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ADJUSTMENT BEHAVIOUR OF LEVERAGE IN CHINESE FIRMS: AN EMPIRICAL ANALYSIS OF OVERALL FIRMS, STATE-OWNED AND NON STATE-OWNED ENTERPRISES

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ABSTRACT

This study investigates the adjustment behaviour and adjustment speed of Chinese firms with regards to capital structure. For this purpose, the study utilises an extensive set of data of 867 A-Listed non-financial Chinese firms over ten years from 2003 to 2012. This study adds useful insights on adjustment behaviour and speed of Chinese firms with regards to firm-specific and country level determinants of leverage policy. To find out the adjustment speed, the study uses multiple generalised method of moments (GMM) for the purpose of robustness. Both of the GMMs report positive and their adjustment coefficients are statistically significant which implies that Chinese firms follow a target level of leverage by adjusting their current leverage policy. Chinese firms take almost 3.5 years for adjustment. The analysis is extrapolated to state owned enterprises (SOEs) and non-state owned enterprises (NSOEs) and it is found that SOEs take longer time to adjust to their leverage policy as compared to NSOEs. The results are consistent for both Arellano Bond (GMM1) and Blundell and Bond (GMM2) dynamic panel data models.

Keywords: leverage, non-financial Chinese firms, generalised method of moments (GMM), capital structure adjustments, target leverage

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INTRODUCTION

Capital structure has become an important subject of study since Modigliani and Miller (1958) proposed their classical theory of irrelevance, that is, the value of a company is independent of its capital structure in a perfect financial market. In the past half century, various theories have been developed to explain corporate financial decisions including the trade-off theory (Miller, 1977), the pecking order theory (Myers & Majluf, 1984), the agency cost theory (Jensen & Meckling, 1976), and the market timing theory (Baker & Wurgler, 2002).

Literature shows that limited research, both theoretical and empirical, has focused on developing countries. Factors which influence the capital structure of firms in developed countries are also relevant to firms in developing countries (Booth, Aivazian, Demirguc-Kunt, & Maksimovic, 2001; Chen, Jiang, & Lin, 2014), but the institutional features can lead to distinct differences (Huang & Song, 2006; Chen, 2004; Wald, 1999). For example, in the US, more than 62% non-financial companies raise their capital through internal financing while in China, more than 50% such firms rely on equity issuance or debt financing to raise capital (Chen, 2004).

Adjustment towards optimal capital structure needs a developed capital market for equity and bonds. In the US, the bond market accounts for 175% of GDP and in Japan 198% of GDP (Saleem, 2013). Various theories have been proposed by researchers to explain capital structure adjustment and its determinants but mainly literature is focused on trade-off and pecking order theories. On the basis of these theories many key variables have been identified such as firm size, growth opportunity, profitability, tangible assets, etc. (Booth et al., 2001; Rajan & Zingales, 1995; Titman & Wessels, 1988).

Firms strive to attain the target level capital structure that they have set for themselves but the adjustment speed depends on the degree of rationality of the firm and on the costs and benefits associated with the adjustment process. Rational firms with no agency problems find it easy to adjust their target leverage but the adjustment speed depends on the cost of adjustment. When the cost of adjustment is less than the benefits gained from the adjustment, the firms will be quick to adjust their existing leverage ratio to target leverage ratio (Qian, Tian, & Wirjanto, 2009).

Being the second largest economy in the world, China is playing an increasingly influential role as an emerging economy in the global economic system. However, this economic development was achieved without a modern

financial system in the region (Chen et al., 2014). For example, the bond market in China is still in its early stages and treasury bills amount to only 3% of corporate bond issuance (Zhang, 2008).

The Chinese economy is still in a transitional phase and adapting to a market oriented economic system, even its securities markets were formed in the 1990s. According to Chen (2004), capital market development and growth of non-state owned enterprise (NSOE) sector were hampered by state monopolies. The ownership structure in Chinese listed firms has government predominance (Sun & Tong, 2003). The government controls the stocks of many listed state-owned enterprises (SOEs). Even after the split share reform in 2005, the government continues to control and influence the choice of capital structure of listed companies (Liu, Tian, & Wang, 2011). This formation provides significant support to the agency conflict between managers and investors as managers have less rights to take part in a company's capital structure decisions: with a low percentage of ownership, managers are interested in getting personal benefits rather than increasing investors' wealth and value of a company (Chen et al., 2014).

Till now, little work has been done regarding capital structure adjustments for non-financial firms in China. Keeping this in mind, this study is conducted to find out the differences between SOEs and NSOEs for the period of 2003–2012. This time period is very important as China has implemented new financial policies and Chinese firms also faced a great amount of financial distress because of financial crisis of 2007–2008.

An Overview of Chinese Market Reforms for SOEs and NSOEs

The considerable economic restructuring and reforms undergone by the Chinese economy over the last 30 years have led to a marked increase in the number of shareholding companies, Chinese firms, SOEs and NSOEs. SOEs and NSOEs differ in the nature of their ownership, agency relations, and bankruptcy risks. The emergence of the stock market has been playing a very significant role in the Chinese economy since it has overlapped with the process of privatisation of Chinese state owned enterprises. The number of listed firms in 1992 was 50; however it increased to 1,378 by 2004. The number of listed NSOEs was 353 in 2004 which made up 25% of the total listed firms. This number was smaller compared to number of listed SOEs, however the market value of these 353 NSOEs accounted for 12.1% of the total market value. A numbers of reforms have been introduced with the development of the Chinese stock market, Notably the corporatisation involving initial public offering of a minority portion of state shares to individual investors who can trade their shares freely on the Shanghai and

Shenzhen stock exchanges. These newly listed companies are still controlled by state through majority share holdings. With this position, the government enjoys two very significant rights, i.e., disposal of assets during mergers and acquisitions and appointment of CEOs. Montinola, Qian and Weingast (1995) and Faccio (2006) argue that these two rights ensure that SOEs have a low risk of bankruptcy because the government can exercise its right of subsidizing the ailing SOEs. Moreover, the government as the majority shareholder provides a number of incentives to these companies, including tax reduction, partial or full repayment of debt, swapping debt with equity and formation of state owned asset management companies to pool in funds to finance the debt burdens.

Moreover banks follow a pecking order in advancing finances to different companies as advised by government whereby SOEs are favoured in bank loans (Brandt & Li, 2003). In contrast, banks' loan granting decisions to NSOEs are based largely on financial rather than political considerations. Because of these reasons it becomes very important to study the adjustment behaviour of leverage in Chinese SOEs and NSOEs.

LITERATURE REVIEW

Capital Structure Theories and Adjustment Towards Optimal Capital Structure

Researchers have given multiple theories to determine optimal capital structure choices for firms but still the knowledge is very limited. Capital structure is a debt to equity ratio and shows how a company finances its operations. Many theories explain the corporate capital structure. It is important to know the difference of opinion among those theories about the target capital structure. In this regard, this study considers the agency theory, the theory of Modigliani and Miller, the trade-off theory and the pecking order theory. The second part of this chapter describes the various determinants of capital structure.

