-owned enterprise (SOE) has become the key to China's successful transformation from a socialist to a market economy. Systematic ownership reform began has relied on a two-pronged initiative of SOE restructuring: while unprofitable small and medium sized SOEs are privatized or merged, large SOEs are converted into shareholding companies with limited liabilities, and a select few are listed on China's two stock exchanges. Thus, publicly listed companies in China represent a relatively high-performing group of business units carved out of a much larger group of SOEs.

The Chinese stock market became a significant vehicle for ownership reform of SOEs after the establishment of stock exchanges in Shanghai and Shenzhen in the early 1990s. Since then, the market has grown rapidly. For example, the total number of listed firms increased from 50 in 1992 to 1,243 by April 2003. In addition, the total market value of publicly listed shares reached RMB 3,833 billion (approximately US\$ 479 billion) and has been ranked second in Asia since 2001 (Hong Kong Economic Journal Monthly, February 2003).

To be eligible for listing, companies must report three consecutive years of profits and their return on equity (ROE) must equal or exceed 10% in the two years prior to an initial public offering. In order to raise additional capital, listed companies should have attained an average ROE of 10% for the prior three years, and at least 6% each year. According to Chinese regulations, stock shares will be labeled "ST" for Special Treatment when a listed company experiences two consecutive annual net losses or when the net assets per share are lower than the stock's par value in the current year.¹ If the loss continues in the following fiscal year, the shares will be

¹ Special Treatment (ST) includes a 5% daily ceiling on price performance, a requirement of audited interim financial statements, and certain other requirements.

labeled “PT” for Particularly Transfer and share trading will be suspended.² De-listing will follow if the company fails to have the “PT” status lifted in the following year.

Listed Chinese companies issue three major classes of shares: state shares, institutional (legal persons) shares, and tradable A-shares.³ State shares are those owned by the state, i.e., the central government, local governments, or wholly SOEs. State shares are non-tradable, but are transferable to government-related institutions. Institutional shares are those held by domestic legal entities including stock companies, financial institutions other than banks, and state-private mixed companies. Securities firms, trust and investment companies, finance companies, mutual funds, and insurance companies constitute the bulk of non-bank financial institutions. Institutional shares can only be traded in blocks in a designated market. Tradable A-shares are held publicly by individuals and/or domestic institutions, and can be traded in the stock market without restriction.

Figure 1 depicts the ownership structure for a typical listed Chinese company. China Kejian Holding Ltd., a leading electronics manufacturer, was first listed on the Shenzhen stock exchange in 1994. The company issued three major types of shares mentioned above. State shares are largely owned by Kejian Group Ltd., a SOE as well as the parent company of the listed company. Institutional investors are comprised of an electronics company and an investment firm. Although individual shareholders collectively possessed 36.7% of the firm’s total outstanding

² Particularly Transfer (PT) means that shares can only be traded on Friday with the assembly open price and a 5% daily ceiling in price movement and no limitation on falling range.

³ There are other types of shares, such as employee shares and foreign shares. The employee shares are offered to workers and managers of a listed company, usually at a substantial discount. Foreign shares (B-, H-, N-, shares) are available exclusively to foreign investors and some authorized domestic securities firms. Many listed companies do not issue employee and foreign shares. If they do, these shares typically account for less than 10% of the total outstanding shares.

shares, they were all very small investors.

(Insert Figure 1 here.)

Table 1 presents the ownership level of all companies listed on the Shanghai and Shenzhen stock exchanges over the period studied. The state, institutional and individual investors, respectively, controlled an average of 31.87%, 28.67%, and 33.42% of the total outstanding shares over the period 1996-2002. All the ownership percentages have large standard deviations, suggesting large variations in ownership mix across firms. The state and institutional ownerships are largely clustered in the range of 0-20%, whereas individual ownership is highly concentrated in the range of 20-40%. Since the individual ownership is widely dispersed, the state is the dominant shareholder in most of the listed companies.

(Insert Table 1 here)

Although the government has attempted to improve firm performance by setting up shareholding companies, many listed companies have not performed well. For example, the percentage of firms reporting losses has increased from 6% in 1996 to 13% in 2002. Such poor corporate performance is frequently attributed to severe agency problems resulting from high government ownership of listed companies (Xu and Wang, 1999; Qi, et al., 2000; Wang, 2003). Gao (1996) suggests that as long as the state remains the controlling shareholder, severe agency problems will persist.

In line with the government's objective of improving non-performing state assets, China has undertaken measures to relax governmental control of listed companies by selling state shares to other groups of investors. As a result, the

proportion of state shares has declined over the years, while the proportions of institutional and tradable A-shares have risen. To examine the effects of this restructuring, I conduct a trend analysis of changes in ownership level for 511 firms that were listed throughout the period 1996–2002. The results are reported below in Table 2.

(Insert Table 2 here)

Panel A of the Table indicates that the number, as well as the percentage, of than companies with 51% or higher levels of state ownership declined from 148 (29%) in 1996 to 114 (22%) in 2002. The proportion of companies with 51% or greater levels of institutional ownership also decreased slightly over the years. In contrast to the trend displayed by the state holdings, the percentage of firms with A-share owners accounting for more than 50% of total stock has consistently increased over the years. Panel B of the Table presents the overall ownership mix by year. These data indicate a decrease in the level of state ownership over the period studied, along with a slight increase in the level of institutional ownership and a larger increase in individual ownership. Prior studies (Xu and Wang, 1999; Qi, et al., 2000; Wang, 2003) find that while a firm's profitability is positively correlated with the fraction of institutional shares and negatively correlated with the fraction of state shares, the influence of individual shareholders on a firm's profitability is irrelevant. These studies attribute the lack of influence by individual shareholders to their incapability of monitoring managerial performance.

3 Literature Review and Research Hypothesis

Agency theory explains how to best organize relationships in which one party (the principal) determines the work, while another party (the agent) undertakes (Eisenhardt, 1985). In business corporations, the essence of the agency problem is the separation of management and ownership, which gives rise to management-owner conflicts and thus agency costs. The manager needs the shareholders' funds and the shareholders need the manager's specialized human capital in order to generate returns on their funds. The agency problem here refers to the difficulties shareholders (the principal) have in assuring that their funds are not expropriated or wasted on unattractive projects by the manager (the agent). To mitigate the extent of agency conflicts, shareholders often replace fixed wages of the manager with compensation based on the profits of the firm, which are mainly reflected in financial reports. However, the determination of financial numbers necessarily involves discretion, which provides the manager an opportunity to manipulate these numbers. Hence, audited financial reports are widely viewed as a means of enhancing the credibility of management-prepared financial reports and mitigating agency costs.

