Empirical Study of Capital Structure on Agency Costs in Chinese Listed Firms

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Abstract: This study examines the impact of capital structure on agency costs in 211 non-financial Chinese listed firms for the period 1999-2001. There are two main findings. (1) Firms with high debt to asset ratio have high ratio of annual sales to total assets and high ratio of return-on-equity. If a firm has a high debt to asset ratio, creditors are much more concerned about the payment of interest and repayment of principal and will have incentives to monitor the firm. Thus, a capital structure with high debt decreases agency costs. (2) Positive and significant correlation is identified between ownership concentration and the return-on-equity ratio. This is because the largest shareholders have a strong interest in firm performance and therefore a high ability to reduce agency costs. Our empirical results further illustrate that firms have inclination of refinancing through stock market and harm small shareholders' interest. [Nature and Science 2003;1(1):12-20].

Keywords: capital structure; agency costs; corporate governance

1. Introduction

The Chinese stock market was established in the early 1990s. By listing on the stock exchange, state-owned enterprises (SOEs) have improved their debt to asset ratio, and promoted their development by directly financing from the stock market. After 10 years' development, there are more than 1200 listed firms on the two stock exchanges now. The total market capitalisation at the end of March 2001 was RMB (Chinese dollar) 5 trillion, 54% of the last year's GDP. This shows that listed firms play a significant role in the national economy. On the other hand, China still has much to do on reform in corporate governance[1]. For historical reasons, the majority of China's listed firms were restructured and transformed from previous state-owned enterprises or other government controlled entities[2] and there are many problems left with the governance structure. The central problem with the governance structure is the ambiguous definition of the controlling power of the state shares. This led to the false placement of state property. "Inside control" problem is serious[3]. Secondly, state shares are uniquely big and there is serious impingement upon the interests of small shareholders. Thirdly, the board of directors is formed mainly by executive directors and controlling shareholders, directors lack integrity obligations, failing to perform their duties industriously[4]. Additionally, there is not much pressure of dividend from shareholders, so re-financing of listed firms usually place the order of debt after additional or right shares. By pecking order pattern of financing observed in advanced country corporations, firms obtain capital by making greater use of internal finance followed by debt and turning to stock market finance only as a last resort. Jensen's (1986) free cash flow theory considers debt can mitigate the agency problems between shareholders and managers of firms and motivate management to act in the interests of the shareholders. How would their financing patterns differ from those of advanced country firms? How to decide the best strategy of refinancing?

There has been much research conducted concerning the agency problem in developed markets. There are three general ways in which to reduce the conflicts of interest between managers and the shareholders: 1) Increasing management ownership because high management ownership aligns the interests of management and shareholders (Jensen, 1993; Ang,

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[1] In its narrowest sense, corporate governance is about the relationship of the owners or shareholders of a firm with its manager (Iskander and Chamlou, 2000), which is often characterized by economists as the "agency problem".

[2] About 75% of listed firms are formerly state-owned. Another 10% are firms that mostly had significant shares held by SOEs. Only less than 10% of listed firms are formerly private-owned firms or foreign-invested firms, which in most cases had SOEs as their joint venture partners. See the website of China Securities Regulatory Commission: www.csrc.gov.cn

[3] The "inside control" viewpoint was aired in 1995 by Japanese scholar Masahiko Aoki.

[4] Wu Jinglian, June 8, 2001. The behaviour of control shareholders and corporate governance. Shanghai security news.

1999). 2) Monitoring management by large shareholders (Shleifer, 1986). 3) Using debt financing to discipline managers (Jensen, 1986; Stulz, 1990). The first option is not the focus of this study. This is because the vast majority of China's listed firms are formerly state-owned or state-controlled firms. The management holding of shares is extremely low, about 0.03% of the total shareholding[5], and it is subordinate to controlling shareholders. This situation will not change in the near future. Similarly, the second option is also excluded. The state holds shares of most listed firms in great concentration, listed firms, is not really separated from controlling shareholders in personnel, financial affairs and assets. Due to the complicated market and administrative process associated with the reform of Chinese property system, many constraints were present on reducing agency costs through the first two options. Thus our research concentrated on the third option mentioned: the impact of capital structure on agency costs.

The contribution of this study is two-dimensional. Firstly, it contributes to the literature of the impact of capital structure on agency costs in Chinese listed firms. Plenty of research about Chinese corporate governance has focused mainly on ownership structure, Xu (2000), Zheng (2002), Shi (2000), Zhang (1996), etc. The focus of this research is to study the interrelationship between the capital structure of listed firms and agency costs of equity. Secondly, among the limited research, Yang et al (2001) analyses the interrelationship between the capital structure of listed firms and agency costs. No empirical analysis has been conducted so far. This paper will fill the gap in this area. It provides evidence on firm capital structure and agency costs measured in terms of ratio of sales to total assets and ratio of return on equity. We wish to provide evidence through empirical study as to how would capital structure influence agency costs.