Modigliani and Miller theory and target capital structure

The first theorem of capital structure by Modigliani and Miller (1958) suggests that "the market value of the company is dependent on its capital structure given continued expected rate of return corresponding to its class". In other words, capital structure does not affect the amount of cash flows that the company may divide among its shareholders and debt holders and does not affect the total value of company's debt and equity (Titman & Grinblatt, 1998). This theorem also assumes

that there is a perfect capital market with full competition and no transaction costs, taxes, asymmetric information, bankruptcy costs, agency costs, or arbitrage opportunities (Berk & DeMarzo, 2007). So, this theory does not assume target capital structure for firms.

H1: According to Modigliani and Miller, firms do not follow a target level of capital structure.

Pecking order theory (POT)

Pecking order theory (POT) proposed by Myers (1984) is one of the main theories of capital structure which explains the determinants that influence the capital structure decisions of firms. This theory explains how the firms finance new investments. Myers (1984) suggested that firms finance a new investment first internally or through retained earnings and then with external funds like debts or equity. Information asymmetry is a problem which is associated with external financing because managers usually possess more knowledge than the investors. So, according to Myers and Majluf (1984), firms prefer internal financing over external financing to resolve the information asymmetry problem. This is called the "pecking order" which prefers internal funds (retained earnings) over external funds and in case of external funds, debt is preferred over equity financing. This specific pattern of financing provides no reason for firms to follow a target capital structure.

H2: According to the pecking order theory, firms do not follow a target level of capital structure.

Trade-off theory and target capital structure

Trade-off theory (TOT) is one of the important theories to explain the determinants of capital structure of firms. According to this theory, optimal capital structure is achieved by a trade-off between costs and benefits associated with leverage in a perfect market environment. This theory suggests that optimal capital structure is attained when marginal benefits derived from the costs of debt and benefits associated with debt financing are equivalent. This concept is known as the static trade-off theory. Optimal capital structure is a function of multiple internal and external factors and these factors change over time due to dynamic nature of the firms. So, firms achieve their target capital structure by considering the dynamic environment in which they carry out their activities (Fischer, Heinkel, & Zechner, 1989). Given the uniqueness of Chinese institutional infrastructure and economic environment, it is important to examine the determinants of the target capital

structure of Chinese firms and contribute to literature from the perspective of developing countries. Findings from China will be of particular relevance to other developing countries and emerging economies.

H3: According to trade-off theory, firms follow optimal (target) leverage.

Agency theory

Agency theory proffers a description of changes in capital structure. This theory explains the difference between principals and agents (Jensen & Meckling, 1976) as both have their own objectives to pursue. Managers (agents) have strong incentives to invest in activities that hope to offer high payoffs if they are successful, even if the probability of success is low. If the outcome is good then managers earn the gain but if it turns out badly then investors (principals) bear most of the costs (Jensen & Meckling, 1976).

It is therefore important to find ways to control the agent, which can be done with various controlling measures. For example, there are monitoring costs and bonding costs of the agent (Jensen & Meckling, 1976). Because of the bonding costs, the agent will be more reliable in the eyes of the principal. Another option is to issue more debt so that the managers can be monitored effectively by debt holders (Ibrahimo & Barros, 2009). Considering its basic assumptions and implications, the agency theory describes the changes in the capital structure but it does not explain the concept of optimal or target capital structure.

H4: According to agency theory, firms do not have any target level of leverage.

Empirical Literature Review of Target Capital Structure

Various theories have been proposed to determine the factors of capital structure of firms but only the trade-off theory gives clear assumptions for target capital structure. This theory states that when marginal benefits and costs of debt financing overlap each other, then firms attain their optimal capital structure. The trade-off theory can be classified into two forms: the static trade-off theory and dynamic trade-off theory. The static trade-off theory states that actual and desired leverage ratios are the same (Myers, 1984). On the other hand, the dynamic theory states that a firm defines its target leverage and makes adjustments towards achieving this target (Myers, 1984; Shyam-Sunder & Myers, 1999). Other theories (pecking

order, agency cost and market timing) assume that firms do not have target leverage so they do not make adjustment to target leverage.

Little empirical work has been done to provide evidence of target leverage and the cost of adjustment in non-financial firms of developing or emerging economies as most studies are focused on developed countries. A study by De Miguel and Pindado (2001) on a sample of 133 Spanish non-financial firms has shown how firm-specific and institutional factors affect capital structure choices by using the instrumental variable approach of Arellano and Bond (1991). They found that Spanish firms incur adjustment cost to achieve their target leverage and that this cost is comparatively lower for them than it is for the non-financial firms of the United States because of greater reliance on debt and lower development of the Spanish bond market.

In another study by Drobetz and Wanzenried (2006) on a sample of 90 Swiss non-financial firms, it is argued that growing firms adjust their target leverage easily but within a dynamic model specification when economic conditions are supportive and showing positive development. It can be assumed that adjustment costs are low and do not hinder the adjustment process. But in another study by Flannery and Rangan (2006), which reports the target leverage adjustment for US firms at 30% per year, it is mentioned that 30% adjustment speed is three times higher than what has usually been reported by other studies. Antoniou, Guney and Paudyal (2008) compare the adjustment speed of target leverage for non-financial firms in market-based economies and bank-based economies and find that non-financial firms in market-based economies adjust to their target leverage faster than those in bank-based economies. They argue that bank-based economies do not depend on debt to ensure the creditworthiness of a company to investors in the market and firms are more vigilant and have to incur the cost of being off-target against agency expenses. If this cost is more than the adjustment cost then the adjustment speed will be slow.

In another empirical study, Getzmann, Lang and Spremann (2014) have used a sample of 1301 non-financial firms listed in the Asian financial markets for the period 1995–2009 to find the capital structure determinants and adjustment speed toward target leverage by using the technique of generalised method of moments (GMM) estimation. They provide evidence that the adjustment speed of non-financial firms in Asia towards their target leverage ranges from 27% to 39%. These results are comparable to the results reported by Flannery and Rangan (2006) for US firms.

Ramjee and Gwatidzo (2012) find that the adjustment cost is low in a sample of 178 South African non-financial firms listed on the Johannesburg stock market for the period of 1998–2008. They use GMM technique to determine the cost and speed of adjustment and find that the adjustment cost of total debt is 0.345 and of long term debt is 0.198, which implies an adjustment speed of 0.665 and 0.802, respectively. These results are comparable to the results for Spanish firms in De Miguel and Pindado (2001).

Haron, Ibrahim, Nor and Ibrahim (2013) provide evidence from 590 non-financial firms listed in Malaysia that firms make adjustments to target leverage as they deviate from it. The authors have used a partial adjustment model and the GMM technique and found that the adjustment cost is lower than the adjustment speed, which are 0.43 and 0.57, respectively. A study on 148 non-financial firms listed on Borsa Istanbul for the period 1998–2010 by Arioglu and Tuan (2014) reports the adjustment speed to target leverage to be about 29%, which is quite comparable to the findings from developed markets.

A study by Chinese researchers, Qian et al. (2009), on a sample of 650 Chinese private listed firms for the period of 1999–2004, found that the Chinese private firms set their target leverage ratio but their adjustment speed is very slow. Further, they found that the relationship of firm size, tangibility and ownership structure with the firm's leverage ratio is positive while profitability, non-debt tax shields, growth and volatility are negatively correlated with leverage ratio.

