FIRM PERFORMANCE AND THE OWNERSHIP OF THE LARGEST SHAREHOLDER

Xiaoyue Chen*, Jeong-Bon Kim**, Steven Shuye Wang*, Xiaodong Xu***

Abstract

We examine the relationship between cash-flow rights held by the largest shareholders and firm performance in Chinese capital market. Using a sample of all listed A-share firms between 2000 and 2003, we find that there are "region effects" with an "M" shape in the relationship between cash flow rights held by the largest shareholder and firm performance. The non-monotonic variations of firm performance associated with changes of the largest shareholdings suggest that there may be an optimal ownership structure existed in listed Chinese firms. We also find that firms under the control of largest state shareholders have poorer performance than that under the control of largest non-state shareholders.

Keywords: the largest shareholder; ownership structure; corporate governance; firm performance

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1. Introduction

Previous studies have extensively examined the effects of ownership structures on the value of firms, and shown that there is a non-linear relation between ownership structure and corporate value (Morck et. al 1988; McConnell and Servaes, 1990; Claessens et al., 2001). Morck, Shleifer, and Vishny (1988) find an N-shaped relationship between managerial equity ownership and firm valuation for a sample of U.S. firm. One interpretation is that firms' performance improves with higher managerial ownership first because of incentive effects, but then after a point managers become entrenched and pursue private benefits at the expense of outside investors. However, the conditions that entrenchment effects significantly correlated with increased managerial ownership change when the ownership beyond a second point, incentive effects are dominant again. The costs of large shareholdings and entrenchment are formalized in the model of Stulz (1988), which predicts a concave relationship between managerial ownership and firm value. In the model, as managerial ownership and control increase, the negative effect on firm value associated with the entrenchment of manager-owners starts to exceed the incentive benefits of managerial ownership. In that model the entrenchment costs of manager ownership relate to managers' ability to block value-enhancing takeovers. McConnell and Servaes (1990) provide empirical support for this relationship in which they find an inverse U-shaped relationship by using U. S. firms' data.

Because most non-U. S. firms in the world are predominantly controlled by a single large shareholder (La Porta, Lopez-de-Silanes, and Shleifer, 1999). This provides the opportunities to check what the largest shareholdings' effects on corporate value. Claessens et al. (2001) provides evidence by using the data of East Asian firms showing that firm value increases with the cash-flow ownership of the largest shareholder, consistent with an incentive effect. But firm value falls when the control rights of the largest shareholder exceed its cash-flow ownership, consistent with an entrenchment effect.

There is, however, little published literature on this issue find the panorama of the relationship between ownership structure and firm performance. For example, Morck et. al (1988) find a positive relation between ownership and Tobin's Q in the 0% and 5% board ownership range, a negative and less pronounced relation in the 5% to 25% range, and perhaps a further positive relation beyond 25%. But because the sample size they used is very small, only 371 Fortune 500 firms in 1980, and the number of firms distributed in the area where board ownership beyond 50% is very few, less than 14 firms. Only 4 firms have board ownership beyond 65%. If we use another sample in which firm's ownership is more concentrated, that means that there are enough firms

distributed in the area where ownership beyond 65%, even 75%, will the N-shaped curve in this area still increase continuously? We argue that it will be not, and firm performance will decrease again. The main reason is about three aspects: first, when ownership is large enough, the liquidity of firm assets will decrease, which will certainly conduce to less monitoring on management from outside market. Second, when ownership is large enough, the composing of the management of a firm will change, more and more professional managers will be replaced by family members or relatives of the controlling shareholder, and the lack of professional background of management will have negative impact on firm performance. Third, when ownership is large enough, management will become more risk adverse, many projects with positive NPV but higher risk will be rejected, which undoubtedly will decrease firm value. If our argument is right, combing with the evidence of Morck et. al (1988), the association between ownership structure and firm performance will show an M-shaped curve. Our suggestion is supported to some extent by the empirical results. By using a largest sample of U.S. firms, McConnell and Servaes (1990) find that firm value indeed decrease when ownership is large enough. Though Claessens et al. (2001) have not examined the association between ownership structure and firm performance particularly, they provide a valuable figure of relationship between market-to-book ratio and ownership of the largest shareholder, which is just like an M-shape.

This paper explores the empirical relationship between ownership of the largest shareholders and firm performance to examine our M-shape suggestions. Our analysis is based on the extensive research that shows that corporate ownership structure can have important effects on both corporate governance and firm performance. We focus on the largest shareholdings should be an important determinant of agency cost and firm performance when there are a control shareholder existing widely in Chinese capital market. We find evidence to support this view.

Our study contributes to provide systematic evidence on the impact on firm performance by the largest shareholders, using firm-specific data from China. We use Chinese data not only because the securities markets of China are among the largest of the world's emerging markets, but also because the characteristics of the largest shareholders in Chinese listed companies are quite different from that of many developed and emerging markets. As of December 31, 2004, there were a combined total of 1,377 companies listed in the Shanghai Stock Exchange and the Shenzhen Stock Exchange, with a total market capitalization of over 3.7 trillion RMB (about US$447 billion). The characteristics of the largest shareholders in Chinese listed companies are quite unique. First, Chinese listed firms have concentrated ownership structure, but their large shareholders are generally state, other firms or institutions. Neither are big banks or consortiums like Germanic or Japanese public corporations, nor is family controller like East-south Asian listed firms. Second, the percentage of ownership rights the largest shareholders held in Chinese firms has a much broader range. The percentage of ownership rights the largest shareholders held in China ranges from less than 1% to near 90%, and divergence between cash-flow rights and control rights held by the largest shareholders is not as sharp as that of firms in many East Asian countries. This not only ensures that we have enough sample size both in ownership dispersed areas and ownership concentrated areas to check our M-shape suggestion, but also makes it possible for us to research the association between ownership structure and firm performance form the largest shareholdings' point of view only, to avoid the limitations when other ownership structure variables such as board ownership or inside ownership is used like prior literature (Morck et. al 1988; Cho, 1998), in which both board ownership and inside ownership are total of a lot of individual ownership. Because when board ownership or inside ownership is used, the distribution of individual ownership is different, the association between ownership structure and firm performance we captured will be different, which make us cannot catch the real relationship exactly like a single number the ownership of the largest shareholder is used. Moreover, the ownership types of the largest shareholders are extremely complicated. Most listed firms have non-tradable state shares, legal person shares, and employees' shares etc., in addition to tradable shares for domestic and foreign individual and institutional investors. In short, most Chinese listed companies are controlled by a single shareholder. The range of the ownership rights held by the largest shareholders is very broad, the ownership structure is mixed and very complicated, and divergence between cash-flow rights and control rights is not as sharp as that of many East Asian countries' firms. With broader ownership rights and different characters of the largest shareholders, whether the relationship between firm performance and ownership of large shareholders will be different from the empirical findings of previous studies is an interesting issue.

