Government Ownership, Concentration,

and the Capital Structure of firms:

Empirical Analysis of an Institutional Context from China

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Abstract

Institutional context influences corporate financing behavior of firms and emerging economies provide an interesting scenario to investigate this phenomenon. Therefore, in this study, we focus on the capital structure decision of Chinese listed firms which continues to have government as a significant shareholder. We choose the sample period after the Split-Share Reform so that we can distinguish the impact of ownership concentration from government ownership by creating a group of non-government-concentrated firms and a group of government-concentrated firms. For the former group, we find non-government concentration positively influences all leverage ratios, while government ownership has no impact. For the latter group, we find government ownership positively influences all leverage ratios. But for short-term debt and total debt, this positive impact turns negative when the firms are dominantly owned by government. The results suggests the changing role of government ownership in capital structure.

Key words
Capital structure, leverage ratios, ownership structure, government ownership, ownership concentration

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1. Introduction

Capital structure decisions are influenced not only by firm- and industry-specific factors, but also institutional factors. The seminal study of Rajan & Zingales (1995) analyzing seven developed countries shows the importance of these three types of factors. Although financing decisions in emerging economies are affected by the same variables as in developed countries, Booth *et al.* (2001) show that distinctive institutional features in emerging countries also play important roles. The vast number of emerging countries therefore provide an interesting scenario to study a variety of institutional characteristics. Throughout the last decade, China - the world's largest emerging economy - has attracted increasing academic interests to study different institutional contexts. Several authors (Chen, 2004; Allen, Qian, & Qian, 2005; Zou & Xiao, 2006; Huang & Song, 2006; Bhabra et al., 2008) report interesting findings in the financing behavior of Chinese firms: these firms rely on informal financing channels, prefer short-term finance and use substantially lower amounts of long-term debt. Ayyagari *et al.* (2010) document that in China local commercial banks provide the highest amount of financing (30%) and this is used by only the very large firms. The bulk proportion of financing comes from self-fund raising, which includes sources such as retained earnings, informal sources, loans from family and friends, trade credits, investment funds, and equity. Studies (Chen, 2004; Zou & Xiao, 2006) also investigate the factors that influence the observed capital structure of Chinese firms and find that the well-documented firm-specific determinants such as firm size, profitability, growth opportunity and asset tangibility are also relevant in China. Yet, their low explanatory power calls for more research on the impact of institutional factors on the capital structure.

A notable institutional context in China is that ownership of publicly traded firms is highly concentrated and the government is a major player in corporate finance (Sun & Tong, 2003). Such an ownership structure matters to capital structure choices because

it can affect agency incentives. There, however, only exists a limited amount of related studies and inconsistent results.

Regarding the studies on ownership concentration among Chinese firms, Cai, et al. (2008) show no impact of concentration on debt maturity, while Liu, et al. (2011) find a non-linear impact of ownership concentration on the use of both short-term and long-term debt.

Empirical results about government ownership is more mixed. Studies like Huang & Song (2006) and Zou & Xiao (2006), show no impact of government ownership on the leverage of Chinese firms, while Bhabra et al. (2008) and Li, *et al.* (2009) document a positive impact on long-term debt for listed and non-listed Chinese firms respectively. Pessarossi & Weill (2013) show that government ownership facilitates firms in corporate bond issue.

In addition to the limited amount of research, the existing studies all analyze a time period before the China's secondary privatization during 2005-2007, namely the Non-Tradable Share Reform[1]. This Reform transformed non-tradable shares to tradable shares and set the stone to change the ownership structure of Chinese listed firms. With reduced government ownership, corporate performance is improved, yet few study is made on its impact on financing decisions. This paper fills this void.

Using the recent data on Chinese listed firms, we make three contribution to the extant literature. First, we are among the very few studies about the impact of ownership concentration on the leverage decision. Ownership concentration has been a significant determinant of capital structure in both developed and developing economies (Brailsford, OIiver, & Pua, 2002; Pindado & La Torre, 2011; La Bruslerie & Latrous,

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[1] It is named so in an official report (CSRC, 2010), and also named in academic literature as Split-Share Structure Reform (Firth, et al. 2010; Hou, *et al.*,2012; Liao, et al., 2014). In this paper, we will denote it simply the Reform.

2012; Céspedes, González, & Molina, 2010). Yet the predominance of government ownership among Chinese listed firms before the Reform obviated the need to study concentration varibles, and that explains why most researches focus on government ownership alone rather than including the concentraiton variables. The Reform of 2005 created a significant shift in the ownership structure of Chinese listed firms. The marked decline of government ownership leads to considerate shareholdings by non-government entities like private enterprises, mutual funds and individuals. These practicalities ask for a study on the impact of ownership concentration separately from government ownership. Second, the Reform allows the government shares to be tradable at their market price, and it proves to improve the effciency of the Chinese stock market (Firth, *et al.*, 2010, Hou *et al.*, 2012;), because crporate financial decisions are made to maximize shareholder's value rather than to achieve the political and social objectives of the state shareholders. Given better aligned incentives, we are interested to see the impact of government ownership on leverage decision in the post Reform period. Thirdly, among the very few research in the post-Reform period, the governemnt ownership is inaccurately measured by its holdings of only non-tradable shares or shares with trading restriction. The large amount of government holdings in tradable shares is not taken into account, which underestimates the actual government ownership. We correct this by hand-collecting shareholding information from annual reports and carefully counting the government shareholdings in both non-tradable and tradable shares.

