Determinants of the leverage of listed companies in China

Master Thesis

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Abstract

The dramatic economic development of China has become one of the major successful stories of last few decades. There are more and more studies on corporate financial policy determinants in emerging countries like China. This paper employs a preliminary study to examine the determinants of the capital structure of quoted companies in China.

This paper applies the classical variables used in previous western literatures to China’s case. Additionally, I add two new variables with respect to China’s contemporary financial situation. Our sample consists of Chinese public firms that listed on two Chinese stock exchanges during period 1998 to 2007.

The results of this paper illuminate that most of those variables in western models also considerably influence the capital structure of Chinese listed companies. The predominant findings of this paper are: (1) the capital structures of emerging countries were changing over recent decades. Currently, the leverage levels of companies in developing countries generally exceed those in developed countries. (2) Most of the capital structure theories supported in G-7 countries are also suitable in China, except the growth opportunity has little relationship with the borrowing decision according to our research. (3) This paper adds two new potential determinants into our models, and finds those contemporary financial factors also contribute the decision of capital structure. (4) The industry classification has little effect on the capital structure of Chinese firms.
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1. Introduction

1.1. Background of this research

The design of capital structure in companies has received substantial attention in the academic literature in recent decades. This paper aims to investigate the determinants of leverage on a panel sample of quoted firms in China. It is well known that public companies have many significant advantages than private ones. For instance, listed firms can pool large capitals externally with efficient risk sharing. In this way, companies are likely to have immense access to capital markets for future financing needs. On the other hand, they also have disadvantages, like dispersed ownership can strengthen agency problem among shareholders and managers, dominant and minority shareholders, as well as shareholders and debt holders. Normally, quoted companies are less willing to lever, even when other determinants of capital structure are constrained. Specifically for debt financing, it also has its advantages and disadvantages. The superiority could be that company owner can still maintain ownership, and companies could benefit from tax deduction. Drawbacks to Debt Financing can be concluded as the high interest of debt, the liquidity shortage, and the risk of bankruptcy.

In this thesis, various characteristics of Chinese capital market and companies’ capital structure are respectively documented. This paper would also provide an explicit picture about whether financial decision of corporations differs significantly between emerging economies and developed countries. Moreover, we will explore what exactly influence the capital structure decisions made by Chinese listed firms.

1.2. Thesis structure

This thesis consists of 8 chapters and is organized as follow: after a brief introduction and the background of the entire thesis, chapter 2 reviews current literatures and presents the most prominent theoretical and empirical findings in terms of capital
structure obtained by other former researchers. The third chapter describes the characteristics of Chinese current capital market and reviews the reform of China’s capital structure these years. This chapter also compares China’s stock market performance to other countries. Section 4, 5 are the empirical part of entire research. In this part, the data of Chinese listed companies are presented, measures of leverage and other independent variables are defined. Chapter 6 shows the main results from previous estimations, and the impacts of potential determinants of capital structure on leverage are examined. This chapter also tries to explore the theoretical logic behind the result. Eventually, chapter 7 and 8 conclude with some limitations of this research as well as the suggestions for the future studies.

2.1. Fundamental Theories

2.1.1. Miller and Modigliani irrelevance propositions

Several essential theories regarding capital structure choice have been developed by previous research. The most referenced by scholars would be the financial policy irrelevance theory proposed by Miller and Modigliani (1961). It is also called MM theorem and it is the origin of other capital structure studies. The MM theorem describes that, in an efficient market, irrespective of taxes, agency costs, bankruptcy costs, together with asymmetric information, the value of a firm makes no difference whether a firm finances itself with debt or equity, and hence the manager could choose the leverage level whatever he wants. We call this theorem MM Proposition. This proposition is based on the principle of arbitrage, which states that there is no such opportunity of riskless profit. In other words, it is impossible for one to buy a financial asset (or a good, in general) at a “low” price in one market and sell it at a “high” price in another market. MM Proposition implies that whether the firm’s

1 An efficient market is one in which securities prices reflect all available information, which implies every security traded in the market is correctly valued by given the available information, Graeme Pietersz(2011), derived from http://moneyterms.co.uk/efficient-markets/
managers issue debt or not would not influence the return to its investors, nor its market valuation and share price.

Does MM Proposition also hold in reality? Nowadays many researchers are working on understanding the departures of MM theory in terms of its unrealistic assumption. For instance, Bolton and Scharfstein (1990) believes the capital structure did have remarkable effects on public firms. He demonstrated that in the presence of capital market imperfections, efficient firms may be forced to exit due to lack of funds. They found firm’s survival ability is decided by the fattest (financial resources), not the fittest (economic efficiency) in the trucking industry in the United States. He illustrated that excessive debt do damage a firm’s survival ability, like debt overhang destroy firm’s further borrowing ability, competitiveness as well as its efficient liquidation.

2.12. Trade-Off theory

Trade-Off theory derives from Miller and Modigliani irrelevance propositions, after developed by Kraus and Litzenberger (1973), it becomes a classic statement that when the marginal tax advantages of a additional unit of debt are equivalent to the additional increase of financial distress costs, companies reach the optimization of their debt ratio. It means the optimal capital structure does exist. The basic logic behind this theory is that an increase of debt can increase the tax shield benefit, since interest payments are tax deductible. If the debt levels of companies exceed the optimal leverage ratio, the marginal benefit of additional raise of debt declines as debt keeps increasing. Meanwhile, the marginal cost still increases accompanied with raised debt level. These costs come from the raising probability of default, and deadweight costs of bankruptcy. Consequently in the case of a good company, the debt must be large enough to act as a signal of their performance and confidence.
2.13. **Pecking order theory**

According to “Pecking Order” theory of financing, among external funds, firms tend to firstly issue the safest security, like Straight debt, convertible bonds, and then treat equity as a last resort. If there is no difference between diverse sources of financing for public firms, they would select leverage with the minimum cost of capital in the U shaped curve (M.Bremen, 2012). According to pecking order theory, debt issuance plays a prominent role in companies’ financing. This paper emphasizes the leverage weight of different Chinese public and industrial firms, and tries to find out the possible determinants of the leverage decision.

Brav, 2009 illustrates the difference between the financial structure of private and public firms are striking. Confronted with the debt or equity choice, public firms are remarkably more likely to choose equity financing comparing with debt financing than private firms due to the level effect. Despite this fact, debt financing still remains a crucial role for companies’ capital raising.

2.2. **Current State of Literature**

How do firms choose their capital structures has been debated for ages. Many researches identify a majority of factors explaining variation in corporate capital structures. They accomplish different findings with respect to those theoretical studies we mentioned in chapter 2.1.