This paper is structured as follows. Section 2 gives previous relevant literature review. Section 3 describes the current status of Chinese corporate governance, section 4 presents the methodology including empirical model and sample. Section 5 gives the empirical results, and section 6 concludes.

2. Literature Review
Agency problems are caused by the separation of ownership from control in large firms (Berle, 1932). Jensen and Meckling (1976) apply agency theory to the modern corporation and formally model the agency costs of external equity[6]. Managers who own anything less than 100% of the residual cash flow rights of the

firm have potential conflicts of interest with the outside shareholders, since they choose to reinvest the free cash rather than return it to investors (Jensen, 1976, 1986). The conflict arises when there is moral hazard inside the firm, which is called the agency costs of equity. This agency problem can be solved by increasing management ownership because high management ownership aligns the interests of management and shareholders (Jensen, 1976). Other possibilities include monitoring of management by large shareholders (Shleifer, 1986), and the use of debt financing to discipline managers (Jensen, 1986; Stulz, 1990).

2.1 Managerial Ownership and Agency Costs
Managerial ownership has considered non-linear forms (Morck, 1988; McConnell, 1995; Kole, 1995). Jensen (1993) "convergence of interest" hypothesis suggests that managerial shareholdings help align the interests of shareholders and mangers, and as the proportion of managerial equity ownership increases, so does corporate performance. In contrast, Morck et al (1988) argued that high level of managerial ownership could lead to 'entrenchment', as external shareholders find the actions of such managers difficult. Kole's (1995) argument suggests that managerial ownership may impact large and small firms differently with respect to value. Ang examined the relationship between agency costs and managerial ownership for small firms, and Singh et al tested same work on the relationship for large firms.

2.2 Concentrated Ownership and Agency Costs
An important line of agency costs literature relates to concentrated ownership. Stiglitz (1985) has argued that one of the most important ways of value maximization by firms is through concentrated ownership of the firm's shares. Shome and Singh (1995) replicate this result and provide evidence that the large shareholder's presence improves accounting performance. Large shareholders thus address the agency problem as that they both have a general interest in profit maximisation, and enough control over the assets of the firm to have their interests respected. Many scholars argued that outside large shareholders reduce managerial entrenchment (Shleifer, 1986; Kang, 1995; Yosha, 1996; Porta, 1998, 1999; Park, 1995; Denis, 1996).

However, this does not exclude the possibility of rising concentration of share ownership to depreciate the market value of the firm (Huddat, 1993; Admati, 1994). The control shareholders often have better access to information, hold more power in selecting management and involve in key decision-makings. Especially when the manager holds fewer shares[7] and is subordinate to

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[5] The statistics get from: www.csrc.gov.cn.
[6] Jensen and Meckling model the agency costs of debt in this paper. However, for our purposes in this paper, it is the agency costs of equity that are relevant.

[7] Morck, Shleifer, Vishny (1988) showed in their empirical study that the proportion of equity held by

controlling shareholders, control shareholders impinge upon the interests of small shareholders by way of non-division of dividends and diversion of profits. The exploitation of small shareholders by controlling shareholders constitutes ex ante an expropriation threat that reduces managerial initiative and non-contractible investments and may come into conflict with performance-based incentive schemes (Burkart, 1997).

2.3 Debt and Agency Costs
Another strand of the agency literature has focused on the role of debt as a means of disciplining managers. Grosseman and Hart (1982) were the first to argue that managers could pre-commit to work hard by using debt rather than equity. Similarly, Jensen's (1986) free cash flow theory considers additional debt beneficial since the firm attempts to improve the productivity of its assets as a result of additional debt acquired. Debt not only reduces the free cash flow but also provides discipline to management through the debt market. Debt monitoring hypothesis is formalised by Harris and Raviv (1990) and Stulz (1990) and empirically demonstrated by Maloney et al. (1993). Shleifer and Vishny (1997) provided extensive survey about the role for debt in reducing the conflict of interests between managers and shareholders [8]. On the other hand, increased leverage also has costs. As leverage increases, the usual agency costs of debt rise, including bankruptcy cost (Jenson 1986). Myers (1977) pointed to the debt overhang problem where firms may forego good projects if they have significant debt outstanding. The reason is that for a firm facing financial distress, a large part of the returns to a good project go to bondholders. Therefore, in choosing their debt-equity level, firms should trade off between the agency costs of debt and the agency costs of equity. By appropriately allocating refinance between equity and debt, capital structure can balance the conflicts between investors and management as well as that between management and creditors.

