Capital Structure of Chinese Listed Companies after the 2008 Financial Crisis: Reliably Important Determinants of Financial Leverage

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Abstract. The paper examines the determinants of capital structure among Chinese listed companies between the years of 2009 and 2014. In the many of the researches conducted in the past returned inconsistent results regarding the variables that can be used for prediction of financial leverage. This research is testing if after the financial crisis of 2008 Chinese companies have changed their financial behavior and if the variables that were identified as reliably important determinants of financial leverage before 2009 are still valid. The variables used cover internal firm characteristics and external economic contexts, including: profitability, asset tangibility, asset growth, firm size, largest shareholding, industry median leverage, state control dummy, PMI, quarterly exports, foreign direct investment, domestic retail sales of consumer goods and money supply. The results show that those firm-specific factors remain crucial when predicting the levels of leverage; meanwhile, adding three macroeconomic factors in the model can contribute to explain the levels of leverage.

Keywords: Capital structure, financial leverage, China, financial crisis, financial behavior.

1. INTRODUCTION

Capital structure is an important part of each firm's strategy development and financial planning, as it is crucial for them to keep the right level of financial leverage in order to grow at competitive speed without putting too much distress on its finance. It had been the topic of many researches during the last few decades, when many researchers tried to find out what drives companies to decide how much money to borrow, but the results regarding the determinant factors often varied quite significantly. Some of the initial researches in the US capital markets, like the empirical study by Titman and Wessels (1988) and the survey by Harris and Raviv (1991) would state opposite results. Because of that, many studies followed in trying to find the reliably important factors in the US and other countries. One of the most recent researches by Frank and Goyal (2009) examined the factors used in various previous researches using the Bayesian information criterion (BIC) and basing on the data of publicly traded firms in the US between 1950 and 2003 checked the results over time, in the end finding six reliably important factors: Industry median leverage, asset tangibility, profitability, firm size, market-to-book assets ratio and expected inflation. Studies in different countries have found that the factors reliable in the US are also important in other developed (Rajan and Zingales, 1995; Wald, 1999) and developing countries (Booth et al., 2001; Demirgüç-Kunt and Maksimovic, 1999).

However, due to the uniqueness of the Chinese market and its environment, the studies above have all avoided including it in their studies. China differs from other countries in that it has relatively weak laws regarding investor protection, accounting standards, quality of government, and corporate governance (Allen et al., 2005), high state influence and control in most of the industries and that the government controls the volume and price of

equity issuance (Chang et al., 2014). With its constantly growing economy and slowly opening to international market, the importance of the country in the world economy is increasing and thus determining the factors influencing capital structure decisions of Chinese companies is also becoming more important. Some studies focused specifically on China, but were again reaching different conclusions regarding the influence of some of the factors. A majority of researches agreed when it comes to the positive influence on financial leverage of firm size and negative influence of profitability, but other determinants get mixed results. For example, Li et al. (2009) found that financial leverage decreases with asset tangibility, but according to many previous researches (Huang and Song, 2006; Qian, Tian, and Wirjanto, 2009; Zou and Xiao, 2006) it has a positive relationship with leverage. A recent study by Chang et al. (2014), similarly to Frank and Goyal (2009) used the BIC to examine the available factors and identified profitability, industry median leverage, asset growth, asset tangibility, firm size, state control and the largest shareholdings as the reliable determinants of capital structure in China. However, the sample used in the research was from years 1998 to 2009, which could prove to be a little bit outdated for a couple of reasons. First of all, most of the observations come from before the financial crisis of 2007-2008, which had a big impact on the markets around the world and influenced the ease with which companies can lend money. That could lead companies to use lower levels of financial leverage. Furthermore, China is still going through a transformation and the institutional changes in the country could have an effect on the firms as well. In particular, although there are still many state-owned enterprises and some major banks are influenced by the government, the influence of state ownership might have dwindled, as the government is trying to create a more capitalistic market.

This paper focuses on how the financial crisis along with the institutional changes influenced the Chinese listed companies. This research is not going to examine the vast amount of factors that were used in previous researches and usually found unreliable, but instead is going to base the research on the findings of the analysis done by Chang et al. (2014) and use the seven determinants which they found to be reliably important, with the addition of a few macroeconomic factors that were not included in previous researches but might also help explain changes in financial leverage levels. Some of the questions that we are attempting to answer are: Did the companies change their financial behavior to adapt to the new reality after 2008? Are the factors that were identified as reliable determinants of financial leverage before the crisis still as reliable as before? If not, what has changed and what are the new factors that should be used?