Specifically, in this study we first examine whether, and how, the incentive and entrenchment effects of the largest shareholders are related to the ownership rights they hold. The different ownership rights not only provide the largest shareholders with different incentives and abilities to maximize their firm' value, but also provide them with different incentives and abilities to expropriate resources at the expense of minority shareholders, which in turn decrease their firm' value (Morck et. al 1988; McConnell and Servaes, 1990; Myeong-Hyeon Cho, 1998; Claessens et. al , 2001). We posit that the relationship between firm performance and the

largest shareholder ownership in China is determined by the combined effect of the positive incentive effect and the negative entrenchment effect. Depends on the percentage of the largest shareholder's ownership, the relationship can be positive or negative. Indeed, we find that performance of Chinese listed companies changes with their ownership right. Different from Morck, Shleifer, and Vishny (1988) who found an N-shaped relationship between managerial equity ownership and firm valuation for a sample of U.S. firms, and consistent with our suggestion, we find that there are "regional effects" with an "M-shape" in the relation between firm performance and cash flow rights held by the largest shareholder in Chinese listed A-share firms. In particular, we find that the performance difference between firms in the "low performance regions" and "high performance regions" of "M" shapes are significant.

Second, we examine whether, and how, the incentive and entrenchment effects of the largest shareholders are related to the ownership type they hold. Chinese listed companies generally have a mixed ownership structure with three predominant groups of shareholders—the state, legal persons, and individuals, accordingly, the largest shareholders also have these three different types of ownership. The different character of ownership provides the largest shareholders with different incentive and ability to maximize firm's value as well as to expropriate resources at the expensive of minority shareholders, for the largest shareholders with different characters have different interested tropism (Aharony and Wong, 2000; Chen and Xu, 2001). Extensive literatures have shown that state ownership is inefficient (Williamson, 1985; Shirley and Walsh, 2000; Xu and Chen, 2003), and that the incentive and ability of the largest shareholder to maximize firm value is weaker when the controlling shareholder has a state character. We therefore predict that the largest shareholders of Chinese listed companies with state character are less likely to engage in adding value. We find that the "M" shape relation held between firm performance and all types of the largest shareholders, however firm performance will be significantly lower if the largest shareholders are the state.

The remainder of the paper is organized as follows. Section II introduces the institutional background and develops the hypotheses. Section III details our sample and data. Section 4 presents the empirical results. Section 5 summarizes main findings and conclusions.

2. Institutional Background and Hypotheses Development

2.1. Institutional background

The Chinese stock market was established in early 1990s by the government as a vehicle to convert its socialist planning economy into a "socialist market economy". The target of state-owned enterprise (SOE) reform is establishing a modern corporate system, so majority shares in the listed firms are state-owned shares at the beginning of the process of corporatization in October 1992, and legally, the People's Congress Council is the ultimate owner. Chinese companies have six different types of shares: state shares, legal person shares, employee shares, A-shares, B-shares and H-shares. State and legal person shares are not tradable, but they can be transferred to domestic institutions upon approval from the China Securities Regulatory Commission (CSRC hereafter). State-owned shares including state share and state-owned legal person shares. State shares exist in China to designate holdings in the SOEs by the central government, local governments, or solely government-owned enterprises. The majority shareholders for most listed firms with state share character are state agencies that lack experience in monitoring and controlling public firms. Legal person shares are owned by domestic institutions, most of which are state-owned legal person shares because they are partially owned by the central and/or local governments. There can be several legal person shareholders in a listed firm. Legal persons are typically business agencies or enterprises of local governments that helped in starting up the public company either by giving permission to operate or by allowing resources under their control to be used for the start up. Legal person and state shares are similar, not only because many legal persons are actually controlled by the state but also because both legal-person and state shares are not tradable. Employee shares, A-shares, B-shares, and H-shares are other minority shares. Employee shares are offered to workers and managers of a listed company, usually at a substantial discount. However, employee shares are limited in quantity. In addition, not all companies issue employee shares. After a holding period of 6 to 12 months, the company can file with the CSRC to allow its employees to sell their shares on the open market. A-shares, B-shares, and H-shares are tradable shares issued by Chinese companies to different constituencies. All three types of shares have the same rights and obligations, the only differences being the type of investors permitted to own and trade them and the currencies used for trading and cash dividends. A-shares are similar to ordinary equity shares except that they are exclusively available to Chinese citizens and domestic institutions. They are mostly held and traded by individuals. It is required that A-shares should account for no less than 25% of total outstanding shares when a company makes it initial public offering. B-shares are traded in either U.S. dollars in Shanghai or Hong Kong dollars in Shenzhen, and they may be held only by foreign entities, foreign individuals, and people from Hong Kong, Macao, and Taiwan. Since June 2001, the B-share market has opened up to Chinese local investors who have

foreign currency accounts in the brokerage firm. H-shares, listed and traded only on the Hong Kong Stock Exchange, are issued by Chinese companies which may or may not have also issued A-shares. Only foreigners may purchase and trade H-shares.

At the end of December 2003, there were 1,284 firms listed on China's two national stock exchanges, the Shanghai Stock Exchange and the Shenzhen Stock Exchange. Almost all these firms are former SOEs except one third are former collective firms and private firms. Though the range of the ownership rights held by the largest shareholders is very broad, and the ownership structure is mixed and very complicated, most of Chinese listed firms are controlled by the largest shareholders. Based on my statistical calculation, at the end of 2003, the median of the largest shareholdings is 40.87%, but the median of the second largest shareholdings is only 4.96%. With different cash flow rights and different characters of the largest shareholders, the principal-agent relationship should be very different.

The recent line of research on law and finance highlights the fact that financial securities are defined not by their implied cash flows but by the rights they bring to the holders. And such rights, in turn, are defined by the legal rules and the quality of their enforcement in which the securities are issued (La Porta et al., 1998, 1999, 2000). Correspond to the mixed and complicated ownership structure, the short history of the China stock market and its governing body CSRC, and the infant stage of the Chinese judicial system and the securities ordinances, the corporate governance system of Chinese listed firms has its particular characteristics, which are far different from that of the other counties in the world. Fox example, Chinese listed firms have concentrated ownership structure, but their large shareholders are generally state, other firms or institutions. Neither are big banks or consortiums like Germanic or Japanese public corporations, nor is family controller like East-south Asian listed firms. Since the *Corporation Law* enacted in 1994, Chinese companies have been undergoing corporate governance reforms. This reform effort is driven by pressures from Chinese government, especially the CSRC. It is also motivated by companies' voluntary efforts to reduce the dependence of financing upon state-owned banks or other debtor capital suppliers. In China, *Corporation Law* prescribes that Chinese listed firms should set up board of directors as well as board of supervisors. They are all established by election from stockholders meeting, and not under subjection each other. Formally this configuration that board of directors and board of supervisors coexist in a corporation is quite similar to the corporate governance system of Japan, but in essence, it is more close to the corporate governance system of United States. Because board of directors of Chinese listed companies is endowed by *Corporation Law* many important rights, such as rights of material management decision-making, rights to representative stockholders interests, etc. they only need to responsible for stockholders meeting. Compare to board of directors, the rights of board of supervisors endowed by *Corporation Law* is limited; they only have some superintendence, no ability to regulate directors and management directly. In recent years, for the sake of improving the effectiveness of corporate governance, several related government regulations were promulgated. Starting from August 2001, Chinese listed companies are required to comprise board of directors with independent directors. In early 2002, another government regulation, *the Principles of Corporate Governance*, was also enacted.

