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CAPITAL STRUCTURE DYNAMICS AND FINANCING DECISIONS OF CHINESE LISTED COMPANIES

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Abstract

This study examines the capital structure dynamics and financing decisions of listed companies in the People's Republic of China. A new dataset of 2048 Chinese listed companies for the period from 1990 to 2014 is used to investigate the determinants of capital structure in the dynamic framework. The difference and system Generalised Method of Moments (GMM) estimators are applied for the dynamic models to alleviate endogeneity concerns in corporate finance research. The costs of adjustment and speed of adjustment to the target capital structure are estimated, showing that the Chinese listed companies take partial adjustment towards their target leverage. The firm-specific factors that are expected to have an effect on the adjustment speed towards the optimum are analysed as well. The results indicate that larger firms tend to adjust faster to their targets. This study also proves that corporate governance mechanisms such as board independence, board size and ownership concentration can determine corporate capital structure while managerial shareholdings and CEO duality have no effect on financing decisions of Chinese listed firms. Additionally, the quantitative analysis is complemented by semi-structured interviews, which can provide valuable insights into the link between theory and practice.

The dynamic version of capital structure has become the frontier not only in the studies of Western economies, but also in the case of China. This study extends previous literature through new and significant empirical findings and methodological contributions; it is expected to be one of the first studies to investigate the dynamic adjustments in the capital structure of Chinese corporations and to examine the effects of firm characteristics on the speed of adjustment towards their target capital structure. It is my belief that through this study, original contributions will be made, and a new light will be shed on this research area.

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Abbreviations used in this thesis

CEO – Chief Executive Officer

CFO – Chief Finance Officer

CSD – Central Securities Depository

CSMAR – China Stock Market and Accounting Research

CSRC – Chinese Securities Regulatory Commission

CNY – Chinese yuan (analogous to RMB)

DPD – Dynamic Panel Data

EBIT – Earnings Before Interest and Tax

FDI – Foreign Direct Investment

FE – Fixed Effects

GDP – Gross Domestic Product

GMM – Generalized Method of Moments

IPO – Initial Public Offering

OECD – Organization for Economic Cooperation and Development

OLS – Ordinary Least Squares

R&D – Research and Development

RE – Random Effects

U.K. – the United Kingdom

U.S. – The United States

SEO – Seasoned Equity Offerings

SHSE – Shanghai Stock Exchange

SOEs – State-Owned Enterprises

SZSE – Shenzhen Stock Exchange

WTO – World Trade Organization

Note: Abbreviations for regression model variables can be found in the respective chapters/tables

CHAPTER 1. INTRODUCTION

1.1 Introduction

This study examines the dynamics of capital structure of publicly listed companies in the People's Republic of China since the early 1990s. Capital structure refers to the way in which a company finances its assets through a specific mix of equity and debt to support its long-term investments (Lachmann, 1978). In other words, it is a company's choice of how to finance its entire operations and development by using different sources of funds. The dynamic version of capital structure has emerged recently that considers a company's financing process as a dynamic process. In practice, a company is not constantly at the level of optimal capital structure. The actual capital structure deviates temporarily from its target and adjusts slowly back to the optimum (Banerjee, Heshmati and Wihlborg, 2004). The conventional static capital structure theory does not explain why the observed leverage level is different from the target level and cannot capture the dynamic adjustment in firms' leverage ratios. Instead, the majority of previous empirical studies has focused on the static capital structure models (e.g., Rajan and Zingales, 1995; Chen, 2004; Chen and Strange, 2005; Huang and Song, 2006; Zou and Xiao, 2006; Frank and Goyal, 2009); dynamic capital structure models have received limited attention. Although the literature contains a limited number of papers on the dynamic process of capital structure, much remains to be done. For instance, simultaneity bias occurs when capital structure and one or more of its determinants are determined in equilibrium. As most corporate decisions, including financing decision, are based on both public and non-public information, suggesting that some factors relevant for corporate behaviour are unobservable. Inability to observe these determinants means that instead of appearing among the explanatory variables, the omitted variables appear in the error term. When the omitted variables are correlated with the included explanatory variables, an endogeneity problem that causes inference to break down. Thus, in this study, the dynamic-panel-data generalized method of moments (DPD-GMM) analysis methodology is used to analyse the dynamic capital structure models. The difference and system GMM estimations are used to control for multiple endogenous variables to avoid dynamic panel bias (Arellano and Bond, 1991; Arellano and Bover, 1995; Blundell and Bond, 1998; Roodman, 2009).