Agency theory suggests that different types of ownership structure have different degrees of agency problems, which create different levels of incentives for controlling and monitoring the management of the firm, and thus varying levels of demand for quality audits (Jensen and Meckling, 1976; DeFond, 1992; Chow, 1982). There are two general types of ownership structure: dispersed and concentrated. When share ownership is dispersed, as is typical in most UK and US listed companies, agency conflicts often arise between managers and shareholders (Jensen and Meckling, 1976). The greater the agency conflicts between managers and shareholders, the higher the demand for quality audits (DeFond, 1992). Prior studies

typically use management ownership to proxy a firm's ownership structure (e.g., Chow, 1982; DeFond, 1992; Gul et al., 1999; Jensen and Meckling, 1976). When the manager owns none, or a small proportion, of the firm's shares, he or she has strong incentives to allocate the firm's resources in ways that are not necessarily consistent with the interests of the principal, because the firm manager aspires to maximize his or her own rather than the owners' utility function. The principal's welfare loss from the managers' divergent behavior is one type of agency cost. To reduce this cost, the principal attempts to control the agent's divergent behavior through monitoring activities. Auditing is a form of monitoring activity. Therefore, companies with low managerial ownership are more likely to engage a high quality auditor. As the manager's ownership increases, the costs to the manager of consuming perquisites also increase, because the manager bears a larger share of the costs of his or her actions. Thus, a firm with high level of managerial ownership would have a lesser need for higher-quality audits than a firm with a low level of managerial ownership (Jensen and Meckling, 1976).

When share ownership is concentrated, as is typical in emerging and transitional economies, block shareholders own the majority of firms' shares and possess the voting rights. According to the efficient monitoring hypothesis (Pound, 1988; Bushee, 1998), increased ownership by large external blockholders serves as a monitor of managers' actions and reduces the likelihood that managers would misuse the firm's resources.⁴ Stapledon (1996) also suggests that large blockholders can improve firm performance by joining the firm's management. Thus, concentrated ownership is viewed as ameliorating the separation of ownership from control that creates agency problems. Accordingly, large blockholders have less incentive to

⁴ The conflict of interest hypothesis suggests that when share ownership is concentrated, the nature of agency problems shifts away from manager-shareholder conflicts to conflicts between controlling owners and minority shareholders (Shleifer and Vishny, 1997). Empirical evidence supports the efficient monitoring hypothesis.

manage a firm's earnings and would prefer to provide credible accounting information through quality audits to improve market returns (Teoh and Wong, 1993; Warfield et al., 1995).

Compared to the typical ownership structure in the West, Chinese ownership structures have distinct characteristics. A typical listed Chinese company has a mixed ownership structure with two predominant groups of blockholders: the state and institutions. Individual shareholders never dominate although collectively they account for about one-third of the total shares outstanding. One of the unique characteristics of the Chinese stock market is that many listed companies are sponsored and controlled by government-related entities. The composition of the board and the supervisory committee of state-dominated companies are usually characterized by an extremely high state presence.⁵ In these companies, general managers are appointed by the government or their unlisted parent companies. Figure 2 depicts the chain of principal-agent relationships in the Chinese stock markets.

(Insert Figure 2 here)

The dominance of state ownership creates a number of agency problems. The first relates to the 'absence of principal' problem. The principal of state shares is the state, which represents all Chinese people. The agents are, by order, the central government, the provincial government, the municipal government, and state-owned enterprise managers and workers. According to the classical agency theory, agents

⁵ In the Chinese stock market, the largest shareholder normally has a control over the board of directors. Xu and Wang (1999) investigate the composition of the boards of 154 listed companies in 1995 and find that on average, 74.3% of the board members in a state-dominated firm represent the largest shareholder, and 54.4% of board members in a legal person dominated firm represent the largest shareholder on the Shanghai Stock Exchange. A similar situation exists on the Shenzhen Stock Exchange.

are supposed to serve the principal's interest. However, due to the nonexistence of a principal and ambiguity of property rights, no agent in this chain of principal-agent relationships has an adequate incentive to pursue profit maximization for the real principal (the Chinese people). Consequently, the state has to bear the residual risk of all these agents' divergent behavior in the form of deteriorating firm performance. The second agency problem relates to the principal's ineffective monitoring of the agents. The government relies upon its control over the board of directors to preserve the value of state properties. However, as many board members who represent the state's interest are appointed and paid by the local government according to their administrative rankings rather than firm performance, they may not have sufficient incentives to monitor management's behavior. Moreover, the preferences of the local government do not necessarily coincide with those of the state. The third agency problem stems from the government's political influence on corporate decisions. The government may divert managerial objectives away from profit maximization and towards such objectives as employment and social welfare maximization. The intervention of government politicians may also lead to sub-optimal investment by managers *ex ante*.

In sum, firms with higher levels of state ownership lack sufficient incentives to monitor divergent management behavior. From an accounting perspective, the high concentration of state ownership provides the government with both the incentive and the ability to control the production of a firm's accounting information and its reporting policies. Given the required profit level for raising additional capital by listed companies, government owners have strong incentives to pressure management to resort to opportunistic choices of accounting methods, but little demand for quality audits (DeFond et al., 2000). Moreover, as the government usually does not need to rely on publicly released financial information for

performance evaluation, it may lack adequate incentives to demand reliable accounting information through quality audits (Klassen, 1997).

In contrast, institution-dominated companies act more like commercial enterprises than government agencies, as they are driven by consumers and, by necessity, are forward-looking, and may play a different governance role. They have a lesser degree of government intervention because they have much more autonomy (Groves et al., 1994). Firms controlled by institutions in China are more similar to institutional firms in the U.S. in the way they are established, governed and managed. Stapledon (1996) indicates that increased institutional monitoring may produce a reduction in total agency costs, if the cost of closer monitoring leads to a larger reduction in the loss of shareholder wealth from managerial shirking and self-dealing.⁶ Unlike government officials, representatives of institutional shareholders are elected to the board of directors by different institutions, act more like businessmen than bureaucrats or politicians, and are paid according to their real managerial efforts. Because of the size of their holdings, representatives of institutional shareholders have strong incentives to actively monitor firm management to promote the best interest of the principal they represent (Pound, 1988; Shleifer and Vishny, 1986). Moreover, these representatives have diverse professional backgrounds and are better equipped with authority and expertise. For example, they can vote on important issues such as the appointment of the auditor, and can also bring significant pressure on management to ensure that an effective corporate governance structure is in place. Prior studies indicate that the higher the

⁶ Stapledon (1996) classifies agency costs into three categories: (a) expenses associated with monitoring activities by and on behalf of the shareholders to limit the non-wealth-maximizing activities of managers; (b) bonding expenditures incurred by the managers to guarantee that they will act in the shareholders' interests; and (c) the residual reduction in the shareholders' maximum possible wealth. So closer institutional monitoring can reduce total agency costs by reducing shareholders' residual loss (c) more than the increase in monitoring costs (a).

holdings of institutions and blockholders, the greater the earnings informativeness (e.g., Warfield et al., 1995). This suggests that, unlike government owners, institutional investors are likely to prefer credible financial information and hire quality auditors to improve earnings informativeness and market returns (Teoh and Wong, 1993).⁷

Under current Chinese regulations, at least 25% of shares outstanding must be sold to the general public. However, the vast majority of individual investors are relatively small investors and their representation on the boards of directors are extremely low even though they possess approximately one third of the total outstanding shares (Xu and Wang, 1999). Such small shareholders do not have a big enough stake in the firm to absorb the costs of monitoring management (Grossman and Hart, 1980). Consequently, no individual shareholder has adequate incentive to monitor management closely. Minority shareholders also lack the ability to claim damages due to the release of false information by listed companies, as there are no adequate corporate governance mechanisms to protect their interests, and the litigation costs involved are relatively high for individual shareholders. Furthermore, most individual investors in China buy stocks for speculative purposes rather than dividend income or long-term growth (Xu and Wang, 1999). This short investment horizon makes individual investors unwilling to monitor and control actions taken by managers. Therefore, although diffused ownership by individual investors