Tian, Han and Zhang (2015) found that Chinese public manufacturing firms adjust their target leverage at different speeds that depend on their life cycle stages. The researchers have used a business life cycle model proposed by Dickinson (2001) for the period of 1999 to 2011 to investigate the determination of their capital structures. They found that firms in different life cycle stages behave differently to adjust their target capital structures. They also found that cash flow patterns have a stronger impact on capital structure than the firm's age.

DETERMINANTS OF TARGET CAPITAL STRUCTURE

This section explains different factors that determine the capital structure of a firm. Various studies have been carried out to explain three categories of factors determining target leverage, i.e., firm-level, industry-level and macroeconomic factors (Rajan & Zingales, 1995; Booth et al., 2001; DeJong, Nguyen, & Kabir, 2008; Jeveer, 2013) as well as adjustment rate towards target leverage (Drobetz & Wanzenried, 2006; Tongkong, 2012; Getzmann et al., 2014). Antoniou et al. (2008)

argue that different countries like the UK, the US, France, Germany and Japan share similar factors determining capital structures of firms but their importance varies because of different governance structures in each of these countries. So country specific factors are also needed in determining the capital structure of firms as firm and industry specific factors alone cannot explain the same. So, in this study, economic growth (GDP growth rate) and inflation are taken as the country specific factors to determine the capital structure of Chinese firms along with other firm level factors.

Size

Pecking order theory (POT) and trade-off theory (TOT) have similar views about adjustment towards target leverage as both consider firm size a factor in this regard. Since adjustment involves costs, which might be smaller for larger firms, therefore larger firms are expected to adjust speedily towards leverage targets.

Rajan and Zingales (1995) used four variables of tangible assets, market to book ratio, size, and profitability to determine their relationship with capital structure in the economies of G7 countries. They found a positive relationship between size and the level of debt. Wald (1999) also found a positive relationship between size and leverage for firms in the US, the UK, Germany and France.

For China, however, researchers have found mixed results for size and leverage. Chen and Strange (2005) and Huang and Song (2006) have shown that there is a positive relationship between size and leverage for the firms in China but Tong and Green (2005), Anwar and Sun (2013), and Zou and Xiao (2006) have shown that leverage and size are negatively correlated.

Growth Potential

Growth opportunities also influence the capital structure as has been suggested by different researchers and theories. For example, Myers (1977) and Titman and Wessels (1988) suggest that growing firms have more flexibility to choose their future investment. According to the pecking order theory, in the first place firms prefer to finance a new investment with internal funds and then through external financing. This predicts that growing firms have lower leverage. Deesomsak, Paudyal and Pescetto (2004) have shown that there is a negative relationship between growth opportunities and leverage. So it can be assumed that adjustment process for growing firms to achieve their optimal capital structure will be faster as growing firms would have flexible capital structure choices to gain their target capital structure.

The agency problem also applies to the relationship between growth and leverage. The choices of investment are made by managers (agents). When there is more flexibility in financial investments as suggested by Titman and Wessels (1988) then managers will also be more flexible in financing their investments. Managers have a preference for satisfying their own goals and maximizing their own utility first and only secondarily that of the shareholders (Jensen & Meckling, 1976). To mitigate this problem, control of the managers is required. A solution for this problem is to issue more debt and therefore, it suggests a positive relation between growth and leverage.

These two theories contradict each other. The empirical research parts of Rajan and Zingales (1995) and Titman and Wessels (1988) find a negative relation between growing firms and leverage. Therefore, this study assumes that there is a negative relation between growth and leverage but faster adjustment speed towards target leverage.

Profitability

Profitability also influences the capital structure. Researchers have found that there is a negative relationship between profitability and leverage (Ozkan, 2001), which is explained by the pecking order theory. Rajan and Zingales (1995) and Titman and Wessels (1988) have also found that there is a negative relationship between profitability and leverage. The pecking order theory suggests that firms prefer internal funds over outside finance (Myers, 1984). But the trade-off theory claims that as the firms are profitable so they would prefer to access external funds rather than using their internal funds to finance their projects.

Profitable firms usually have more ease to access external funds to finance their projects. TOT suggests that there's a positive relationship between leverage and profitable firms. Having all the financing options in hand, it will be easier and quicker for profitable firms to adjust their leverage targets.

Chinese researchers have shown that there is a negative relationship between profitability and leverage (Chen, 2004; Tong & Green, 2005; Huang & Song, 2006; Anwar & Sun, 2013; Zou & Xiao, 2006; DeJong et al., 2008). Therefore, a negative relationship between profitability and leverage and faster adjustment is assumed for this study.

Tangibility

Tangibility is defined as the collatralisable assets which can be used to get loans. According to Myers and Majluf (1984), issuing debt by this way helps a firm avoid associated costs. So, this finding suggests that tangibility has a positive correlation with leverage which supports the trade-off theory. Researchers have shown mixed results as some researchers find a positive relationship between tangibility and leverage (Wald, 1999; Viviani, 2008; DeJong et al., 2008; Rajan & Zingales, 1995; Titman & Wessels, 1988) and others have shown a negative relationship between these variables (Mazur, 2007; Karadeniz, Yilmaz Kandir, Balcilar, & Beyazit, 2009). Booth et al. (2001) have given evidence in their study on the firms in Pakistan, India, Brazil and Turkey that there is a negative relationship between tangibility and leverage. It is expected that firms with more tangible assets have more access to both sources of funds (debt/equity) so such firms are more likely to attain their target leverage.

Chinese Researchers like Chen (2004) and Huang and Song (2006) in their few studies on the Chinese market have found that there is a positive relationship between tangibility and leverage. Therefore, this study assumes a positive relation between tangibility and leverage.

Non-debt Tax Shield (NDTS)

According to DeAngelo and Masulis (1980), NDTS is an alternative to tax shield on debt financing. When firms' income is consistently becoming low or negative then non-debt tax shield is applicable to them. Studies have shown quite mixed results regarding the relationship between NDTS and leverage. Bradley, Jarrell and Kim (1984) have shown a positive relationship between the NDTS and leverage but Wald (1999) has shown a negative correlation between NDTS and leverage.

In China, researchers have shown that there is a negative relationship between NDTS and leverage. Huang and Song (2006) and Anwar and Sun (2013) provide evidence for negative relationship between NDTS and leverage. They provide evidence that Chinese firms consider it only in long term debt financing so tax has very low significance. In this case the adjustment speed for firms towards their target capital structure is expected to be slower.

Tax

Tax is a very important factor which determines the capital structure for firms as Modigliani and Miller (1963) have suggested that companies should gain more

debt financing because financing through debt allows firms to avail tax deductions associated with it due to interest payments on debt. So researchers like Sett and Sarkhel (2010) have found that there is a positive relationship between effective tax rate and leverage.

Chinese researchers Huang and Song (2006) have shown that there is a negative relationship between tax rate and leverage which supports the pecking order theory. But Chen and Strange (2005) have shown that there is no significant relationship of tax rate with leverage in China. However, for the purposes of this study, it is assumed that there is a negative relation between tax and leverage. So, it can be assumed that when tax rate is high (increasing) then firms are expected to be quick to adjust to their target capital structure and vice versa.

Volatility

Volatility is a very important factor to determine capital structure of firms as it measures the probability of financial distress. Researchers like Choi and Richardson (2016), DeJong et al. (2008) and Booth et al. (2001) have found that there is a negative relationship between volatility and leverage.