Research into Chinese companies' capital structure dynamics is urgently needed. Most of the listed enterprises in China were established under the planned economic system as state-owned enterprises (SOEs). The government still maintains its controlling rights after the companies went public (Cheng et al., 2010). Numerous private companies are ones transformed from SOEs after a series of tough reforms. This prominent reforming process fundamentally results in a uniqueness of capital structure in Chinese firms (Sun and Tong, 2003). As the operations and growth of companies crucially depend on their access to capital finance and whether they utilize these funds efficiently, companies' choices of capital structure will accordingly affect their efficient use of financial capital, the values of company assets and the structures of corporate governance. Nowadays, China is the fastest developing country and the largest recipient inward and outward FDI (foreign direct investment) among the emerging economies (Perkowski, 2012). With the swift development of the Chinese economy, the capital market in China is expanding rapidly. For example, stock-market capitalisation increased from 4 percent of GDP in 1992 to 80 percent of GDP in 2010. The equity and bond markets have expanded from an average of approximately 11 percent of the financial system in 1990-1994 to an average of about 53 percent in 2005-2010 (Didier and Schmukler, 2013). By the end of October 2013, 2489 companies were listed on China's stock markets (CSRC, 2013). Thus, it is essential to have a deep understanding about the dynamics of Chinese companies' capital structure, which has significant influence on the performance and achievements of the listed corporations and thereby affects the development of the whole economy.

This study adopts a mixed method of quantitative and qualitative data analysis. It uses dynamic adjustment models and panel methodology to investigate the cross-sectional as well as time-series variations in the leverage ratios of Chinese companies from 1990 to 2014. Applying the dynamic trade-off theory of capital structure enables me to explain why the leverage ratio is allowed to deviate from its optimal level, to measure how large the deviation is and to discover what determines the speed of adjustment to the target capital structure. The rationale

behind utilizing data since 1990 is that reliable company data has only been available since the early 1990s when the Shanghai Stock Exchange (SHSE) and the Shenzhen Stock Exchange (SZSE) were established and a mixture of equity and debt financing in Chinese corporations became available (Zou and Xiao, 2006). The capital structure theories including static and dynamic trade-off theory, pecking order theory, signaling effect theory and market-timing theory underpin this study. Some firm-specific determinants of the optimal capital structure are derived on the basis of the empirical literature. Crucial to the model setting of this study, several important dynamic models of capital structure are evaluated and compared in detail. The institutional background and the patterns of capital structure of Chinese corporations in reality, especially the unique institutional system in China are also identified.

The remainder of this chapter will address the following points:

- Introducing the research objectives and outlining the research questions to be answered
- Stating the justification and potential contributions of my research.
- Presenting an overview of the empirical models and methodologies used
- Outlining the structure of this thesis

1.2 Research Questions and Objectives:

The aim of this study is to investigate the dynamics of capital structure in Chinese financial markets from three perspectives. First, I will examine the determinants of the capital structure of Chinese listed companies in the static and dynamic framework. Then I will estimate the deviation of company's actual leverage ratio from their optimal capital structure. The speed of adjustment towards companies' optimal capital structure can be quantified by using the dynamic capital structure models. I will also find out which firm characteristics determine the speed of adjustment. Furthermore, this study investigates the impacts of corporate governance, ownership structure and industrial effects on the financing choices of

Chinese listed firms. As China's financial markets are still relatively ineffective at allowing businesses to raise capital, this study may offer some evidence and recommendations for the authorities to facilitate fund raising. It also intends to provide suggestions for Chinese companies on choosing corporate optimal capital structure and obtaining the maximum value of the corporations. In addition, I also conducted fieldwork in China to discover how financial executives make financing decisions in practice. Through face-to-face interviews with CFOs, the reasons behind their choices and their financing preferences are investigated, which is helpful to provide further insights into the link between theory and practice.