⁷ Lee and Gray (2002) argue that in countries where bankers are more significant than shareholders as financiers of corporations, as in France, Germany, and Japan, banks would have direct access to required information, and thus their demand for publicly available financial information would not be very strong. Compared to banks in Japan, Chinese banks play a more passive role on monitoring their clients. This is because banks in China are restricted from engaging in share trading. Unlike Germany and Japan, all institutional shares are held by non-bank financial institutions in China (Xu and Wang, 1999). Moreover, although banks maintain close financial ties with companies through debt financing, most banks in China are controlled by the government and therefore, they have not been very active in monitoring clients' activities. In a major step towards the resolution of China's serious banking problems, the government established four state-owned non-banking asset management companies in 1999 to deal with the huge burden of non-performing loans from the state-owned banks (Lin et al., 2003).

theoretically provides the basis for a demand for independent auditing, individual investors may not necessarily demand credible information through quality audits (DeFond, 1992; Francis and Wilson, 1988; Watts and Zimmerman, 1983).

Prior studies frequently attribute poor performance of listed companies in China to their ownership structure, which gives rise to severe agency problems (e.g., Qi et al., 2000; Gao, 1996; Xu and Wang, 1999; Wang, 2003). These studies find that the firm's profitability is positively (negatively) correlated with the fraction of institutional (state) shares. Regulators in China have taken measures to deal with the inefficiency of state ownership by selling off state shares to other groups of investors, such as institutional and individual shareholders.⁸ As indicated earlier, such measures are bringing about ownership changes in China. A change in ownership structure is also paralleled by a change in the composition of the board of directors.⁹ It is expected that this change will have an impact on the degree of auditing demanded by listed companies in China. Thus I summarize the directional hypothesis as follows:

Client firms tend to switch to higher quality audit firms as a result of increases (decreases) in the percentage of institutional and individual (state) shares.

⁸ In December 1999, China Jialing (Stock No. 600877) and Qian Tires (Stock No. 000589) became the first two companies to pilot the 'allocation of state-owned shares to holders of A-shares'. In June 2001, the State Council promulgated the 'Interim Regulations on Reduction of State-owned Shares to Raise Social Security Funds', prescribing that 'the reduction of state-owned shares, including state shares and state-owned institutional shares, should be interpreted as a behavior to transfer state-owned shares of listed companies to public investors of individuals and securities investment funds', and that 'stock issue should be the key channel for the reduction of state-owned shares'. However, within three months after the promulgation of the regulations, stock prices in both Shanghai and Shenzhen Stock Exchanges dropped over 30%, which led to the decision by the China Securities Regulatory Commission to suspend its implementation. Subsequent reductions of state shares must be approved by the Ministry of Finance.

⁹ For example, the largest state shareholder of Fangxiang Guandong Ltd. (Stock No. 000757) was Neijiang State Assets Management Bureau who held 50.3% of the firm's total shares outstanding at the end of 2001. The board of directors of the firm was composed of five members representing the state interest and two members acting for institutional investors. In July 2002, Neijiang State Assets Management Bureau sold all its state shares to other three domestic institutional-entity owners. The increase in institutional ownership was paralleled by an incremental increase of five members representing the interest of different institutional investors and the vanish of members acting for the government.

4 Research Method

4.1 Sample data

To test the hypothesis, I collected ownership data of listed companies that changed their auditors during the 1997-2002 period. This information is available from the *Securities Times* and the *Shanghai Securities News*. Table 3 shows that 632 firms switched their auditors over the sample period. To reduce noise and avoid the need to control some non-agency variables, several categories of switching companies are excluded from the sample. First, involuntary auditor switches resulting from either license suspension of the previous auditor due to irregularities, or from the merger of the incumbent auditor with other auditors, are excluded. Second, because that companies received prior audit qualifications tend to switch auditors in the subsequent year (Chow and Rice, 1982; Krishnan, 1994; Krishnan and Stephens, 1995), companies receiving qualified opinions in the year before an auditor switch are excluded. Third, companies that switched auditors more than twice during a three-year period are eliminated from the sample, since these switches may relate to factors other than ownership structure change (e.g., opinion shopping). Fourth, since failing companies have a greater tendency to switch auditors than healthier companies (Schwartz and Menon, 1985), companies reporting two or three consecutive years of loss (i.e., ST and PT companies) are deleted from the sample. Fifth, companies issuing B-shares are excluded from the sample, because a change in the domestic auditor could be the result of a change in the international auditor for a B-share company. Finally, companies with unusually high growth (i.e., a doubling/trebling in size) are excluded from the sample so as not to give undue weight to these high-growth companies (DeFond, 1992). Thus, the final sample consists of 208 firm-year observations. Table 3 displays the construction and the constitution of the final sample.

(Insert Table 3 here)

4.2 Regression model

As discussed earlier, a change in ownership structure may give rise to greater demand for quality-differentiated audits. In this study, audit quality is proxied by auditor size, which is measured based on client size relative to the total clientele of an audit firm (DeAngelo, 1981; DeFond, 1992; Francis and Wilson, 1988), and quality-differentiated audits are captured by comparing the size of the new auditor with that of the old auditor in the year of auditor change.¹⁰ Thus, a switch from a smaller, less independent audit firm to a larger, more independent one indicates demand for a higher-quality audit. I estimate the following regression model to test the relationship between changes in companies' ownership structures and voluntary demand for quality audits by listed Chinese companies.

$$\begin{aligned} \Delta \text{Quality} = & b_0 + b_1 \Delta \text{State} + b_2 \Delta \text{Institutions} + b_3 \Delta \text{Individuals} + b_4 \Delta \text{Size} + \\ & b_5 \Delta \text{Leverage} + b_6 \Delta \text{accrual} + b_7 \Delta \text{Industry} + b_8 \Delta \text{ROE} + \\ & b_9 \Delta \text{Management} + b_{10} \Delta \text{After99} + e \end{aligned}$$

The dependent variable, $\Delta \text{Quality}$, is defined as the natural logarithm of the ratio of combined assets of listed companies audited by the *new* auditor to that by the *old* auditor in the year of auditor switch (DeAngelo, 1981; Francis and Wilson, 1988; Johnson and Lys, 1990; Defond, 1992). Thus, a ratio above one suggests a greater preference for a higher-quality auditor. Changes in ownership structure are measured as changes in the percentage of shares held by the state, institutions, and individual investors, respectively, between year t and $t-1$. I predict that the coefficient b_1 will be

¹⁰ Alternative definitions of audit quality are included in the sensitivity tests.

negative and that b_2 , and b_3 will be positive.

Six agency-related variables are used to control for the effect of changes in agency costs on auditor choice.¹¹ Increases in client firm size can be expected to increase agency costs due to increased remoteness of principals from the observation of agents' actions. The larger the size of client firm, the greater the magnitude of wealth transfers (agency costs). Since client size is significantly related to auditor choice (DeFond, 1992; Healy and Lys, 1986), a *Size* variable, measured as the percentage change in total assets between year t and $t-1$, is included in the model.

