DOES CORPORATE OWNERSHIP AFFECT CAPITAL STRUCTURES AND ADJUSTMENT OF CAPITAL STRUCTURES — EVIDENCES FROM CHINESE LISTED COMPANIES

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Abstract

In Chinese transition economy, compared with state-owned firms, private firms face higher financial friction in financing activities, but have more incentive to adjust toward optimal capital structure to maximize the shareholders' benefit. Based on panel data of China's listed firms from 1998 to 2007, we compare the capital structures of state-owned and privately-owned listed firms. The empirical results show that there is structural difference in static capital structure between state-owned and private listed firms while controlling for firm characteristics. We then investigate the difference in dynamics of the capital structure between these two groups of firms. Further study results tell us that the adjustment to an optimal capital structure to be faster for the private firm than for the state-owned firm.

Keywords: Corporate Ownership, Financial friction, Capital structure adjustment, Ownership discrimination

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1. Introduction

Since the establishment of the Reform and Openness policies 30 years ago, the non-state-owned economy has experienced a dramatic development. In 2005, the non-state-owned economy has contributed to 65 percent of GDP in China. The non-state-owned economy increasingly contributes to the governments' tax income, exports, and employment creation. In the past 30 years, the non-state-owned economy has rapidly grown as measured by the number of enterprises, and by the amount of assets. In addition, a variety of ownership structures have emerged. In the context of Chinese transition economy, it is of great importance to figure out the role of corporate ownership structures in motivating the efficiency of corporate governance. This paper aims at investigating the impact of corporate ownership structure on corporate capital structure in listed companies in Chinese stock markets. However, the impact is ambiguous for two reasons. On one hand, market forces, outside monitoring, and compensation plans all incent the management of private firms to operate under and migrate toward an optimal capital structure. In contrast, the incentives of the management of state-owned firms are not as clear. On the other hand, it is commonly recognized that private firms encounter higher financial frictions than state-owned firms (Lu and Yao, 2004). As a result, state-owned firms have advantage over private firms in adjusting their capital structure to their target capital structure. Our objective in this paper is to examine whether there is a systematic difference in capital structure between state-owned firms and private firms. We also examine whether private firms differ from state-owned firms in the dynamic process in the adjustment toward optimal capital structure, with previous studies provide evidence that Chinese firms do target optimal capital structures and adjust toward optimal capital structures (Yuan, 2004; Wang, et al, 2007). Our finding that state owned firms have lower debt to assets ratios provides support to the hypothesis that the managers of private firms build capital structures that are conducive to shareholders' benefits. Further study results that the adjustment to an optimal capital structure to be faster for private firms than for state-owned firms support the hypothesis that private firms have more incentive than state-owned firms to adjust capital structure towards to the optimal capital structure to maximize firms' market value.

The paper is organized as follows. Section 3 introduces briefly the "ownership discrimination" that private firms have to face in financing in the context of Chinese transition economy. Section 3 reviews previous studies. In Section 4, we specify a leverage-adjustment model whereby we measure the change in the liability-asset ratio. Section 5 is variable descripti-

on and data description. Section 6 provides empirical results. Finally, Section 7 is conclusion and policy implication.

2. "Ownership Discrimination" in Chinese Transition Economy

The economic reform in China inevitably pushed enterprises to transfer their financing resource from governmental financial support to commercial loans from commercial banks in the early 1980s. After 1990, the development of Chinese security markets provided new financing channels to enterprises. However, in order to guarantee the leadership of state-owned economy, the sustainability of production and the stability of economic reform, the Chinese government still insisted on leading capital allocation. As a result, private enterprises suffer so-called "Ownership Discrimination" in financing effort.