2.2. Hypotheses development

China capital markets are well characterized as having mixed ownership structure, weak investor protection, poor legal systems, lax law enforcement, low disclosure and/or audit quality, and underdeveloped markets for corporate control. These characteristics contribute to poor corporate governance in Chinese listed companies. Since the largest shareholders in Chinese listed companies have different characters and ownership rights, the effectiveness of corporate governance is different. When ownership rights held by the largest shareholders are less than 25%, the ownership structure of a firm is comparatively disperse, just like most of the public corporations in United States have. The control rights should be always controlled by management completely, so the main principal-agent problem the listed companies to overcome is that of the conflicts of interest between shareholders and managers (Jensen and Meckling, 1976). However, when ownership rights held by the largest shareholders are up to 25%, the voting rights held by the largest shareholders may be up to dominant (Leech & Leahy, 1991), the control rights of a firm should be shared by management and controlling shareholder together. The two important principal-agent problems, the conflicts of interest between shareholders and managers and the conflicts of interest between large shareholders and outside shareholders, should be coexisting in a film. But when ownership rights the largest shareholders held more than 50%, the largest shareholders should control the firm completely, and the main principal-agent problem the listed companies to overcome is that of the conflicts of interest between large shareholders and outside shareholders.

In Chinese capital market, not only the ownership of the largest shareholders determines principal-agent problems, but also the characters of the largest shareholders have important effects on principal-agent problems and the effectiveness of corporate governance.

So we argue that in Chinese capital market firm performance is affected by agency cost, which

is determinate by the character and proportion of the ownership held by the largest shareholders, when other things are equal. We suggest that the greater the agency problem a firm has, the worse it performs. We examine these ideas by using the following three hypotheses:

H1: There are "region effects" with an "M" shape in the relationship between cash flow rights held by the largest shareholders and firm performance.

H1 can be illustrated by Figure 1. In Figure 1, following our analysis above, we divide the cash flow rights of the largest shareholders into three regions: region I, managers hold control rights completely; region II, managers and the largest shareholder share control rights; and region III, the largest shareholder holds control rights completely. We first disentangle the incentive effects and entrenchment effects respectively, and then capture the total effects of the largest shareholdings on firm performance by deducting the entrenchment effects from the incentive effects. The following is the main reason why H1 is tenable we analyze based on the total effects of Figure 1.

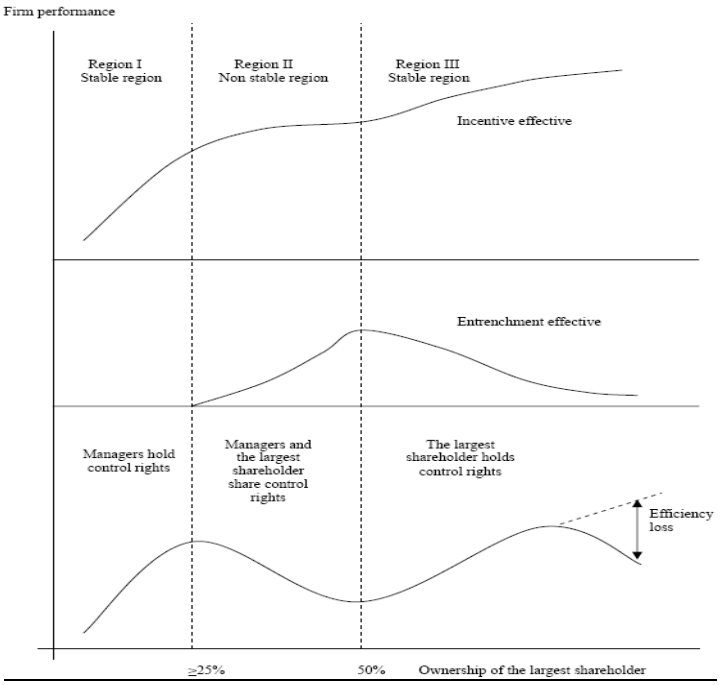

Figure1. The relationship between firm performance and ownership of the largest shareholders in Chinese listed firms

The figure depicts how firm performance is affected by different agency costs, which are determinate by cash flow rights held by the largest shareholders.

In region I, the voting rights controlled by the largest shareholders are too small to be comparatively dominant, that is, managers in fact hold the control rights completely, so the main principal-agent problem in this region is the classic one of "how to deal with the interest conflicts between professional managers and outside owners". This is a stable region, management can make long-term decisions. Because of no control rights, the largest shareholders can do nothing to expropriate firm assets, what they can do is to monitor managers to work hard to maximize firm value. With the cash flow rights of the largest shareholder increase, the firm performance should be increase, because the largest shareholder has more and more incentives and abilities to monitor managers to decrease agency cost (Jensen and Mecking, 1976; Shleifer and Vishny, 1997). However, the tendency of firm performance increasing could not maintain continuously, as the cash flow rights increase, the largest shareholders also have more abilities to intervene in management decision-making, so in region I, the marginal rate of the curve about ownership is more than zero, which is decreasing.

In region II, the voting rights held by the largest shareholders become large enough so that managers and the largest shareholders have to share control rights together. Because there are always conflicts between managers and the largest shareholder, it is of no benefits for management to make long-term decisions, so this is not a stable region. At the

beginning of this region, managers will be comparatively dominant in contesting voting rights, which makes the largest shareholder having little abilities and probabilities to entrench or tunnel. When the ownership held by the largest shareholders approaches the first maximum point, the marginal rate of the curve about ownership equals zero. At the margin, the costs of entrenchment effects will be equal to the benefits of incentive effects. As the cash flow rights increase, the largest shareholder has more and more incentive and abilities to expropriate firm assets for his own interests, and makes the entrenchment effects associated with expropriation exceed the incentive benefits of ownership. Low efficiency of decision-making and weak investor protection consequentially induces firm performance to decrease. Similarly, the tendency of firm performance could not decrease continuously, because the cash flow rights increase right along, the largest shareholders could share more from firm net income. It is no necessary for them to entrench more. When the ownership held by the largest shareholders approaches the right boundary of the region II, at the margin, the costs of entrenchment effects will be equal to the benefits of incentive effects.