The subsequent parts of the paper are organized as follows. Section 2 presents the related literature, reviews relevant theories and contains hypothesis' predictions. In section 3 the data sample and research methodology are described. Section 4 discusses the research results, and section 5 presents the conclusions drawn from the research.

2. LITERATURE REVIEW

There have been several capital structure theories, most of them are based on the Modigliani-Miller Theorem (Modigliani and Miller, 1958), which states that in a perfect market leverage does not influence the cost of capital and the way company is financed does not matter. However, the real market is not a perfect one and the imperfections make the capital structure relevant. Among the capital structure theories of the real market, probably the most popular two are the trade-off theory and pecking-order theory, which are going to be introduced shortly in this section and followed by predictions of the explanatory variables on financial leverage based on the two theories. Both of the theories have supporters and critics arguing about their correctness, but because it is not the main issue of this paper, for more throughout review and comparison of the theories one may refer to Frank and Goyal (2008).

2.1 The trade-off theory

The trade-off theory states that when a company is choosing how to finance its operations, it seeks to balance the costs and benefits of debt. The theory in its original version was developed by Kraus and Litzenberger (1973), who considered the tax saving benefits of debt, as the interest expenses are tax-deductible and the dead-weight bankruptcy cost. Others have proposed to include different factors like agency costs and transaction costs. Myers (1984) states that a company that wants to follow the trade-off theory should set a debt-to-value target that is determined by the balance of debt benefit and bankruptcy costs and then slowly move towards it. However, the tax laws are more complicated than it assumes and the potential bankruptcy and agency costs are not very clearly defined, which makes it difficult in practice to calculate what is the perfect ratio (Frank and Goyal, 2008).

2.2 Pecking-order theory

The pecking-order theory is initially proposed by Donaldson (1961) and later modified by Myers and Majluf (1984). It has its source in the information asymmetry - that is the managers knowing more about the situation of a firm than their potential investors. According to the theory, a firm should have preference for financing with retained earnings over financing with debt, and only issue new equity to finance its operations as a last resort. The reasoning behind it is that investors do not have full

information and must rely on many noisy signals to judge the condition of a firm and the risk of its returns. If a company is using internal financing or financing through debt, it gives the investors signal that the firm is in a good condition and that its management is confident about meeting the obligations related to the debt. On the other hand, if a company issues new equity, it gives a signal of distress which may lower the share price. Normally management should not want to bring new external ownership and doing so might mean that the management thinks the company's stock is over-valued.

2.3 Explanatory variables

Profitability. Return on assets is going to be used as the measure for this factor. The two theories presented above have opposite predictions regarding this variable. According to the trade-off theory, as companies become more profitable, they are going to want to borrow more money in order to shield them from tax. In addition, higher profitability results in more free cash flow and increasing the leverage could help to keep a grasp on the management and tackle the agency costs (Jensen, 1986). However, the prediction of the trade-off theory does not seem to be correct in the majority of studies and a new dynamic trade-off model predicts negative relationship of profitability and leverage (Strebulaev, 2007).

The pecking-order theory predicts that profitability has negative influence on the leverage, as with increased profitability the firm is going to have more internal funds to spend on its investments.

In Table A.1, we can find that almost all of the previous researches on capital structure of Chinese companies report a negative relationship between the two attributes, and often a lot more significant than in other countries. This is because of the difficulties that Chinese listed companies face when trying to raise external funds, whether it is in the form of debt or equity, making the retained earnings much more important to the firms in China than to those in the US. Furthermore, the China Securities Regulatory Commission requires companies to be highly profitable for a period of time before being able to issue new equity, causing profitability to have even more negative influences on the leverage (Chang et al., 2014).

Assets tangibility. Asset tangibility increases company's credibility, because the tangible portion of assets can be used as a collateral by the lender and as a result reduce its risk. Also in case of bankruptcy, tangible assets are easier to value and liquidate than intangible assets, effectively reducing the bankruptcy costs (Jensen and Meckling, 1976). According to the trade-off theory, this would have a positive effect on the leverage, as the balance between tax reduction and financial distress is moved higher.

Under the assumptions of pecking-order theory, the prediction is opposite, as higher asset tangibility reduces the information asymmetry and makes issuance of new equity cheaper and debt less preferable.

Although some researches regarding non-listed companies get results revealing a negative relationship between the variables (Li et al., 2009), the majority of previous researches focusing on listed companies in China show positive relationships, as can be seen in Table A.1.