China migrated through several phases in the development of non-state-owned economy. During the *experimental phase*, which took place form 1978 to 1986, the Chinese government relaxed socialist ideological constraints, revise the constitution and provided legal status and legitimacy for private commercial. However, during the *experimental phase* the Chinese government was not very enthusiastic in developing the non-state-owned economy. It was hard for private enterprises to receive financial fund from state-owned financial institutions. The main source of financing for private enterprises during the *experimental phase* was through internal financing. During the *fine-tuning phase*, which took place from 1987 to 1991, legislation and policy measures expanded private and cooperative joint ventures. Despite the outbreak of the "June 4" in 1989 (Tiananmen Event), the legal, institutional and physical infrastructure was established to stimulate non-state-owned economy during this period. During the *fine-tuning phase*, external financing accounted for a larger proportion of private enterprise corporate financing for two reasons. First, the Chinese government's attitude to private economy became positive and active. Secondly, economic reforms within state-owned financial institutions pushed these institutions to award commercial loans to private enterprises based upon the market principles of risk and return. However, private enterprises were still excluded from equity financing in the stock market. During the *endorsement phase*, which occurs after 1992, the Chinese government aimed at full-scale economic liberalization. One significant political event was Mr. Deng's speech in October 1992. Deng reconfirmed China's determination to establish a ''Socialist-market economy'' as a response to Chinese people's common doubt about the opening policy after the "June 4" Event in 1989. The deep reform in state-owned financial institutions and the expansion of the policies facilitating private enterprises' access to financing created a wide financing channel for private enterprises, including equity financing in stock market. As of 2007, there are 410 privately-owned listed companies in China, accounting for over 30 percent of the total listed companies.

While the financing channel has widened for private enterprises, has "Ownership Discrimination" by banks against private enterprises been eliminated? According to the "Trade-off" theory in corporate finance, a company determines its optimal capital structure by trading off the benefits of tax shield from debt against the costs of bankruptcy. A deviation from the optimal capital structure causes the loss in the company's market value. Thus, companies will take positive steps to offset deviations from their optimal capital structure. The speed at which a company adjusts its capital structure depends on the financial friction it faces. The higher financial friction a company faces, the more slowly the company adjusts its leverage towards the target leverage (Flannery & Rangan, 2006). Therefore, if private publicly-traded companies face higher financial friction in financing than state-owned publicly-traded companies, private companies will adjust towards the target leverage more slowly than state-owned companies, ceteris paribus.

3. Theoretical Background

The investigation on whether or not a corporate pursues an optimal capital structure has been one of the most active inquiries in finance since Modigliani and Miller's irrelevance proposition in 1958. There are two academic camps on the subject of optimal capital structure. To the extent that we identify differences between state-owned company capital structure adjustment and private company adjustment, we can provide insight into the correctness of these camps.

The advocators of optimal capital structure state that firms have a target debt-equity ratio that minimizes the costs of prevailing market imperfections, such as taxes, bankruptcy costs and agency costs. The Modigliani and Miller (1961) Theorem tells us that the value of the levered firm, ceteris paribus, equals that of the unlevered firm plus the value of the debt tax shield. Kraus & Litzenberger (1973) take the associated penalties with bankruptcy into account and show that the market value of a levered firm equals the unlevered market value, plus the corporate tax rate times the market value of the firm's debt, less the complement of the corporate tax rate times the present value of bankruptcy costs. When firms are subject to stochastic bankruptcy cost and corporate income taxes, "optimal capital structures involve less debt financing than the maximum amount of borrowing allowed by the capital market, and, hence, shareholder-wealth-maximizing firms will search for optimal capital structures rather tan simply maximize their borrowing" (Kim, 1978: 47). After taking non-debt tax shields, such as accounting depreciation, depletion allowances, and investment tax credits, and differential personal taxes into account, DeAngelo and Masulis (1980) state that each firm in market equilibrium has a unique interior optimum leverage decision. Managers act as agents on behalf of the owners of company. Jensen (1986) points out that

the debt can motivate organizational efficiency for two reasons: (1) debt reduces the cash flow available for managers to spend in discretionary private benefits so that the agency costs of free cash flow are reduced; (2) shareholder and managers are motivated by the threat of failure to pay back debt. The leverage should be increased until the marginal cost of debt besides bankruptcy costs equals the marginal benefit of debt. Jensen emphasizes that the role of debt in motivating organizational efficiency is particularly important to growing organizations with generate large cash flows On a conceptual level Jensen's reasoning can be applied to state owned companies. Managers of state owned companies are likely entrenched and may more easily pursue private benefits under a capital structure that is low in debt.