Chinese researchers like Huang and Song (2006) and Anwar and Sun (2013) have also confirmed the same results and have provided evidence that there is a significantly negative relationship between volatility and leverage. Therefore, this study assumes a negative relation between volatility and leverage and a slower adjustment speed to achieve target leverage.

Liquidity

Liquidity is a very important determinant of capital structure of firms. Capital structure theories take the relationship of liquidity with leverage in different ways as the trade-off theory argues a positive relationship between liquidity and leverage and proposes that firms with higher liquidity ratios should go for debt or borrowings which can facilitate companies to adjust their capital structure ratios instantly. While, on the other hand, pecking order theory shows a negative relationship between liquidity and leverage because firms with higher liquidity ratios prefer to use internal funds (retained earnings) to finance their new investment projects (Viviani, 2008). Researchers like Mazur (2007) and Qureshi, Imdadullah and Ahsan (2012) have given their findings which are consistent with the pecking order theory. Therefore, this study assumes a negative relationship between liquidity and leverage but faster adjustment speed towards the target leverage.

Economic Growth

GDP is considered as the measure of the welfare of the economy. A low GDP reflects low expenditure by firms and consumers and vice versa (Gleditsch, 2002). GDP growth is taken as the measure of economic growth in this study. Various studies have shown the relationship between GDP growth and capital structure decisions of firms. Researchers have shown that GDP growth and capital structure have negative relationship (Dincergok & Yalciner, 2011; Camara, Pessarossi, & Rose, 2014). Researchers argue that an increase in the GDP growth rate will increase the profits so firms would prefer to use their internal funds, which is a basic assumption of the pecking order theory (Gajurel, 2006). Rajan and Zingales (1995) have given evidence in their study that negative correlation of GDP growth rate and leverage would confirm the pecking order theory and positive relationship would support the trade-off theory. It can be assumed that firms in countries with sound economic growth are expected to adjust to their target capital structure quicker than firms in countries with poor economic growth.

Another study, conducted by DeJong et al. (2008) in a sample of 42 countries from 1997–2001, found that not only firm specific factors like tangibility, size, profitability and growth opportunities but country specific factors like economic growth (GDP Growth) are also important factors in determining the capital structure decisions. They have shown that there is a positive relationship of economic growth with the corporate capital structure and they further argue that in countries with stronger and sound legal systems, firms prefer debt over equity. In short, country specific factors are important while deciding capital financing options for firms. Therefore, a positive relationship between economic growth and leverage is assumed for this study.

Inflation Rate

Inflation rate is a measure to check the uncertainty in economy. It is one of the important country specific variables to determine the capital structure of firms. Researchers have found mixed results as Frank and Goyal (2009) have found that there is no relationship between inflation and capital structure of a firm but Gajurel (2006) has found that there is a negative relationship between inflation and capital structure. In this case firms will be slower to adjust their targeted capital structure. Contrary to this, researchers like Sett and Sarkhel (2010) and Hanousek and Shamshur (2011) have found that there is a positive relationship between inflation rate and leverage and it supports the TOT, which suggests that adjustment speed towards their optimal capital structure is expected to be quicker. Therefore, a positive relation between inflation and leverage is assumed for this study.

DATA AND METHODOLOGY

In this research article, annual data has been used from the financial statements of non-financial firms of China for the time period of 2003–2012. This time period exactly shows the impact of financial crisis on the capital structure of firms in China. For this research, data has been taken from very reliable Chinese databases like RESSET and CSMAR. Firm level data (Profitability, Size, Tangibility, Liquidity, Non-Debt Tax Shield and Volatility) has been accessed from RESSET and CSMAR while economic data (Economic growth, Tax Rate and Inflation) has been taken from EIU-Country Data. Table 1A (see Appendix A) shows the list of all variables and its proxy descriptions with expected relationships with leverage.

Data has been carefully selected for the firms and excludes firms on the basis of following criteria as mentioned by Harrison and Widjaja (2014):

1. Financial institutions such as banks, insurance firms, leasing firms, private equity and investment firms.
2. Newly listed or delisted firms during the period of research 2003–2012.
3. Non-availability of certain accounts to calculate variables (Profitability, Size, Tangibility, Liquidity, Non-Debt Tax Shield, Volatility, Economic growth, Tax Rate and Inflation).
4. The leverage value is larger than the total asset value.

On the basis of above criteria, there are 867 firms in total from various sectors listed on both Shenzhen and Shanghai stock exchanges (Refer Table 2A in Appendix B for the distribution of firms across industries). Further we base our model on the dynamic trade off theory as suggested by Fischer, Heinkel and Zechner (1989), Harford, Klasa and Walcott (2009), and Öztekin and Flannery (2012). Harford et al. (2009) study is based on deviation from a target level by calculating the difference between actual and estimated values. However this study uses generalized method of moments to calculate speed of adjustment for Chinese firms. For generalized method of moments this study utilizes estimation model and techniques employed by Haron et al. (2013) and Memon, Rus and Ghazali (2015) to estimate the adjustment speed of leverage in Chinese firms.

Model Development

$$\begin{aligned} LEV_{it} = {} & \gamma\beta_0 + \rho LEV_{it-1} + \delta_1 PROF_{it} + \delta_2 SIZE_{it} + \delta_3 TANG_{it} + \\ & \delta_4 LIQ_{it} + \delta_5 VOL_{it} + \delta_6 GP_{it} + \delta_7 NDTS_{it} + \delta_8 TAX_{it} + \\ & \delta_9 ED_{it} + \delta_{10} INF_{it} + \eta_i + \lambda_t + \upsilon_{it} \end{aligned} \quad (1)$$

where,

LEV_{it} is the total leverage which can be calculated by total debt ratio, *PROF* is the profitability, SIZE is the size of the firm, TANG is the tangibility, LIQ is the firm's liquidity, VOL is the volatility in earnings, GP is growth potential of a firm, NDTS is the non-debt tax shield, INF is the inflation, ϵ = random error term, i = firms in the same cross-section (e.g., 1, 2, 3 ... n), and t = period of time (years).

During analysis we incorporate a dummy for SOE. We follow Safdar and Yan (2016) to classify firms into state-owned and non-state-owned firms. We take those firms as state owned enterprises in which government shares are at least 25%. For any given year for a firm having more than 25 % state ownership it is categorised as a state owned firm and variable SOE has the value of 1 for such firms and 0 otherwise. In order to address the issue of any possible endogeneity and problems associated with a target level of capital structure the study uses a dynamic model based on the following equation (Oztekin & Flannery, 2012; Haron et al., 2013).

$$LEV_{it} - LEV_{it-1} = \gamma(LEV^{*}_{it} - LEV_{it-1}) \tag{2}$$

In Equation 2, $(LEV^{*}_{it} - LEV_{it\text{-}1})$ shows the adjustment required by a firm to adjust to a target level. γ is the coefficient of adjustment. Values of this coefficient ranges from 0 to 1. If γ is equal to zero then $LEV_{it} = LEV_{t\text{-}1}$ which implies that the firm does not try to achieve an optimal level of a leverage due to the associated costs and wants to remain with its current policy. However if γ is equal to 1 then $LEV_{it} = LEV^{*}_{it}$. In this case the firm wants to achieve a target level of leverage.