To separate the impact of ownership concentration from government ownership, we creat two groups out of the Chinese listed firms. One group is the non-government-concentrated firms where government is *not* the largest shareholder. We find the non-government concentration positively influences leverage; government as a minority shareholder has little impact. Another group is the government-concentrated firms where government is the largest shareholder. We find government ownership positively influences all leverage ratios; but for short-term and total debt ratios, this positive impact change signs when government ownership is considerably high.

The rest of the paper is organized as follows: Section 2 briefly presents the recent institutional arrangement related to share ownership and financing of firms in China. A review of the theoretical arguments of ownership impact on capital structure is presented in the following section. Section 4 describes the data and methodology. Section 5 discusses the empirical results. Section 6 concludes the paper.

2. Government ownership and corporate financing in China

Since the start of China's economic reform in the late 1970s, the attempt to reduce government ownership in Chinese corporates has never stopped. When the two Chinese stock exchanges (Shanghai Stock Exchange and Shenzhen Stock Exchange) were founded in early 1990s, the first lot of IPO firms were large or medium-sized State-Owned Enterprises (SOEs). This was the so-called share issue privatization by the Chinese government in 1990s to reform its SOEs. Part of the corporate ownership were transferred to private hands. Yet with an ideology of the socialist market economy, the state still retained a substantial portfolio of the ownership of privatized enterprises (Sun & Tong, 2003). The state control is kept by creating different share classes. Common shares in China are classified into four categories: A-shares, B-shares, H-shares and N-shares. A-shares are the largest part of the stock market and can only be sold to domestic investors. A-shares include state, legal person, employees and public shares[2]. State and legal person shares are non-tradable and largely controlled by the government and its agencies (Bhabra et al., 2008)[3]. In this study, we define government ownership by the shares held by government, its agencies and SOEs.

The predominance of government ownership has obstructed the proper development of

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[2] State shares are held by government and its agencies. Legal person shares are held by domestic enterprises or institutions with a legal person status. They represent not only state interests, but also private and collective interests. Employee shares are held by corporate employees. These three types of share were prohibited from trading. Public shares are shares issued to the public, also called tradable A shares.

[3] Some legal person shares are ultimately owned by government controlled organizations such as SOEs.

Chinese stock market (Beltratti, et al. 2012). Because it was not tradable at the market price, the government-held shares were priced at the book value of the assets and government agents could not benefit from capital gains. The incentive to improve firm performance is almost absent for government agencies. To solve this issue, the Split-Share Reform starting in 2005 lifted the trading restriction on state and legal person shares, and made these shares publicly tradable. Practically, holders of non-tradable shares compensated the holders of tradable shares by giving out a portion of their shares at mutually agreed prices. By the end of 2007, the reform was completed by the majority of the firms concerned (CSRC 2008, Firth, et al., 2010, Li, *et al.*, 2011; Liao, *et al.*, 2014,).

One the one hand, the Split-Share Reform diluted government ownership since additional shares were granted to former tradable shareholders who were private investors. On the other hand, the interest of government agents is now aligned with other shareholders and government agencies become concerned with share price movements since their shares are also priced to market[4]. With this improved corporate governance, the impact of government on its holding firms' capital structure is yet to be examined.

Due to a nascent stock market and a small public debt market, Chinese listed firms have been relying heavily on bank borrowing. The World Bank statistics in 2012 shows that the domestic credits by banks as a percentage of the country's GDP is 134% for China, in contrast to 50% for the U.S. and 88% for the world average. The public capital market only started to play an increasingly important role in financing Chinese corporates with the promulgation of the Securities Law in 1999 (CSRC, 2008). The most recent data available from the National Bureau of Statistics of China shows that the total stock market capitalization rose from 18% in 2005 to 42% of the GDP in 2013. With the

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[4] In the Split-Share Reform, government ownership is often transferred to national social security funds, the evaluation of these funds are based on the stock market performance.

development in the stock market, the financing choice of Chinese listed firms continues to be an interesting topic.

3. Impact on capital structure

Ownership concentration and identity are the two dimensions of ownership structure. In our institutional setting, government ownership is a prominent feature of Chinese listed firms that underwent significant changes during the Reform. Thus in the following we review the effect of ownership concentration and government ownership on capital structure.

Ownership concentration

Extant literature provides several competing hypotheses regarding the relationship between ownership concentration and debt usage. A positive relationship is predicted by the arguments of monitoring, difficult-to-adjust, and dilution avoidance. First, monitoring argument suggests that large shareholders have the incentive and power to monitor and control management (Shleifer & Vishny, 1986). Debt, as a direct and internal disciplinary tool, is thus chosen by large shareholders to reduce management's incentives in non-optimal activities such as perquisite consumption and non-profitable investment (Brailsford, *et al.*, 2002; Pindado & La Torre, 2011). Second, holding a high non-diversifiable stake in the firm, management tends to reduce debt usage to avoid financial distress. The existence of large external shareholders makes it difficult for managers to adjust debt ratio in their own interests (Friend & Lang, 1988). Last, if the cencentated ownership lies with a party who wants to retain control of the firm, such as a family or a government, then debt financing is often preferred to avoid ownership dillution (Driffield, Mahambare, & Pal, 2007).