The opponents of the existence of an optimal capital structure largely base their theories on the assumption of information asymmetry between managers and investors. A corporation's capital structure largely depends on the management discretion which is influenced by stock prices fluctuation. The famous pecking order theory is among these theories. This theory tells us that the information asymmetry exists between managers and investors (the owners). Managers act to maximize the value of the existing shareholders and will raise equity only if the existing stock is overvalued. Investors recognize this objective of management. The result is that management first finances through internal funds, followed by debt issuance, and then finally equity (Donaldson, 1961; Myers, 1984; Myers & Majluf, 1984). Baker and Wurgler (2002), under the so-called Timing Hypothesis find that unlevered firms tend to be those that raised funds when their market-to-book ratios were high and that levered firms tend to be those that raised funds when their market-to-book ratios were low. However, Razin et al. (2001) draw an opposite conclusion that debt is preferred to equity since the choice of equity finance signals that the firm's shares are overvalued. Also, Welch (2004) shows that the U.S. corporations do little in adjusting capital structure to counteract the effect of the fluctuation of stock price on its leverage.

There is an extensive body of literature testing trade-off theory and pecking order theory. There is no consistent conclusion. Some studies find that firms adjust actively toward optimal capital structures (Virolainen, 1990; Kjellman & Hansen, 1995; Loof, 2004; Leary & Roberts, 2005). Some studies confirm pecking order theory but contradict trade-off theory (Titman & Wessels, 1988; Baskin, 1989; Pinegar and Wilbricht, 1989; Fama & French, 2002). It should be noted that using the dynamic approach to empirically study corporate capital structure has been a growing trend in the literature since Jalivand and Harris (1984) firstly modeled the dynamic process whereby a firm adjusts toward long-run financial targets. Especially, in the studies of Banerjee et al. (2000), Kumbhakar et al. (2002) and Fama and French (2004), researchers did a good job to deal with the combination of panel data of firms with dynamic adjustment model. For companies in China, the Yuan (2002) confirms the trade-off theory by analyzing listed companies in Chinese stock markets for the period of 1995-2002. In addition, based on the data of listed companies in Chinese A stock markets from 1998 to 2005, Wang et al. (2007) provide the evidence for the existence of optimal capital structures in Chinese firms' financial policies and firms' effort in adjusting toward optimal capital structures.

While a lot of studies about optimal capital structure focus on the corporate financing choice between bond issuance and equity issuance, a stream of studies turn to investigate the role of bank loans in corporate financing. The financial intermediaries specialize in collecting information about borrowers, interacting with borrowers over time, monitoring loan contracts with firms, and even directly control the firms' investment decisions. Therefore, the financial intermediaries are thought to be able to partially alleviate the information asymmetry between inside managers and investors (Leland and Pyle, 1977; Ramakrishnan and Thakor, 1984; Carey, Post and Sharpe, 1998; Diamond, 1984; Haubrich, 1989). The model of Bolton & Freixas (2000) aiming at comparison between equity, bonds and bank debt shows that compared with bond financing, bank lending is more flexible but more expensive. As a result, only those firms in financial distress would turn to bank debt. Diamond (1991) links the credit rating to financing choice and concludes that higher-credit-rated corporations choose bank loans, especially under the circumstance of high anticipated interest rates and low anticipated nationwide profitability. These studies reveal the conclusion that the source of capital or the relationship between firms and financial intermediaries affects capital structure. Analyzing 3,404 small firms covered by the 1988 and 1989 National Survey of Small Business Finances in the US, Petersen and Rajan (1994) find that the close ties with institutional creditors are highly related to the availability of financing but not the price of credit. In contrast, Berger and Udell (1995) find that borrowers with longer banking relationships pay lower interest rates and less likely to pledge collaterally.

In the context of recognizing the important role of bank loans in corporate capital structure, some scholars begin to study corporate capital structures in bank-dominated systems. Loof (2004) find large cross-country differences in determinants to optimal capital structure by comparing the arm's-length systems in US and UK with the bank-dominated systems in Sweden, Finland, France, Germany and Italy. The economic transition that China is experiencing is featured, to some extent, by the transformation of financial system from a relation-based bank-dominated system, targeting at an arm's-length security market dominated system. Despite the progress made, state-owned firms still have advantages over private firms in securing financing. First, since state-owned firms have political objectives since as employment goals, it is likely that if they are in financial distress, the government will support through direct investment, loans, and/or reduced taxes. The government can also write off prior loans or

change the terms of prior loans. These "soft budget constraints" are commonly seen in transition and socialist economies. (Frydman, et al., 1999). For state-owned firms, their close relationship with the government creates a critical financial source for bank loans (Sun, et al., 2005). In contrast, when private firms search for bank loans, they face "ownership discrimination" because of both the limited loan resource remaining to private firms, which results from the state-owned firms' inelastic demand of bank loans, and the inefficient operation of state-owned commercial banks (Zhang, 2000; Lu & Yao, 2004; Tian, 2005; Fang, 2007). Needless to say, in the context that bank loans play an important role in corporate financing in China, we will carefully take bank loans into account in the following model specification and empirically examination.