By putting Equation 1 into Equation 2 we get the following equation:

$$\begin{aligned} LEV_{it} \;=\; & \gamma\beta_0 + (1-\gamma)LEV_{it-1} + \gamma\beta_1 PROF_{it} + \gamma\beta_2 SIZE_{it} + \gamma\beta_3 TANG_{it} \\ & + \gamma\beta_4 LIQ_{it} + \gamma\beta_5 VOL_{it} + \gamma\beta_6 GP_{it} + \gamma\beta_7 NDTS_{it} \\ & + \gamma\beta_8 TAX_{it} + \gamma\beta_9 ED_{it} + \gamma\beta_{10} INF_{it} + \eta_i + \lambda_t + \gamma e_{it} \end{aligned} \tag{3}$$

In Equation 3, corresponds to firm specific effects while are the time specific effects. Simplifying Equation 3 following equation results.

$$\begin{aligned} LEV_{it} \;=\; & \gamma\beta_0 + \rho LEV_{it-1} + \delta_1 PROF_{it} + \delta_2 SIZE_{it} + \delta_3 TANG_{it} + \\ & \delta_4 LIQ_{it} + \delta_5 VOL_{it} + \delta_6 GP_{it} + \delta_7 NDTS_{it} + \delta_8 TAX_{it} \\ & + \delta_9 ED_{it} + \delta_{10} INF_{it} + \eta_i + \lambda_t + \upsilon_{it} \end{aligned} \tag{4}$$

All other variables are mentioned and described in Table 1A (see Appendix).

Data panelling methods and random effect model have been used in this model. The RE model applies a different intercept for each data unit in both cross-section and time series in order to maintain the level of degrees of freedom. Data has been analysed and run through Stata to examine the presence of significant correlation between the independent variables (Profitability, Size, Tangibility, Liquidity, Non-Debt Tax Shield, Volatility, Growth Potential, Economic growth, Tax Rate and Inflation) and the dependent variable (total leverage).

Table 1
Descriptive statistics

Variable	Overall			SOEs			NSOEs		
	Obs	Mean	S.D.	Obs	Mean	S.D.	Obs	Mean	S.D.
TD	8790	0.61	0.60	4586	0.55	0.29	4204	0.68	0.81
TAX	8790	0.23	0.08	4586	0.23	0.08	4204	0.22	0.08
NDTS	8790	0.02	0.03	4586	0.02	0.03	4204	0.01	0.03
VOL	8790	0.17	0.49	4586	0.14	0.40	4204	0.21	0.57
PROF	8790	0.09	0.23	4586	0.08	0.21	4204	0.09	0.26
LIQ	8790	1.34	0.97	4586	1.31	0.93	4204	1.37	1.00
TANG	8790	0.30	0.19	4586	0.32	0.19	4204	0.28	0.18
SIZE	8790	21.78	1.28	4586	21.94	1.17	4204	21.62	1.38
GP	8790	1.43	1.27	4586	1.30	1.15	4204	1.56	1.37
GDP	8790	10.45	1.77	4586	10.48	1.76	4204	10.42	1.77
INF	8790	3.08	2.09	4586	3.08	2.09	4204	3.07	2.10

Notes: TD is the total debt to asset ratio. TAX is the corporate tax rate measured through the ratio of company' income to the tax paid. NDST is the non-debt tax shield. VOL is the volatility in EBIT measured by the standard deviation in EBIT. PROF is the profitability measured through return on equity. LIQ is the liquidity measured through networking capital. TANG is the tangibility measured through the ratio of fixed assets with total assets. SIZE is firm's size measured by taking the natural log firm's total assets. GP is the growth potential of each firm measured by taking the ratio of firm's total market value and book value. GDP is the real annual growth in GDP. INF is the inflation rate. S.D. = Standard Deviation

RESULTS AND DISCUSSION

In this section, we provide results of our analysis. Table 1 represents the descriptive statistics. It indicates that the mean value of leverage ratio is higher for the non-state owned enterprises than for the state-owned enterprises in China. However, the corporate tax rate is higher for the state-owned enterprises which might imply that state owned enterprises have better and efficient utilisation of leverage as compared to non-state owned enterprises. But the profitability rate is almost equal

between state owned and non-state owned enterprises. The non-debt tax shield is slightly higher for state owned enterprises. State owned enterprises report a higher tangibility ratio compared to non-state owned enterprises. The liquidity position has good prospects for SOEs and NSOEs as both have almost equal liquidity ratio compared to overall firms. Table 1 reports similar size for both state owned and non-state owned enterprises, which excludes size biasness from the analysis of separate sub samples of SOEs and NSOEs.

Table 2 shows the correlation matrix, the star sign indicates a significance of correlation between variables at 95 % significance level. The table indicates that there is no significant positive correlation between independent variables that can lead to the problem of multicolinearity.

Table 2
Correlation matrix

Variables	TD	TAX	NDTS	VOL	PROF	LIQ	TANG	SIZE	GP	GDP	INF
TD	1										
TAX	0.040*	1									
NDTS	-0.134*	0.052*	1								
VOL	0.2270*	0.062*	-0.138*	1							
PROF	-0.002	0.019	0.013	0.014	1						
LIQ	-0.334*	-0.122*	-0.087*	-0.144	0.069*	1					
TANG	-0.030*	0.122*	0.449*	0.0056	-0.035*	-0.342*	1				
SIZE	-0.188*	-0.034*	0.182*	-0.191	0.098*	-0.118*	0.1084*	1			
GP	0.055*	-0.053*	-0.121*	0.0975	0.123*	0.2288*	-0.106*	-0.402*	1		
GDP	0.008	0.1004*	0.0513*	0.0141	0.0277*	-0.054*	0.0584*	-0.137*	0.1633*	1	
INF	-0.007	0.036*	0.0257*	-0.002	0.0233*	-0.0043	0.0079	-0.041*	-0.0151	0.4397*	1

Notes: * represents significance at 95% significance level. TD is the total debt to asset ratio. TAX is the corporate tax rate measured through the ratio of company' income to the tax paid. NDST is the non-debt tax shield. VOL is the volatility in EBIT measured by the standard deviation in EBIT. PROF is the profitability measured through return on equity. LIQ is the liquidity measured through networking capital. TANG is the tangibility measured through the ratio of fixed assets with total assets. SIZE is firm's size measured by taking the natural log firm's total assets. GP is the growth potential of each firm measured by taking the ratio of firm's total market value and book value. GDP is the real annual growth in GDP. INF is the inflation rate.

Regression Analysis

Tables 3, 4 and 5 represent regression output for overall, state owned and non-state owned firms respectively. Results include the impact of firm and country level characteristics on the leverage policy of Chinese Firms. Columns 1 and 2 of Tables 3, 4 and 5 represent the results of Arellano Bond (GMM1) and Arellano, Bond and

Bundell (GMM2) regressions, respectively, for the dynamic model of our study. Columns 3 and 4 represent results for fixed effects with an autoregressive term (FE [AR]) and simple fixed effects (FE), respectively. Table 3 pertains to overall firms, while Tables 4 and 5 represent results for state owned and non-state owned enterprises respectively. The use of GMM (Generalised Method of Moments) is to estimate the adjustment speed for firms. By adjustment speed we mean with what speed the firm is going to change its leverage policy.