Finally, two previous studies most closely related to this study are Ang et al (1999) and Singh (2002). In the first case, Ang et al provided evidence on corporate

ownership structure and agency costs measured in terms of asset utilization and operating expenses. Ang used data on small business in America to examine how agency costs vary with a firm's ownership structure. They find agency costs 1) are higher when an outsider rather than an insider manages the firm; 2) are inversely related to the manager's ownership share; 3) increase with the number of non-manager shareholders, and 4) to a lesser extent, are lower with greater monitoring by banks. In the second study, Singh and Davidson extend the work of Ang's analysis of relationship between corporate ownership structure and agency costs to large publicly traded corporations. Using slightly different measures of agency costs[9], they analysed multi-period data for the year 1992 and 1994, and studied not only inside ownership structure as a determinant of agency costs, but also the role of outside large equity holders in disciplining the management. They found outside large shareholders' ownership may only have a limited effect on reducing agency costs and board size was negatively related to asset turnover, and unrelated to discretionary expenditures.

In this paper, following their example we use ratio of sales to assets as one of the measures of agency costs[10]. Additionally, we use ROE as an alternative measure of agency costs to analyse the possible impact of variables on agency costs in Chinese listed firms. Although ROE is a more manipulability measure in economic sense, the regulating authorities in China use this particular ratio as a standard to decide whether a firm is qualified for right shares or additional shares. It is one of the most strictly regulated ratios in China and is widely used for comparative purpose.

3. Chinese Corporate Governance
3.1 Ownership Structure and Corporate Governance
The main characteristic of the Chinese corporate governance is the over concentration of equity structure. Most of the listed firms in China are transformed from state-owned enterprises. Ownership structure displays the phenomenon of the co-existence of control shareholders, who are normally related to the state and many other small and comparatively weak shareholders. State shares are uniquely large. Statistics show that the state holds shares of most listed firms in great concentration. Of the listed companies, 54% of the equities belong to the state or state-owned corporate

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managers and the valuation of the firm and proportion is in inverted U-shape.

[8] Several articles model the benefits and costs of debt, the benefit is usually the reduction in the agency cost, such as preventing the manager from investing in negative net present value projects, or forcing him to sell assets that are worth more in alternative use. The main costs of debt is firms may be prevented from undertaking good projects because debt covenants keep them from raising additional funds, or else they may be forced by creditors to liquidate when it is not efficient to do so.

[9] Use the SG & an expense ration instead of operating expenses to measure agency costs.
[10] Singh found the SG&A expense ratio not significantly influenced by ownership. This is because governance variables are not as visibly related to cash flows generated by firms that are sales revenues. We conducted a similar analysis and didn't find any significance relationship either.

persons[11]. Among the 1104 listed firms on Shenzhen and Shanghai stock markets, the proportion of shares of the number one shareholder had reached 45% and the second largest shareholder made up 8%.

The management level lacks long-term incentive and restraining mechanism. The board of directors is mainly formed by control shareholders. The lack of independent directors makes it difficult to display their regulating and balancing roles. Among all the directors of the listed firms, 73.3% have the background of state shares (27.9%) or shares of state-owned corporate persons (45.4%). Since the manager holds fewer shares, and is subordinate to controlling shareholders, the agency problem between shareholders of a firm and its manager has turned into the second dimension of the agency problem in a firm, the conflict between the controlling shareholders and small shareholders.

3.2 Leverage and Corporate Governance

The central goal of corporation, including public listing, is to establish "a modern enterprise system" in China, featuring the corporate governance structure that separates the government from enterprises. Another objective is to raise capital for SOE's and reduce their high level of debt to asset ratio by increasing direct finance through selling equity to the public. The vast majority of China's listed firms are formerly state owned or state controlled firms, mostly large and better performing firms. Before initial public offering, they do their best to dispose of the debt. So, the debt to asset ratio of listed firms is lower during the first couple of years after initial public offering.

According to capital structure theory, the way to refinance is determined by the cost of capital. In developed capital market, the top managers are restrained by shareholders and creditors, facing the pressure of paying dividend and debt. The empirical results show that listed firms obtain capital first from internal sources, then from debt, and last from equity. Capital cost influences the style of financing. In China, due to the special ownership structure of listed firms, state share is absolutely the largest among total shares and the representatives of state shares are usually absent. This reduces the restriction to management, and the managers would over pursue the control right of cash flow. The consequence is that re-financing of listed firms would have partiality for equity rather than debt. Additionally, there is not much pressure of dividend

from shareholders, so refinancing of listed firms in China usually place the order of debt after additional or right shares.