4. Model Specification

First of all, we primarily measure capital structure by a firm's leverage, i.e., debt-asset ratio (Fama and French, 2002).

$$L_{i,t} = \frac{D_{i,t}}{D_{i,t} + E_{i,t}}$$

Where $L_{i,t}$ is the firm i's leverage at time t; $D_{i,t}$ denotes the value of firm i's debt at time t; $E_{i,t}$ denotes the value of firm i's equity at time t. Here, we specify the following model to test whether private listed companies face "Ownership Discrimination" in financing,

$$L_{i,t} = \beta X_{i,t} + \varepsilon_{i,t}$$

where $L_{i,t}$ is firm i's observed leverage at time t; β is a coefficient vector; $X_{i,t}$ is a vector of firm i's financial characteristics at time t. Particularly, corporate ultimate control, $CTRL_{i,t}$, is included in $X_{i,t}$ as a explanatory variable. $CTRL_{i,t}$ is a time-variant dummy variable that takes on the value of 1 if a firm is ultimately controlled by the state or state agency; and 0, otherwise. Here, it is worthwhile to briefly clarify the concepts of corporate control and corporate ownership. Ownership refers to the right to claim dividends. "Control right is the right of a common stock shareholder to vote, in person or by proxy, for members of the board of directors and other corporate policies such as the issuance of senior securities, stock splits and substantial changes in operations." (Du and Dai, 2005: 60) In recent ten years, although a lot of Chinese firms were privatized when they became listed companies in stock markets, Chinese government still controls corporate governance of these firms by different means. The firms that the government firmly controls are not different from those in which the government is large shareholders. In order to more exactly measure the effect of corporate relationship with the government on corporate capital structure in Chinese firms, we substitute ultimate corporate control to corporate ownership.

As we mentioned before, corporate ownership may not only influence capital structure, but may also influence the leverage adjustment speed. Due to financial frictions that prevent firms from adjusting immediately to their target capital structure, we assume the adjustment towards to target leverage to be partial, i.e., the adjustment cannot be completed within one period (Fama & French, 2002; Loof, 2004; Flannery & Rangan, 2006). A standard partial adjustment equation is given by

$$L_{i,t} - L_{i,t-1} = \delta(L^*_{i,t} - L_{i,t-1})$$

where $L^*_{i,t}$ is the target leverage; δ is the adjustment parameter reflecting the gap between a firm's desired leverage adjustment and its actual leverage adjustment and $|\delta| < 1$. Here, we do not allow the adjustment parameter to vary across firms and over time. However, taking a firm's ownership into account, we specify two adjustment parameters: one is the average adjustment parameter for state-owned firms, the other is for private firms. Thus, we have

$$\begin{cases} L_{i,t} - L_{i,t-1} = \delta_1(L^*_{i,t} - L_{i,t-1}) \\ L_{i,t} - L_{i,t-1} = \delta_0(L^*_{i,t} - L_{i,t-1}) \end{cases} \quad (4)$$

Where δ_1 is the adjustment parameter for state-owned firms and δ_0 is the adjustment parameter for private firms. Eq. (4) equals

$$L_{i,t} - L_{i,t-1} = \delta_0(L^*_{i,t} - L_{i,t-1}) + (\delta_1 - \delta_0)(L^*_{i,t} - L_{i,t-1})CTRL_{i,t} \quad (5)$$

However, $L^*_{i,t}$ is unobserved. According to the study of Flannery and Rangan (2006), the target leverage can be expressed as

$$L^*_{i,t} = \beta \mathrm{X}_{i,t-1} \quad (6)$$

Substituting (6) into (5) and rearranging gives us an estimable model (2)

$$L_{i,t} = \delta_0\beta \mathrm{X}_{i,t-1} + (\delta_1 - \delta_0)\beta \mathrm{X}_{i,t-1}CTRL_{i,t} + (1-\delta_0)L_{i,t-1} + (\delta_0 - \delta_1)L_{i,t-1}CTRL_{i,t} + \mu_{i,t} \quad (7)$$

where $\mu_{i,t}$ is error terms. The model specification implies that the leverage-adjustment parameter for private firms is given by 1 minus the coefficient estimate of $L_{i,t-1}$; the leverage-adjustment parameter for state-owned firms is given by 1 minus the sum of the coefficient estimate of $L_{i,t-1}$ and the coefficient estimate of $L_{i,t-1}CTRL_{i,t}$.