Adjustment Behaviour in Chinese Firms

Two GMM models were used to determine the adjustment speed of leverage policy in Chinese firms. This adds robustness to our study. GMM1 (Arellano Bond) indicates an adjustment coefficient of 0.936 for overall firms. This indicates an adjustment speed of approximately 0.07 (1–0.936). This speed according to our GMM2 (Arellano, Bond and Blundell) is approximately 0.35 (1–0.65) which indicates that Chinese firms take almost 3.5 years to adjust to their target leverage policy. Adjustment speed for Chinese firms before and after the 2008 crisis provides some important insight and empirical findings. Tables 6 and 7 represent results for leverage adjustment and its determinants before and after the 2008 crisis. According to Table 6, the coefficient for lagged leverage (Lev1) is positive for both GMM1 and GMM2, however it is statistically insignificant, but if we look at the findings of Table 7, it provides some interesting findings. The adjustment speed is 0.23 (1–0.77) according to GMM1 (Table 7). GMM2 reports an adjustment speed of 0.12 (1–0.88) (see Table 7). This shows that reliance on trade off model of capital structure decreases after the 2008 crisis. It means after the 2008 crisis, Chinese firms were more inclined to follow a trade-off model of financing rather than target leverage.

Adjustment Behaviour of State owned and Non-state owned enterprises

Columns 1 and 2 of Tables 4 and 5 represent results for our generalised method of moments (GMM) models for state-owned and non-state owned enterprise. The results indicate that GMM1 and GMM2 report higher adjustment coefficients for state owned enterprises and report a lower coefficient for non-state owned enterprise. This shows that state owned enterprises take longer to adjust to their target level of leverage than non-state owned enterprises. Results of both GMM1 and GMM2 are consistent with our findings, which add robustness to our results. GMM1 reports an adjustment coefficient of 0.48 (1–0.52) for state owned enterprise, while for non-state owned enterprises it reports a coefficient of 0.11 (1–0.89), which is lower than the coefficient for state owned enterprise indicating a lesser time taken by non-state owned enterprises to adjust to their target level of leverage policy.

Table 3
Regression results for overall firms

	GMM1	GMM2	FE(AR)	FE
Lev(l1)	0.936***	0.657***		
	(0.008)	(0.018)		
TAX	-0.042	-0.045	-0.047	-0.06***
	(0.038)	(0.033)	(0.058)	(0.065)
NDTS	-0.238	-0.313	-0.024*	-0.737**
	(0.103)	(0.105)	(0.110)	(0.151)
VOL	0.027**	0.042**	0.008	0.023
	(0.011)	(0.011)	(0.010)	(0.009)
PROF	0.027**	0.021**	0.030**	0.01
	(0.014)	(0.013)	(0.010)	(0.015)
LIQ	-0.088**	-0.086	-0.11**	-0.153**
	(0.008)	(0.008)	(0.006)	(0.005)
TANG	-0.056**	-0.073***	0.152	0.084***
	(0.033)	(0.042)	(0.038)	(0.037)
SIZE	-0.052**	-0.021***	-0.15**	-0.067**
	(0.009)	(0.009)	(0.009)	(0.006)
GP	0.002	-0.002	0.023	0.029***
	(0.003)	(0.003)	(0.003)	(0.004)
GDP	-0.007**	-0.003**	-0.01**	-0.012**
	(0.001)	(0.001)	(0.002)	(0.002)
INF	0.000	0.000	0.002	0.001
	(0.001)	(0.001)	(0.001)	(0.002)
CONSTANT	1.404***	0.839	4.208	2.369***
No of instruments	55.000	47.000		
Abond Test	0.062	0.173		
Sargan Test	62.660	42.318		
Adj. R-square			0.122	0.179
Bhargava et al. (Ramaswami, Srivastava, & Bhargava, 2009)			0.805	
Baltagi-Wu LBI			1.084	
Hausman Test			186.040	134.090

Notes: *, **, *** shows significance at 90%, 95% and 99% respectively. Standard errors are given in parentheses (). TD is the total debt to asset ratio. TAX is the corporate tax rate measured through the ratio of company' income to the tax paid. NDST is the non-debt tax shield. VOL is the volatility in EBIT measured by the standard deviation in EBIT. PROF is the profitability measured through return on equity. LIQ is the liquidity measured through networking capital. TANG is the tangibility measured through the ratio of fixed assets with total assets. SIZE is firm's size measured by taking the natural log firm's total assets. GP is the growth potential of each firm measured by taking the ratio of firm's total market value and book value. GDP is the real annual growth in GDP. INF is the inflation rate.

Table 4
Regression results for state owned enterprises

	GMM1	GMM2	FE(AR)	FE
Lev(L1)	0.528***	0.301***		
	(0.008)	(0.009)		
TAX	-0.055	-0.039	-0.013	-0.384
	(0.031)	(0.027)	(0.054)	(0.588)
NDTS	0.202**	0.201**	0.25**	0.87***
	(0.087	(0.084)	(0.101)	(1.300)
VOL	-0.07***	-0.07***	-0.070	-0.17***
	(0.011)	(0.013)	(0.011)	(0.063)
PROF	0.04***	0.045***	-0.008	0.161**
	(0.011)	(0.012)	(0.011)	(0.142)
LIQ	-0.087**	-0.078*	-0.08**	-0.10***
	(0.008)	(0.007)	(0.005)	(0.036)
TANG	0.127**	0.087***	0.081**	0.067**
	(0.027)	(0.027)	(0.034)	(0.260)
SIZE	-0.003**	-0.023***	-0.04**	-0.002**
	(0.006)	(0.007)	(0.009)	(0.046)
GP	0.002**	0.004**	0.009*	0.037**
	(0.002)	(0.002)	(0.003)	(0.029)
GDP	-0.003**	-0.001**	-0.03**	-0.01***
	(0.001)	(0.001)	(0.002)	(0.021)
INF	0.000	0.000	0.001	0.003
	(0.000)	(0.000)	(0.001)	(0.013)
Constant	0.387	0.027	-0.382	0.820***
No. of Instruments	55.000	47.000		
Abond Test	0.237	0.489		
Sargan Test	52.010	46.230		
Wald chi^2		1474.070		
Adj R-square			0.161	0.221
Bhargava et al.			0.94	
Baltagi-Wu LBI			1.15	
Hausman Test			131.09	104.37

Notes: *, **, *** shows significance at 90%, 95% and 99% respectively. Standard errors are given in parentheses. TD is the total debt to asset ratio. TAX is the corporate tax rate measured through the ratio of company' income to the tax paid. NDST is the non-debt tax shield. VOL is the volatility in EBIT measured by the standard deviation in EBIT. PROF is the profitability measured through return on equity. LIQ is the liquidity measured through networking capital. TANG is the tangibility measured through the ratio of fixed assets with total assets. SIZE is firm's size measured by taking the natural log firm's total assets. GP is the growth potential of each firm measured by taking the ratio of firm's total market value and book value. GDP is the real annual growth in GDP. INF is the inflation rate.