In the past, a pair of researchers have examined the Cross-Section of Corporate Capital Structure (Lemmon, Zender, 2008), and the Capital Structure in many countries. For developed countries, Barclay and Smith (1995) develop an empirical

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2 The level effect refers to consequences that arise from the fact that private firms’ relative cost of equity to debt capital is higher than that of public firms.
study on the United States, Rajan and Zingales (1995) extended this method to the G-7 countries, Kuczynski (2005) applied the same model to data in Japan, and Danbolt (2000 and 2002) continued this story into United Kingdom. On the other hand, developing countries became a popular research area in terms of capital structure. Pandey (2001) uses data from Malaysia, Patrik Bauer focus on Czech Republic, and Debrabrata (2009) attempt to explore the determinants of debt financing in India. In 2001, Booth dug into the data from ten developing countries, which are Mexico, India, Brazil, South Korea, Malaysia, Jordan, Pakistan, Turkey, Zimbabwe, and Thailand respectively.

In different cases, various factors have different impacts on leverage decision. For some variables, they somehow have universal effects on capital structure all over the world. In chapter 4, we will cite more empirical results of previous literatures throughout the individual variable explanation. Korteweg concluded that the median firm could capture net benefits of leverage up to 5.5% of firm value. Jensen (1986) also conclude various gain brought by debt financing. Firstly, debt plays a role in motivating organizational efficiency, since managers with considerable cash flow would increase dividend themselves, and invest in low-return projects on other purpose. There are numerous evidences for the benefits of increased leverage, such as in financial restructuring cases (Clifford Smith, 1985) and leverage buyout (Grimm, 1985). Nevertheless, excessive debt is inappropriate since it also has corresponding costs. Theories of optimal capital structure basically explore companies' choice of debt versus equity financing by a well-known trade-off: firms choose a leverage ratio that optimally maximize the benefits of debt such as agency benefits because of the reductions in free cash flow (Jensen (1986)) and interest tax shields mentioned by Kraus and Litzenberger (1973). On the other hand, there are many kinds of costs of debt, which include the direct costs, like the increasingly probability of bankruptcy (Warner (1977)) as well as indirect costs such as debt overhang (Myers (1977)), asset substitution (Jensen and Meckling (1976)), as well as asset fire-sales (Shleifer and Vishny (1992)).
Lemmon and Zende (2008) found that the majority of variation in leverage ratios is caused by unobvious time-invariant factors that generate dramatically stable capital structures over time periods. Additionally, Rajan and Zingales (1995) developed that factors examined by previous studies as determinants of firm leverage in the United States, are similarly correlated in other countries as well. Scholars are continuing this topic by applying it to emerging regions.

Laurence and Vojislav (2001) analyzed new data of firms in 10 developing countries, and provide us evidence that capital structure decision is influenced by same determinants as in developed countries employed by preceding scholars. Furthermore, J. Chen (2003) observed that the trade-off model has limited explanatory power over China, and Chinese firms appear to follow a “New Pecking order”—retained profit, then equity, and lastly debt. Furthermore, Samuel and Song (2006) noticed that there are many differences in capital structure between China and other countries. For instance, Chinese debt borrowing increases with volatility and the static tradeoff model seems to be a better explanation of capital structure for Chinese quoted firms than pecking order. In this paper, we are trying to dig out the influence of existing and some new variables on listed companies’ capital structure in China.

3. China’s Corporatization and its Institutional Environment

3.1. State-owned Enterprises

At present, the institutional environment for Chinese firms has its own pronounced features, which is the Chinese government still holds the majority of shares in state-owned enterprises (SOEs) by directly shares owning or indirectly shares controlling through state-owned institutions, such as state investment companies, government-owned corporations, and state asset management agencies. In non government-owned corporations, the major form of ownership turns to individual shareholding; independent non-state institutional investors are
very rare. This situation makes China has some specific institutional structures from developed countries as well as many other developing countries. Theoretically, it can be expected that SOEs are not aim to maximize their profit, so their profitability may have little effect on their capital structure. Moreover, SOEs’ size (proxy for bankruptcy cost) and tangible assets (collateral) seems play less role, since SOEs are less likely to deeply involve a financial crisis compared to the privately controlled firms. In this case, whether those independent variables can influence capital structure of Chinese firms could be a compelling topic to us. Agency theory (Jensen and Mecking, 1976) employed that conflict between shareholders and managers leads the ownership structure also becoming one of the important determinants of capital structure. In Yike’s paper in 2011, he stated that by controlling other variables, the state owned companies seem to have higher leverage ratio than other non-SOEs after the reform of 2005. Moreover, he analyzed the impacts of determinants of each sample set on their leverage and compared their difference. Yike found most variables have the same impacts on both SOEs and non-SOEs, except tangibility has significant effect on non-SOEs, but not on SOEs.

3.2. Capital Market of China

As the dramatic development of China’s economy, China’s capital market has also been strengthened during last few decades. China has two stock exchanges in its mainland: one is Shanghai stock exchange which is established in 1990. The other is Shenzhen stock exchange with smaller size. Meanwhile, Hong Kong, as part of China after 1997, has sixth largest stock exchange in the world in terms of market capitalization.

China’s stock market had a three-tiered share structure, which consist of A-shares, B-shares and H-shares. A-shares are shares of China-managed companies. It is denominated by Chinese currency, Renminbi (RMB), and traded in Shanghai and
Shenzhen stock exchanges. It contributes the main role of Chinese capital market, and only Chinese citizen and some selected foreign individual investor are authorized to trade A-shares. Bill Kazer (2007) demonstrates that China has encouraged better firms to list on the domestic market, that give more options to Chinese citizen. While Shanghai and Shenzhen Stock Exchange substantially improve the number and quality of domestic listed companies, the door to the foreign investment has also been expanded. B-shares are shares of China-incorporated companies. They are issued and incorporated in mainland China, but traded in foreign currency. They are transacted in US dollars in Shanghai exchange and Hong Kong dollars in Shenzhen. 11 years ago, only foreigners were allowed to trade B-shares. Since 2001, domestic investors are able to trade B-shares as well due to reforms of Chinese market reforms. Nowadays, companies can issue both A-shares and B-shares. The third type of shares is H shares, which refers to the shares of companies issued and operated by companies in mainland China, but are traded on the Hong Kong Stock Exchange. H-shares are traded in Hong Kong exchange, and dominated in Hong Kong dollars. Nevertheless, it is still under the supervision of Chinese governments and restricted by Chinese financial market regulation. Since mainland residents were previously banned from investing in the Hong Kong exchange, H-shares were only facing to Hong Kong and western investors. After 2007, Chinese government began to allow mainland residents to invest in the Hong Kong exchange, so H shares are opening to every investor all over the world currently. But in fact, as Li Jiang illustrated (2003), rare mainland individuals invest in H-shares so far since there still exist price premium on H-shares due to Chinese government’s intervention.