Here I am mainly going to answer the following questions:

- What are the determinants of capital structure of Chinese listed companies?
- How have these determinants being evolved, and how important are they for companies' financing choices?
- Which firm characteristic influences the speed of adjustment to the target capital structure?
- How fast do firms adjust their capital structure in response to firm characteristics that influence the distribution of debt and equity?
- Which characteristic of ownership structure affects firms' financing decisions?
- Do corporate governance mechanisms influence capital structure?
- How does a financial executive make financing decisions in practice?
- Do capital structure theories and practice actually match?

1.3 My Potential Contributions:

The importance of how companies are financed has been well-documented in financial and management research as financial capital is crucial to the formation and operation of a company (Tirole, 2006). However, it is still unclear what the optimal capital structure is and how financial managers make capital structure

decisions. This study complements and enriches the existing research about capital structure by making empirical and methodological contributions. From a theoretical perspective, most of the previous literature is based on static capital structure theories. There are only a few papers that concentrate on the dynamic process of capital structure of Chinese firms. Thus, it is increasingly important to control for the dynamic nature of capital structure. China is a unique transitional economy; it has distinct institutional features and a different economic background to Western economies (Chen and Strange, 2005). Accordingly, existing capital structure theories developed on the basis of Western economies might not be able to explain the practice of China. It is important and essential to test the applicability of the modern theories to the Chinese financial markets. From an empirical point of view, both quantitative and qualitative data analysis are adopted to analyse corporate financing of Chinese listed firms. The qualitative analysis of my first-hand observations from the interviews with CFOs and financial managers complements the results of quantitative method. Findings obtained through surveys have enabled me to investigate the hidden motivations behind the managers' financing decisions. As the number of surveys conducted on Chinese firms is limited, this study is expected to fill the gap in the literature. It is one of the first of several studies that investigates the thoughts of financial executives, government officials and bank managers in China. To some extent, this study will have some implications for government and policy makers on how to alleviate the problems of financing difficulties and inefficiency in capital allocation for Chinese companies. It can also provide recommendations for Chinese firms in relation to their choices of corporate optimal capital structure and to the making of the maximum value of the corporations.

This research is also expected to make contributions in methodology. Dynamic capital structure models are used to measure the factors influencing the companies' capital structure. There are econometric challenges within the study of the dynamics of capital structure. The first challenge comes from the methodology and data to be used within the context of Chinese financial system. Measurements for the same variable differ across the literature, which may cause different results. For

instance, Rajan and Zingales (1995) divided annual earnings before interest and tax (EBIT) by total assets as a measurement of profitability, while Zou and Xiao (2006) replaced net profit with operating profit divided by the book value of total assets to measure profitability. It seems that the measurement of Zou and Xiao (2006) is more practical due to the fact that many Chinese firms tend to use investment and other one-time revenue to control reported profit for the purpose of meeting the profitability requirement of rights issues. Thus, we also need to consider the background and custom of Chinese companies when analysing their choices of capital structure, which have been ignored by many prior studies.

In addition, a minority of researchers uses a dynamic panel data approach to study financing choices of Chinese companies, because in the regressions with panel data, the error terms of a time period may be correlated over cross-sections, or the present of serial correlation would result in endogenous problems. A regressor variable is endogenous when it is correlated with the error term, and this leads to biased and inconsistent OLS coefficient estimates (Gujarati and Porter, 2009). However, most researchers do not adapt their econometric specifications to the panel nature of their data (Petersen, 2007). In order to solve this problem, current study will adjust the multiple regression model of target leverage by including a lagged dependent variable as suggested by the partial adjustment model. The difference GMM and system GMM estimation, developed by Holtz-Eakin, Newey and Rosen (1988), Arellano and Bond (1991), Arellano and Bover (1995) and Blundell and Bond (1998), are proved to be the most efficient estimator for dynamic panel data model. The detail procedure of how the dynamic partial adjustment model is generated and relevant methodological issues are elaborated in detail in Chapter 4 and 5. By utilizing the dynamic capital structure model and controlling for individual heterogeneity and multiple endogenous variables, this study is expected to make empirical contributions to the literature.