The optimal debt-to-equity ratio is the point at which firm value is maximised, the point where the marginal costs of debt just offset the marginal benefits. The over low level of debt to asset ratio reflected the poor management of corporate financial gear of Chinese listed companies. Refinancing through equity is not the optimal strategy to reduce their capital cost. It's not a common phenomenon for a modern corporate to rely almost totally on it's own capital, using none or merely little debt. One of the most important reasons that Chinese listed companies don't bother to use debt is the fact that they generally can obtain "free capital" easily from the equity market. In order to limit the "equity financing thirst", China Security Regulatory Commission requires[12] that the debt to asset ratio of listed firms who want to add shares on stock market must have higher debt to asset ratio than the average level of the same industry (Table 1). Listed firms have paid more attention to their capital structure since then, and it helps to improve the capital structure of listed firms.

4. Data and Methodology
4.1 The Data
The sample was a pool of several data of firms listed on the China (Shanghai and Shenzhen) Stock Exchanges from 1999 to 2001. 211 listed firms[13] were randomly chosen excluding finance and insurance industry, ST (special treatment)[14] and PT (particular transfer)[15] firms were not included in the sample either. The accounting data was obtained from listed firms' annual reports from 1999 to 2001, which were published on the web site (http://www.csrc.gov.cn) of China's Securities Regulatory Commission (CSRC). The inside and outside ownership information and board size

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[11] State shares are held by government bodies such as state asset management agencies, or institutions authorised to hold shares on behalf of the state such as a wholly state-owned investment firm. Legal person shares are shares held by any entity or institution with a legal person status, including an SOE or a firm controlled by an SOE.

[12] In Table 1, the debt to asset ratio is the industry average level of listed firms. The industry classification conforms to the first grade industry classification of Chinese Stock Exchange. This policy was announced on March 18th 2001.

[13] There were 1160 listed firms on stock market in the end of 2001. Sample =1160 - (43 ST firms +8 PT firms) * 20% - 11 firms IPO after 1999 =211 firms.

[14] Shanghai Stock Exchange and Shenzhen stock exchange declared emerging abnormal phenomenon from some listed firms' financial statements. Such listed firms' stock was specially treated. The stock is called ST stock. There are 43 ST firms in China's two stock exchanges at the end of 2001.

[15] Listed firms that have continuous 3-year loss are called PT firms. There are 8 PT firms at the end of 2001.

Table 1. Listed Firms Industry Average Debt to Asset Ratio (%)

Industry Classification	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(12)	(11)	(13)
Average Debt to asset ratio	39.2	30.60	47.74	39.93	54.71	36.97	49.21	61.94	91.74	73.65	38.70	42.51	63.38

(1) Agriculture, Forestry, Animal Husbandry and Fishing. (2) Mining. (3) Manufacture. (4) Reduction and Distribution of Electricity, Gas and water.(5) Construction. (6) Transport, Storage and Post. (7) Information transmission, Computer services and software. (8) Whole sale and Retail sale.(9) Finance and Insurance. (10) Real estate. (11) Resident service and other service. (12) Disseminate and Culture. (13) Synthesis. Material source: http://www.bigsun.com.cn/data/agora/20020730/125466.hml.

Table 2. Sample Descriptive Statistics

Variable	1999		2000		2001		Pooled	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Assets turnover	0.5335	0.4783	0.5500	0.4591	0.5634	0.4503	0.5575	0.4608
Return on equity ratio %	11.4210	10.4800	9.9839	9.6400	7.2498	7.8200	9.6150	9.5500
Debt to asset ratio %	40.4895	38.5374	39.6272	38.7600	41.4436	41.1300	40.4429	40.0496
Outside block ownership:								
The largest shareholder %	48.7506	49.0200	46.3133	45.5000	46.3500	45.9700	46.6115	47.2100
The five largest shareholders %	61.6255	61.6600	59.2176	60.1000	58.3813	58.9900	59.6540	60.5100
Total sales (RMB 10000)	90894.29	46347.96	116239.10	65616.90	136408.90	73046.00	115986.3	62795.68
Board size	9.6540	9.0000	9.7678	9.0000	9.7915	9.0000	9.7300	9.0000
Managerial ownership %	0.0441	0.0191	0.0316	0.0154	0.0273	0.0116	0.0343	0.0150

The data in this table contain 211 non-financial companies listed on the Stock Exchange of China. Outside block ownership is defined as percentage of total stock held by the largest shareholder and the five largest shareholders. Debt to asset ratio is debt divided by total assets in the end of accounting year. The size of the board of directors measures board size by determining the number of board members. Managerial ownership is the percentage of shares owned by managers.

information were obtained from the web site: http://www.cnlist.com and http://www.cninfo.com.cn.