Table 1 presents a picture about how listed companies in China issue A or B share from Year 1994 to 2004. The first column indicates the number of Chinese listed

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3 Definite by China Daily, 2006, derived from
companies, the rest columns describe the companies which issue A shares only, B shares only, both A and B shares, both A and H shares respectively.

Table1: Chinese listed firm’s distribution

This table shows the distribution of listed companies in China in different capital market from 1994 to 2004. Values in column ‘A shares only’ means the number of companies that only go public in A shares market and traded by domestic residents. “B shares only” implies the companies that only issue B shares. “Both A and B shares” presents the number of companies that both issue A and B shares simultaneously. “Both A and H shares” illustrates the number of firms that issue both A and H shares at the same time.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of listed companies</th>
<th>A shares only</th>
<th>B shares only</th>
<th>both A and B shares</th>
<th>both A and H shares</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>291</td>
<td>227</td>
<td>4</td>
<td>54</td>
<td>6</td>
</tr>
<tr>
<td>1995</td>
<td>323</td>
<td>242</td>
<td>12</td>
<td>58</td>
<td>11</td>
</tr>
<tr>
<td>1996</td>
<td>530</td>
<td>431</td>
<td>16</td>
<td>69</td>
<td>14</td>
</tr>
<tr>
<td>1997</td>
<td>745</td>
<td>627</td>
<td>25</td>
<td>76</td>
<td>17</td>
</tr>
<tr>
<td>1998</td>
<td>851</td>
<td>727</td>
<td>26</td>
<td>80</td>
<td>18</td>
</tr>
<tr>
<td>1999</td>
<td>949</td>
<td>822</td>
<td>26</td>
<td>82</td>
<td>19</td>
</tr>
<tr>
<td>2000</td>
<td>1088</td>
<td>955</td>
<td>28</td>
<td>86</td>
<td>19</td>
</tr>
<tr>
<td>2001</td>
<td>1160</td>
<td>1025</td>
<td>24</td>
<td>88</td>
<td>23</td>
</tr>
<tr>
<td>2002</td>
<td>1224</td>
<td>1085</td>
<td>24</td>
<td>87</td>
<td>28</td>
</tr>
<tr>
<td>2003</td>
<td>1287</td>
<td>1146</td>
<td>24</td>
<td>87</td>
<td>30</td>
</tr>
<tr>
<td>2004</td>
<td>1377</td>
<td>1236</td>
<td>24</td>
<td>86</td>
<td>31</td>
</tr>
</tbody>
</table>

We notice the number of listed companies in China increases dramatically. According to Bill Kazer, Chinese regulators are stimulating domestic companies to list on a mainland bourse, which makes Shanghai the sixth largest in the world. In addition, we
can see the number of companies who issue A-shares increase constantly, meanwhile the boom of B shares issuance retarded from year 2000. We can infer that the requirement of B-shares issuance and its regulation are much stricter than those of A-shares.

During these 10 years, the most striking thing for the Chinese capital market would be the equity reform in 2004 and 2005. To understand this reform, it is necessary to understand some concepts and background. Firstly, The China Securities Regulatory Commission (CSRC), as the main regulatory bodies in China, is contributing a pivotal role in the innovation of Chinese capital market, such as changing investor composition, creating specific production, and improving methods of stock trading. According to reports by KPMG in 2007, as of the end of 2004, the entire equity capital of listed companies consists of 714.9 billion shares. It includes 454.3 billion non-tradable shares (NTS), which counts 64% of the total equity capital market. Moreover, there are 74% of NTS are state-owned shares. NTS is a type of shares that provide the holders with the same priority as holders of ordinary shares. However, it cannot be publicly traded in the secondary market. At that time, these shares typically belong to the government or to local financial institutions. This unreasonable ownership structure of capital structure strongly impedes the development of Chinese financial market.

Andrea and Marianna (2009) stated that the 2005 reform of the Chinese stock market mainly attempt to aim to eliminate non-tradable shares, and consequently innovate on the ownership structure of firms. The financial reform in China consists of many aspects regarding ownership structure and stock trading system innovation. Hereby we conclude two vital dimensions. First of all, CSRC tried to lower the public ownership of firms and advocate a true privatization process following the corporatization. Before 2005, state-owned and legal person-owned shares could not be traded on stock exchanges. As a result, large shareholders paid little attention to the prices of other tradable shares held by the public. In 2005, the government made
non-tradable shares becomes tradable. This made the interests of large shareholders in line with that of outside shareholders. The Second reform dimension, as Bernardo (2009) described, is that CSRC enhanced corporate governance through a prior status for minority investors and a more active market for corporate management. The stock reform brought significant impacts to Chinese stock market. According to Beltratti (2006), this reform led a dramatic 8 percent positive abnormal return for listed companies.

3.3. International Comparison of the Extent of Leverage

Laurence Booth, Varouj, Asli, and Maksimovic (2001) once compared the leverage level among countries, and they found the debt ratios of listed firms vary considerably across countries from period 1985 to 1991. In this section, I also compare the recent leverage ratio of non-financial listed companies across 10 countries. The sample countries of this paper consist of G7 countries, which are France, Germany, Italy, Japan, United Kingdom, United States, and Canada respectively. Besides those developed countries, they also include some developing countries, like China, Brazil, India, Malaysia, and Thailand. Table 1 compares our result to what Laurence and Vojislav found in 2001. In this paper, firm's total book-debt ratio can be calculated as total debt (total long term debt plus current debt) divided by total asset. It is the most suitable way to measure to leverage in terms of the data availability. Since the sample set of this paper may be differing from theirs, the difference may not be measured exactly. However, we can still have a general picture of the changes between 1980s and 2000s.

Table 2: Average debt ratio taken by non-financial listed companies in China

This table compares the leverage level taken by listed firms across different countries. The second column is the result obtained by Laurence and Varouj (2001) for different countries from Year 1985 to
The third column is the result I achieved for period 2004 to 2008. Laurence and Varouj (2001)
define the total debt ratio as total liabilities divided by total liabilities plus net worth of available
quoted firms. And I define the total debt ratio as the ratio of book value of total debt to total asset.