On the other hand, a negative impact of concentration is expected due to substitution and expropriation. The substitution argument says that large shareholders are actively engaged in monitoring management so that they replace the disciplining role of debt

(Grier & Zychowicz, 1994). The expropriation hypothesis argues that large controlling shareholders, when their control rights exceed cash-flow rights, are incentivized to expropriate minority shareholders by either transferring resources out of the firm or supporting non-profitable projects for their private benefits (Johnson, *et al*., 2000; Shleifer & Vishny, 1997). To do so, they try to avoid credit monitoring.

Empirical studies find a positive relationship in Australia and Spain (Brailsford, *et al*., 2002; Pindado, & La Torre, 2011), but a negative relationship in the UK. In France and Latin American countries, a non-linear relationship is documented (La Bruslerie & Latrous, 2012; Céspedes, *et al.*, 2010).

The impact of ownership concentration on capital structure in China has been sparsely studied. To the best of our knowledge there are only two related articles. Cai, *et al*. (2008) study debt maturity in China, and find that dispersed shareholding leads to more usage of short-term debt relative to long-term debt. A more relevant study by Liu et al. (2011) argue that both monitoring and expropriation hypotheses may be at work among Chinese listed firms. Ownership concentrated on a few largest shareholders leads to a higher debt usage in order to discipline managers. However, due to the lack of protection for minority shareholders in China, excessive concentration can create an incentive for large shareholders to expropriate minority shareholder to pursue their private benefit, thereby avoiding debt financing. This study covers the period of 2002 to 2009 and ignores the confounding effect of government which can be the largest shareholder. Thus, our paper is the first study in the post-Reform period to distinguish the impact of non-government concentration from the impact of government ownership on the leverage decision.

Government ownership

Government ownership is defined as state shares and legal person shares, that are held by the central government, local government and government agencies and SOEs (Delios, Zhou, & Xu, 2008). It is mostly a unique feature of non-market-based

economies, and little research of government ownership is available on the market-based economies with an exception of Dewenter & Malatesta (2001). They study a sample of the world's largest 500 firms, and find that SOEs are more highly levered because SOEs tend to borrow rather than issuing stocks to avoid the dilution of state control and additionally SOEs may enjoy implicit or explicit loan guarantees to borrow at favorable rates. This lowers the risk of financial distress.

Prior studies on Chinese firms have discussed the pivotal role of government ownership in obtaining bank financing (Bhabra *et al.*, 2008; Li *et al.*, 2009; Liu *et al.*, 2011; Zou & Xiao, 2006), echoing the better-access and anti-dilution explanation for more debt usage due to government ownership. The Split-Share Reform asked the government to reduce their shareholdings to hand over firms to more market forces. The incentive to retain control was dampened, yet the impact on debt is unclear.

The other view of the government's impact on debt usage has also been well documented. Severe owner-management conflict arises in SOEs and government has no incentive to monitor and control their managers due to the double delegation and the segregation of voting and cash flow rights (Lin, Ma, Malatesta, & Xuan, 2011; Zou & Xiao, 2006).[5] This gives managers the chance to actually control the firm and tunnel resources from the firm to other uses. One way is to issue equity and to direct raised capital to firms in their personal benefits. Debt, as a disciplinary tool, can constrain overly spending and impose debt covenants. Thus firms with high government ownership and speculative managers tend to avoid debt financing. Especially when the government owner is the parent SOE, the listed firm is often used to raise capital for her parent firm. In addition, when issuing equity firms with high government ownership

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[5] Double delegation says the ultimate owners of the government shares are Chinese citizens, and they delegate management of the state assets to government agencies, which further delegate to managers. The government agencies have the control rights but not the cash rights, and the cash flows are received by Ministry of Finance. The compensation to government agency staff is civil servant salary and independent on the firm performance. Thus the government agencies have no incentive to monitor and control managers.

are more likely to get approval (Li *et al*., 2012).

The Split-Share Reform has mitigated government's incentive to keep control, but also improved the corporate governance by aligning the interest of the government owner and management. These lead to an offsetting effect of government on debt usage, but other forces like better access and exploitation of parent SOEs on debt usage are still at work. This paper thus studies the empirical effect with the post-Reform data and a better measure of government ownership.

4. Data and methodology

We compile a large date set of domestic Chinese firms listed in Shanghai and Shenzhen Stock Exchanges between 2007 and 2012. The year 2007 is selected as the starting year because the new Chinese GAAP came into effect in January this year when Chinese listed firms complied with the International Financial Reporting Standards. Data was collected from China Stock Market and Accounting Research (CSMAR) database[6], and the annual reports of listed firms. The mainland Chinese stock market consists of three separate boards: the Main Board (MB), Small and Medium Enterprises (SMEs) board and Growth Enterprise Market (GEM). The Main Board includes large mature corporations with a big scale of operation and profits, while SMEs and GEM focus on small and fast-growing innovative firms. Due to the differences in supervisory and financial reporting system, this study chooses main board listed firms in Shanghai and Shenzhen Stock Exchanges. Consistent with previous studies, financial firms like banks, insurance and securities companies are excluded. As we focus on domestic listed Chinese firms, firms cross-listed in Hong Kong and overseas stock exchanges are excluded due to the potentially mixed institutional differences and different investor

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[6] This database has been used by several studies (Chen *et al*., 2006; Lo *et al*., 2010; Tian and Estrin 2013).

base.[7] We also exclude firms that don't have complete data, or have negative equities.