1.4 Methodological Approach

In contrast to previous research, this study utilises a mixed method of quantitative and qualitative data analysis. Chapter 4 and Chapter 5 use quantitative method of the secondary data and Chapter 6 is based on qualitative data analysis of my first-hand observations. In the spirit of comparative studies, the different financing choices among companies under different ownership structures and industries will be investigated. The dynamic adjustment models and panel data analysis methodology will be applied. It is more practical to use dynamic panel data analysis, because some variables contained in the empirical model vary with time and between firms, while some are time-invariant or firm-invariant. Neither cross-sectional nor time-series studies are able to control for this individual heterogeneity and time variance leading to biased results (Baltagi, 2002). Thus, the panel data method will be used to control for these time-invariant and firm-invariant variables.

1.5 Structure of This Thesis

The remainder of the thesis is organized as follows. Chapter 2 presents a review of theoretical and empirical literature of the capital structure. In Chapter 3, the background, development and business environment of listed corporations are reviewed. A description of the Chinese economic reform, monetary and banking reform, capital market reform and corporate governance of Chinese listed companies is included. Chapter 4 empirically investigates the dynamics of capital structure and the adjustment speed towards target capital structure of Chinese listed companies. Chapter 5 illustrates the impacts of corporate governance mechanisms on capital structure based on dynamic capital structure models. Chapter 6 gives a qualitative study of capital structure and corporate financing decisions. The findings of Chapter 6 provide further insights into the stories behind the data that complement the results of Chapter 4 and 5. Chapter 7 summarises the research findings, outlines the contributions of this study, discusses the limitations and makes some suggestions for further research.

CHAPTER 2. LITERATURE REVIEW

2.1 Introduction

This chapter reviews the theoretical and empirical literature related to capital structure, which is characterized by a board set of theories. The Miller and Modigliani theory, agency cost theory, signaling effect theory, trade-off theory and pecking order theory laid the ground for research into capital structure. However, recently emerging theories, including the market timing theory and dynamic trade-off theory, have increasingly challenged previous theories. The following paragraphs critically examines several decades of theoretical development and methodology implementation progress in the theories of capital structure; from the most basic signaling theory, the MM theorem, the earlier classical studies by Myers and Majluf (1984) and Jensen (1986), to the most recent contributions in the field of modern dynamic capital structure theory.

2.2 Review of Conventional Theories

2.2.1 MM theory:

The irrelevance theory of Modigliani and Miller (1958) was proposed by Franco Modigliani and Merton Miller that forms the basis for modern thinking on capital structure (Brealey et al., 2008). Modigliani and Miller (1958) argue that in a perfect market, how a firm is financed is irrelevant to its market value, the rate of return the shareholders expect to receive on their shares raise as the firm's debt-equity ratio increases. The theorem is valid under very strict assumptions which are: 1) at any given level of risk, individuals and companies can all borrow at that same rate of interest, which remains constant regardless of the gearing; 2) there are no costs attached to market transactions, the supply of information or the process of bankruptcy; 3) there is no difference between corporate borrowing and personal borrowing in terms of risk; 4) there is no taxation. The MM theory is obviously not valid in the practical world. Frank and Goyal (2009) state that although the Modigliani-Miller theorem does not provide a realistic description of how firms finance their operations, it provides a means of finding reasons why financing may matter.