Table 5
Regression results for non-state owned enterprises

	GMM1	GMM2	FE(AR)	FE
LEV(L1)	0.899***	0.644***		
	(0.010)	(0.019)		
TAX	-0.010	-0.016	-0.047	0.679
	(0.052)	(0.049)	(0.101)	(1.066)
NDTS	0.257	0.243	0.246	-3.556**
	(0.164)	(0.175)	(0.204)	(2.527)
VOL	0.001	0.039	0.008	0.069
	(0.013)	(0.016)	(0.016)	(0.095)
PROF	0.087**	0.072**	0.050***	-0.351
	(0.015)	(0.016)	(0.018)	(0.299)
LIQ	-0.119**	-0.110**	-0.168**	-0.136**
	(0.012)	(0.011)	(0.009)	(0.081)
TANG	0.064	0.019	0.143***	2.043**
	(0.054)	(0.074)	(0.064)	(0.590)
SIZE	-0.122***	-0.065**	-0.169**	-0.187**
	(0.013)	(0.015)	(0.011)	(0.084)
GP	0.016****	0.009**	0.035**	0.104**
	(0.003)	(0.004)	(0.005)	(0.044)
GDP	-0.014***	-0.008**	-0.014**	-0.036**
	(0.002)	(0.002)	(0.004)	(0.035)
INF	0.000	0.000	0.002	0.015
	(0.001)	(0.001)	(0.002)	(0.026)
Constant	3.005	1.850	4.595	4.347***
No of Instruments	55.0	47.0		
Abond Test	0.4	0.7		
Sargan Test	67.0	57.3		
Wald chi^2		2277.0		
Adj R-square			0.18	0.10
Bhargava et al.			0.77	
Baltagi-Wu LBI			1.08	
Hausman Test			123.07	107.65

Notes: *, **, *** shows significance at 90%, 95% and 99% respectively. Standard errors are given in parentheses. TD is the total debt to asset ratio. TAX is the corporate tax rate measured through the ratio of company' income to the tax paid. NDST is the non-debt tax shield. VOL is the volatility in EBIT measured through the standard deviation of EBIT. PROF is the profitability measured through return on equity. LIQ is the liquidity measured through networking capital. TANG is the tangibility measured through the ratio of fixed assets to total assets. SIZE is firm's size measured by taking the natural log firm's total assets. GP is the growth potential of each firm measured by taking the ratio of firm's total market value and book value. GDP is the real annual growth in GDP. INF is the inflation rate.

Table 6
Regression analysis before crises for overall firms

	GMM1	GMM2	FE(AR)	FE
Lev(L1)	0.438	0.008		
	(0.111)	(0.033)		
TAX	0.056	-0.105	-0.103*	-0.156
	(0.155)	(0.085)	(0.104)	(0.107)
NDTS	0.137**	0.536	0.09**	0.084**
	(0.251)	(0.334)	(0.176)	(0.204)
VOL	-0.083	-0.059	-0.01**	-0.04**
	(0.041)	(0.035)	(0.019)	(0.015)
PROF	-0.024	-0.087	-0.021	-0.01**
	(0.024)	(0.029)	(0.015)	(0.019)
LIQ	-0.095**	-0.093**	-0.10**	-0.121
	(0.013)	(0.015)	(0.009)	(0.008)
TANG	0.108**	0.062**	0.130	0.147
	(0.123)	(0.085)	(0.055)	(0.053)
SIZE	-0.170	-0.029**	-0.16**	-0.2***
	(0.072)	(0.035)	(0.019)	(0.014)
GP	-0.013	0.003	0.043	-0.004
	(0.012)	(0.011)	(0.006)	(0.006)
GDP	-0.039	-0.012*	-0.01**	-0.04**
	(0.010)	(0.005)	(0.005)	(0.003)
INF	-0.005	-0.005	-0.021	0.007
	(0.006)	(0.006)	(0.005)	(0.006)
_cons	4.175**	0.943**	4.389**	5.629
No of Instruments	43	35		
Abond Test	0.235	0.392		
Sargan Test	53	31		
Wald chi^2		1234		
Adj R Square			17.05	18.12
Bhargava et al.			1.29	
Baltagi-Wu LBI			1.86	
Hausman Test			136	119

Notes: *, **, *** shows significance at 90%, 95% and 99 % respectively. Standard errors are given in parentheses. TD is the total debt to asset ratio. TAX is the corporate tax rate measured through the ratio of company' income to the tax paid. NDST is the non-debt tax shield. VOL is the volatility in EBIT measured through the standard deviation of EBIT. PROF is the profitability measured through return on equity. LIQ is the liquidity measured through networking capital. TANG is the tangibility measured through the ratio of fixed assets to total assets. SIZE is firm's size measured by taking the natural log firm's total assets. GP is the growth potential of each firm measured by taking the ratio of firm's total market value and book value. GDP is the real annual growth in GDP. INF is the inflation rate.

Table 7
Regression analysis for overall firms after crises–2008

	GMM1	GMM2	FE(AR)	FE
Lev(L1)	0.774***	0.884***		
	(0.035)	(0.014)		
TAX	-0.029	-0.021	-0.251**	-0.150
	(0.053)	(0.056)	(0.115)	(0.116)
NDTS	0.513***	0.423**	0.793***	0.238
	(0.181)	(0.167)	(0.222)	(0.209)
VOL	0.017	0.015	0.060**	0.030
	(0.022)	(0.021)	(0.023)	(0.019)
PROF	-0.020	-0.007	-0.044**	-0.04**
	(0.019)	(0.019)	(0.025)	(0.023)
LIQ	-0.073**	-0.072**	-0.112**	-0.12**
	(0.010)	(0.011)	(0.013)	(0.010)
TANG	-0.140**	-0.141**	0.030	0.044
	(0.052)	(0.054)	(0.095)	(0.076)
SIZE	-0.022	-0.048***	-0.203**	-0.16**
	(0.016)	(0.013)	(0.028)	(0.018)
GP	0.004	0.004	0.033**	0.019**
	(0.005)	(0.005)	(0.009)	(0.008)
GDP	0.000	-0.008**	-0.055**	-0.03**
	(0.005)	(0.004)	(0.016)	(0.006)
INF	-0.001	0.001	0.017***	0.009**
	(0.001)	(0.001)	(0.006)	(0.002)
_cons	0.762**	1.346**	5.734**	4.584**
No of Instruments	37	41		
Abond Test	0.21	0.43		
Sargan Test	57	66		
Wald chi^2		1342		
Adj R Square			14	25
Bhargava et al.			0.997	
Baltagi-Wu LBI			1.79	
Hausman Test			143	112.08

Notes: *, **, *** shows significance at 90%, 95% and 99% respectively. Standard errors are given in parentheses. TD is the total debt to asset ratio. TAX is the corporate tax rate measured through the ratio of company' income to the tax paid. NDST is the non-debt tax shield. VOL is the volatility in EBIT measured through the standard deviation of EBIT. PROF is the profitability measured through return on equity. LIQ is the liquidity measured through networking capital. TANG is the tangibility measured through the ratio of fixed assets to total assets. SIZE is firm's size measured by taking the natural log firm's total assets. GP is the growth potential of each firm measured by taking the ratio of firm's total market value and book value. GDP is the real annual growth in GDP. INF is the inflation rate.