Another type of contractual relationship with the potential for divergence of interests is the relationship between debtholders and shareholders. As the amount of debt increases, the potential amount of the wealth transfer away from debtholders increases, resulting in a greater incentive for such transfers and a greater demand for monitoring (Chow, 1982; DeFond and Jiambalvo, 1994; Jensen and Meckling, 1976). Thus I include a *Leverage* variable in the model to capture the potential wealth transfers (i.e., agency costs). This variable is measured as the change in the ratio of total liabilities to total assets between year t and $t-1$.

When ownership is separated from management, conflicts of interests often arise between shareholders and managers. Shareholders may contract with management under arrangements that attempt to mitigate the extent of conflicts of interests between the two groups. One such arrangement is to align managers' interests with those of shareholders. This alignment is often tied to accounting numbers. However, the determination of accounting numbers necessarily involves

¹¹ Fifty-six companies that switched auditors in 2002 disclosed their audit fees for both 2001 and 2002. A comparison of audit fees for these two years indicates that switching companies on average paid an extra of RMB 49,100 (approximately US\$6,000) per audit subsequent to auditor switch. This suggests that audit fee is unlikely to be a factor affecting clients' auditor switch decisions. Similarly, companies with new stock issues may change from a smaller to a larger auditor to increase the marketability of new issues (DeFond, 1992). However, there were only six companies raised additional capitals through new issues in the sample. Omission of the control variable, new issues, will not confound the test results since it is not systematically related to the dependent variable.

judgment and discretion, which gives the manager an opportunity to manipulate these numbers via short-term accruals (DeFond, 1992; Healy, 1985). One mechanism for enhancing the credibility of management-prepared accounting numbers is to hire a quality auditor. Therefore, the larger the short-term accruals, the greater the vulnerability to earnings management and the greater the demand for quality audits as a monitoring mechanism. In this study, I use $\Delta Accrual$, which is measured as the change in the ratio of short-term accruals to total assets between year t and $t-1$, to measure the effect of vulnerability to manipulation on the demand for monitoring. Short-term accruals are constructed as changes in accounts receivable plus inventory minus accounts payable and accrued expense over the two years. A positive sign of coefficient for $\Delta Accrual$ represents an increased demand for quality audits. Notationally,

$$Accrual_i = (AR_t + INV_t) - (AP_t + AccrExp_t)$$

where

AR_t = Accounts receivable of the client at the end of year t in observation i .

INV_t = Inventory of the client at the end of year t in observation i .

AP_t = Account payable of the client at the end of year t in observation i .

$AccrExp_t$ = Accrued expenses of the client at the end of year t in observation i .

$$\Delta Accrual = Accrual_t / Total Assets_t - Accrual_{t-1} / Total Assets_{t-1}$$

As with size, the complexity of an organization increases the agency costs. The greater the complexity and diversity of an organization's activities and operations, the greater the difficulty in monitoring the divergent behavior of agents. In China, companies in protected industries (e.g., petrochemicals, energy, and raw materials) are large monopolies. As these companies are generally more complex and geographically dispersed than unprotected companies, they are likely to demand quality audits to monitor the manager's divergent behavior. Accordingly, I include an

Industry dummy variable in the model (coded one for protected companies and zero otherwise) to capture organizational diversity and complexity.

Return on equity (ROE) is an important quantitative criteria and index for the regulatory authorities to assess the companies' financial conditions for the initial public offering and the rights issue. Chinese regulations stipulate that listed companies must maintain a minimum ROE for raising additional capital by a rights issue. Hence financially distressed companies are more likely than healthier companies to make income-increasing accounting changes to meet arbitrary profit targets, and to hire more accommodating auditors to mask these changes (DeFond et al., 2000). In this study, a *ROE* variable is included in the model to control for the impact of firm performance on auditor reporting decisions. This variable is measured as the percentage change in ROE between year t and t-1.

Carpenter and Strawser (1971) and Beattie and Fearnly (1995 and 1998b) find that management change (the chairman of the board, the general manager, and CEO) often leads to an auditor change. Agency theory considers the auditor-client relationship as a mutual contract. A change in management (principal) may alter the principal-agent relationship, which in turn could lead to a change in auditor (agent). In this study, a dummy variable, *Management* (coding one for management change before the year of auditor switch and zero otherwise), is included in the model to capture the effect of management change on auditor switching. Finally, the year dummy variable, *After99*, is included in the model to control for the change in the audit environment (particularly the audit firm mergers after 1999).

5 Empirical Results

5.1 Descriptive statistics

Table 4 reports descriptive statistics on the independent variables included in the regression model. Table 4 shows that of the 208 companies that voluntarily switched their auditors, 107 companies switched to larger auditors while 101 switched to smaller ones. Companies switching to a larger auditor have a greater decrease in the percentage of state shares (-5.14%) than companies switching to a smaller auditor (-1.01%).¹² On the other hand, companies with greater increase in non-state shares generally demand higher quality auditors. These univariate results are directionally supportive of the association of changes in ownership structure with the choice of auditor. Meaning, the greater the decreases (increases) in the proportion of state shares (institutional and individual shares), the greater the demand for a large-sized auditor.

(Insert Table 4 here)

5.2 Regression results

Table 5 reports Pearson correlations amongst the independent variables. Some interesting observations can be drawn from the table. First, the significantly negative correlation between $\Delta State$ and $\Delta Institutions$ suggests, perhaps not surprisingly, that the percentage increase in institutional shares was directly attributed to the decrease in the proportion of state shares. Second, the negative correlation coefficient between ΔROE and $\Delta State$ suggests that greater state ownership is associated with poorer firm performance. Finally, it appears that companies in protected industries have a lesser extent of decrease in the fraction of

¹² A drop of 1% in state shares represents a decline of two million state shares for a listed company.

state shares, which may reflect the official position that the state should remain in control of key industries.

(Insert Table 5 here)

To avoid multicollinearity problems arising from the high correlation (-0.973) between *?State* and *?Institutions* if these two variables are simultaneously included in the model, I run two separate regressions and report the results in Table 6.

(Insert Table 6 here)

Both models are significant at the 5% level, which indicates a strong relationship between the dependent and independent variables. All of the significant coefficient signs in the models are in the hypothesized directions. As predicted by the hypothesis, and indicated by the significantly negative (positive) coefficient for the *?State* (*?Institutions*) variable, companies with greater decreases (increases) in the proportion of state (institutional) shares are associated with the demand for higher quality auditors. The coefficient on *?Individuals* is positive but not significant at conventional levels, indicating that greater ownership by individual investors does not lead to improved preference for audit quality. This suggests that while diffused ownership theoretically provides the basis for a demand for independent auditing, domestic investors have neither the incentive nor the capability to monitor managerial performance, and thus have little regard for auditor differentiation. One control variable, *Industry*, is (weakly) significantly positive. This may support the proposition that as companies in protected industries have less need to use earnings management to respond to regulatory constraints on profit level (Aharony, et al.,

2000), they have incentives to use a higher-quality auditor to improve the credibility of accounting information. This is also consistent with agency theory which states that the greater the complexity and geographical dispersion of an organization's activities and operations, the greater the difficulty in monitoring the divergent behavior of agents, thus the greater the demand for reputable auditors to monitor the manager's deviating actions.