<table>
<thead>
<tr>
<th>total debt ratio</th>
<th>Year 1985 to 1991</th>
<th>Year 2004 to 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>--</td>
<td>25.2%</td>
</tr>
<tr>
<td>Brazil</td>
<td>30.3%</td>
<td>26.1%</td>
</tr>
<tr>
<td>India</td>
<td>67.1%</td>
<td>30.1%</td>
</tr>
<tr>
<td>Malaysia</td>
<td>41.8%</td>
<td>22.7%</td>
</tr>
<tr>
<td>Thailand</td>
<td>49.4%</td>
<td>26.6%</td>
</tr>
<tr>
<td>United States</td>
<td>58%</td>
<td>20.1%</td>
</tr>
<tr>
<td>Japan</td>
<td>69%</td>
<td>20.6%</td>
</tr>
<tr>
<td>Germany</td>
<td>73%</td>
<td>18.8%</td>
</tr>
<tr>
<td>France</td>
<td>71%</td>
<td>21.8%</td>
</tr>
<tr>
<td>Italy</td>
<td>70%</td>
<td>24.9%</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>54%</td>
<td>17.2%</td>
</tr>
</tbody>
</table>

Source: partly numbers are derived from table 1 in paper “Capital Structures in Developing Countries”
written by Laurence Booth, Varouj, Asli, and Vojislav Maksimovic (2001)

Table 2 provides summary data on the distribution of leverage ratios across the 11
countries. The second column represents the average debt ratio over quoted
companies for countries chosen by Laurence and Vojislav (2001) during the period
1985 to 1991. The third column is leverage ratio I measure by the data from WRDs.
For both the developed and developing countries, I estimate the averages debt ratio of
listed firms from the data for the entire 2004 to 2008. Base on data from year 1985 to
1991, we can see the book-debt ratio varies significantly from only 30 percent in
Brazil to an incredible number of 73 percent in Germany. Nevertheless, from recent
years, this difference became much smaller. This result is in line with Rajan and
According to Rajan and Zingale, leverage ratios exhibit a significant extent of convergence over time. For instance, firms with relatively high leverage tend to move toward more moderate levels of leverage.

Another thing is that during Year 1985 to 1991, almost all the developing countries have a lower debt level for their listed firms than those of G-7 countries except for United Kingdom. However, during these few years, this situation is likely to go to the opposite direction. As we can see from the third column, firstly the leverage level of both developed and developing countries decline dramatically. Furthermore, debt levels of some developing countries have already exceeded those of G-7 countries. This result seems to be contrary to the finding of Rajan and Zingale in 1995 that firms with relatively high (low) leverage level appear to maintain their high (low) leverage for over 20 years.

4. Determinants of Capital Structure in China

As Harris and Raviv (1991) illustrated, “Several studies shed light on the specific characteristics of firms and industries that determine leverage ratios.” Basically, as we mentioned in Chapter 2, most literature point out leverage increases with tangible assets, growth opportunities, and firm size and decreases with firm’s performance volatility (bankruptcy probability), firm’s profitability and uniqueness of the product. In the following, we will explain the expected impacts brought by each potential determinant on leverage decision from the theoretical point of view. Along with reviewing literature of past scholars, we will describe the unique features of each variable in China.

4.1. Size

Referring to Rajan and Zingales (1995, p. 1451), “larger firms tend to be more diversified and fail less often, and thus have a lower probability of bankruptcy.”
this case, size could have a positive connection with the debt providing. Laurence and Vojislav (2001) believe the capital structure in emerging countries holds the same story as G-7 countries as Rajan and Zingales (1995) indicated. Trade-off model also supports this view. However, some studies demonstrated a negative relation between size and leverage, Myers and Majluf (1984) indicates that larger firms will prefer to finance with internal funds rather than external debt. Moreover, the negative relation may be because larger firms have a better reputation in capital market, thus would gain more in the secondary market and focus less on debt financing. Another expression is that many larger firms are owned by governments. Some governors hold larger shares of the companies, so we can image the direction and behavior of companies is always on behave of their shareholder. On the other hand, protection on debtholders is relatively unbending and poor. Michael (2008) once notice that, In China, the numbers of small and medium-sized enterprise is more than 95% of all private sector firms, for listed companies, a few firms with astounding size also dominate the entire market.

4.2. Tangibility

Most scholars believe tangibility has the similar correlation with leverage as “size”, which is positive. Rajan and Zingales (1995, p. 1453) revealed the rationale underlying this factor is that more tangible assets contributes corporations to collateralize for financing and thus reduce their agency costs of debt. Jensen and Meckling (1976) said issuing debt by tangible assets reduce the problems of agency costs of equity, which cause underinvestment problems and underpriced new equity. Tangibility appears to be a more crucial factor in China, since Chinese market is full of uncertainty, and asymmetric information. There are millions of new companies establishing every day, and banks had merely information about them. As a result, banks normally ask firm provides enough collateral for secured debt, especially those newly public firms who are not well connected to the firms before.
4.3. Profitability

The impact of profitability on leverage decision is ambiguous. Jensen (1986) demonstrates that high profits should be associated with higher leverage, because the corporate control of such company is effective and make managers pay out cash by levering up. This helps firms with a large amount of cash flow prevent wasting resources on low-return projects. However, the pecking order theory argues high profits should be associated with lower leverage. Profitable firms prefer internal funds to debt for financing due to the transaction costs. In Rajan and Zingales’s study, most of the time this relationship is negative in G-7 countries. Chinese listed firms are much more profitable than private companies in China. As Shanghai Securities News reported in May 2010, the net profits of China’s 1,837 companies keep increasing year by year. It already reaches 50.52 billion dollar in the first quarter 2010. Those leading companies in each industry basically all benefit remarkably and contribute the vast percentage of entire revenue of all companies.

4.4. Growth Opportunities

Growth potential is supposed to be an essential factor to affect capital structure. Larger growth opportunities imply more intangible asset and fewer tangible assets to be collateralized for borrowing, and thus a negative relationship exists. In addition, Myers (1977) and Jensen (1986) thought Firms with greater growth opportunities have more conflict between debt and equity interests, and thus difficult to level up. Rajan and Zingales find firms would take less debt as an increasing market to book ratio, since the firm issues equities when share prices are above their “true” value. On the contrary, Miller and Modigliani (1961) point out the true value of the growth opportunities is that the firms have more chances to make additional investments in real assets that will yield extra return than the "normal” level, and hence are more able
Most paper use book to market ratio as the proxy of growth opportunities. In this paper, we use another measurement for growth opportunity due to the limited data, which we will explain particularly in the next section. China is regarded as a country with fast growing rate and biggest growing opportunity. Bloomberg once said, “China is officially becoming a technology powerhouse”. It lists 50 Tech Hot Growth Companies 2010, and China takes two of top five. However, many large listed companies have governments backing them up, and lack of growth motivation.