In order to mitigate the potential endogeneity of independent variables with respect to leverage, independent variables are all lagged for one year. With this term, one year's observations were dropped off and the final usable sample consists of 5075 firm-year observations for 1207 firms, distributing across 12 different industries: farming, mining, manufacturing, utilities, construction, transportation and warehousing, information technology, wholesale and retail sale, real estate, social service, communication and cultural, and conglomerates.

The general equation to be estimated is as follows,

$$Leverage_{i,t} = \alpha + \beta_1 ownership\ concentration_{i,t-1}$$
$$+ \beta_2 government\ ownership_{i,t-1} + \beta_3 controls_{i,t-1} + \varepsilon_{i,t}$$

Leverage$_{i,t}$ denotes the dependent variable for firm i in year t. Variables of interest are ownership concentration and government ownership; control variables are firm size (natural logarithm), liquidity, profitability, growth opportunity and tangibility in year $t-1$. $\varepsilon_{i,t}$ is the error term.

We use four alternative measures to describe debt usage, which includes total liabilities, total debt, long-term debt, and short-term debt, all as a percentage of total assets. Ratio of total liabilities to total assets (TL) measures the residual interest of shareholders in liquidation. It is often argued that total liabilities include items such as accounts payable, which is used for transaction purposes but not financing. Thus this indicator tends to overstate the leverage level. In China, however, many Chinese firms do use trade credit

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[7] These firms are subject to different accounting and tax rules, and have access to international financial market. There investors also have a different risk return demand from domestic investors. Therefore the capital structure decision for this group of firms differ from their domestic peers and excluded from our sample.

also as a means of financing (Huang & Song, 2006). Thus we consider this measure in this study as well. The second measure is the ratio of total debt to total assets (LEV). Total debt includes both short-term and long-term debt. This measure does not consider the potential offsetting effects between particular assets and non-debt liabilities, and thus tends to understate the leverage. The third measure is the long-term debt ratio (LD), a common leverage measure which is used to finance long-term investment projects. The last measure is the short-term debt ratio (SD). This financing source is a significant source of finance for Chinese firms, as will be seen in the summary descriptive.

In this study, we use the book value rather than market value to calculate leverage ratio, because financial markets fluctuate with time, and managers regard market leverage as an unreliable indicator for making financial policy. Moreover, firms are likely to consider book leverage ratios as bank loan contracts are written in terms of book value.

Ownership concentration (LARG) is described by the proportion of largest shareholder to total shares. The squared largest shareholding term (SQUARE) is included to capture the nonlinear relation between ownership concentration and leverage.

A unique feature of the Chinese stock market is the dual share ownership, where tradable and non-tradable shares exist. Among tradable shares, there are A, B, H, N and S shares. A and B shares are issued and traded in Shanghai and Shenzhen Stock Exchanges. A share are for domestic investors; while B shares are traded only by foreign investors. H, N, S shares are outstanding shares listed outside of the mainland China, respectively in Hong Kong, New York and Singapore exchanges. Among non-tradable shares, there are state owned shares, legal person shares, managerial shares, employee shares, etc. State owned shares and legal person shares are the dominant part of the non-tradable shares, meant to allow the state to keep the control rights of listed firms.

Since the Split-Share Reform, the majority of state and legal person shares become

tradable. However, the extant literature have used the government ownership data reported by CSMAR, where only the non-tradable [8] government ownership is considered. This underestimates government ownership tremendously after the Reform.

To accurately measure government ownership, in addition to the government ownership reported by CSMAR, we further check the top ten shareholders from firms' annual reports. This top ten list includes both tradable and non-tradable shareholding. We check each owner on this list and identify government ownership. In sum, government ownership equals the number of shares held by the government agencies and SOEs in A shares[9], both tradable and non-tradable, divided by all issued share capital including all share classes.

In addition to the ownership variables, we include well-documented determinants of capital structure, such as firm size, liquidity, profitability, growth opportunity and tangibility, as control variables (Huang & Song, 2006; Zou & Xiao, 2006). We use the natural logarithm of total assets to measure firm size. Liquidity is measured as the ratio of current assets to current liabilities. Profitability is defined as the ratio of earnings before interest and tax divided by total assets. Tobin's Q is used to measure growth opportunities. Tangibility is measured as the ratio of fixed assets to total assets. All variables and measurement are summarized in Table 1.

{Insert Table 1 here}

5. Empirical results

All the variables are winsorized at 0.5% level at both tails to eliminate the impact of outliers. Table 2 provides the summary statistics of major variables. Panel A presents

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[8] After the Reform, this is also called Restricted shares.

[9] Government ownership can also appear in a firm's H, S, N shares via SOEs, but we only consider its ownership in A and non-tradable shares, which are issued to domestic Chinese investors.

the full pooled sample descriptives out of 5075 firm-year observations. The average (median) total liabilities (TL) is 53.6% (54.7%) of total assets. It is relatively lower when compared with firms in other developing and developed countries, e.g., India, Pakistan, Japan and Germany (Booth, et al., 2001; Chakraborty, 2010; Huang & Song 2006). The ratio is more than twice of the total debt ratio (LEV), reflecting a large amount of non-debt liabilities of Chinese listed firms. The average (median) total debt ratio (LEV) of the sample firms is 24.6% (23.9%), comparable to other developing countries like India and Brazil (Céspedes, et al., 2010; Chakraborty, 2010). The average (median) long-term debt ratio (LD) is only 8.7% (3.8%) and is notably lower than in developing and developed countries (Booth, *et al.*, 2001). The average short-term debt ratio (SD) is 16%, which accounts for two thirds of the total debt. This suggests the popularity of short-term debt rather than long-term debt among Chinese listed firms.