Firm size. Firm size influences the capital structure of companies in several ways. First of all, bigger firms usually have considerably lower risk of bankruptcy and higher resistance to market volatility. In addition, bigger firms are often able to access outside funding at lower costs than their smaller competitors and are overall more likely to diversify the sources of their financing. According to the trade-off theory, these points should result in a positive relationship between firm size and leverage. On the other hand, it is believed that small and large firms have different levels of information asymmetry, as the larger firms have usually been existed for a longer time and are better known, and sometimes are subject to higher scrutiny (Kurshev and Strebulaev, 2007). Because of that, the pecking-order theory suggests a negative relationship between the variables, as firms can access equity cheaper.

Previous researches in China and other countries are generally consistent and report firm size to be positively related to firm's leverage.

Asset growth. Asset growth is a proxy variable for growth opportunity. It is not as popular as market to book asset ratio proxy variable, but because of the frequent mis-pricing existent in the Chinese stock markets, it does appear to be a better variable to represent growth opportunities in China (Chang et al., 2014). Firms with higher growth opportunity often face bigger financial distress and less of free cash-flow problem. Following the trade-off theory, this should move the target leverage to lower levels, as the company should want to reduce the distress and does not need to worry about agency costs as much. However, in the years before the financial crisis of 2008, many of Chinese listed companies having a considerable amount of shares in possession of government were enjoying borrowing privileges from Chinese banks (Qian et al., 2009). In addition, because of equity issuing restrictions specific to China, companies with growth opportunities might be forced to use debt in higher levels, as they are not able to raise enough capital through retained profits and equity (Chang et al., 2014). This means that growth opportunities might have much lower influences on leverage in China than in other countries.

The pecking-order theory suggests a positive influence of growth opportunity on leverage, as retained earnings and debt should be the prime source for financing company's

investments. However, this assumes that the profitability of a firm is held at a constant level (Frank and Goyal, 2008). As shown in Table A.1, previous researches in Chinese market returned inconsistent results regarding the influence between growth opportunity and leverage.

Industry median leverage. There is no doubt that the level of leverage across different industries varies and the industry median leverage has been found to be one of the most important determinants of companies' financial leverage in many researches (Bowen et al., 1982; Lemmon et al., 2008; MacKay and Phillips, 2005). In the studies focusing on China, only Li et al. (2009) and Chang et al. (2014) included the variable, although in their results the significance was a little lower than for example, in Frank and Goyal (2009) research on the US firms, where it was explaining the most variance of the factors included, both of them still found it to be one of the most important factors in predicting the capital structure.

State control dummy. State control dummy is a variable that is almost exclusive to Chinese market. Researches regarding capital structure and the factors influencing it in the US, developed and developing countries do not include it, because in most of the countries, state-controlled enterprises either do not exist or account for a fraction of the markets. In China, although the percentage of state owned enterprises (SOEs) is decreasing, the change is very slow and SOEs still constitute a major part of the market and are present in virtually every industry. SOEs enjoy some benefits not available for private enterprises, as many financial institutions are also state controlled and allow for the lending of money to SOEs on privileged conditions and financial help in case of distress, suggesting that these companies should have higher levels of leverage. On the contrast, because of unfair treatment they also might find it easier than privately owned enterprises to raise equity, which could result in a negative influence on the leverage.

For the reasons mentioned above, state control is included in almost every research focusing on capital structure of Chinese companies, but the results are rather inconsistent. Li et al. (2009) and Qian et al. (2009) found that a positive relationship between state ownership and leverage exists. Huang and Song (2006); Zou and Xiao (2006) and Bhabra et al. (2008) find state ownership to be neutral on leverage, while Chang et al. (2014) and Firth et al. (2008) even found negative relationships between the two.

Largest shareholding. Largest shareholding is the percentage of company shares held by the top shareholder. This variable similarly to state control dummy is rather specific for China. The weak rights of investors in Chinese market and the sparingly effective law enforcement induces the controlling shareholders to thinking that as long as they

keep the control, new equity is a form of financing that does not bind them to anything. That would suggest that they might prefer equity to debt. The higher the percentage of shares held by the largest shareholder, the lower the risk that he loses control during dilution, so if the above assumptions are correct, then the largest shareholding should be negatively related with leverage. The variable was included and found to have a significantly negative relationship by Chang et al. (2014).