4.5. Volatility

Volatility is considered as a proxy for risk by many literatures, because the return on assets varies through successive time period. An asset whose return fluctuates considerately can be characterized as to have a greater risk, since investors may lose dramatic value at the time they are trying to sell it. As a result, it is expected to be negatively related to leverage. Lack of corporate governance and the poor quality of listed companies make public firms in China are sometimes regarded as immature and unstable. For instance, the stock prices of A-shares of most companies fluctuate greater than their B-shares. It implies the regulation of secondary market in China is immature and there are enormous speculate behavior and black case work by leading players. In this perspective, Chinese firms can be characterized as riskier than companies in other market.

4.6. Deposit Reserve Ratio

To ensure the needs of customers withdraw their deposits and liquidation, financial institutions need to put numerous deposits in the central bank. Deposit reserve ratio can be expressed as the minimum reserves requirement set by the central bank that
each commercial bank must hold of customer deposits and notes. The required reserve ratio can be regarded as a tool of monetary policy, which influences the country's business activeness by changing amount of available funds to make loans. Central banks in western countries hardly change this ratio due to the liquidity problems for banks with inadequate reserves when customers unexpectedly request larger amount of money and this ratio also influence the borrowing and lending interest, thus the entire economic stability. However, in China, the reserve ratio has been altered for many times. Since 2006, China seemed to put much more effect on monetary control, it has adjusted 10 times reserve ratio, and increased the ratio from 8.5% in 2006 to 13% by the end of 2007. In 2011, the People's Bank of China announced to cut deposit reserve ratio by 0.5 percentage points from December 5, which was the first time to cut this ratio during last three years. As we can see, since the remarkably economic development during these few years, Chinese government wants to increase the deposit reserve rate in order to slow down the excessive development pace. Hence, theatrically, the raise of reserve ratio would reduce the available loans to companies, it is more difficult to lever up. In this paper, the data with respect to reserve ratio are obtained through National Bureau of Statistics of China.

4.7. Lending Interest Rate

Lending interest rate is the rate charged by banks on loans to prime customers. In China, interest rates are determined by The Peoples' Bank of China (PBC). The annual lending interest rate can be obtained through the World Bank. Historically, from 1996 to 2012, China Interest Rate averaged 6.5 percent, which can be characterized as benchmark interest rate in China. Among that period, it reached a maximum of 10.08 percent in 1996 and a record low of 5.3 Percent in August of 2010. In this paper, data regarding lending interest rate can be derived from “Data Worldbank”. Logically, a high lending interest rate indicates lower leverage level taken by companies, since the lending cost raise simultaneously. Besides the impacts
to leverage level, ChinaDaily (2006) stated the bank sometimes raised the lending interest rates in purpose of slowing down the ridiculous inflation.

4.8. Industry Classification

In such a big dataset, we could meet some problems of sampling, which implies different number of observations in different industries may lead different selection biases among those industries. Moreover, correlation between leverage and estimated determinants may arise from unobserved factors. To solve it, we introduce the industry and time dummies in our model as well.

Joseph and Oliver provide a mean leverage analysis industry-by-industry in China during the sample period year 1995 to 2005 in their paper. The results indicate that the leverage level taken by public firms in China do not differ extraordinarily across industries. The leverage level measured by ratio of total debt to total varies from 13% to 43% for all industries. Long-term debt seems to be more prevalent in strictly regulated industries, like medical, petroleum, and transportation industries. On the contrary, companies in consumer-based industries such as drugs and garment are more likely issue short term debt.

5. Methodology

5.1. Sample Chosen

The main data of this paper would be obtained from “Wharton Research Data Services (WRDS)”. WRDS is a web-based business data service, which has become an essential research tool for over 290 institutions around the world. It contains the accounting and market data for more than one thousand public companies in China up
to the year 2012. Besides, we can get information of most Chinese listed companies year by year from the “annual report of listed in China” provided by National Bureau of Statistics of China. The Data-World Bank and its annual report of listed firms also play an important role to help us complete our data set.

In this paper, we only focus on nonfinancial firms in China, since their capital structure is basically different from the financial institution. These industrial firms consist of companies in different areas, like petroleum, coal, textile, chemistry, transportation, real estate, and construction.

In the end, the companies with most comprehensive data will be used in the final sample, which are around 1700 quoted industrial Chinese companies. In order to avoid the immeasurable effects brought by the financial crisis in 2008, this paper decide to select data that covers the period from 1998 to 2007. Within this period, Chinese economy has been grown stably, except the capital structure altered significantly through the equity market reform in 2004 and 2005.

5.2. Data processing

From WRDs, we originally download 15266 observations from 2059 public firms. Some companies went public after 1998 and some firms delisted before 2007. The original data of this paper obtained from WRDs are highly needed adjusted: For instance, the book value of some items of some companies on their balance sheet are reported in different currency, like Hong Kong dollars, Pounds, US Dollars and so on. We change all other currency used data to Chinese currency: “CNY”. While processing the data, we delete the missing observation and drop the theoretical impossible number. For example, there are 57 companies whose total asset value is zero. There are 500 observations that have negative value of sales. In addition, we
delete observations with minus sign book leverage. Eventually, we finalize our dataset of 1723 quoted firms with 12452 observations.

5.3. Research model

Since the sample of this paper contains data across thousands of firms and over time, I attempt to employ the panel data method by using ordinary Least Square (OLS) model. In this paper, OLS regression is used to measure the connection between leverage level and other firm features such as companies’ profitability, firm size and industry dummy. The basic regression model can be specified as follows:

\[ Y_{it} = a + \beta X_{it} + U_{it} \]

\( Y \) denotes the dependent variable leverage, which can be measured by 2 proxies in this paper, overall debt and long term debt. \( \beta \) is a \((k \times 1)\) vector of coefficients and \( X \) is a \((k \times 1)\) vector of k explanatory and dummy variables for the i th firm at period t. \( i \) explains the cross-section dimension and \( t \) indicates time dimension. \( U_{it} \) is the error term. Within independent variables \( X \), we have profitability, tangibility, growth opportunities, risk, deposit reserve ratio and lending interest rate. We will discuss the measurement of each variable in more detail in the next sections.