5. Variables and Data

The data of corporate funds flow statements is indispensable in the analysis of corporate capital structure. The listed companies in Chinese stock markets did not begin reporting funds flow statements until 1998. Hence, our sample period begins in 1998. We choose the non-financial companies listed in the "Full Circulation A-stock Market" at the end of 1998 as samples and track their financial information annually until 2007. We eliminate financial firms such as banks, mutual funds and insurance companies from the sample, because their debt levels are not choice variables but instead driven by regulation. As a result, their debt-like liabilities are not strictly comparable to the debt issued by non-financial firms. Our data are provided by Wind Database. Lastly, we exclude firms whose assets are negative and with less than 3 firm-year observations,

and obtain a sample of the data for 820 firms with 7,722 firm-year observations.

Capital structure can be measured by either book value or market value. We follow Fama & French (2002) and restrict the analysis in this paper to book leverage, which is defined as book debt divided by the sum of book debt and book equity. The book debt is defined as the sum of short-term loan, long-term debt due in a year and long-term debt. We choose book ratios for three reasons. First, because listed companies in Chinese stock markets always have several types of shares simultaneously: A stocks, B stocks, H stocks and non-circulation stocks, it is really hard to calculate the market leverage ratios for Chinese listed companies. Second, Although "finance theory tends to downplay the importance of book ratios, with previous research largely analyzing market-valued debt ratios", the results from book leverage ratios are still comparable to those results from market leverage ratios when authors analyze both ratios (Flannery and Rangan, 2006: 471). Third, "since market value increases with profitability, there is no prediction about market leverage" (Fama and French, 2002: 9). In addition, we select the explanatory variables for observed leverage and target leverage that are used in the study of Flannery & Rangan (2006). These variables are:

MB: Market to book ratio of assets. The market value of asset is defined as the sum of the market value of circulated stock (float), non-tradable shares time book value of asset per share and book debt.

EBITDA_A: the ratio of earnings before interest, depreciation and taxes as a proportion of total assets to total assets.

SIZE: natural log of total assets.

FA_A: the ratio of fixed assets to total assets

DEP_A: the ratio of depreciation to total assets.

Indm: median debt ratio of firm i's industry, which is the first level of industry classification in the industry classification system defined by China Securities Regulatory Commission, at time t. This variable can be used to control for unobserved industrial factors.

Prior studies view R&D expenses as an important factor in determining corporate capital structure (Fama & French, 2002; Flannery & Rangan, 2006). However, Chinese listed companies are not required to report R&D expenses to the public in the annual fund flow statements. As a result, we cannot include R&D expenses as a control variable. Table 1 provides the summary statistics of all variables involved in this study.

<Insert Table 1 here>

6. Empirical Findings

<Insert Table 2 here>

We first analyze the impact of corporate ownership on corporate capital structure. Table 2 shows the test for difference between leverage means. The average book debt ratio is 33.8 percent for state-owned firms and 40.3 percent for private firms. The difference between means is significant at the 1% level. These results tell us that there is systematic difference between state-owned firms and private firms in book debt ratio.

<Insert Table 3 here>

In our second step we model Equation (2) by regressing leverage on the explanatory variables identified from the literature as well as the corporate control variable. The regression results are shown in Table 3. Column 1 shows the estimation result for the pooled cross-sectional model. The estimated coefficient of $CTRL_{i,t}$ is -0.06 and statistically significant at the 1% level. Column 2 shows the estimation result for a year fixed effects model. The adjusted R-square of the pooled model is 0.1888 and the adjusted R-square year fixed effects model is 0.1935. The coefficient estimates in both models are qualitatively similar in magnitude and both are statistic significance at the 1% level. Column 3 shows the estimation result for the model including both firm fixed effects and year fixed effects. Compared the adjusted R-squares in Column 1 and Column 2, the adjusted R-square of 0.7316 in Column 3 is much higher, which indicates that the firm dummies are important in controlling for unobserved firm heterogeneity. The estimated coefficient of $CTRL_{i,t}$ is -0.029 and statistically significant at the 1% level. It means that the average debt ratio of the state-owned firms is, ceteris paribus, 0.029 lower than that of the private firms in China. The regression results in Table 3 provide us with a conclusion consistent with that in Table 2, and convince us that after controlling for important corporate financial characteristics, there is systematic difference between state-owned firms and private firms in capital structures.