Macroeconomic factors. Many different macroeconomic factors have been included in previous researches, but other than inflation being a reliable determinant in the US (Frank and Goyal, 2009), all of them seem to be unimportant when determining the capital structure of a company. Chang et al. (2014) used three macroeconomic variables in his research focusing on China: inflation, GDP growth and the growth rate of overall after-tax profits of industrial firms, but found all of them to be insignificant. In this research, we are going to include five macroeconomic factors that have not been used in previous researches and check for their importance.

First one of them is the amount of *Quarterly Exports* in whole China. Many argue that the economic growth in China in the past few decades was highly driven by foreign trade, thus the export could be a good indicator of economic developments (Cui, 2007). A bigger than usual increase in exports might be signaling growing demand and growth opportunities, driving companies to quickly borrow more money in order to finance new investments and get the most of this opportunity. On the other hand, if exports decrease it is likely that the global economy is slowing down and the demand is decreasing, so companies might want to resign from some riskier investments and reduce the debt. That suggests that the growth in quarterly exports should be positively related with financial leverage.

Another factor is the *Foreign Direct Investment (FDI)*. There have been many researches proposing that FDI-export linkage exists, and it seems to be particularly strong in China (Zhang, 2015). A big part of Chinese exports constitute of exports by companies that were created by foreign investments, but the FDI also has a positive effect on the exports of domestic companies. The foreign companies are usually more experienced at exporting, but because the domestic companies can mimic their behavior, their presence reduces the export costs for local companies in the same industries, making exporting more attractive and increasing its volume (Sun, 2012). For these reasons, if a correlation between FDI and the level of financial leverage used by Chinese companies exists, it is likely to have a positive relationship.

The next factor is *Domestic Retails Sales of Consumer Goods* (DRSoCG). The variable similarly to Quarterly Exports can be considered as an indicator of the demand

levels, but a few important differences between the two exist. First of all, as the name suggests DRSoCG takes into account only sales within China. Furthermore, it only includes non-production and non-business physical commodity sold to individuals and social institutions, and revenue from providing catering services. Individuals include rural and urban households, population from abroad, while social institutions include government agencies, social organizations, military units, schools, institutions, neighborhood (village) committees. Predictions are then the same as in case of Quarterly Exports, of positive relationship between DRSoCG and leverage, but this variable will show if companies adjust their capital structure in reaction to domestic demand changes.

The fourth of the macroeconomic factors included is *Money Supply*. This variable could be considered as a proxy variable for inflation. As the money supply grows or shrinks, the prices usually react in the same way. According to the trade-off theory, if money supply grows, companies should want to borrow more money, as the tax-shielding is higher when inflation levels are high (Robert and Taggart, 1985). On the other hand, when money supply is increased, for example, due to quantitative easing implementation by government, the money is often pumped into stocks, increasing the market value of companies' shares and making it more attractive for them to issue new equity, which in turn would lower the financial leverage levels within them.

And the last variable included is manufacturing *Purchasing Managers' Index* (PMI). The PMI level is based on a survey of purchasing managers within manufacturing companies, whom are asked questions about the companies' outlook compared to previous years. The fields they are asked about are production level, new orders from customers, speed of supplier deliveries, inventories, order backlogs and employment level. This is also an indicator that might suggest growing or declining demand and increasing or decreasing growth opportunities for companies, but coming from within the manufactures, rather than their customers. It might be based on some data and knowledge that is available to the managers, but not openly available to the people from outside of the company and it also might include some predictions of the future, rather than being based purely on the past data like Quarterly Exports and DRSoCG. Although also predicted to have a positive relationship with the financial leverage, for the reasons above it is likely to have a different level of significance than Quarterly Exports or DRSoCG.

3. DATA SET AND MODEL
3.1 Data description
This research is based on the data of companies listed on the Shanghai Stock Exchange and Shenzhen Stock Exchange main boards (SME and ChiNext growth stocks excluded) between March 31, 2009 and December, 31 2014, with the exclusion of financial firms. All the firm related data are obtained from the China Stock Market and Accounting Research (CSMAR) database, while the macroeconomic data come from the National Bureau of Statistics of China (NBS). Industry classification by the China Securities Regulatory Commission (CSRC) from 1999 is being used, despite the existence of newer classification guidelines from 2012. The reason for this is that there are an excessive number of industry groups in the new guidelines, resulting in serious underrepresentation in some industries (often less than 5 companies) and thus incorrectly affecting the industry median leverage, which is one of the independent factors.