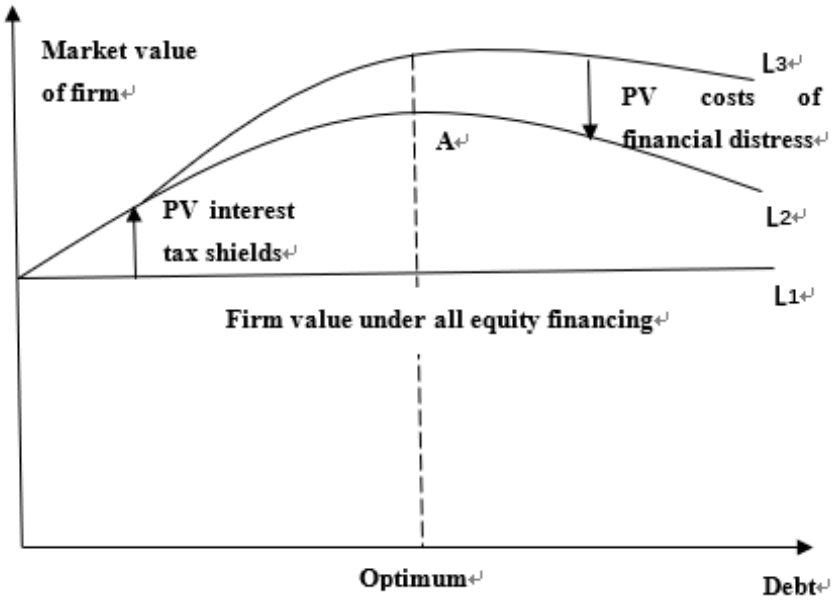
There are three important conclusions of Modigliani and Miller's irrelevance theory: the first is that companies with the same level of business risk will, in equilibrium, have the same weighted average expected cost of capital. Secondly, changes in a company's leverage ratio should leave its WACC unchanged. The increased return required by ordinary shareholders that arises out of an increased in leverage represents the compensation required for bearing additional financial risk. Finally, the analysis leads us to conclude that the financing decision is relatively unimportant. It can have no bearing on the value of the company and so does not affect the wealth of ordinary shareholders.

Modigliani and Miller (1963) revisited their work in 1963 and included tax effects into their model, suggesting that firms should finance completely by debt to maximise company value. They argue that the tax advantage of debt financing is greater than originally suggested, because issuing debt can provide the firms with tax shields in the form of interest deductibility. However, the MM theory with tax effects is challenged because of the possibility of discontinuity caused by bankruptcy and the distortions due to asymmetric information. Since then, the trade-off theory and pecking order theory of capital structure have been emerging.

2.2.2 Trade-off and pecking order theory:

The traditional trade-off theory of capital structure implies a significant tax incentive for corporate borrowing (Modigliani and Miller, 1963). Due to the effects of agency costs and bankruptcy costs, there exists an optimal capital structure for companies that requires them to trade-off between the tax benefits of increasing leverage and the costs of financial distress that is caused by high debt ratios (Myers, 1984). This is illustrated in Figure 2-1 below:

Figure 2-1: The static trade-off theory of capital structure



Source: Myers (1984)

Figure 2-1 shows that a firm's optimal debt ratio is determined by the trade-off of benefits and costs of debt financing. The straight line L_1 indicates the market value of an all-equity firm under the Modigliani and Miller (1958) regime, in which firm value is irrelevant to its capital structure. Curve L_3 shows how the costs of financial distress increase with the increasing leverage in this firm. Here, the costs of financial distress include legal and administrative costs of bankruptcy, moral hazard, monitoring and contracting costs (Myers, 1984). Curve L_2 illustrates that the market value of the firm rises with the increase of debt level, then after financing a certain proportion of debt (the optimum debt ratio), the value of the firm begins to decline (point A), because the costs of financial distress outweigh the benefits of tax shields. If there is no cost of adjusting to the optimum, each firm's observed debt level should be equal to its optimal debt ratio. However, the adjustment costs cannot be avoided in practice, therefore wide variations observed in firms' actual debt ratios (Myers, 1984).

Trade-off theory has made vital contributions to the study of capital structure. It

implies that tangibility is positively related with capital structure, as tangible assets serve as good collateral to decrease financial distress costs; companies with more tangible assets are better equipped to provide collaterals for debt financing. Thus, companies with higher tangibility are expected to have lower bankruptcy costs. The trade-off theory also predicts that the profitability of a firm is expected to be positively related to its leverage ratio, because high profitability can lower the risks of bankruptcy (Jensen, 1986). In sum, the trade-off theory of capital structure hypothesises that the firm-specific factors representing debt benefits are expected to have positive effects on leverage while the factors representing debt costs are expected to have negative effects on leverage. However, the trade-off theory has some limitations. First, it cannot explain why some of the most profitable firms tend to borrow the least. Second, Myers and Majluf (1984) questioned the accuracy and the empirical relevance of the trade-off theory, proposing the pecking order theory as a competing theory to the trade-off theory.