5.3 *Sensitivity analysis*

I perform the following four sets of sensitivity tests and summarize the results in Table 7. First, I test whether the results are robust to alternative definitions of the dependent variable. In this regard, I rerun the regressions by using two alternative definitions for audit quality: (1) auditor affiliation and (2) auditor independence. In the affiliation model, I classify auditors into either top 10 (=1) or non-top 10 (=0) groups based on the total client assets audited, since top 10 auditors in China are of higher quality than their counterparts (DeFond et al., 2000).¹³ Thus, a change from a non-top 10 to a top 10 auditor suggests a demand for a higher-quality auditor. In the independence model, I consider economic dependence of auditors upon their clients and compute this dependence as the difference between the ratios of the switching client firm's assets to the total assets of the clients of the old auditor, minus the same ratio for the new auditor (DeFond, 1992). Positive difference suggests a preference for a quality-differentiated auditor. Table 7 (Tests 1 and 2) reports the results of regressing auditor affiliation and independence variables.

(Insert Table 7 here)

¹³ I did not compare Big 5 vs. non-Big 5 because of insufficient switches to and from the Big 5 auditors to perform a meaningful statistical analysis. For example, switching from a Big 5 to a non-Big 5 auditor and vice versa have only 12 and 10 observations respectively over the sample period.

Second, I examine whether the results are sensitive to alternative classifications of ownership structure. Wang (2003) further classifies state shareholders into bureaucratic state shareholders and corporate state shareholders,¹⁴ and finds that firm performance is negatively correlated with government-controlled firms. Following this classification, I break up the ownership of state shares into two categories, i.e., shares owned by government agencies and shares held by corporations such as SOEs. As corporations are market-oriented economic entities and act similarly to institutions, I treat corporate shareholders and institutional shareholders as a homogeneous group. The results of replicating Table 6 using this alternative classification of share ownership are reported in Test 3 of Table 7.

Third, instead of using the annual *changes* in ownership structure over two years, I test the effect of the relative *dominance* by institutions over the state on auditor choice in a given year. If greater ownership by institutions reduces agency costs through enhanced corporate governance while greater ownership by the state creates severe agency problems, then firms with greater institutional shares are more likely to engage a quality auditor than firms with greater government shares. To test this proposition, I use the difference between the proportions of shares held by institutions and the state as a continuous variable to measure the relative dominance by institutions over the state. The greater the difference, the greater the dominance of institutional investors. All variables are as previously defined, except that I use year-end financial statement numbers (instead of annual changes in the main model) to measure dependent and independent variables. Empirical results are reported in

¹⁴ Bureaucratic state shareholders are government bureaus including central government ministries and commissions, national industry groups, local government bureaus, local state assets management bureaus, and local state assets management companies. Corporate state shareholders are non-government agencies such as SOEs or other types of market-oriented economic entities (Wang, 2003).

Test 4 of Table 7.

Finally, I focus on the sub-sample of 105 firm-years that do not have simultaneous institutions and state ownership. In this sub-sample, 49 observations have state shares but no institutional shares, while the remainder has institutional shares but no state shares. I use a dummy variable, *Institutions*, which equals one if a firm has institutional shares but no state shares and zero otherwise, to measure the absolute dominance by institutional over state owners. All other variables are as previously defined. Test 5 of Table 7 displays the test results.

All of the sensitivity test results point to a single conclusion regarding the experimental variables. Tests 1 to 3 provide a consistent result: changes in share ownership are associated with changes in audit quality. More specifically, companies with greater decreases in the proportion of state shares are more likely to switch to a higher-quality auditor than companies with smaller decreases in the proportion of state shares, whereas companies with greater increases in the proportion of institutional shares have a greater tendency to switch to a higher-quality auditor than companies with smaller increases in the proportion of institutional shares. The results of Tests 4 and 5 measuring the relative ownership dominance by institutional over state owners are also supportive of the argument that companies dominated by institutional investors would voluntarily demand higher-quality auditors than companies dominated by the state.¹⁵ One control variable, *After99*, is significantly positive at the 10% level in Tests 1, 4 and 5, which suggests that clients are more likely to be associated with a larger audit firm subsequent to the firm mergers started in early 2000. Client *Size* is also significantly positive at the 1% level in Tests 4 and

¹⁵ The weaker results for the explanatory variables in the sensitivity Test 4 may lie on the sample. The results of test 4 are based on companies that switched auditors. To examine the proposition that greater ownership by institutional investors is associated with higher quality auditors, I extend the sample to include non-switching companies and use the 2002 data to rerun Test 4. As expected, the explanatory variables of the interest have then become strongly significant at the 1% level.

5, indicating that larger firms are more likely to engage an auditor who is of higher quality than smaller firms.

In conclusion, the main results, together with the results of sensitivity tests, suggest that greater institutional ownership can improve the supply of credible accounting information via quality audits by listed companies in China.

6 Conclusions

To improve firm performance and corporate governance, China has in recent years relaxed governmental control over corporate affairs through ownership reform. The reform has brought about changes in firm ownership structure. This paper examines whether changes in corporate ownership affect the demand for differential quality audits. Agency theory suggests that different type of ownership structures have different degree of agency problems, which lead to different incentives for shareholders to control and monitor firm management. When shares are concentrated and controlled by institutional shareholders, as opposite to government-entity owners, institutional investors have strong incentives to closely monitor divergent behavior of corporate management through independent auditing. Using an agency theory framework, I hypothesize that the fall of states shares and the corresponding rise of institutional and individual shares will lead to a demand for higher-quality audits in China's stock market.

The empirical test results, based on 208 voluntary auditor switches pooled over the period 1996-2002, are supportive of the hypothesized association between changes in ownership structure and changes in auditor quality. Specifically, the decreases in the percentage of state shares and the increases in the fraction of institutional shares result in a general increase for higher-quality audits by listed companies in China. The results are robust after controlling for client size, leverage, industry, accruals, management change, return on equity, time effect, and for other alternative definitions of audit quality and ownership structure. However, the results do not support the proposition that diffusion of ownership by domestic individual investors lead to a preference for credible accounting information and thus for quality audits. This suggests that small individual shareholders have neither the incentive nor the capability to monitor corporate management.

These findings have policy implications for Chinese regulators. First, to encourage the supply of quality accounting information, a certain degree of ownership concentration by large institutional owners is needed in China's stock markets. The presence of large external blockholders is also important to a sound corporate governance that provides protection of the interest of minority shareholders. Second, China should diversify the government ownership and introduce other forms of large external shareholders. The government's recent initiative in selling off state shares is an important step in improving the efficiency of China's stock markets, the effectiveness of corporate governance, and the credibility of accounting information.

The results are subject to some limitations. The hypothesis that larger audit firms provide higher quality audits is based on the argument put forward by DeAngelo (1981) that as larger audit firms have more clients, they have more aggregate client-specific quasi-rents at stake if a low-quality audit becomes known. Empirical studies using pricing in IPOs, discretionary accruals, earnings response coefficients, frequency of audit qualifications and auditor litigation as measures of audit quality are generally supportive of DeAngelo's argument. Similar to most studies, I have not distinguished the effects of auditor competence from auditor independence. Thus, it is not clear whether the hypothesized relation between auditor size and audit quality still holds after controlling for the difference in auditor competence.