Originally the sample included 31,196 quarterly observations, but some observations containing missing or clearly erogenous data had to be removed and a further requirement of total asset value of at least RMB 50 million was incorporated, removing in total 196 observations. Further, in order to manage the outliers, the six-sigma principle is used on profitability, asset tangibility, asset growth and leverage, removing the observations that lie outside of mean ± 3σ and leaving the final sample consisting of 30,608 observations.

Some of the variables did not have readily available data and had to be calculated based on the data from financial reports. The data reported at the end of each period was used and the variables were calculated as follows:
· Leverage = Total debt / book value of total assets.
· Profitability = Operating income / total assets.
· Industry Median leverage = Median of book leverage (total debt / total assets) by industry and quarter of the year.
· Asset tangibility = Fixed assets / total assets.
· Asset growth = Difference in assets between the current and previous quarter / assets of the previous quarter.
· Firm size = Natural log of total assets at the end of the quarter.
· Largest shareholding = Shares held by the largest shareholder / total shares.
· State control dummy = if shares controlled by the state > 50% then = 1, otherwise = 0
· PMI = Average of the PMI for the last three months.

3.2. Descriptive statistics and correlations.
The mean leverage is 0.202, considerably lower than the 0.272 reported for Chinese listed companies before 2009 by Chang et al. (2014). This alone indicates that Chinese listed companies indeed reduced their debt quite significantly after the financial crisis of 2008. The mean asset growth is also much lower than before the crisis, with

0.036 compared to 0.14. On the other hand, profitability stayed at the similar level with 0.021 compared to 0.027. The mean number of shares held by the largest shareholder is 36.3% compared to 40.3% before, which means the ownership of Chinese listed companies is becoming more spread out. It is also important to note that only 6.29% of observations in the sample are SOEs, in contrast to the majority of the sample used by Chang et al. (2014) being SOEs. However, even in the private companies the state often has a considerable amount of shares and still can influence the operations of the firm. The mean PMI during the period researched is 51.69, indicating that overall managers were slightly positive about the outlook of their companies during this time.

3.3. Model and methodology

The following linear regression model (1) will be used to analyze the influence of the selected variables on financial leverage of the companies.

$$Lev = \alpha + \beta Prof + \gamma AT + \delta AG + \theta FS + \mu LS + \pi SOE$$

$$+ \rho PMI + \sigma QE + \tau FDI + \varphi DRsoCG + \omega MS + \varepsilon$$

where Lev – Leverage, α - a constant, β, γ, δ, θ, μ, π, ρ, σ, τ, φ and ω are the coefficients, Prof – profitability, AT – asset tangibility, AG – asset growth, FS – firm size, LS – largest shareholder, SOE – state control dummy, PMI – purchasing managers' index, QE – quarterly exports, FDI – foreign direct investment, DRSoCG – domestic retail sales of consumer goods, MS – money supply and ε – error term.

As could be seen from the descriptive statistics, the mean leverage considerably decreased during the period researched. This raises questions regarding the reason for such decrease. For example: Have the determinants that were found to be reliably important before changed within the companies enough to account for the change in leverage? Or maybe the determinants have not changed by a lot and the source of the change in leverage is not included in the regression model? Finally, maybe factors that were initially thought to be reliably important became unimportant or their relationship with leverage changed? By checking how much of the variance in leverage the above factors can explain, it should be possible to answer these and some more questions.

4. RESULTS

A few models comprising different groups of variables are compared. The first of the models is going to use only firm-specific factors, the second one only industry-specific and macroeconomic factors, and the third one is going to include all of the factors. The results of these linear regressions, including R^2 of each model and the coefficient and significance of each of the variables in each model, can be seen in Table 1.

The first model includes profitability, firm size, asset tangibility, asset growth, state control dummy and the largest shareholding as the independent variables and has R^2 of 0.199, meaning the model including only these firm-specific variables explains around 19.9% of the variation within leverage. All of the variables are significant on 0.01 level, but the three variables with by far the highest standardized coefficients are profitability with -0.304, firm size with 0.267 and asset tangibility with 0.219, followed by largest shareholding with only -0.044, asset growth with 0.035 and state control dummy with -0.020.

The second model includes domestic retail sales of consumer goods, industry median leverage, money supply, PMI, quarterly exports and FDI as the independent variables has R^2 of 0.013, explaining only around 1.3% of the variation within leverage. This already tells us that the firm-related factors are much more important when predicting the leverage levels, but the macroeconomic factors might still improve the predictions. In this model DRSoCG and industry median leverage are significant at 0.01 level, money supply is significant at the 0.05 level and PMI, quarterly exports and FDI are insignificant. DRSoCG has a coefficient of -0.119, industry median leverage of 0.092 and money supply of 0.069.