The largest shareholder (LARG) owns on average over one-third of a firm's outstanding shares, suggesting a high level of concentration. The average (median) government ownership is slightly lower at 29.2% (30%). This level of government ownership is similar to prior studies after the Reform (Hou, *et al*, 2012), and it is significantly lower than its level before the Split-Share Reform[10], an effect of the Reform.

After the Reform, the largest shareholder is no longer always the government. In some firms, private shareholders such as institutional owners, families or individuals become the largest owner. In order to distinguish between the government effect and the concentration effect, we split our sample into two subsamples: government as the largest shareholder in Panel B, and non-government owner as the largest shareholder in Panel C. The comparison between the two subsamples show that government-concentrated firms tend to be large, less liquid, less market-valued, have more tangible

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[10] Bhabra *et al*. (2008) and Zou & Xiao (2006) both reported about 61% ownership by state and legal person.

assets. They are more levered in terms of total liabilities, total debt, long-term debt, but not necessarily in the short debt usage.

{Insert Table 2 here}

Table 3 presents the Pearson correlation coefficients between the major variables for the full pooled sample and two subsamples. In general, short-term debt is more related to total debt than long-term debt due to its higher weighting in debt financing.

For the government-concentrated subsample in Panel B, concentration and government ownership are highly correlated (0.866), but concentration is marginally correlated with leverage. This suggests that concentration variable will not add much explanatory power if government ownership is the explanatory variable for the government-concentrated subsample[11]. For this subsample, the government shows an opposite relation with long-term and with short-term debt, and accordingly little correlation with total debt and total liabilities.

For the non-government-concentrated subsample in Panel C, the concentration variable is more correlated with leverage than with the government variable. It implies that the largest shareholder is more influential on the financing policy than any government ownership for such firms. In addition, concentration is more related to long-term debt than to short-term debt[12].

{Insert Table 3 here}

To disentangle the effect of government ownership and concentration, we report results of the non-government-concentrated subsample in Table 4 and the government-concentrated subsample in Table 5.

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[11] This is also to avoid the multicollinearity problem between the concentration and the government variable.

[12] This will be changed when non-linear relationship is considered in Table 4.

In Panel A of Table 4 the impact of concentration is reported. There is a significant non-linear effect of concentration on total liabilities and short-term debt in model (2) and (8). However, the turning point of the non-linear relationship occurs at a concentration level of 82% for model (2), and 83% for model (8),[13] which are above the possible maximum concentration level of 78.1%. This means the effect of concentration on total liabilities and short-term debt is monotonically increasing, though not in a linear way. Regarding the impact on long-term debt and total debt, model (3) and (5) present a linear positive impact of concentration[14]. To summarize, concentration delivers a positive impact on all leverage measures, highlighting the arguments of disciplinary debt usage and reluctance to dilute ownership.

{Insert Table 4 here}

Panel B of Table 4 adds government ownership in the regression, and shows evidences echoing Table 3 results that government ownership has no significant impact on all leverage ratios[15]. In sum, for firms that do not have government as the largest shareholder, government holding does not exert any impact on their capital structure, instead the largest non-government shareholder positively affects the debt usage.

Now regarding the government-concentrated firms, due to the high correlation between largest shareholding and government ownership found in Table 3, we exclude the concentration variable and analyze only the effect of government ownership in Table 5. We add a squared term of government ownership due to the competing forces of government on leverage as reviewed earlier. We find a consistent nonlinear effect of

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[13] The turning point is calculated as the ratio between the coefficient of LARG and the coefficient of SQUARE.

[14] The significant coefficient of SQUARE in model (6) takes away the significance of LARG, while LARG alone is highly significant in model (5). In addition the R squared does not change much from model (5) to (6). Thus we consider the significance of SQUARE is an artifact of LARG effect.

[15] We also ran the test by further narrowing down the sample by excluding firms with zero government ownership. The results do not change.

government on all measures of leverage, as seen in Model (2), (4), (6) and (8). It says before reaching an ownership level of 81%, 63%, 70% and 56%, government positively affects total liabilities ratio, total debt ratio, long-term debt and short-term debt ratio respectively. Given that the maximum government ownership is 81.4%, the effect on long-term debt and total liabilities are mostly positive, suggesting a better access to long-term debt for firms with government ownership (Bhabra et al., 2008, Li et al., 2009), and the intention to retain control (Zou & Xiao, 2006). But it goes a bit differently for short term debt usage. Government effect is firstly positive and then turns negative. It suggests that some government ownership is viewed as a positive signal of firms' creditworthiness, and firms tend to use more short-term debt with a higher government ownership. When government ownership is excessively high over 56%, however, it leads to declining short term debt usage. It seems the concern for expropriation takes hold. Short-term lenders may doubt government-concentrated firms' credibility in paying back short-term debt, and refuse to lend. But long-term debt does not decline, possibly because it enjoys favorable government policy. Another possible explanation for less deb usage at high government ownership level can be the use of equity market. Firms with a government ownership above 70% use both less long term and short term debt, as they find it easier to get an approval for raising equity capital in the market.

Additional tests

We use the time-averaged sample and ran our analysis again. We find either less significant results (sometimes insignificant) or similar results to the pooled sample. This can be caused by the time variation of our sample. Then we ran fixed effect regression to explain such time variation, yet the results show that the ownership variables fail to explain the time variation within a firm.