In region III, the cash flow rights held by the largest shareholders beyond 50%, the largest shareholders control the firm completely. Based on the interpretation given by Morck et al. (1988) and the theory developed by La Porta et al. (2002), firm performance should be significantly correlated with increased ownership held by the largest shareholders, that is, the more the cash flow right held by the controlling shareholders is, the better the firm performs. However, the tendency can not increase continuously. When the cash flow rights exceed certain critical point, firm performance may decrease again. Because the more the cash flow rights held by the controlling shareholders is, the worse the liquidity of firm assets is. In addition, too high cash flow rights necessarily result in less monitoring from capital market; too high cash flow rights always accept low risk projects only; too high cash flow rights also easily bring on owners duality, that is, it always makes for owners to manage firms directly and exclude excellent professional managers to employ. Poor liquidity, lack of monitoring, rejecting risk and excluding professional may induce firm performs worse (Holmstrom and Tirole, 1993), which we denote as "efficiency loss" in figure 1. If firm performance represents firm value here, the difference between dashed and real line is then the present value of "efficiency loss".

Some extensive studies suggest that state ownership is inefficient and the corporate governance of state-owned firms is weak, which stem from the idiosyncratic that state ownership has, such as multi-agent, multi-objectives, and lack of professional background (Williamson, 1985; Shirley and Walsh, 2000). Furthermore, the state-owned legal persons behave differently from the state government, by contrast to the evidence that state ownership having negative impacts on firm performance, state-owned legal-person ownership having positive impacts on firm performance (Xu, X. & Wang, Y., 1997; Sun, Q. & Tong W., 2003), in respect that state-owned legal-person ownership has professional background and the pursue for its own interests, so we predict that a firm with a state character of the largest shareholder performs worse than that of a firm with a non state character of the largest shareholder. We hypothesize:

H2: The "M" shape existing in the state-owned firms at the performance dimension is lower than that of existing in the non state-owned firms.

3. Sample Selection and Data

Our sample includes all A-share companies that were listed before 1999. Financial statement and corporate governance data are extracted from *Genius Securities Information System* database of the Shenzhen GTI Financial Information Limited ; Market data are obtained from the *CSMAR* Database of the China Accounting and Finance Research Center of the Hong Kong Polytechnic University and the Shenzhen GTI Financial Information Limited, and supplemented by manually collected data from various issues of *The Shenzhen Stock Exchange Fact Book*, *Annual Statistics of the Shanghai Stock Exchange* , and annual financial reports of individual companies in the sample. In addition, we also retrieved some missing data from the *Taiwan Economic Journal* (TEJ) database. The final sample includes 885 listed non-financial A-shares between 2000 and 2003, the total number of firm-year observations is 3,540[1].[See appendices, Table 1].

Panel A of Table 1 reports the sample composition by industry following the industry classification codes promulgated by the CSRC in 2001. 57% of the sample firms belong to manufacturing industry, while the rest firms distribute relatively evenly in other eleven industries. Panel B shows the stock exchange membership of the sample firms, from which we can see that the two stock exchange membership of our sample firms is almost equal.

Table 2 presents the distribution of sample observations by percentage intervals and type of the largest shareholder's ownership. Table 2 shows that in China, the ranges of the largest shareholdings are very broad, but most of the largest shareholders are controlling shareholders. Of the total 3540 sample observations, more than 91% are firms that their largest shareholdings are more than 20%, nearly 68% are firms that their largest shareholdings are more than 30%, and more than 37% are firms that their largest shareholdings are more than 50%. Based on

[1] Because some data are not available for all sample firms in all years, the number of firms analyzed varies from year to year, but the variation is quite small.

the generally accepted standard that the essential cash flow rights a controlling shareholder should hold within the confines of 20%-25%, more than 70% Chinese listed firms have a controlling shareholder, half of which have an absolutely controlling shareholder. Furthermore, the ownership concentration is more severe in state controlled companies than that of non-sates controlled firms. For non-state controlled firms, more than 82% of them with their largest shareholdings are less than 50%, while the figure for state and state legal person controlled firms is only 63% and 49%, respectively,. This is consistent with the view that concentration of the Chinese listed companies with non state-owned character is less than that of the Chinese listed companies with state-owned character. [See appendices, Table 2].

Table 3 shows some basic statistics for the three types of firms between 2000 and 2003. To evaluate the relationship between cash-flow rights held by the largest shareholders and firm performance, we use Tobin's *Q*, market to book ratio (*Mkt/Book*), and return on assets (ROA) as measures of firm performance. Tobin's *Q* is the ratio of the market value of the firm divided by the replacement cost of the assets. For the market value of the firm, we use the market value of tradable equity plus the book value of non-tradable equity and liabilities; for the replacement cost of the assets, we use the book value of the total assets. Stock return is the annual stock market return on the tradable-A shares. *Mkt/Book* is the ratio of the total market value of equity divided by the total book value of equity. ROA is the ratio of earnings before interests and taxes to total assets. Previous studies sometimes also use return on equity (ROE) as measure of firm performance. However, in China, the accuracy of reported ROE is often subject to earnings management or even deliberated manipulation, because it is one of the most important benchmark financial ratios for the CSRC to judge firms' qualifications in initial public offering and seasoned offering, as well as conditions for delisting. For example, CSRC prescribes that the minimal requirement for firms to be qualified for rights offering is that their average ROE of the prior three years should be no less than 10% and the lowest ROE during the three years should not be less than 6%. Because seasoned offering is an important financing channel for Chinese listed firms, there is always a strong motivation for management to manipulate earning to achieve the qualification of offering or to avoid to be delisted. Tobin's *Q*, *Mkt/Book* ratio, and ROA, on the other hand, are relatively less affected by earnings manipulations.

Table 3 shows that the Tobin's *Q* and *Mkt/Book* ratio of "other share" firms are larger, although are more volatile as well, than that of state- or state legal person controlled firms. Between state-owned firms, state-owned legal person firms tend to have slightly higher and more volatile firm values. There is little differences in the average ROA among the three types of the largest shareholders. No matter which performance measure is used, state-owned shares have the lowest performance relative to other types of ownership. In regard to percentage of the largest shareholdings, state and state legal person shares have significantly higher ownership concentration in relative to other shares. There is, however, no much difference in the average firm size among the three different types of shares. Finally, state shares have the highest level, and relatively less volatile, of mean leverage. This is because state-owned firms are easier in getting long-term loans from Chinese banks that are also owned or controlled by the governments, and that a closer bank relationship for state-owned firms reduces the volatility of debt financing. We will control for these size and leverage differences in our analysis. [See appendices, Table 3].