Furthermore, we add the fixed effects model into our analysis. Fixed effect model is an advanced linear regression model whose intercept terms “\( a \)” vary over the individual units \( i \). In our paper, the year fixed effects are controlled in the last specification, which implies it includes a year dummy variable for each company \( i \). I set year 1998 as benchmark. Year dummy = 0 if \( \text{fyear} = 1998 \) and 1 elsewhere. The parameters \( a \) and \( \beta \) can be estimated just like ordinary least squares model.
5.4. Variables

In terms of the variables, the following table lists the way we measure those X and Y in the model. Moreover, the predicted signs of determinants of capital structure can be summarized in table 3.

Table 3: Summarizes the Potential Variables and their Expected and Empirical Impacts on Leverage

This table lists all the variables we used in this thesis. The second column presents the measurements and proxies of different variables in this paper. The last two columns summarize of the implications of capital structure theories and empirical evidences on the relationship of capital structure determinants with leverage level.

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Measurement</th>
<th>Theoretical Predicted Signs</th>
<th>Major Empirical Studies’ Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall leverage (LEV)</td>
<td>Ratio of book value of total debt to total assets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long term leverage (LT LEV)</td>
<td>Book value of long term debt divided by total asset</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Independent variables

| Size (SIZE) | Logarithm of total assets | +/- | + |
| Profitability (PROF) | Ratio of earnings before interest, tax, and depreciation to total assets | +/- | - |
In the literature, the dependent variables “Leverage” can be interpreted in different ways. In each paper, the specific option depends on the objective of their research. For this paper, we take two proxies to measure leverage. The first one is the ratio of book value of total debt to total assets. I use it to measure overall leverage. The second one is long term leverage level, which is calculated as book value of long term debt divided by total asset. The reason we use these two measurements is that to some cases, the impacts brought by determinants to long term and short term debt are remarkably different. We can clearly distinguish those differences by regress both items. For independent variables, as most other study, we use the logarithm of total assets to measure firm’s size and the ratio of earnings before interest, tax, and depreciation (EBIT) to total assets to measure profitability. Tangibility is proxied by the ratio of tangible assets to total assets. In terms of growth opportunities, most
studies use the book to market value, but WRDs data provides limit and inexact data of Chinese stock price to some extent. Obviously there are some alternative proxies for growth opportunity. Rozef (1982) and Lehn and Poulsen (1989) use sales growth to proxy for growth opportunities. In this paper, we use the growth rate of turnover instead. The deposit reserve ratio and lending interest rate of China are adjusted constantly, so we take the annual average value into the regression model.

5.5. Econometric principles

5.51. Heteroskedasticity and Autocorrelation

An essential assumption of OLS model is the variance of each residual must be constant and does not depend on other regressors. Heteroskedasticity is a problem we frequently encountered in cross-sectional models. Heteroskedasticity implies that the error terms are mutually uncorrelated, while the variance may vary over the observations. If there existing heteroscedasticity among observations in a dataset, the parameter estimator obtained from OLS model is not valid since it is still unbiased and the variance is not minimum anymore.

Secondly, autocorrelation of the errors is also a main problem for time series data in regression analysis. It happens when the observations of one variable are correlated across entity, which is also called serially correlated. The consequences of autocorrelation are similar to those of heteroskedasticity: OLS regression coefficients remains unbiased, but it becomes inefficient and its standard errors could be estimated incorrectly to some extent.

As the problems we mentioned above, it is inappropriate if we still use simple OLS model. Li (1985) indicated the test of heteroskedasticity and serial autocorrelation problem will be automatically solved by using “Clustered Robust” standard errors on
the regression command in STATA. Specifically, robust regression is an alternative to least squares regression when data is contaminated with outliers or influential observations and it can also be used for the purpose of detecting influential observations. It is also a way to solve the heteroskedasticity and autocorrelation problem.

Besides, cluster analysis is the task of assigning a set of objects into groups, which leads the degree of association becoming strong between members of the same cluster and weak between members of different clusters. It is a way to organize observed data into meaningful structures, and solve the classification problems. It also controls the cross section dependence to some extent. In this paper, Standard errors are adjusted for 1723 clusters in gvkey in table 7, which means our regressions cluster the standard errors at the firm level.  

**5.52. Coefficient of determination**

Coefficient of determination is interpreted as a measure of how well a statistical model is likely to predict future outcomes. In the regression analysis, it is always represented as R square (R^2). R^2 takes the values between 0 and 1. The higher the R^2 indicates the greater contributions that the independent variable could make for the changes of dependent variable. In the other word, the more useful the model is. For example, if R^2 of a model is 0.75. This means that the in the regression, 75% variation observed in dependent variable Y can be explained by the independent variables. Coefficient of determination has its own drawback: If there are more independent variables being added in a model, the R square increases anyway, no matter those independent variables contribute in explaining the alteration of the dependent variable or not. This weakness can be solved by the modification of itself: adjusted R square.

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4 The method we used is referred to “how to group objects into similar categories, cluster analysis”

However, in our case, we already apply robust regression into our analysis and cluster the standard errors at the firm level, so the adjusted R square seems not necessary. For fixed effect model, we apply within R square.

5. Results

6.1. Descriptive Statistics

Table 4 describes the summary statistics of the 12453 observations in our sample set. The leverage ratio varies from 0 to 0.9938. Most variables do not vary from their mean significantly, except growth opportunity and risk. The value of risk ranges from 0 to 77627, and its standard deviation even reaches remarkable 1583, which implies the instability of stock market and immaturity of listed firms in China.

Table 4: Summary Statistics for Variables Used in Simultaneous Regression Analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Leverage</td>
<td>12453</td>
<td>0.2425</td>
<td>0.1608</td>
<td>0.0000</td>
<td>0.9938</td>
</tr>
<tr>
<td>Long Term Leverage</td>
<td>12453</td>
<td>0.0584</td>
<td>0.0884</td>
<td>0.0000</td>
<td>0.6294</td>
</tr>
<tr>
<td>Size</td>
<td>12453</td>
<td>7.2437</td>
<td>1.1165</td>
<td>0.3428</td>
<td>13.8739</td>
</tr>
<tr>
<td>Tangibility</td>
<td>12453</td>
<td>0.4778</td>
<td>0.1967</td>
<td>0.0000</td>
<td>0.9984</td>
</tr>
<tr>
<td>Profitability</td>
<td>12453</td>
<td>0.0451</td>
<td>0.3672</td>
<td>-6.6441</td>
<td>0.7010</td>
</tr>
<tr>
<td>Growth Opportunity</td>
<td>12453</td>
<td>1.1327</td>
<td>3.0339</td>
<td>0.0000</td>
<td>189.3339</td>
</tr>
<tr>
<td>Risk</td>
<td>12453</td>
<td>146.1392</td>
<td>1583.76</td>
<td>0.0000</td>
<td>77627.41</td>
</tr>
</tbody>
</table>
6.2. Correlation Analysis

Table 5 presents a correlation matrix including dependent and independent variables in the previous model. The outcomes of this correlation matrix imply the level of multicollinearity among observations.