Second, the sample represents only a small subset of China's enterprises: a better-performing group of enterprises that were selected to be listed on the two stock exchanges. Therefore, caution is needed when interpreting the results. Further study can investigate whether the hypothesized relationship between corporate ownership and auditor differentiation still holds for unlisted companies in China. Third, the study respectively used auditor size, affiliation, and independence to capture auditor

quality. To provide more information on quality and reduce possible noise in the dependent variable, further research may use a combined measure of audit quality to study the incremental effect of a combined measure over a single measure. Finally, apart from client size, there are other alternative surrogates of audit quality, such as auditor opinions, discretionary accruals, auditor litigation, and earnings response coefficients. Further study could employ each of these variables as a representation of audit quality.

Figure 1: Ownership structure of a typical Chinese listed company

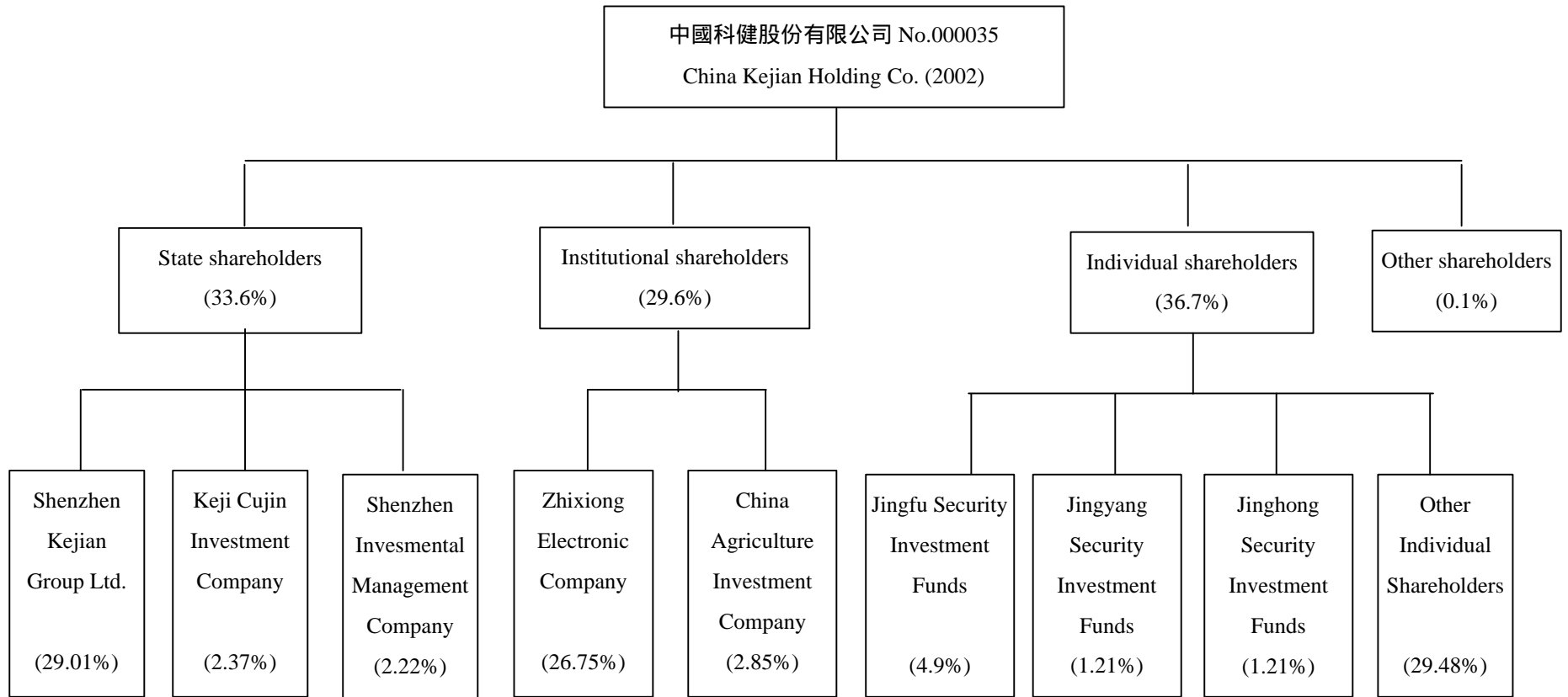


Figure 2: Agency Setting in the Chinese Stock Market

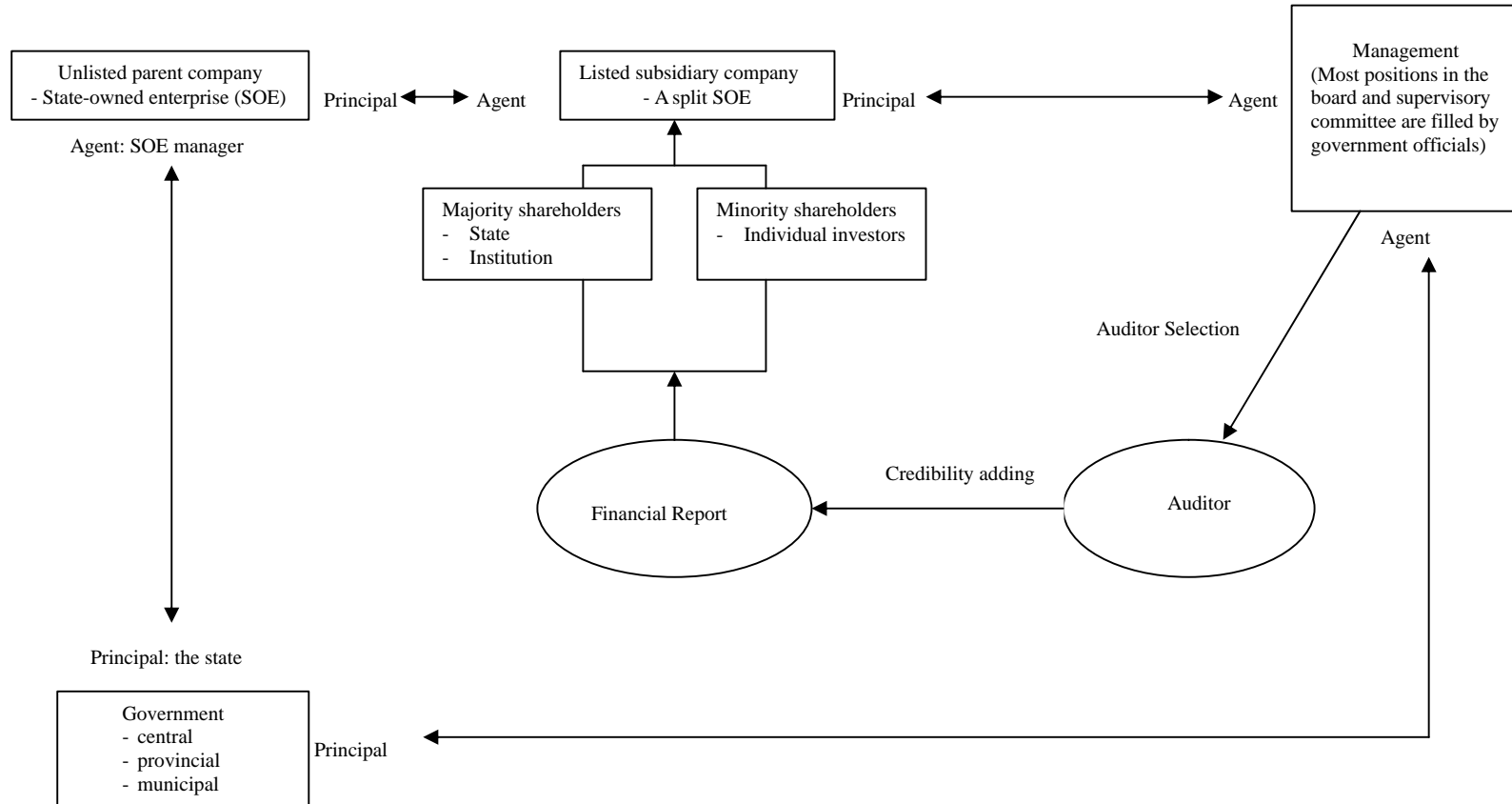


Table 1: Share Ownership Level of Listed Chinese Companies (1996 – 2002)

	Mean	Std. Dev.	0-20%	20-40%	40-60%	60-80%	80-100%
State	31.87	26.59	38.37	18.53	23.33	19.02	0.75
Institutional	28.67	26.73	48.48	16.62	16.20	17.69	1.02
Individual	33.42	13.74	13.23	59.98	23.29	2.95	0.56
Others	6.04	7.76	94.53	4.87	0.60	0	0

Table 2: Changes in Ownership Level for 511 Companies Listed throughout the Period 1996-2002

		Mean		1996		1997		1998		1999		2000		2001		2002	
		#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Panel A: Ownership mix by percentile																	
State shares:	0-50%	385	(75.34)	363	(71.04)	372	(72.80)	386	(75.54)	392	(76.71)	392	(76.71)	394	(77.10)	397	(77.69)
	51-100%	126	(24.66)	148	(28.96)	139	(27.20)	125	(24.46)	119	(23.28)	119	(23.29)	117	(22.90)	114	(22.31)
		511	(100)	511	(100)	511	(100)	511	(100)	511	(100)	511	(100)	511	(100)	511	(100)
Institutional shares:	0-50%	366	(71.62)	356	(69.67)	361	(70.65)	359	(70.25)	357	(69.86)	369	(72.21)	381	(74.56)	378	(73.97)
	51-100%	145	(28.38)	155	(30.33)	150	(29.35)	152	(29.75)	154	(30.14)	142	(27.79)	130	(25.44)	133	(26.03)
		511	(100)	511	(100)	511	(100)	511	(100)	511	(100)	511	(100)	511	(100)	511	(100)
Individual shares:	0-50%	439	(85.91)	468	(91.59)	466	(91.19)	462	(90.41)	450	(88.06)	423	(82.78)	406	(79.45)	398	(77.89)
	51-100%	72	(14.09)	43	(8.41)	45	(8.81)	49	(9.59)	61	(11.94)	88	(17.22)	105	(20.55)	113	(22.11)
		511	(100)	511	(100)	511	(100)	511	(100)	511	(100)	511	(100)	511	(100)	511	(100)
Other shares:	0-50%	511	(100)	510	(99.80)	510	(99.80)	510	(99.80)	510	(99.80)	511	(100)	511	(100)	511	(100)