Our results can be interpreted in three ways. First, we provide evidence of management entrenchment in state-owned firms. As debt can have a disciplining effect on management, it appears that the management of state-owned firms prefers equity to debt. The second interpretation is that state-owned firms lack an incentive to use debt due to the lack of a debt tax shield. There is conflict of interests between large shareholders and minority shareholders (La Porta et al., 1999; Claessens et al., 2002). When the state is the large shareholder of a firm, the benefit of private shareholder, besides the possible debt tax shield, is very likely to be ignored. Third, since most of state-owned firms are large firms in terms of both assets and the number of employees and have sufficient internal financial funds, they do not, or might not have to, utilize the leverage. As a result, the leverage ratios for state-owned firms are low, although these firms are adjusting regularly management policies during the era of transition economies. Although our empirical results do not disentangle these three possible interpretations, the contrasting debt ratios between state owned and private firms lends support to the stream of literature where capital structure matters; otherwise there would

not be a systematic difference between the state-owned and private firms.

Let us turn to other independent variables in Table 3. The results are consistent with the hypotheses of Flannery and Rangan (2006). The negative sign of EBITDA_A implies that a firm with higher earnings could prefer lower leverage. The negative sign of MB means that since higher market to book ratio of assets is signal of higher expected future growth, a firm with high market to book ratio of assets would protect the expected future growth by limiting leverage. The positive sign of SIZE indicates larger firms tend to operate with higher leverage. The positive sign of FA_A implies that a firm with greater tangible assets tends to operate with higher leverage. The negative sign of DEP_A implies that a firm with more depreciation needs less tax shield from debt financing.

<Insert Table 4 here>

As we mentioned before, compared with state-owned firms, private firms encounter greater financing friction, but might be more active to adjust their capital structure to maximize shareholders' benefit. We investigate the ambiguous impact of corporate ownership on the dynamics of corporate capital structure by estimating Equation (7). The regression results are shown in Table 4. We show results for a pooled cross-sectional mode in Column 1, results for a year fixed effects model in Column 2, and results for a firm and year fixed effects model in Column 3. We find that the model strongly explains the dynamic of capital structure (the adjusted R-square is 0.7057). The inclusion of the lagged dependent variable is a critical variable in obtaining the high adjusted R-squared.

Recall from the model that the leverage-adjustment parameter for private firms is given by 1 minus the coefficient estimate of $L_{i,t-1}$ and the leverage-adjustment parameter for state-owned firms is given by 1 minus the sum of the coefficient estimate of $L_{i,t-1}$ and the coefficient estimate of $L_{i,t-1}CTRL_{i,t}$. Both $L_{i,t-1}$ and $L_{i,t-1}CTRL_{i,t}$ are statistically significant at the 1% level in all three models. Using the firm year fixed effects model, we find that private listed firms adjust, on average, towards optimal capital structures by 53.5% (1-0.465) annually, i.e. for private firms, the actual adjustment amount in capital structures is 53.5% of the target adjustment amount. In combination with the estimated coefficient of $L_{i,t-1}CTRL_{i,t}$, we find that the state-owned listed firms adjust, on average, towards optimal capital structure by 47.6% (53.5%-0.059) annually. These results indicate that state-owned listed firms adjust toward optimal capital structures slower than private listed firms. We can see that although private firms have more difficulty in financing than state-owned firms, private firms are more active than state-owned firms to adjust toward optimal capital structures in order to maximize the benefit of shareholders.