Table 5: Correlation analysis

This table pictures the correlations between dependent and independent variables. Every single number in the correlation matrix is to describe the degree of relationship between two variables.

<table>
<thead>
<tr>
<th>Overall Debt</th>
<th>Long Term Debt</th>
<th>Size</th>
<th>Tangibility</th>
<th>Profitability</th>
<th>Growth Opportunity</th>
<th>Risk</th>
<th>Deposit Reserve Ratio</th>
<th>Lending Interest Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Debt</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long Term Debt</td>
<td>0.4971</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td>0.1030</td>
<td>0.2921</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tangibility</td>
<td>0.2242</td>
<td>0.3962</td>
<td>0.2328</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Profitability</td>
<td>-0.1994</td>
<td>0.0395</td>
<td>0.0774</td>
<td>-0.0057</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Growth_opportunity</td>
<td>0.0069</td>
<td>-0.0070</td>
<td>-0.0329</td>
<td>0.0088</td>
<td>-0.0030</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk</td>
<td>-0.0105</td>
<td>0.0471</td>
<td>0.2732</td>
<td>0.0829</td>
<td>0.0501</td>
<td>-0.0014</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>deposit reserve ratio</td>
<td>-0.0179</td>
<td>-0.0026</td>
<td>0.1050</td>
<td>0.0149</td>
<td>-0.0212</td>
<td>0.0015</td>
<td>0.0282</td>
<td>1</td>
</tr>
<tr>
<td>Lending interest rate</td>
<td>-0.0434</td>
<td>-0.0041</td>
<td>0.0207</td>
<td>-0.0159</td>
<td>0.0581</td>
<td>-0.0072</td>
<td>0.0128</td>
<td>0.8465</td>
</tr>
</tbody>
</table>

As table 5 demonstrated, it is understandable that dependent variables overall debt
and long term debt are highly correlated with each other, since they are both measurements of leverage. For independent variables, perfect multicollinearity issue is not detected in our model. Most correlation items between the independent variables are quite small. As a result, we will not put too much concerning on the multicollinearity problem among the independent variables. Another thing is that some correlation coefficients are not significantly different from zero at the 5% level.

6.3. Regression Estimation Results and Discussion

Table 6 develops three different models on two dependent variables: overall debt and long term debt. The analysis of determinants of capital structure was developed by applying OLS and Fixed Effect models for each dependent variable. For OLS models, I design two models to distinguish the effect caused by original factors and contemporary financial situation. Both models are developed together with robust consideration.

**Table 6: regression analysis on different factors**

The table presents the results of the regression of the change in overall and long term leverage on five firm characteristics: profitability, tangibility, sizes, risk, together with growth of opportunities. This table also incorporates the effects of financial situation (lending interest rate and deposit reserve ratio) into the regression of leverage. The data covers from year 1997 to 2007, and measurements of different variables are shown in table 3. First two regressions cluster the standard errors at the firm (gvkey) level. And year fixed effects are controlled for the last specifications. The R square for the pooling and fixed effect models are adjusted for degrees of freedom. All t-statistics are in parentheses.
## Overall Leverage vs. Long Term Leverage

<table>
<thead>
<tr>
<th></th>
<th>Overall Leverage</th>
<th>Long Term Leverage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OLS</td>
<td>OLS</td>
</tr>
<tr>
<td></td>
<td>Fixed Effect</td>
<td>Fixed Effect</td>
</tr>
<tr>
<td>Size</td>
<td>0.01301***</td>
<td>0.0141***</td>
</tr>
<tr>
<td></td>
<td>(4.65)</td>
<td>(11.20)</td>
</tr>
<tr>
<td>Tangibility</td>
<td>0.1644***</td>
<td>0.1282***</td>
</tr>
<tr>
<td></td>
<td>(9.04)</td>
<td>(16.21)</td>
</tr>
<tr>
<td>Profitability</td>
<td>-0.2818***</td>
<td>0.0134</td>
</tr>
<tr>
<td></td>
<td>(-3.04)</td>
<td>(-1.16)</td>
</tr>
<tr>
<td>Growth Opportunity</td>
<td>0.00038</td>
<td>-0.0009</td>
</tr>
<tr>
<td></td>
<td>(-1.05)</td>
<td>(-0.45)</td>
</tr>
<tr>
<td>Risk</td>
<td>-3.22E-06***</td>
<td>-1.80E-06***</td>
</tr>
<tr>
<td></td>
<td>(-4.01)</td>
<td>(-4.74)</td>
</tr>
<tr>
<td>Deposit Reserve</td>
<td>0.00062</td>
<td>-0.00424***</td>
</tr>
<tr>
<td></td>
<td>(0.32)</td>
<td>(-4.00)</td>
</tr>
<tr>
<td>Lending Interest</td>
<td>-0.0084 *</td>
<td>0.00902***</td>
</tr>
<tr>
<td></td>
<td>(-1.83)</td>
<td>(3.92)</td>
</tr>
<tr>
<td>Rate</td>
<td>0.0230</td>
<td>0.0230</td>
</tr>
<tr>
<td></td>
<td>(0.57)</td>
<td>(-4.11)</td>
</tr>
<tr>
<td>Ind Dummy</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.0230</td>
<td>-0.1441 ***</td>
</tr>
<tr>
<td></td>
<td>(-0.60)</td>
<td>(-9.23)</td>
</tr>
<tr>
<td>Observations</td>
<td>12412</td>
<td>12412</td>
</tr>
<tr>
<td>R-square</td>
<td>0.1637</td>
<td>0.2836</td>
</tr>
</tbody>
</table>

**Notes:**

* ** Significant at 1% level.

* * Significant at 5% level.

* Significant at 10% level.

Figures under the estimated values represent t-statistics (in parentheses).