4. Empirical Analysis

In this section, we test our two hypotheses by using both basic statistical analysis (Claessens et al., 2001; Volpin, 2002; and La Porta et al., 2002) and cross-sectional and piecewise regressions (Morck et al., 1988; and Cho, 1998). We also provide some visual evidences to illustrate the "M" shape relation between firm performance and the cash-flow rights held by the largest shareholders.

4.1. Basic statistical analysis and some visual evidence

Hypothesis 1 predicts that there are "region effects" with an M-shape in the relationship between cash flow rights held by the largest shareholders and firm performance. To test Hypothesis 1, we start by continuously dividing the largest shareholdings into seven percentage intervals, and then compare the average firm performance across these intervals. [See appendices, Table 4].

Table 4 shows the association between firm performance and ownership of the largest shareholders. Consistent with the hypothesis 1 of "regional effects" of the largest cash flow ownership on firm performance, the three performance variables generally have an inclination to an M-shape with the share of cash flow rights in the hands of the largest owner. Ownership intervals 1 (0-20%), 4 (40-50%), and 7 (above 70%), generally, are associated with lower mean and median firm performance than that of intervals 2 and 3 (20-40%), 5 and 6 (50-70%), and the difference are statistically significant. To save space, we have not presented the results here. In addition, ownership interval 2 tends to be associated with the first highest mean and median firm performance of the "M" shape (denoted as *Fmax*), and ownership interval 5and 6 tend to be associated with the later highest mean and median firm performance of the "M" shape (denoted as *Lmax*), although the difference between the first and

later maximum are generally not significant different from zero except for some Tobin's *Q*s. Table 4 also shows that the M-shaped "region effects" exist for all types of ownership held by the largest shareholders, though the associated *Fmax* and *Lmax* intervals may not be the same across different ownership types.

Table 4 also provides supportive empirical evidence to Hypothesis 2. In general, performance of state shares is lower than other types of shares in each ownership interval, indicating that ownership of the largest shareholders with state character is somehow not effective in ensuring firm performance improvement. Figures 2-1, 2-2 and 2-3 illustrate the "M" share relation between firm performance, in terms of Tobin's Q, *Mkt/Book* ratio, and ROA, and the largest shareholdings respectively.

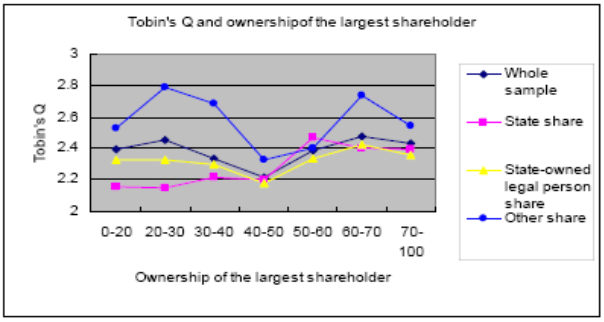

Figure 2.1.

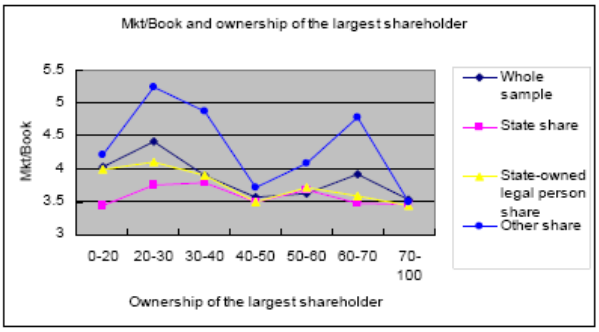

Figure 2.2.

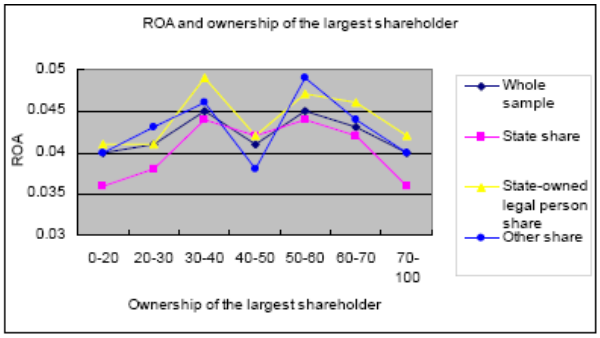

Figure 2.3.

4.2. Regression analysis

To further test our two hypotheses, H1 and H2, following Morck et al. (1988) and Cho (1998), we estimate piecewise regressions allowing for three changes in the slope coefficient on the largest shareholder's ownership. Based on the observations obtained from Table 4 and by using a grid search technique (Cho, 1998), we identify three breakpoints and divide the percentage of the largest shareholders' ownership (LSH) into four regions accordingly:

Region 1: 0<LSH< 32%. In this region, we expect firm performance improves with the increases of the largest shareholdings;

Region 2: 32≤LSH<50%. In this region, we expect firm performance decreases with the increases of the largest shareholdings;

Region 3: 50≤LSH<75%. In this region, we expect firm performance improves with the increases of the largest shareholdings; and

Region 4: LSH≥75%. In this region, we expect firm performance improves with the increases of the largest shareholdings.

We first test the different directions of the largest shareholdings on firm performance in each of the four regions defined above by estimating the following pooled regressions:

$$Performance_{it} = \beta_0 + \beta_1 LSH_{it} + \beta_2 State_i + \beta_3 State_i * LSH_{it} + \beta_4 Lnsize_{it} + \beta_5 Leverage_{it} + FixedEffects + \varepsilon_{it} \quad (1)$$

where $Performance_{it}$ is the performance of firm *i* in year *t*, measures, proxied by Tobin's *Q*, *Mkt/Book* ratio, and ROA, respectively; *LSH* denotes the percentage ownership held by the largest shareholders; if the test results do support H1, we expect the signs of *LSH* in the four regions should be positive, negative, positive, and negative, respectively. To test H2, i.e., the "M" shape existing in the state-owned firms at the performance dimension is lower than that of existing in the non state-owned firms, we include a "*State*" dummy variable which takes value one if a firm character is "state share", and zero otherwise. *State*LSH* captures the joint effects in which the ownership of the largest shareholder with a state character. If the test results do support Hypothesis 2, we expect coefficients β_2 and β_3 should be negative. To control for other factors that related to firm performance, we also include the logarithm of firm size (*Lnsize*), leverage, and *fixed effects* such as industries and years in the regression model. [See appendices, Table 5].