The sample was a pool of seven ratios of firms listed on the China (Shanghai and Shenzhen) Stock Exchanges from 1999 to 2001 (Table 2). The debt to asset ratio includes data of firms' assets turnover, return on equity, debt to asset ratio, outside block ownership (the percentage of shareholding of the largest and five largest shareholders), firm total sales, board size and managerial ownership.

4.2 Methodology
The methodology we use is a system of simultaneous equations.

The system of two equations to be estimated is:

Agency costs=β_0+$\beta_1$capitalstructure+β_2Conc+β_3Size +$\beta_4$board+$\sum\beta_j$Dum$_{jt}$ (1)

Capital structure=β_5+β_6Conc+β_7ROE+β_8Val (2)

(Conc – concentration)

We use two alternative measures for agency costs. The first measure for agency costs is the ratio of annual sales to total assets (asset utilization), following the research of Ang et al (1999). This ratio measures management's ability to employ assets efficiently. A high ratio of annual sales to total assets shows a large amount of sales and ultimately cash flows that are generated for a given level of assets. While a high asset turnover may be identified with efficient asset management practices and hence shareholders value creation, a low asset utilisation reflects asset deployment for unproductive

purposes. Therefore, higher asset turnover has less agency conflict.

We use an additional measure of agency costs, the ratio of return on equity (ROE), as a measure of profitability. This indicator measures profitability from a different angle. In China, most listed firms were transformed from state owned enterprises. In order to protect the value of state assets, fixed assets depreciation rates are centrally determined and often are artificially low, thus leading to an upward bias in fixed asset estimates. Current assets include some stockpiled goods that either cannot be sold at their book value, or cannot be sold at all. ROE is clearly a more preferable indicator of profitability, matching the common usage of the market economics. Profit is the return to equity holders; therefore higher turn on equity has less agency conflict.

Independent variables were chosen mainly based on the existing agency literature. The first variable used is capital structure, measured by debt to asset ratio (total debt divided by total book assets). The second variable used is ownership concentrations. Ownership concentration is measured by the proportion of the shares held by the largest shareholder to the total shares and the share proportion of the top five largest shareholders. The third categories of variables are control variables. They are included in the regressions to control for other potential influences on the agency costs of firms. The variables included are the size of board of directors, firm size, and industry Dummies.

The number of board members measures the size of the board of directors. The measure of a firm's size is the logarithm of total sales. The industry dummy variable is Chinese listed firms' classified 13 industries, excluding financial firms. This provides 11 industry dummy variables in the multiple regression models.

To solve potential endogenous problems, whether the ratio of return on equity or the debt to asset ratio is simultaneous is tested. On one hand, the debt to asset ratio can affect return on equity. Firstly, an increase in the debt to asset ratio, through financial charges would reduce profit. A high debt-asset ratio, finally, should imply a high degree of external control as creditors, concerned about the payment of interest and the repayment of the principal. Creditors have incentives to monitor the enterprise. A higher degree of supervision could lead to higher profitability. Secondly, by using debt, ROE would increase even though the profit doesn't increase, with a constant equity. On the contrary, obtaining capital through equity would reduce ROE. On the other hand, ROE affect the leverage, with a high level of ROE, listed firms can get funds from newly accumulated profits or from stock market by additional or right shares. The debt to asset ratio may depend not only on ROE but also on the ownership structure. If there is high ownership concentration, the control shareholders might want to reduce the dividend, implying a low debt to asset ratio. However, if the equity value growth is high, the firm can obtain plenty of cash flow, and impact on debt to asset ratio. We use Val to measure the equity value growth. This valuation

is used by Leech and Leahy (1991) and is calculated as the market value of the firm at the end of its accounting year, divided by the book value of equity.

Thus, with two equations, one determining agency costs, and the other determining the debt to asset ratio, another exogenous variable is needed in the determination of the debt to asset ratio in order for equation (1) to be identified. This is outside ownership concentration. When agency costs is measured by asset turnover, using only equation (1) would suffice. When agency costs are measured by ROE, the debt to asset ratio is an endogenous variable and two equations are necessary.