	51-100%	0	(0)	1	(0.20)	1	(0.20)	1	(0.20)	1	(0.20)	0	(0)	0	(0)	0	(0)
		511	(100)	511	(100)	511	(100)	511	(100)	511	(100)	511	(100)	511	(100)	511	(100)
Panel B: Overall ownership mix																	
	Mean	1996		1997		1998		1999		2000		2001		2002			
State shares:	28.48	31.33		29.75		28.19		27.43		27.91		27.67		27.08			
Institutional shares:	31.06	30.32		30.76		31.723		31.57		30.75		31.36		31.43			
Individual shares:	33.58	29.95		30.31		31.06		33.63		36.32		36.66		37.13			
Other shares:	6.88	8.4		9.18		9.52		7.37		5.02		4.31		4.36			

Table 3: Sample Selection Criteria

	1997	1998	1999	2000	2001	2002	Total
Number of auditor switches	29	87	50	93	256	117	632
Less: Missing data	8	0	0	4	3	0	15
Involuntary auditor switches	0	50	0	0	173	26	249
Firms with qualified opinions	4	3	15	15	14	18	69
ST/PT firms	0	6	10	14	20	16	66
Firms switched auditors more than twice	0	0	0	1	1	0	2
Firms issuing B-shares and banks	2	3	1	2	5	2	15
High-growth firms	2	0	0	3	2	1	8
Final sample	13	25	24	54	38	54	208

Table 4: Descriptive Statistics on the Independent Variables by Auditor Size (N=208)

	Switch to larger auditors (N=107)		Switch to smaller auditors (N=101)		t-statistic	
	Mean	Std. deviation	Mean	Std. deviation	Mean difference	Significance
? State shares	-5.14	16.64	-1.01	12.61	-4.13	0.046**
? Institutional shares	4.47	16.82	0.19	12.80	4.28	0.041**
? Individual shares	2.33	5.08	1.44	3.98	0.89	0.164
? Client assets (log)	12.22	22.92	14.43	21.49	-2.21	0.486
? Leverage	2.37	11.13	3.13	8.49	-0.76	0.581
? Short-term accruals	-0.03	0.28	0.01	0.13	-0.04	0.240
Industry (dummy)	0.22	0.42	0.08	0.27	0.14	0.004***
? ROE	0.14	6.92	0.13	7.37	0.02	0.985
Management change (dummy)	0.50	0.50	0.45	0.50	0.05	0.396
After99 (dummy)	0.71	0.46	0.69	0.46	0.02	0.787

* , ** , *** : Significant at 10%, 5%, 1%

Table 5: Pearson Correlation Matrix amongst Independent Variables

	? State	? Institutions	? Individuals	? Size	? Leverage	? Accrual	Industry	? ROE	Management
? State									
? Institutions	-0.973*** (0.000)								
? Individuals	-0.106 (0.126)	-0.037 (0.591)							
? Size	0.025 (0.730)	-0.053 (0.463)	0.122* (0.087)						
? Leverage	-0.068 (0.333)	0.103 (0.139)	-0.110 (0.116)	0.304*** (0.000)					
? Accrual	-0.032 (0.643)	0.022 (0.750)	-0.066 (0.344)	-0.149** (0.036)	0.069 (0.320)				
Industry	-0.147** (0.034)	0.155** (0.026)	-0.046 (0.513)	-0.002 (0.974)	-0.026 (0.711)	-0.011 (0.872)			
? ROE	-0.143** (0.043)	0.161** (0.023)	-0.025 (0.725)	0.010 (0.889)	0.111 (0.116)	0.029 (0.679)	-0.027 (0.699)		
Management	0.008 (0.903)	-0.018 (0.791)	0.039 (0.578)	-0.032 (0.653)	-0.013 (0.852)	0.004 (0.959)	-0.006 (0.930)	-0.113 (0.110)	
After99	0.064 (0.360)	-0.056 (0.425)	0.056 (0.421)	0.033 (0.642)	0.079 (0.261)	-0.114 (0.102)	0.103 (0.138)	-0.161** (0.022)	0.074 0.289