The estimates of Model (1) presented in Table 5 are generally consistent with the statistical analysis results reported in Table 4[2]. No matter which firm performance measure is used, we observe that firm performance changes are associated with the percentage ownership changes of the largest shareholders across different ownership regions, and tend to have the "expected" changing directions, after controlling for other related variables. The signs of the coefficients for *LSH* are positive in region 1, negative in region 2, positive in region 3, negative in region 3, and they are significant at least at the 10% level. The above results provide further supporting evidence, although not very strongly, to Hypothesis 1 that there are "region effects" with an "M" shape in the relationship between cash flow rights held by the largest shareholders and firm performance. Second, the estimated coefficients of the state dummy variable are all negative although most of them are not statistically significant. The coefficients for *State*LSH* are all negative in each region, but are not statistically significant, except in region 2, indicating that significant different performance between state share firms and non-state share firms emerges only in that ownership region.

In summary, Table 5 provides empirical support to Hypothesis 1 that there are "region effects" with an "M" shape in the relationship between cash flow rights held by the largest shareholders and firm performance. Table 5 also provides some consistent but relatively weak support to Hypothesis 2 that the "M" shape existing in the state-owned firms at the performance dimension is lower than that of existing in the non state-owned firms.

4.3. Relation between firm performance and ownership of the largest shareholder: piecewise regression

Finally, to further test our two hypotheses, H1 and H2, following Morck et al. (1988) and Cho (1998), we estimate the following piecewise regression model allowing for three changes in the slope coefficient on the largest shareholder's ownership:

$$Performance = \beta_0 + \beta_1 LSH1 + \beta_2 LSH2 + \beta_3 LSH3 + \beta_4 LSH4 + \beta_5 State + \beta_6 Lnsize + \beta_7 Leverage + FixedEffects + \varepsilon \quad (2)$$

Let LSH represents the ownership percentage of the largest shareholders,

*LSH*1 = LSH if LSH < 32%,
= 32% if LSH ≥32%;
*LSH*2 = 0 if LSH < 32%,
= LSH-32% if LSH ≥ 32%;
*LSH*3 = 0 if LSH < 50%,
= LSH-50% if LSH ≥ 50%;
*LSH*3 = 0 if LSH < 75%,
= LSH-75% if LSH ≥ 75%.

Lnsize, Leverage, and *FixedEffects* are control variables and *State*, is the "state share" dummy variable defined before. [See appendices, Table 6].

Table 6 reports the estimates of the piecewise regression model (3). Consistent with the results reported in Tables 5, the coefficients of the four ownership variables *LSH1*, *LSH2*, *LSH3*, and *LSH4* have the expected signs of positive, negative, positive, and negative, respectively. These results further confirm that firm performance, in terms of Tobin's *Q*, the *Mtk/Book* ratio, and ROA, changes with the percentage level of the largest shareholders ownership in the four regions, and the relation between firm performance and the largest shareholders cash rights can be well represented by "M" shaped "regional effects". The coefficient on ownership character variable *State* exhibits negative and significant association with Tobin's Q, which is consistent with Hypothesis 2. Note also that the negative relation between leverage and ROA is also consistent our former results and prior works (Sun and Tong, 2003).

In summary, the empirical results presented in this section suggest that performance of the listed Chinese A-share firms in the sample is associated the level of the largest shareholders ownership. With the level of the largest shareholdings changes, the

[2] To save space, we have not report the results of control variables here though they are all consistent with our expectation and statistically significant.

combined effect of the incentive and entrenchment effects also changes in a manner that can be well-described as "M" shape regional effects. Second, Chinese listed firm with state share character is associated with lower firm performance relative to non-state shares. Overall, our results are consistent with our two hypotheses, although the empirical results for the second hypotheses are less strong statistically.

To check for the robustness of our hypotheses further, we first use ownership of the three largest shareholders to proxy for ownership structure, and find the basic empirical results keep virtually the same. It is expectable because in China most of listed firms are controlled by the largest shareholders. At the end of 2003, the median of the largest shareholdings is 40.87%, but the median of the second largest shareholdings is only 4.96%. We also use data between 1996-2000 to check our hypotheses and find our results are not changed; generally there are "region effects" with an "M" shape in the relationship between cash flow rights held by the largest shareholder and firm performance. In particular, though this region effects is robust under various characters of the ownership held by the largest shareholders, firms under the control of a state shareholder have poorer firm performance than the others under the control of a non-state shareholder. Because Chinese capital market develops very fast, the sample size in that period is quite smaller than that of the period of 2000-2003. To save space, we have not reported the results here.

5. Conclusion

This paper documents that the level and character of the largest shareholdings are associated with firm performance in China stock market after controlling for standard empirical determinants of firm performance. Using a sample of 885 listed A-share firms between 2000 and 2003, we find that there are "region effects" with an "M" shape in the relationship between cash flow rights held by the largest shareholder and firm performance. The non-monotonic variations of firm performance associated with changes of the largest shareholdings suggest that there may exist an optimal ownership structure in listed Chinese firms. This non-linear relationship between firm performance and the largest shareholding is consistent with Claessens et. al (2001) who found a similar non-linear pattern for a sample of East Asian firms. Second, we find that firms under the control of large state shareholders have poorer performance than that under the control of large non-state shareholders. Our findings are consistent with some prior empirical results (Che and Qian, 1998; Sun and Tong, 2003) that state shares and legal-person shares have opposite impacts on firm performance, despite the fact that legal-persons are mostly state-owned in nature.

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Appendices

Table 1. Membership of sample firms by industry and stock exchange

		No. of firms	Frequency (%)
Panel A: Industry membership of sample firms			
Agriculture, forestry, animal husbandry and fishery	A	19	2.15
Excavate industry	B	9	1.02
Manufacturing industry	C	505	57.06
Food and drink	C_0	42	4.75
Textile, clothing and fur	C_1	40	4.52
Timber and furniture	C_2	1	0.11
Paper making and printing	C_3	18	2.03
Petroleum, chemistry and plastic	C_4	100	11.30
Electronic industry	C_5	29	3.28
Metal, nonmetal mining	C_6	81	9.15
Machine, equipment and instrument	C_7	140	15.82
Medicine, biological products	C_8	43	4.86
Other manufacturing	C_9	11	1.24
Electric power, coal gas, water product and supply	D	32	3.62
Building industry	E	16	1.81
Traffic, transport and storage industry	F	29	3.28
Information technology industry	G	45	5.08
Wholesale and retail trade	H	84	9.49
Real estate industry	J	29	3.28
Social service industry	K	33	3.73
Propagation and culture industry	L	8	0.90
Colligation	M	76	8.59
Panel B: Stock exchange membership of sample firms			
Shenzhen		454	51.30
Shanghai		431	48.70
Total		885	100.00

Table 2. Distribution of the ownership held by the largest shareholders

Ownership intervals (%)	State share		State-owned legal person share		Other share		Entire sample	
	Obs.	%	Obs.	%	Obs.	%	Obs.	%
<20	66	5.15	81	5.93	151	16.95	298	8.42
20-30	249	19.41	194	14.20	405	45.45	848	23.95
30-40	273	21.28	186	13.62	87	9.76	546	15.42
40-50	218	16.99	218	15.96	93	10.44	529	14.94
50-60	237	18.47	278	20.35	111	12.46	626	17.68
60-70	161	12.55	262	19.18	35	3.93	458	12.94
>70	79	6.16	147	10.77	9	1.01	235	6.64
Total	1283	100.00	1366	100.00	891	100.00	3540	100.00

Ownership Intervals are the percentages of ownership held by the largest shareholders. State share, state-owned legal person share and other share denote the character of the ownership held by the largest shareholders as state share, state-owned legal person share and non state-owned share respectively.