Theoretical estimation in terms of the relation between size and leverage is ambiguous, but most empirical studies stay positive, which is also the case of our research.
According to the results reported in Table 6, SIZE is positively significant at the 1% level in all models. Let us focus on the fixed effect model for the overall leverage from the economical perspective of view, a one standard deviation increase in SIZE leads to an increase in overall leverage of about 4.8% (0.0426×1.1165). Within the determinant we select in our research, SIZE has the biggest impact on the capital structure in this specification. Therefore, our result support the idea that larger firms has much lower cost of financial distress, and thus may be easier to finance by leverage, both in a long term and short term debt. This can be also explained by that Chinese government has most control over these large quoted firms, and they have more connection of the banks. Those larger firms can be treated as too big to fail, if they go to the bankruptcy, the benefit of states would also be damaged, and thus has negative impacts to local economy and society. Therefore, the larger firms are supposed to have lower cost of financing and they are easy to borrow money from creditors.

From the theoretical point of view, tangibility is positively associated with leverage as size does. Based on our study, it is also suitable for the case of Chinese listed companies. The relationship between tangibility and leverage is statistically significant for all models. It is the second most important determinant for the overall leverage in our study. While one standard deviation increases in Tangibility, there is around 3.7% of overall leverage raised. From this point, we realize that collateral plays an important role in raising leverage in China, which is also the case in G7 countries in previous research. There is an intriguing point regarding tangibility variable proposed by Berger and Udell (1994). They point out that the relationship between firms and creditors contributes dramatically to business in China. If firms have a close connection with creditor, they can obtain a great amount of money with less collateral, and this phenomenon are more likely happen in a short term debt financing than long terms. In Berger and Udel’s research, it is also observed that the collateral is less important for short term debt financing.
The impact of profitability is ambiguous on leverage from past literatures. In our research, profitability in this paper is negatively associated with leverage in terms of overall leverage, which is consistent with Pecking Order as we mentioned in chapter 4. However, for the long term debt, the relationship becomes positive and insignificant, which indicates profitability matters essentially for its short term debt, not long term debt decision for a Chinese listed firm. This result indicates Chinese firms with enough capital gains are more likely to financing by internal retained earnings, and then equity financing, and least by short term external debt.

It is noticeable that all the coefficients of growth opportunity variable are insignificant in all of our models except the fixed effect model in short term debt. Although the t-statistics are below significant level, we can see a positive relation between short term leverage and growth opportunity, and negative relation between long term debt and growth opportunity. The insignificance actually reflects the Chinese stock market entry requirement. In China, a company can enter A-shares market only if he reaches some profitability requirement. However, companies can enter NASDAQ\(^5\) if they have large enough growth opportunity or big enough market share. Concerning the stock issuance requirement and regulation, for most listed companies in China, growth opportunity seems to be less important than other factors, such as profitability, or tangibility.

Risk, to be regarded as a proxy of probability of bankruptcy, is supposed to be negatively related to leverage. The result of this paper shows that risk is also a factor that influences the capital decision of Chinese listed companies. However, the numbers of coefficients are relatively small compared to developed countries researched by other scholars. However, still, in the economical point of view, even though the coefficient of variable risk is small, the standard deviation is largest among

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\(^5\) NASDAQ, is an American stock exchange. "NASDAQ" originally stood for "National Association of Securities Dealers Automated Quotations": Derived from” http://en.wikipedia.org/wiki/NASDAQ”
all the determinants. Hence one standard deviation increase in RISK is along with about 0.5% \((1583.76 \times 3.36E-06)\) decrease of overall debt. Compared to other factors, RISK contributes relatively less on the leverage decision. This is probably because the stock market is quite unstable and immature enough at this moment in China. It is not a secret that there are thousands of speculators investing or even controlling stock market by using black case work. Sometimes large companies do not care short term earning volatility, since they have back up by governments. As a result, the volatility of earning and stock price is not that crucial for Chinese quoted firms.

For the leverage level, the sign of deposit reserve ratio is estimated as perdition, which is negative. The increase of reserve ratio lowers the availability of loans for quoted companies, which makes them more difficult to lever up, and thus turns a negative relation. But for the short term debt, the coefficient is not significant in the OLS model, which implies that the short term debt financing decision made by listed firms is not influenced too much by deposit reserve ratio.

The lending interest rate is also telling a compelling story. Theoretically, higher lending rate increases the cost of external financing, and thus declines the volume of debt level. However, obtained results from China’s data indicate that it only works in the OLS specification of short term debt. Most companies are still willing to issue debt even if the lending interest rate arises. It seems like the borrowing cost does not cause much concern of top manager of listed companies as other factors do. The economically significant level is also relatively lower than other factors, which is 0.297% decrease of total debt as with one standard deviation of lending interest rate.

Industry dummy is incorporated within OLS regression but not in the fixed effect model. As table 6 shown, the signs of coefficients do not alter dramatically with and without industry dummy, which indicates the industry classification has little influences to the capital structure of Chinese firms.
According to R square presented in table 4, we found the R square in models with financial control variables is slightly larger than the model without those financial factors in both long term and overall leverage cases. This finding claims a fact that the financial factors indeed have some additional influence on the variation of leverage level. Moreover, when the leverage is expressed in long term debt, our models have greater explanatory power than in overall debt.

6. Limitation

A comprehensive description of determinants of leverage of China’s listed companies is well beyond the scope of this paper. In addition, many numbers and facts mentioned in this paper for illustrating China’s well reform of capital structure may be exaggerated by the government. Sometimes foreign investors would be deceived by the astonishing numbers and ignore the potential danger.

During the research, it turns out the data we could access is limited, especially the data in terms of stock price. That is also a reason why we abandon using market value to measure growth opportunity and market leverage. Nevertheless, in terms of the scope of this thesis, data analysis in this thesis is considered to be enough.

In this paper, I mentioned the stock reform in year 2004 and 2005 in China, but did not dig into this topic. Further study on the influence of this capital market reform would be interesting.

7. Conclusion

This paper investigates determinants of capital structure of quoted firms in China during the period 1998 to 2007. Firstly we find a dramatic difference between the capital choices of public firms in emerging economics like China and firms in other
developed economies. Besides, their capital structure changes from time to time. Second, from results we obtained, capital structure theories are broadly confirmed. By applying our methodology to Chinese data, we have found leverage of listed firm in China is positively correlated with size and tangibility. On the other hand, it is negatively connected to profitability and risk. In our research, growth opportunities measured by earning growth have nothing to do with capital decision. The effects of deposit reserve rate and lending interest rate are ambiguous. Eventually, this study also shows there is little relation between leverage and industry classification.
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