In sum, largest shareholding and government ownership are influential in explaining the cross-sectional difference in debt usage, but not the time variation. High

concentration of shareholding and high government ownership are both associated with high leverage, regardless of the measure of leverage except for the short-term debt. Government ownership disincentives firms' usage of short-term debt when this ownership reaches a very high level.

6. Conclusions

This paper studies the impact of government ownership in the new institutional context after the China Split-Share Reform of 2005. This Reform has reshaped government's position in the ownership structure of Chinese listed firms. Since ownership is not necessarily concentrated in the government, it is necessary to distinguish the impact of ownership concentration from the impact of government ownership.

Using the recent data and a more accurate measure of government ownership, we do find that government has a different impact on capital structure for two groups of listed firms, namely, the non-government-concentrated firms where government is *not* the largest shareholder, and the government-concentrated firms where government is the largest shareholder. These difference in government ownership also leads to a different impact of government on the two groups' capital structure.

For firms where government is the largest shareholder, government ownership positively affects long-term and total liabilities ratios, consistent with prior studies that government helps in accessing long-term debt and wants to retain the control of the firms. While such positive impact is also exerted on short-term debt usage, but turns negative when government control becomes very high.

For firms where government is *not* the largest shareholder, government ownership has little impact on capital structure. In contrast, the ownership concentration becomes a more relevant factor on capital structure. The higher stake held by the largest

shareholder, the more debt is used, highlighting largest shareholder's use of debt to discipline managers and retain the control. We do not find evidence on tunneling by the largest shareholder.

Our study shows some positive results of China's privatization process. After the Split-Share Reform, government ownership declines in some listed firms, and shows little impact on the firms' leverage decision. This is an appealing outcome to the Chinese regulators when they try to cede the government control and let the firms operate by the market principals.

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Table 1 Definition of variables

Variable	Notation	Definition
	TL	Total liabilities divided by total assets
Leverage	LD	Long term debt divided by total assets
	LEV	Total debt divided by total assets
Ownership concentration	LARG	Shares held by the largest shareholder divided by total shares
	$LARG^2$	Square of LARG
State ownership	GOV	Shares held by the state divided by total shares
Firm size	SIZE	Natural logarithm of total assets
Liquidity	LIQ	Current assets divided by current liabilities
Profitability	PROF	Earnings before interest and tax divided by total assets
Growth opportunity	Q	(Equity market value + Liabilities market value) / (book value of total assets)
Tangibility	TANG	Fixed assets divided by total assets

Table 2 Summary of descriptive statistics

This table provides descriptive statistics of variables. The sample includes Chinese Main Board listed firms with A-shares from 2007 to 2012. For the dependent variables TL, LEV, LD and SD, statistics are based on the period 2008-2012. For the remaining independent variables, statistics are based on period 2007-2011. All variables are defined in Table 1 except that size here is the value of total assets in million Chinese RMB. All variables are winsorized at 0.5% both tails. Panel B and C show descriptive for two subsamples. Panel B shows government-concentrated firms where government is the largest owner, and Panel C shows non-government-concentrated firms where the largest owner is non-government entity.

Panel A Full pooled sample of 5075 firm-year observation

Variables	No. of firms	Mean	Median	S.D.	Minimum	Maximum
TL	5075	0.536	0.547	0.185	0.093	0.94
LEV	5075	0.246	0.239	0.169	0	0.692
LD	5075	0.087	0.038	0.113	0	0.523
SD	5075	0.159	0.14	0.125	0	0.546
LARG	5075	0.359	0.337	0.156	0.079	0.781
GOV	5075	0.292	0.3	0.233	0	0.814
SIZE(mil)	5075	6,340	2,760	11,700	190	105,000
LIQ	5075	1.426	1.201	0.95	0.158	6.451
PROF	5075	0.056	0.052	0.065	-0.25	0.296
Q	5075	1.966	1.589	1.221	0.745	8.991
TANG	5075	0.27	0.236	0.189	0.001	0.822

Panel B Government-concentrated pooled sample of 3285 firm-year observation

Variables	No. of firms	Mean	Median	S.D.	Minimum	Maximum	Mean Difference from Panel C
TL	3063	0.548	0.566	0.182	0.093	0.94	0.034***
LEV	3063	0.255	0.247	0.176	0	0.692	0.027***
LD	3063	0.095	0.047	0.119	0	0.523	0.022***
SD	3063	0.16	0.141	0.127	0	0.546	0.005
LARG	3063	0.385	0.382	0.154	0.079	0.781	0.074***
GOV	3063	0.435	0.443	0.156	0.036	0.814	0.407***
SIZE(mil)	3063	7,690	3,190	13,800	190	105,000	3850***
LIQ	3063	1.349	1.15	0.894	0.158	6.451	-0.218***
PROF	3063	0.055	0.051	0.062	-0.25	0.296	0.002
Q	3063	1.83	1.513	1.054	0.745	8.991	-0.385***
TANG	3063	0.291	0.257	0.193	0.001	0.822	0.060***

Panel C Non-government-concentrated pooled sample of 1790 firm-year observation

Variables	No. of firms	Mean	Median	S.D.	Minimum	Maximum
TL	2012	0.514	0.518	0.188	0.093	0.94
LEV	2012	0.229	0.227	0.153	0	0.692
LD	2012	0.073	0.025	0.099	0	0.523
SD	2012	0.156	0.138	0.121	0	0.546
LARG	2012	0.311	0.273	0.15	0.079	0.781
GOV	2012	0.028	0	0.053	0	0.269
SIZE(mil)	2012	3,850	2,000	5,690	190	81,300
LIQ	2012	1.567	1.297	1.029	0.158	6.451
PROF	2012	0.057	0.054	0.07	-0.25	0.296
Q	2012	2.216	1.763	1.448	0.745	8.991
TANG	2012	0.231	0.196	0.176	0.001	0.822

Table 3 Correlation coefficient matrix

This table presents the Pearson correlation coefficients between capital structure and firm specific characteristics. From here after, SIZE is measured as the natural logarithm of total assets.