5. Empirical Results
Empirical results are presented in Table 3 (Panel A & B) and Table 4. Table 3 presents the OLS regression analysis result that analysed agency costs, measured by asset utilisation and ROE respectively. Panel A gives the result of agency costs measured by asset utilisation and Panel B gives the result of agency costs measured by ROE. Table 4 presents the result of the simultaneous equation of ROE.

5.1 Agency Costs Measured by Ratio of Annual Sales to Total Assets
In panel A of Table 3, dependent variable proxy for agency costs is the ratio of annual sales to total assets. There are three groups of independent variables: capital structure variables, ownership concentration variables and control variables. Rows 1 and 2 report the

Table 3. Multivariate Regression Analysis debt to Asset Ratio and Ownership Concentration to Agency Costs
Panel A: Agency costs as measured by the ratio of annual sales to total assets.
Panel B: agency costs as measured by ratio of return on equity.

Regress-ion	Constant	Debt to asset ratio	Ownership concentration %		Control variables			Adj-R-squared
			The largest shareholder	The five largest shareholders	Board size	Firm Size (log -sales)	Industries	
Panel A:								
Row 1	0.1411 (2.2505) **	0.0072 (7.8303)***	0.0026 (2.9038)***					0.0912
Row 2	0.2093 (2.6118) ***	0.0069 (7.4990)***		0.0012 (1.0415)				0.0806
Row 3	-1.1820 (-8.0504)***	0.0028 (3.4429)***	0.0002 (0.2773)		-0.0094 (-1.9838)**	0.1718 (14.4776)***	Yes	0.3986
Row 4	-1.2294 (-7.9337)***	0.0027 (3.3710)***		0.0010 (0.9863)	-0.0088 (-1.8553)**	0.1716 (14.8980)***	Yes	0.3995
Panel B:								
Row 5	5.0937 (4.0120)***	0.1287 (6.9215)***	0.0279 (1.4925)					0.0684
Row 6	2.7343 (1.7017)*	0.1251 (6.8009)***		0.0626 (2.7472)***				0.0762
Row 7	8.9014 (2.5744)***	0.1416 (7.4026)***	0.02619 (1.3788)		-0.5538 (-4.9447)***	0.1217 (0.4356)	Yes	0.1663
Row 8	7.2598 (1.9893)**	0.1364 (7.1781)***		0.0377 (1.6420)*	-0.5447 (-4.8468)***	0.1817 (0.6694)	Yes	0.1674

Values in parentheses are t values. *10% level, ** 5% level ***1% level

Equation. (1): Agency costs $=\beta_0+\beta_1$capital structure $+\beta_2$Conc $+\beta_3$ Size $+\beta_4$ Board $+\sum\beta_j$ Dum$_j$

Table 4. Impact of Debt to Asset Ratio on the Ratio of Return on Equity (2SLS results)

Regression	Constant	Debt-to-asset %	Ownership Concentration		Control Variables			Return on Equity %	Equity Market-to-Book Value
			The largest shareholder %	The five largest shareholders%	Board	Firm size (log sale)	Industries		
Eq. (1)									
1999	-29.9728 (-74.9606)***	0.9154 (254.1369)***		0.0585 (22.2788)***	-0.0186 (-1.6130)	0.1813 (6.7096)***	No		
2000	-20.9198 (-36.2628)***	0.6317 (187.1876)***		0.0345 (9.9195)***	-0.0140 (-0.8665)	0.3565 (9.0342)***	Yes		
2001	-50.1593 (-9.3704)***	0.8332 (18.7996)***		0.1354 (4.3807)***	-0.1589 (-1.0291)	1.5859 (4.3131)***	Yes		
pool 1	-25.6625 (114.1235)***	0.6978 (428.5688)***	0.1198 (102.6309)***		-0.0179 (-2.6085)***	0.1859 (11.3209)***	Yes		
pool 2	-26.2627 (-61.7831)***	0.6868 (235.0715)***		0.0895 (35.6543)***	-0.0385 (-3.0672)***	0.3490 (12.0077)***	Yes		
Eq.(2)									
1999	31.3633 (5.3222)***			-0.0577 (-0.6591)				1.0353 (2.4545)**	0.0795 (0.2693)
2000	26.1591 (3.5698)***			-0.06832 (-0.6374)				1.5447 (3.6285)***	0.3620 (0.8032)
2001	41.1093 (6.7670)***			-0.2024 (-1.9635)**				0.7980 (1.9841)**	1.4301 (4.0992)***
pool 1	34.7605 (12.1722)***		-0.1694 (-3.2660)***					1.3532 (4.4911)***	0.1105 (0.5409)
pool 2	34.7928 (9.1036)***			-0.13278 (-2.1735)**				1.3031 (4.4705)***	0.2024 (1.0390)