Let us turn to other explanatory variables in Table 4. The involvement of interaction terms causes multi-collinearity problems in the regression (See Table 5). As a result, most of the variables representing firm characteristics are statistically significant either in interaction term or in single term, rather in both. However, the findings that some interaction terms are statistically significant also provide us with further evidence that the dynamics of capital structure for state-owned firms is different from that for private firms. It should be noted that theoretically speaking, the estimates of δ_0, δ_1 and β in Equation (7) are overidentified. In other words, we can have more than one numerical value can be obtained for some of the parameters. The insignificance of some parameter estimates caused by multicollinearity makes it more difficult in addressing the question of overidentified. Here, we simply get parameter estimates for δ_0 and δ_1 from the coefficient estimates for $L_{i,t-1}$ and $L_{i,t-1}*CTRL_{i,t}$.and ignore the estimates of β.

7. Conclusion

Based on panel data of China's listed firms from 1998 to 2007, we not only compare the static capital structures of state-owned and privately-owned listed firms, but also compare the dynamics of the capital structures of state-owned with that of privately-owned listed firms. During the era of economic transition, private firms in China face "ownership discrimination" in financing activities, both debt financing and equity financing. However, market forces, outside monitoring, and compensation plans all incent the management of private firms to operate under and migrate toward optimal capital structures to maximize shareholders' benefit. Based on the different incentives of the managers of private and state-owned firms and different situations in which they conduct financing activities, we expect, ceteris paribus, that the capital structures of private and state-own firms differ. However, the impact of corporate ownership on corporate capital structure is ambiguous from the theoretical perspective. From our empirical studies, we find that state owned firms have lower debt to assets ratios. Our interpretation is that the managers of private firms build capital structures that are conducive to maximizing shareholders' benefits. We then investigate the difference in dynamics of the capital structure between these two groups of firms. Further study results show that during the adjustment of capital structure, private firms adjust more quickly to an optimal capital structure than state-owned firms. Our findings support the hypothesis that when a state-owned firm is privatized, that firm becomes subject to the disciplining forces of the market and more active to pursue maximum market value of the firm, thus the adjustment to an optimal capital structure to be faster for private firm than for state-owned firm.

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Table 1. Data Summary

Variable	Mean	Median	S.D.	Max.	Min.
BDR	0.3531	0.3467	0.2099	0.9986	-0.0340
MB	1.6054	1.3852	0.7478	16.7606	0.8393
EBITDA_A	0.0318	0.0394	0.0994	2.0371	-3.0982
SIZE	4.9785	4.9017	0.9861	9.2283	1.3784
FA_A	0.3450	0.3228	0.1926	0.9850	0.0008
DEP_A	0.0230	0.0195	0.0165	0.2151	-0.0337
Indm	0.3502	0.3549	0.0605	0.4972	0.0890
CTRL	0.7687	1.0000	0.4217	1.0000	0.0000

Table 2. Testing Difference between Leverage Means

State-owned Firms	Private Firms
N=5936	*N*=1786
Leverage Mean=0.338	*Leverage Mean*=0.403
S.D.= 0.206	*S.D.*=0.216
t value=11.27***	

Table 3. Estimation Results for Eq. (2)

	(1)	(2)	(3)
$MB_{i,t}$	-0.024	-0.037	-0.017
	(-7.68***)	(-10.00***)	(-5.97***)
$EBITDA\_A_{i,t}$	-0.648	-0.653	-0.473
	(-29.06***)	(-2912***)	(-30.37***)
$SIZE_{i,t}$	0.028	0.024	0.108
	(11.15***)	(9.03***)	(26.79***)
$FA\_A_{i,t}$	0.159	0.159	0.169
	(11.14***)	(11.15***)	(11.18***)
$DEP\_A_{i,t}$	-1.784	-1.641	-0.548
	(-10.70***)	(-9. 57***)	(-3. 49***)
$Indm_{i,t}$	0.513	0.621	0.393
	(13.66***)	(13.30***)	(8.13***)
$CTRL_{i,t}$	-0.060	-0.062	-0.029
	(-11.29***)	(-11.58***)	(-4.88***)
Constant	0.127	0.163	-0.180
	(6.44***)	(5.97***)	(-3.30***)
Firm Fixed Effects?	/	/	Yes
Year Fixed Effects?	no	Yes	Yes
N	7722	7722	7722
(Adj) R-Square	0.1888	0.1935	0.7316

Note: t-statistics in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%

The selection of firm fixed effects in Column 3 is based on the Hausman test we apply to compare the fixed-effects model and the random-effects model. The test rejects the null hypothesis that there is no systematic difference between the fixed-effects model and the random-effects model at the 1% level.