Model 3 includes all of the variables and its value of R^2 is 0.227 and thus explains around 22.7% of the variation within the leverage. This result is much lower than the explanatory power of 36% of the variation in leverage in the model using seven core factors in research based on the data of Chinese listed companies from 1998 to 2009. The main reason for this is the big difference in the explanatory power of profitability during that period and years 2009-2014. However, it is still higher than the R^2 reported in the research based on companies listed in the United States by Frank and Goyal (2009), where its value equaled 0.192. Profitability, asset tangibility and firm size are the three factors with the highest coefficient, the same as in Model 1, but the coefficients are slightly different and the significance of the macroeconomic factors has changed. In this case DRSoCG, PMI and FDI are all insignificant and the rest of the factors are significant at the 0.01 levels, including "quarterly exports" which was insignificant and "money supply" which was not significant at this level in Model 2. The coefficient of profitability is -0.306, of firm size 0.278 and asset tangibility 0.243, all slightly higher than in the first model. They are followed by three factors with coefficients of similar size: quarterly exports by 0.143, money supply with -0.138 and industry median leverage with 0.133, the next highest coefficient is of DRSoCG, but it was found to be insignificant. The coefficients of the last

three significant factors are -0.044 for the largest shareholding, 0.034 for asset growth and -0.029 for SOE.

Table 1 Comparison of linear regression models.

	Model 1		Model 2		Model 3	
	Coeff.	Sig.	Coeff.	Sig.	Coeff.	Sig.
Profitability	-.304	.00	-	-	-.306	.00
Firm Size	.267	.00	-	-	.278	.00
Asset Tang.	.219	.00	-	-	.243	.00
Asset Growth	.035	.00	-	-	.034	.00
SOE	-.020	.00	-	-	-.029	.00
Lrgst. Shrhld	-.044	.00	-	-	-.044	.00
DRSoCG	-	-	-.119	.00	-.047	.10
IndMedLev	-	-	.092	.00	.133	.00
Money Sup.	-	-	.069	.01	-.138	.00
PMI	-	-	-.011	.12	.001	.90
Qtr. Exports	-	-	.006	.68	.143	.00
FDI	-	-	.004	.55	.007	.32
R²	0.199		0.013		0.227	

5. CONCLUSION

This paper investigated the capital structure and its determinants within Chinese companies listed on Shanghai and Shenzhen stock exchanges after the financial crisis of 2008 – between the year 2009 and 2014. It found that Chinese listed companies have decreased the leverage levels in these years, and although the determinants that were identified as reliably important before the crisis are still significant, their explanatory power has changed quite considerably.

According to the research, nine of the factors used are d e helpful in determining the financial leverage levels: profitability, firm size, asset tangibility, quarterly exports, money supply, industry median leverage, largest shareholding, asset growth and state ownership. Of those, although profitability is still the most important one, its explanatory power seems to have decreased the most after the crisis. The firm-specific factors remain crucial when predicting the levels of leverage, but some macroeconomic factors can contribute to a better model slightly.

Table A.1: Comparison of results in selected studies focusing on China.

	Profitability	Assets tangibility	Firm size	Growth opportunities	Industry median leverage	State control
(Chen, 2004)	ROA (-)	(+)	Assets (+)	Asset growth (+)		
(Tong and Green, 2005)	ROA (-)		Invested capital (+)	Asset growth (+)		
(Huang and Song, 2006)	ROA (-)	(+)	Sales (+)	Tobin's Q (+)	Industry dummies	State ownership
(Zou and Xiao, 2006)	ROA (-)	(+)	Assets (+)	Market to Book ratio (-)		State ownership
(Bhabra, Liu, and Tirtiroglu, 2008)	ROA (-)	(+)	Assets (+)	Tobin's Q (-)	Industry dummies	State ownership
(Qian et al., 2009)	ROA (-)	(+)	Sales (+)	Sales growth	Industry dummies	State ownership (+)
(Li et al., 2009)	ROA (-)	(-)	Sales (+)		Industry median lev. (+)	State ownership (+)
(Chang et al., 2014)	ROA (-)	(+)	Natural log of assets (+)	Asset growth (+)	Industry median lev. (+)	State control dummy (-)

Source: The table was modified from (Chang et al., 2014). (+) and (-) indicate positive and negative relationship, no sign means there is no significant relationship.

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