Table 3. Descriptive statistics

Sample	State share	State-owned legal person share	Other share	Entire
Tobin's Q	2.614	2.683	3.019	2.740
	(1.282)	(1.291)	(1.616)	(1.384)
Mkt/Book	4.441	4.494	5.909	4.820
	(2.858)	(2.974)	(4.143)	(3.315)
ROA	0.036	0.040	0.038	0.038
	(0.049)	(0.049)	(0.050)	(0.038)
LSH	43.883	48.427	32.742	42.832
	(16.070)	(17.686)	(14.739)	(17.520)
Lnsize	21.084	21.138	20.730	21.016
	(0.852)	(0.874)	(0.926)	(0.895)
Leverage	0.073	0.058	0.070	0.066
	(0.097)	(0.118)	(0.256)	(0.159)
Observations	1283	1366	891	3540

Tobin's Q is the ratio of the market value of the firm divided by the replacement cost of the assets. Mkt/Book is the ratio of the total market value of equity divided by the total book value of equity. ROA is the ratio of earnings before interest and tax to total assets. LSH is the percentage of the shares held by the largest shareholders. State is a dummy variable which equals to one if the largest shareholder is a state shareholder, and zero otherwise. Lnsize is the nature logarithm of the total assets value. Leverage is defined as the ratio of total long-term liabilities to total assets. Standard deviations are in parentheses. Observations are firm-year observations for the 885 sample firms from 2000 to 2003.

Table 4. The relationship between the ownership held by the largest shareholders and firm performance

Ownership Intervals (%)	<20	20-30	30-40	40-50	50-60	60-70	>70	Fmax=Lmax t, Wilcoxon Z
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	
Panel A: Whole sample								
Tobin's Q	2.785	2.823^{F}	2.759	2.603	2.730	2.733^{L}	2.700	2.14**
	(2.393)	(2.455^{F})	(2.336)	(2.219)	(2.385)	(2.475^{L})	(2.433)	(-0.75)
Mkt /Book	5.311	5.395^{F}	4.735	4.535	4.564^{L}	4.381	4.423	1.49
	(4.026)	(4.414^{F})	(3.894)	(3.575)	(3.630)	(3.915^{L})	(3.533)	(0.75)
ROA	0.037	0.040^{F}	0.039	0.037	0.039^{L}	0.038	0.037	0.50
	(0.040)	(0.041)	(0.045^{F})	(0.041)	(0.045^{L})	(0.043)	(0.040)	(0.54)
Observations	[298]	[848]	[546]	[529]	[626]	[458]	[235]	-
Panel B: State share								
Tobin's Q	2.454	2.633^{F}	2.602	2.576	2.748^{L}	2.648	2.594	-1.96*
	(2.155)	(2.150)	(2.217^{F})	(2.205)	(2.473^{L})	(2.404)	(2.392)	(-1.29)
Mkt /Book	4.472	4.483	4.742^{F}	4.287	4.632^{L}	4.349	4.150	1.48
	(3.434)	(3.753)	(3.794^{F})	(3.489)	(3.681^{L})	(3.469)	(3.462)	(0.45)
ROA	0.036	0.037	0.038^{F}	0.034	0.041^{L}	0.033	0.029	-1.61
	(0.036)	(0.038)	(0.044^{F})	(0.042)	(0.044^{L})	(0.042)	(0.036)	(0.06)
Observations	[66]	[249]	[273]	[218]	[236]	[161]	[79]	-
Panel C: State-owned legal person share								
Tobin's Q	2.668	2.759	2.778^{F}	2.609	2.645	2.735^{L}	2.630	0.67
	(2.326)	(2.329^{F})	(2.297)	(2.178)	(2.335)	(2.423^{L})	(2.357)	(-0.80)
Mkt/Book	4.857	5.161^{F}	4.782	4.323	4.169	4.327^{L}	4.141	2.37**
	(3.996)	(4.107^{F})	(3.905)	(3.497)	(3.722^{L})	(3.593)	(3.443)	(1.96**)
ROA	0.035	0.039	0.041^{F}	0.040	0.043^{L}	0.037	0.039	-0.94
	(0.041)	(0.041)	(0.049^{F})	(0.042)	(0.047^{L})	(0.046)	(0.042)	(0.05)
Obs.	[81]	[194]	[186]	[218]	[278]	[262]	[147]	-
Panel D: Other share								
Tobin's Q	2.870	3.143	3.232^{F}	2.652	2.909	3.108^{L}	3.009	0.17
	(2.528)	(2.788)	(2.684^{F})	(2.328)	(2.401)	(2.741^{L})	(2.547)	(-0.20)
Mkt /Book	5.753	6.416^{F}	5.988	4.555	5.418	6.370^{L}	4.897	0.10
	(4.213)	(5.251^{F})	(4.880)	(3.710)	(4.087)	(4.785^{L})	(3.493)	(0.14)
ROA	0.037	0.041^{F}	0.037	0.030	0.040^{L}	0.027	0.030	0.39
	(0.040)	(0.043)	(0.046^{F})	(0.038)	(0.049^{L})	(0.044)	(0.040)	(-0.10)
Observations	[151]	[405]	[87]	[93]	[111]	[35]	[9]	-

Observations are firm-year observations for the 885 sample firms from 2000 to 2003. Tobin's Q is the ratio of the market value of the firm divided by the replacement cost of the assets. Mkt/Book is the ratio of the total market value of equity divided by the total book value of equity. ROA is the ratio of earnings before interest and tax to total assets. LSH is the percentage of the shares held by the largest shareholders. F and L denote the first and the last maximum of the means and medians across the seven ownership intervals, respectively. t- and Wilcoxon Z tests test the significance of the difference between the first and the last maximum in the mean and medians, respectively. Medians and Wilcoxon Z-values are in parentheses. ***, **, * indicate significant at less than the 1%, 5%, 10% level, respectively (two-tails).