Equation. (1): $ROE = \beta_0 + \beta_1$ Capital structure $+ \beta_2 Conc + \beta_3$ Size $+ \beta_4$ Board $+ \sum \beta_j Dum_{jt}$
Equation. (2): Capital structure $= \beta_5 + \beta_6 Conc + \beta_7 ROE + \beta_8 Val$
Values in parentheses are t values. *10% level, ** 5% level *** 1% level

regression result on capital structure together with the largest shareholder concentration and the five largest shareholders' concentration respectively. Rows 3 and 4 report the regression result including the control variables: board size, firm size and industry dummies.

In all of the four rows mentioned above, a positive relationship between agency costs and capital structure was identified, all significant at a better than 1% level. This proves that firms with a higher debt to asset ratio are more efficient in their asset utilization. This result supports Jensen's (1986) theory of free cash flow, which considers additional debt beneficial as the firm attempts to improve the productivity of its assets as a result of additional debt acquired. Such positive relationship between capital structure and asset utilization is also identified by Gorman (2000), Ang (1999) and Singh (2001).

We found mixed result for the largest shareholder concentration, a positive relationship with agency costs displayed in Row 1, while an insignificant relationship was found in Row 3 when regressed with other control variables. For the five largest shareholders' concentration, no significant relationship was identified with agency costs. This proves that control shareholders don't have much interest in improving their asset utilization ratio. This result is found by Signh et al (2001) too, as they report that the proportion of equity held by outside block owners does not relate to agency costs as measured by asset utilization.

Among the control variables, the coefficients for the control variables for board size are negative and significant at 5% in relation to the asset turnover ratio as

displayed in both Row 3 and Row 4. This shows that large boards reduce asset utilization and they are detrimental to shareholders' interest. This is because the function and work procedures of board of directors are not standardized. The amounts of shares held by directors are extremely low (Table 1, managerial ownership). Many directors are appointed by the government, and they are not paid by the listed companies, but paid by some government institutes instead. This way they hardly find their own interest align with the company. In the absence of integrity obligation, directors fail to perform their duties industriously to improve the firms' asset utilization. The negligence of large shareholders together with smaller shareholders' lack of supervision incentive, the smaller shareholders would choose to 'vote with feet', which would deteriorate the 'insider control' problem among the management of listed companies. The firm size factor among the control variables shows a positive relationship to asset utilization, significant at 1%. Hence the agency costs would be lower for a larger firm. Large firms have more efficient corporate governance. There are five industries' coefficients significant with asset turnover. They are electricity, transportation, wholesales, real estate and service industry. Except for wholesales, the coefficients of other industries are negatively related to asset turnover.

5.2 Agency Costs Measured by Ratio of Return on Equity
In Panel B of Table 3, dependent variable proxy for agency costs is ROE instead of asset utilization as in

Panel A, with the independent variables identical to that of Panel A. Row 5 and Row 6 report the regression result on capital structure with largest shareholder ownership concentration and five largest ownerships' concentration respectively. Row 7 and Row 8 result including also the control variables: board size, firm size and industry dummies.

As expected, we found a positive relationship between capital structure and ROE, significant at 1% level, confirmed the result in Panel A. Firms with a higher leverage level have a higher return on equity. This conforms to the theory that creditors, concerned with the repayment of the debt, would exert positive influence on the management of the firm and thus improve the firm's profit return. The ownership concentration, however, displayed different result than that of Panel A: they are positive with ROE at 1% and 10% respectively in Row 6 and Row 8. Comparing to the asset utilization result, our ROE result proves that large shareholders concern about their profitability. The highly concentrated ownership would benefit the operation of the business. For the control variables, the board size result is consistent with that of Panel B and showed negative relationship with ROE, both significant at 1%. Firm size displayed positive relationship with ROE, but not significant. The industry dummy variable for the 11 industries doesn't show any significance, except one at a 10% level. Together with the industry result from Panel A, it proves the industry factor doesn't play any significant role in deciding the agency costs.

Since the debt to asset ratio could be an endogenous variable, to solve the potential endogeneity problems we need two equations, one determining the ratio of return on equity, and the other determining the debt to asset ratio. Table 4 reports the two stage least-squares regression results.