GMM2 (Arellano, Bond and Bundell GMM) of column 2 in Tables 4 and 5 also indicates that state owned enterprises take longer time to adjust to their leverage policy. It reports an adjustment coefficient of 0.70 (1–0.30) for state-owned and 0.66 (1–0.36) for non-state owned enterprises. This again shows that state owned enterprises take more time to adjust to their target leverage ratio.

Table 8 provides the mean difference analysis through ANNOVA. It clearly indicates that difference of means for leverage between SOEs and NSOEs is statistically significant.

Table 8
Annova analysis for SOEs and NSOEs

Variable	Mean of leverage
SOE	0.55
NSOE	0.68
F-value	31.07
Probability of F	0.000

Firm and Country Level of Determinants of Leverage in Chinese Firms

Results for overall firm (Table 3) show negative and statistically significant coefficients for TAX, SIZE, and LIQ. This shows that higher tax forces the firms to adjust their leverage policy to a downward point. VOL is negatively related to leverage and the relationship is statistically significant. This shows that higher the volatility in earnings (EBIT), lesser is the firm reliance on debt. Similarly volatility in EBIT is also a sign of an uncertain position that compels firms to take less leverage in order to avoid risks associated with financial distress. Growth potential (GP) showed a positive and significant coefficient for overall firms. This shows that bigger sized firms have greater following and lower information asymmetry. They have greater access to the debt market. Moreover if such firms have growth potential it will lead these firms to raise more and more debt. Similarly profitability shows a positive relationship with debt which shows that profitable firms are at a safer position to raise more debt and thus profitability positively influences the leverage level in Chinese firms. Firm's liquidity has a negative and statistically significant relationship with leverage in Chinese firms which implies that liquid firms tend to raise less debt as compared to firms with low level of liquidity.

As far as the country level determinants of leverage are concerned, GDP shows an astonishingly negative and statistically significant relationship with leverage. One explanation in this regard might be that GDP growth in most of the

years covered by this study is negative and thus it can be inferred that firms tend to lower their leverage with the prospect of a slow growth rate. Moreover inflation is found to have no relationship with leverage policy for overall firms in China.

Results in Tables 4 and 5 correspond to state owned and non-state owned enterprises respectively. Table 4 shows that NDTS shows a positive and statistically significant relationship with leverage policy. The positive relationship of growth potential with leverage implies that even in time of higher growth prospect the leverage policy of state owned enterprises shows an upward trend. Firm's size, liquidity, and tangibility show a negative and statistically significant relationship with firm's leverage. Profitability shows a positive relationship with leverage for SOEs. SOEs with profitability are at greater ease to raise more funds through debt. Similarly tangibility also adds to firms' ability to raise more debt since the fixed assets can be used as collateral to raise funds.

For NSOEs, results in Table 5 indicate that NDTS and SIZE have a negative and statistically insignificant relationship. This is in contrast to state owned enterprises. This shows these two factors might not be applicable while considering the upward trends in a leverage policy of non-state owned enterprises. Liquidity also shows a negative and statistically significant relationship with leverage of non-state owned enterprises. The growth potential shows a positive and statistically significant relationship with leverage of non-state owned Chinese enterprises and thus implies that in time of growth opportunities non-state owned enterprises tend to raise more funds through debt. GDP shows negative and statistically significant relationship with leverage for both state owned and non-state owned enterprises, while inflation is found to have no relationship with leverage for both state owned and non-state owned enterprises.

CONCLUDING REMARKS

This study is intended to find out the relationship of leverage with country and firm level characteristics. This study is unique because it not only estimates the adjustment speed in leverage policy for Chinese firms but also finds the adjustment speed for SOEs and NSOEs. For this purpose the sample for overall firms is divided into state owned and non-state owned enterprises. To find out the adjustment speed the study used multiple GMM for the purpose of robustness. Both of the GMM report a positive and statistically significant adjustment coefficient, which implies that current leverage is dependent on past leverage and that Chinese firms follow a target level of leverage by adjusting their current leverage policy. It was further found that state owned enterprises report a high adjustment coefficient than non-

state owned enterprises, which implies that non-state owned enterprises take longer to adjust to their target level of leverage.

Apart from adjustment speed, firm and country level determinants of leverage were also tested for their relationship with leverage policy in Chinese firms. It is found that firms' size, profitability, growth potential, and tangibility have a significant influence on firms' leverage policy. Small sized firms and firms with higher growth prospect tend to raise more debt to finance their investment decisions. Moreover firms having profitability and greater tangibility are at ease to raise more debt. Volatility in earnings reported a negative and statistically insignificant relationship which indicates that in times of higher volatility firms tend to reduce their debt level in order to cope with financial distress risk associated with higher level of debt. GDP is found to have a negative relationship since in most of the years covered by this study the real growth in GDP is negative. Inflation shows no relationship with leverage policy of Chinese firms.

Thus this study adds useful insights on the adjustment behaviour of Chinese firms with regard to their leverage policy and also the firm specific and country level determinants of leverage policy. The study provides useful evidence on the adjustment behaviour of Chinese state owned and non-state owned enterprises having policy implications for the managers of these companies.

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APPENDIX A

Table 1A
Independent variables, their description and expected relationship with leverage in Chinese firms

Variable name	Model name	Proxy	Effect on leverage (+/-)
Tax rate	TAX_{it}	Effective rate %	-
Non-debt tax shield	$NDTS_{it}$	Depreciation expenses/total assets	-
Volatility	VOL_{it}	Standard deviation of EBT/total equity	-
Profitability	$PROF_{it}$	Profit before tax/total equity	-
Liquidity	LIQ_{it}	Current assets/current liabilities	-
Growth potential	GP_{it}	Tobin's Q (ratio of market to book value of assets)	-
Tangibility	$TANG_{it}$	Net fixed assets/total assets	+
Firm size	$SIZE_{it}$	ln(total assets)	+
Economic growth	EG_t	% change of GDP	+
Inflation rate	INF_t	Average of consumer price index and producer price index	+
Ownership	O	Dummy = 0 for non-state owned firms and 1 for state owned firms	+

APPENDIX B

Table 2A
Distribution of firms across industries

Industry Code	Industry Name	No. of firms
A01	Farming	22
A02	Forestory	6
A03	Animal Husbandary	13
A04	Fishery	11
A05	Service industry for farming, forestry, animal husbandry and fishery	2
B06	Coal mining and washing	26
B07	Exploitation of petroleum and natural gas	7
B08	Extracting and dressing of ferrous metal mines	6
B09	Extracting and dressing of non-ferrous metal ores	22
B11	Mining support activities	15
C13	Agro-food processing industry	42
C14	Foodstuff manufacturing industry	32
C15	Wine, soft drinks and refined tea industry	36
C17	Textile industry	69
C18	Leather, fur, down and related products and footwear	16
C20	Timber processing, wood, bamboo, cane, palm fibre and straw products	7
C21	Cabinet making industry	9
C22	Paper making and paper product industry	28
C23	Printing and reproduction of recorded media	7
C24	Culture, education, engineering beauty, sports and entertainment goods industry	14
C25	Petroleum refining, coking and nuclear fuel	21
C26	Chemical feedstock and chemical manufacturing industry	203
C27	Medicine manufacturing industry	179
C28	Chemical fibre manufacturing industry	25
C29	Rubber and plastic products industry	49
	Total	867