Table 4. Estimation Results for Eq. (7)

	(1)	(2)	(3)
$MB_{i,t-1}$	0.007	0.002	0.001
	(1.76*)	(0.57)	(0.19)
$EBITDA\_A_{i,t-1}$	0.048	0.044	-0.038
	(1.97**)	(1.79*)	(-1.48)
$SIZE_{i,t-1}$	0.011	0.010	0.041
	(3.35***)	(3.13***)	(7.08***)
$FA\_A_{i,t-1}$	0.016	0.014	0.029
	(0.81)	(0.75)	(1.14)
$DEP\_A_{i,t-1}$	-0.606	-0.449	-0.662
	(-2.47**)	(-1.82*)	(-2.09**)
$Indm_{i,t-1}$	-0.034	0.038	0.296
	(-0.78)	(0.81)	(4.06)
$CTRL_{i,t-1}$	-0.004	-0.009	0.00029
	(-0.42)	(-1.07)	(-0.03)
$L_{i,t-1}$	0.812	0.812	0.465
	(56.63***)	(56.89***)	(24.03***)
$MB_{i,t-1}*CTRL_{i,t}$	-0.007	-0.008	-0.002
	(-1.45)	(-1.80*)	(-0.41)
$EBITDA\_A_{i,t-1}*CTRL_{i,t}$	-0.072	-0.059	-0.093
	(-2.09**)	(-1.73*)	(-2.56**)
$SIZE_{i,t-1}*CTRL_{i,t}$	-0.010	-0.010	0.00035
	(-2.96***)	(-2.93***)	(0.07)
$FA\_A_{i,t-1}*CTRL_{i,t}$	0.020	0.021	0.002
	(0.92)	(0.97)	(0.08)
$DEP\_A_{i,t-1}*CTRL_{i,t}$	-0.004	-0.078	0.069
	(-0.01)	(-0.29)	(0.20)
$Indm_{i,t-1}*CTRL_{i,t}$	0.001	0.005	-0.145
	(0.03)	(0.10)	(-2.17**)
$CTRL_{i,t-1}*CTRL_{i,t}$	0.025	0.030	0.036
	(1.58)	(1.92*)	(2.23**)
$L_{i,t-1}*CTRL_{i,t}$	0.061	0.059	0.059
	(3.61***)	(3.53***)	(2.69***)
Constant	0.045	-0.003	0.031
	(2.54**)	(-0.16)	(0.54)
Firm Fixed Effects?	/	/	Yes
Year Fixed Effects?	no	Yes	Yes
N	6902	6902	6902
(Adj) R-Square	0.7057	0.7090	0.7773

Note: t-statistics in brackets; * significant at 10%; ** significant at 5%; *** significant at 1%

The selection of firm fixed effects in Column 3 is based on the Hausman test we apply to compare the fixed-effects model and the random-effects model. The test rejects the null hypothesis that there is no systematic difference between the fixed-effects model and the random-effects model at the 1% level.

Table 5. VIF test

Variable	VIF	Tolerance
$MB_{i,t-1}$	2.74	0.364879
$EBITDA\_A_{i,t-1}$	2.52	0.397204
$SIZE_{i,t-1}$	4.84	0.206696
$FA\_A_{i,t-1}$	7.18	0.139209
$DEP\_A_{i,t-1}$	8.47	0.118001
$Indm_{i,t-1}$	3.90	0.256575
$CTRL_{i,t-1}$	6.95	0.143922
$L_{i,t-1}$	4.56	0.219456
$MB_{i,t-1}*CTRL_{i,t}$	6.94	0.144078
$EBITDA\_A_{i,t-1}*CTRL_{i,t}$	2.80	0.357406
$SIZE_{i,t-1}*CTRL_{i,t}$	32.98	0.030323
$FA\_A_{i,t-1}*CTRL_{i,t}$	13.23	0.075592
$DEP\_A_{i,t-1}*CTRL_{i,t}$	12.65	0.079076
$Indm_{i,t-1}*CTRL_{i,t}$	29.29	0.034136
$CTRL_{i,t-1}*CTRL_{i,t}$	23.83	0.041969
$L_{i,t-1}*CTRL_{i,t}$	7.61	0.131337