For equation (1), both the pooled data result and the result of each individual year show that the debt to asset ratio has positive relationship with the ratio of return on equity at significant better than 1% level. This result supports Jensen's (1986) debt monitoring hypothesis. This is examined by Harris and Raviv (1990) and Stulz (1990) and empirically demonstrated by Maloney et al. (1993) and Gul and Tsui (1998). Highly leveraged firms should be subject to better supervision than those listed firms whose assets are primarily financed through "free" equity that comes with little monitoring.

The result for the largest and the five largest shareholders' concentration is identical to each other. They are both positive to ROE at significant better than 1 percent level in equation (1) in all the results. This finding supports the view that large shareholders play an active role in corporate governance (Shleifer, 1986; Yafeh, 1996; Denis, 1996). However, all the results are negative on debt to asset ratio (equation 2). Although

they are only significant at the pooled level, except for year 2001, this shows the large shareholders prefer to refinance through equity than debt. The reason of an increased significance of the third year and for the pooled result is because CSRC requires the average return on equity level over the last three year (from 2001) must be more than 10% to be qualified for additional share. Thus if a firm's return on equity ratio is higher than this level, they like to finance from equity more than debt. This result conforms to Shleifer and Vishny's (1997) theory that large shareholders claim they both have a general interest in profit maximization, and enough control over the assets of the firm to have their interests respected.

Our results also provide new evidence for the second dimension of agency problem: the conflict between large shareholders and small shareholders. Since the boards of directors are mainly constituted by large shareholders in China, the boards' decisions reflect large shareholders' will. The positive relationship between large shareholder and ROE confirmed by our data (Table 4) proves that the large shareholders are very concerned about the agency problem to maximize their own benefits. Higher return on equity would mean more profits for the large shareholders. However, the non-significant positive relationship between larger shareholder and asset utilization found in Table 3 (panel A) illustrated they are not genuinely interested in improving the firm utilization. Again their significant negative relation with debt to asset ratio, their prejudice against using debt the less costly capital, proves that they are sacrificing the smaller shareholders' interest for their own good. Although large investors can be very effective in solving the agency problem, they may also inefficiently refinance the firm through equity while using debt could have maximize the firm value. Driven by their own interest they may also redistribute the wealth of the firm from other small investors. Because small shareholders unlike creditors, they are not promised any payments in return for their financial investment in the firm, and have no claim to specific assets of the firms.

Board size has a negative relation to agency costs, and its coefficient is not significant at each individual year, but significant at a better than 1% level at pooled level. The individual level result is that the large shareholders are motivated to care for the company performance. This somehow counter-effects the negative effects of the overall board members' 'shirking' behavior. However, this kind behavior would reveal itself more clearly through pooled year by members' seeking more discrete ways to enhance their own interest at the firms' cost. Large companies are more efficient in dealing with agency problems. All the results of ROE are positive to the capital structure, significant at either better than 1% or 5%. The equity market-to-book value is not significant.

6. Conclusion

There have been many research conducted concerning agency costs in developed markets, however, not enough attention has been paid to emerging market like China. The contribution of this study is two-dimensional. Firstly, it contributes to the literature of the impact of capital structure on agency cost in Chinese stock market. Secondly, among the limited research concerning capital structure, Yang et al (2002) analyses the interrelationship between the capital structure of listed firms and agency costs in a descriptive way. However, no empirical analysis has been conducted so far. This paper provides statistical evidence on firm capital structure and agency costs measured in terms of ratio of sales to total assets and ratio of return on equity.

The forces working on firms' capital structure in other countries also work in a quite similar way in China. The results indicate that firms with a higher debt to asset ratio have a higher ratio of sales to assets and a higher ratio of return on equity, and this relationship is statistically significant at better than 1 percent level. Capital structure theories suppose that managers make financing decisions so as to maximize value of equity for shareholders. This finding is supportive of the theory put forth by Williams (1987) that additional debt decreases agency costs and the theory by Jensen (1986) that debt can reduce the agency costs of free cash flow by reducing the cash flow available for spending at the discretion of managers. The ownership structure also affects capital structure. Firms with higher Ownership Concentration tend to have lower debt to asset ratio. Why do Chinese listed firms have such a low leverage? One possible reason is that Chinese firms prefer and have access to equity financing once they go public as most firms enjoy a favorable high stock price.

Our results also support Shleifer and Vishny's (1997) statement is that large shareholders claim that they both have a general interest in profit maximization, and enough control over the assets of the firm to have their interests respected. However, we also find that large shareholders are mostly concerned about their personal benefits, thus failing to improve the asset turnover. The absolute control of listed firms' large shareholders makes it difficult for small shareholders to vote against the board's decision. This results in firms' inclination of refinancing through stock market and it harms the small shareholders' interest.

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