Panel A Full sample of 5075 firm-year observations

	TL	LEV	LD	SD	LARG	GOV	SIZE	LIQ	PROF	Q	TANG
TL	1										
LEV	0.615	1									
LD	0.669	0.366	1								
SD	0.743	0.497	0.001	1							
LARG	0.054	0.060	0.124	-0.038	1						
GOV	0.060	0.079	0.120	-0.027	0.548	1					
SIZE	0.321	0.296	0.387	0.086	0.319	0.294	1				
LIQ	-0.368	-0.512	-0.096	-0.410	-0.005	-0.096	-0.122	1			
PROF	-0.131	-0.230	-0.013	-0.165	0.149	0.035	0.163	0.152	1		
Q	-0.283	-0.303	-0.249	-0.157	-0.175	-0.167	-0.445	0.169	0.133	1	
TANG	0.269	0.012	0.190	0.192	0.038	0.153	0.047	-0.397	-0.028	-0.052	1

Panel B Government-concentrated pooled sample of 3285 firm-year observations

	TL	LEV	LD	SD	LARG	GOV	SIZE	LIQ	PROF	Q	TANG
TL	1										
LEV	0.621	1									
LD	0.695	0.384	1								
SD	0.738	0.504	0.029	1							
LARG	-0.020	-0.016	0.061	-0.084	1						
GOV	0.001	0.008	0.102	-0.093	0.866	1					
SIZE	0.315	0.308	0.392	0.071	0.276	0.256	1				
LIQ	-0.413	-0.541	-0.163	-0.423	0.009	-0.007	-0.134	1			
PROF	-0.173	-0.273	-0.030	-0.212	0.139	0.122	0.146	0.143	1		
Q	-0.289	-0.307	-0.259	-0.159	-0.088	-0.107	-0.385	0.196	0.198	1	
TANG	0.313	0.021	0.256	0.198	0.046	0.070	0.042	-0.404	-0.004	-0.081	1

Panel C Non-government-concentrated pooled sample of 1790 firm-year observations

	TL	LEV	LD	SD	LARG	GOV	SIZE	LIQ	PROF	Q	TANG
TL	1										
LEV	0.600	1									
LD	0.596	0.318	1								
SD	0.759	0.488	-0.068	1							
LARG	0.164	0.144	0.208	0.036	1						
GOV	-0.050	0.023	-0.069	-0.007	-0.112	1					
SIZE	0.311	0.242	0.345	0.110	0.290	-0.133	1				
LIQ	-0.279	-0.457	0.058	-0.394	0.041	-0.017	-0.045	1			
PROF	-0.051	-0.160	0.026	-0.085	0.186	-0.043	0.216	0.162	1		
Q	-0.273	-0.284	-0.225	-0.158	-0.230	-0.012	-0.497	0.109	0.057	1	
TANG	0.140	-0.046	-0.007	0.180	-0.081	-0.051	-0.051	-0.365	-0.068	0.043	1

Table 4 Impact on non-government-concentrated firms

This table presents the OLS regression results on the non-government-concentrated subsample, defined in Table 2. Panel A reports the impact of largest shareholding on leverage, and Panel B adds government ownership in the model. The results are based on the pooled subsample during 2007 to 2012. Both industry and year dummies are considered in all regressions. The dependent variables are total liabilities (TL), total debt (LEV), long-term debt (LD) and short-term debt (SD), and scaled by total assets respectively. The independent variables are as defined in Table 1. ***, **, * are significant at the 0.001, 0.01, and 0.05 level. Figures reported in parentheses are t-statistics.

Panel A: Impact of largest shareholding on leverage

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	TL	TL	LEV	LEV	LD	LD	SD	SD
LARG	0.097***	0.256***	0.076***	0.200**	0.052***	-0.069	0.023	0.262***
	(4.06)	(2.61)	(3.36)	(2.36)	(3.13)	(-1.12)	(1.33)	(3.94)
SQUARE		-0.210*		-0.164		0.159**		-0.315***
		(-1.74)		(-1.55)		(1.97)		(-3.81)
SIZE	0.025***	0.026***	0.031***	0.032***	0.029***	0.028***	0.002	0.003
	(5.90)	(6.03)	(8.01)	(8.17)	(12.42)	(12.09)	(0.75)	(1.15)
LIQ	-0.093***	-0.094***	-0.035***	-0.035***	0.006***	0.007***	-0.041***	-0.041***
	(-19.30)	(-19.35)	(-9.22)	(-9.27)	(2.79)	(2.90)	(-15.07)	(-15.27)
PROF	-0.366***	-0.374***	-0.156***	-0.162***	-0.069**	-0.063**	-0.088**	-0.100**
	(-5.39)	(-5.47)	(-2.85)	(-2.96)	(-2.28)	(-2.06)	(-2.03)	(-2.30)
Q	-0.014***	-0.014***	-0.013***	-0.013***	-0.004**	-0.004**	-0.010***	-0.009***
	(-3.61)	(-3.51)	(-4.43)	(-4.34)	(-2.21)	(-2.38)	(-3.94)	(-3.73)
TANG	-0.150***	-0.149***	0.080***	0.080***	0.086***	0.085***	-0.005	-0.004
	(-5.25)	(-5.24)	(3.20)	(3.22)	(5.25)	(5.24)	(-0.25)	(-0.22)
Adj-R^2	0.39	0.39	0.21	0.21	0.24	0.24	0.22	0.22
N	1790	1790	1790	1790	1790	1790	1790	1790