Table 5. Association between firm performance and the largest shareholder's ownership: Split sample analysis

$$Performance_{it} = \beta_0 + \beta_1 LSH_{it} + \beta_2 State_i + \beta_3 State_i * LSH_{it} + \beta_4 Lnsize_{it} + \beta_5 Leverage_{it} + FixedEffects + \varepsilon_{it} \quad (1)$$

Region	(1) LSH< 32	(2) 32 ≤LSH < 50	(3) 50 ≤LSH < 75	(4) LSH≥ 75
Predicted sign of LSH	+	-	+	-
Panel A: Performance = Tobin's *Q*				
Intercept	1.264	4.623	1.530	8.809
	(3.27)***	(11.23)***	(2.92) ***	(2.51) ***
LSH	0.026	-0.037	0.015	-0.071
	(1.77)*	(-3.70)***	(1.86)**	(-1.85)*
State	-0.158	-0.032	-0.058	-0.032
	(-0.46)	(-0.72)	(-0.16)	(-0.10)
State*LSH	-0.0005	-0.006	-0.001	-0.005
	(-0.04)	(-1.73)*	(-0.25)	(-0.15)
Control variables	included	included	included	included
Adj-R^2	0.367	0.201	0.171	0.138
Number of observations	1205	951	1198	94
Panel B: Performance = *Mkt/Book*				
Intercept	3.930	5.638	2.842	6.540
	(5.91)***	(7.43)***	(3.21) ***	(2.71) ***
LSH	0.029	-0.056	0.034	-0.039
	(1.60)*	(-3.00)***	(2.28)**	(-1.31)*
State	-0.431	-0.242	-0.559	-0.115
	(-0.79)	(-0.39)	(-1.71)*	(-0.24)
State*LSH	-0.007	-0.003	-0.013	-0.105
	(-0.32)	(-1.21)	(-1.63)*	(-1.46)
Control variables	included	included	included	included
Adj-R^2	0.120	0.126	0.123	0.122
Number of observations	1193	953	1209	93
Panel C: Performance = *ROA*				
Intercept	-0.069	0.143	0.057	0.685
	(-2.01)**	(3.50)***	(1.96) **	(2.20) **
LSH	0.0008	-0.0002	0.0004	-0.007
	(1.64)*	(-1.56)*	(1.62)*	(-1.79)*
State	-0.012	-0.019	-0.020	-0.022
	(-0.42)	(-0.55)	(-1.30)	(-1.99)**
State*LSH	-0.0004	-0.0005	-0.0003	-0.0005
	(-0.37)	(-1.61)*	(-1.56)*	(-2.11)**
Control variables	included	included	included	included
Adj-R^2	0.264	0.255	0.361	0.156
Number of observations	1202	961	1197	88

Tobin's Q is the ratio of the market value of the firm divided by the replacement cost of the assets. Mkt/Book is the ratio of the total market value of equity divided by the total book value of equity. ROA is the ratio of earnings before interest and tax to total assets. LSH is the percentage of the shares held by the largest shareholders. State is a dummy variable which equals to one if the largest shareholder is a state shareholder, and zero otherwise. Observations are firm-year observations for the 885 sample firms from 2000 to 2003. Control variables include Lnsize, Leverage, and other dummy variables controlling for fixed effects of calendar years and industry. t-values are in parentheses. Observations are all firm-year observations from 2000 to 2003; Observations that are more than three standard deviations from the mean for Tobin's Q, Mkt/Book, and ROA are excluded. ***, **, * indicate significance level for a two-sided test at less than the 1%, 5%, 10% level, respectively.

Table 6. Association between firm performance and the largest shareholder's ownership: piecewise regression

$$Performance = \beta_0 + \beta_1 LSH1 + \beta_2 LSH2 + \beta_3 LSH3 + \beta_4 LSH4 + \beta_5 State + \beta_6 Lnsize + \beta_7 Leverage + FixedEffects + \varepsilon \quad (2)$$

Dependent variable	Predicted sign	Tobin's Q	Mkt/Book	ROA
Intercept		3.118	5.770	-0.072
		(5.79)***	(8.56)***	(-4.15)***
LSH1	+	0.004	0.032	0.003
		(0.13)	(0.96)	(3.83)***
LSH2	-	-0.006	-0.021	-0.0004
		(-1.21)	(-2.79)***	(-0.86)
LSH3	+	0.002	0.007	0.0009
		(0.42)	(0.90)	(1.69)*
LSH4	-	-0.108	-0.178	-0.004
		(-2.15)**	(-1.75)*	(-0.56)
State	-	-0.345	-0.522	-0.006
		(-4.23)***	(-4.41)***	(-0.98)
Lnsize		-1.048	-1.776	-0.034
		(-26.31)***	(-19.06)***	(-24.89)***
Leverage		0.433	1.343	-0.025
		(1.83)*	(2.43)**	(-2.48)**
Adj-R^2		0.010	0.011	0.011
Number of observations		3448	3448	3448

Tobin's Q is the ratio of the market value of the firm divided by the replacement cost of the assets. Mkt/Book is the ratio of the total market value of equity divided by the total book value of equity. ROA is the ratio of earnings before interest and tax to total assets. LSH is the percentage of the shares held by the largest shareholders. State is a dummy variable which equals to one if the largest shareholder is a state shareholder, and zero otherwise. Lnsize is the nature logarithm of the total assets value. Leverage is defined as the ratio of total long-term liabilities to total assets.

LSH1 = ownership of the largest shareholder if ownership of the largest shareholder <0.32,
= 0.32 if ownership of the largest shareholder ≥ 0.32.

LSH2 = 0 if ownership of the largest shareholder<0.32,
= ownership of the largest shareholder - 0.32 if 0.32 ≤ ownership of the largest shareholder < 0.50,
= 0.18 if ownership of the largest shareholder ≥ 0.50.

LSH3 = 0 if ownership of the largest shareholder<0.50,
= ownership of the largest shareholder - 0.50 if 0.50 ≤ ownership of the largest shareholder < 0.75,
= 0.25 if ownership of the largest shareholder ≥ 0.50.

LSH4 = 0 if ownership of the largest shareholder<0.75,
= ownership of the largest shareholder - 0.75 if ownership of the largest shareholder ≥ 0.75.

Dummy variables controlling for fixed effects of calendar years and industry are also included. t-values are in parentheses. Observations are all firm-year observations from 2000 to 2003; Observations that are more than three standard deviations from the mean for Tobin's Q, Mkt/Book, and ROA are excluded. The final sample size is 3448 firm-year observations. ***, **, * indicate significance level for a two-sided test at less than the 1%, 5%, 10% level, respectively.