* , ** , *** : Significant at 10%, 5%, 1%

Table 6: Multivariate Results for the Association between Changes in Ownership Level and Auditor Differentiation (N=208)

	Predicted Sign	Model No. 1			Model No. 2		
		Coefficient	t-statistic	P-value	Coefficient	t-statistic	P-value
Intercept		-0.084	-0.932	0.353	-0.084	-0.930	0.354
? State	-	-0.181	-2.464	0.015**			
? Institutions	+				0.183	2.513	0.013**
? Individuals	+	0.072	0.973	0.332	0.095	1.290	0.199
? Size	+	-0.027	-0.328	0.743	-0.020	-0.248	0.805
? Leverage	+	0.060	0.742	0.459	0.051	0.622	0.534
? Accrual	+	0.035	0.476	0.634	0.034	0.466	0.642
Industry	+	0.145	1.975	0.050**	0.145	1.980	0.049**
? ROE	+	0.010	0.137	0.891	0.005	0.073	0.942
Management	?	-0.064	-0.880	0.380	-0.065	-0.889	0.375
After99	+	0.096	1.269	0.206	0.093	1.243	0.215
Adjusted R ²			0.042			0.043	
Model F-stat.			1.927			1.948	
P-value			0.050**			0.048**	

Model specification:

$$? \text{ Quality} = b_0 + b_1 ? \text{ State} + b_2 ? \text{ Institutions} + b_3 ? \text{ Individuals} + b_4 ? \text{ Size} + b_5 ? \text{ Leverage} + b_6 ? \text{ Accrual} + b_7 \text{ Industry} + b_8 ? \text{ ROE} + b_9 \text{ Management} + b_{10} \text{ After99} + e$$

Variable definitions:

- ? Quality = Natural logarithm of the ratio of combined assets of companies audited by the new auditor to that by the old auditor in the year of auditor change.
- ? State = Percentage change in state shares between year t and t-1.
- ? Institutions = Percentage change in institutional shares between year t and t-1.
- ? Individuals = Percentage change in individual shares between year t and t-1.
- ? Size = Percentage change in client firm assets between year t and t-1.
- ? Leverage = Change in the ratio of total liabilities to total assets between year t and t-1.
- ? Accrual = Change in the ratio of short-term accruals to total assets between year t and t-1.
- Industry = 1 if the client firm operates in the 'protected' industries and 0 otherwise.
- ? ROE = Percentage change in return on equity between year t and t-1.
- Management = 1 if client firm changes its management and 0 otherwise.
- After99 = 1 if the client firm switched auditor after year 1999, and 0 otherwise.

*, **, *** : Significant at 10%, 5%, 1%

Table 7: Summary of Sensitivity Test Results

Variables	Intercept	? State	? Institutions	? Individual	? Size	? Leverage	? Accrual	Industry	? ROE	Management	After99	Model p-value	
Predicted sign		(-)	(+)	(+)	(+)	(+)	(+)	(+)	(+)	(?)	(+)		
Test 1:	Logistic regression for auditor affiliation model (Dependent variable is change from a non-top10 to a top 10 (1) and otherwise (0))												
Model 1	Coefficient	-3.029	-0.031		0.020	0.001	0.029	-0.571	0.004	0.013	-0.664	1.245	
	p-value	0.000***	0.014**		0.666	0.976	0.359	0.711	0.995	0.703	0.181	0.068*	0.065*
Mode 2	Coefficient	-3.019		0.030	0.031	0.001	0.026	-0.584	0.006	0.012	-0.673	1.232	
	p-value	0.000***		0.014**	0.510	0.931	0.404	0.707	0.993	0.741	0.176	0.070*	0.066*
Test 2:	OLS regression for auditor independence model (Dependent variable is the difference between the ratios of the switching client's assets to the total clientele assets of the old auditor, minus the same ratio for the new auditor)												
Model 1	Coefficient	-0.022	-0.264		-0.016	-0.143	-0.114	-0.054	-0.030	0.006	-0.067	0.084	
	p-value	0.354	0.000***		0.823	0.129	0.132	0.549	0.672	0.933	0.351	0.245	0.015**
Model 2	Coefficient	-0.021		0.267	0.021	-0.135	-0.122	-0.044	-0.030	0.001	-0.067	0.081	
	p-value	0.366		0.000***	0.769	0.150	0.109	0.623	0.666	0.984	0.347	0.261	0.013**
Test 3:	OLS regression for auditor size model (Dependent variable is natural log of the ratio of dollar assets audited by the new auditor to that by the old auditor).												
Model 1	Coefficient	-0.062	-0.240		0.091	-0.030	0.101	0.052	0.169	0.018	-0.049	0.059	
	p-value	0.484	0.001***		0.213	0.707	0.217	0.467	0.019**	0.807	0.502	0.427	0.010***
Model 2	Coefficient	-0.063		0.238	0.127	-0.020	0.085	0.051	0.169	0.012	-0.052	0.058	
	p-value	0.476		0.001***	0.085	0.807	0.294	0.483	0.018**	0.874	0.477	0.432	0.011**

Variables	Intercept	Institutions-State	Institutions	Size	Leverage	Accrual	Industry	ROE	Management	After99	Model p-value
Predicted sign		(+)	(+)	(+)	(+)	(+)	(+)	(+)	(?)	(+)	
Test 4:	OLS regression for auditor size model (Dependent variable is natural log of the total clientele assets of the new auditor)										
Coefficient	3.185	0.120		0.301	-0.122	-0.022	0.019	-0.085	0.039	0.171	
p-value	0.000 ^{***}	0.098 [*]		0.000 ^{***}	0.104	0.763	0.799	0.235	0.573	0.019 ^{**}	0.000 ^{***}
Test 5:	OLS regression for auditor size model (Dependent variable is natural log of the total clientele assets of the new auditor)										
Coefficient	2.941		0.233	0.345	-0.131	-0.025	0.035	-0.119	-0.114	0.274	
p-value	0.000 ^{***}		0.031 ^{**}	0.005 ^{***}	0.195	0.806	0.737	0.214	0.242	0.009 ^{***}	0.001 ^{***}

Variable definitions:

For Tests 1 to 3, the definition of independent variables is as previously defined (see Table 6).

For Tests 4 and 5:	Institutions-State	=	Difference between the proportion of Institution shares and State shares in year t.
	Institutions	=	1 if a firm has institutional shares but no state shares in year t and 0 otherwise.
	Size	=	Natural logarithm of the client firm assets at the end of year t.
	Leverage	=	Ratio of total liabilities to total assets at the end of year t.
	Accrual	=	The ratio of short-term accruals to total assets at the end of year t.
	ROE	=	Return on equity at the end of year t.

Industry, Management and After99 variables are as previously defined (see Table 6).

^{*}, ^{**}, ^{***}: Significant at 10%, 5%, 1%

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