Panel B: Impact of government ownership and largest shareholding on leverage

	(1) TL	(2) TL	(3) LEV	(4) LEV	(5) LD	(6) LD	(7) SD	(8) SD
GOV	0.047	0.066	-0.080	-0.068	-0.038	-0.018	-0.041	-0.049
	(0.68)	(0.95)	(-1.36)	(-1.15)	(-0.98)	(-0.47)	(-0.86)	(-1.01)
LARG		0.252**		0.205**		-0.067		0.265***
		(2.56)		(2.41)		(-1.10)		(3.98)
SQUARE		-0.200*		-0.174		0.157*		-0.322***
		(-1.65)		(-1.63)		(1.94)		(-3.87)
SIZE	0.028***	0.027***	0.032***	0.031***	0.030***	0.028***	0.002	0.003
	(6.58)	(6.11)	(8.30)	(7.97)	(12.76)	(11.90)	(0.83)	(1.01)
LIQ	-0.093***	-0.093***	-0.035***	-0.035***	0.006***	0.007***	-0.041***	-0.041***
	(-19.38)	(-19.31)	(-9.35)	(-9.33)	(2.73)	(2.88)	(-15.15)	(-15.31)
PROF	-0.333***	-0.374***	-0.131**	-0.162***	-0.052*	-0.063**	-0.080*	-0.099**
	(-4.99)	(-5.48)	(-2.44)	(-2.95)	(-1.74)	(-2.06)	(-1.88)	(-2.29)
Q	-0.015***	-0.014***	-0.015***	-0.013***	-0.004***	-0.004**	-0.010***	-0.009***
	(-3.87)	(-3.43)	(-4.83)	(-4.41)	(-2.72)	(-2.42)	(-4.13)	(-3.79)
TANG	-0.152***	-0.147***	0.075***	0.078***	0.083***	0.085***	-0.007	-0.005
	(-5.30)	(-5.16)	(3.01)	(3.12)	(5.04)	(5.13)	(-0.35)	(-0.29)
Adj-R2	0.38	0.39	0.20	0.21	0.24	0.24	0.22	0.22
N	1790	1790	1790	1790	1790	1790	1790	1790

Table 5 Impact on non-government-concentrated firms

This table presents the OLS regression results on the impact of government ownership on leverage, using only the government-concentrated subsample, defined in Table 2. The results are based on the pooled subsample during 2007 to 2012. Both industry and year dummies are considered in all regressions. The dependent variables are total liabilities (TL), total debt (LEV), long-term debt (LD) and short-term debt (SD), and scaled by total assets respectively. The independent variables are as defined in Table 1. GOVSQ is the squared term of GOV. ***, **, * are significant at the 0.001, 0.01, and 0.05 level. Figures reported in parentheses are t-statistics.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	TL	TL	LEV	LEV	LD	LD	SD	SD
GOV	-0.020	0.318***	-0.098***	0.249***	-0.034***	0.138***	-0.063***	0.109*
	(-1.35)	(4.75)	(-5.89)	(3.28)	(-3.03)	(2.89)	(-5.06)	(1.91)
GOVSQ		-0.386***		-0.396***		-0.197***		-0.196***
		(-5.29)		(-4.61)		(-3.57)		(-3.08)
SIZE	0.032***	0.034***	0.040***	0.042***	0.032***	0.034***	0.007***	0.008***
	(13.78)	(14.63)	(15.04)	(15.93)	(18.46)	(18.80)	(3.78)	(4.36)
LIQ	-0.110***	-0.109***	-0.053***	-0.053***	-0.001	-0.001	-0.052***	-0.052***
	(-29.72)	(-29.62)	(-16.47)	(-16.38)	(-0.46)	(-0.38)	(-22.12)	(-22.02)
PROF	-0.530***	-0.529***	-0.354***	-0.353***	-0.108***	-0.108***	-0.243***	-0.243***
	(-9.46)	(-9.48)	(-6.88)	(-6.86)	(-3.46)	(-3.45)	(-6.42)	(-6.41)
Q	-0.018***	-0.018***	-0.016***	-0.015***	-0.005***	-0.005***	-0.010***	-0.010***
	(-5.92)	(-5.73)	(-5.84)	(-5.63)	(-3.31)	(-3.14)	(-5.13)	(-4.99)
TANG	-0.131***	-0.127***	0.162***	0.166***	0.107***	0.109***	0.057***	0.059***
	(-7.98)	(-7.78)	(8.93)	(9.15)	(7.87)	(8.02)	(4.19)	(4.34)
Adj-R^2	0.50	0.50	0.37	0.37	0.35	0.35	0.28	0.28
N	3285	3285	3285	3285	3285	3285	3285	3285

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