The pecking-order theory was first suggested by Donaldson (1961) and then modified by Myers and Majluf (1984) based on asymmetric information. Asymmetric information has significant effects on the choices between internal and external financing and on the choices between the new issues of debt and equity; it implies that external financing is costly and therefore avoided by companies (Brealey et al., 2008). Hence, the pecking order theory suggests that firms prefer funding internal equity first, and then issue debt, with the last being external equity financing (Myers, 2001). This financing hierarchy can help decrease the problem of underinvestment (Myers, 1977; Myers and Majluf, 1984). According to Myers (1977), underinvestment problem refers to an agency problem between debt-holders and equity-holders. As equity may be mispriced by the market under asymmetric information, a firm may reject a valuable investment opportunity with positive NPV because debt-holders will gain more benefits from the project, leaving insufficient returns to shareholders (Myers and Majluf, 1984). The theory of underinvestment problem conflicts with the assumption in the MM theory that investment decisions can be made independent of financing decisions. Meanwhile, the pecking-order theory can explain why more profitable firms generally borrow

less, because they prefer to use internal funds with more internal financing available (Myers and Majluf, 1984). Contrary to the predictions of the trade-off theory, the pecking order theory implies that there is a negative relationship between firm tangibility and capital structure. It claims that firms with more tangible assets tend to have less information asymmetry, thus the firms are more likely to issue equity. In other words, the information asymmetries would force the firms with massive intangible assets to be greatly leveraged, hence tangibility is negatively related to firm leverage (Harris and Raviv, 1991). However, the pecking order theory is limited. It assumes that managers act in the existing shareholders' interest, maximizing the value of existing shares, which brings me to consider the implication for managers who do not act in the interests of existing shareholders. If such managers act in their own interests, would the results be different from the implications of the pecking order theory?

2.2.3 Agency theory:

Jensen and Meckling (1976) suggest that major insights into the capital structure problems can be gained if they are understood in terms of agency theory. Theory of agency is the foundation theory of capital structure. An agency relationship can be defined as a contract between two or more parties when one party (the agent), acts for or on behalf of the other (the principal), in a particular domain of decision problems (Ross, 1973). Jensen and Meckling (1976) argue that, in general, it is impossible to ensure that the agent will make optimal decisions that maximize the welfare of the principal at zero cost. The agency problem exists in all corporations and at every level of management. They also define agency costs as the sum of the bonding expenditures by the agent, the monitoring expenditures by the principal and the residual loss.

The agency costs of equity are caused by conflicts between shareholders and managers; associating with the asymmetric information and the separation of ownership and control in the corporations. Managers normally know more about

the corporate situation such as the value of assets, growth and investment opportunities than the shareholders. Shareholders have to rely on the mangers to decide what information they should have, which may lead to the problem of moral hazard and adverse selection (Jensen and Meckling, 1976). For instance, the managers may hazard corporate funds on risky ventures as it is not their money they are risking. Besides, if a company has issued debt, the conflicts between the debt- and equity-holders generate an agency cost of debt (Colombo and Stanca, 2006). Issuing debt implies that any benefits of a firm's excess return from its implemented investment projects will belong to the equity-holders, which means a transfer of wealth from debt-holders to equity-holders. With the conflicts of interest between shareholders and managers, and between debt-holders and equity-holders, the decisions on capital structure are vital for corporations which requires them to maintain a balance between costs and benefits.

2.2.4 Signaling effect theory:

The first formal models on signaling effects of managerial actions were developed by Ross (1977) and Leland and Pyle (1977). Ross (1977) applies the signaling theory to the study of financial markets under asymmetric information and suggests that managers who have private high-quality information about a company's expected cash flows can signify the company's future earning level to potential investors. In particular, he demonstrates that an increased amount of debt use would effectively signal that the company's prospects have improved. One significant contribution of Ross' study is that he establishes the incentive-signaling model based on the work of Spence (1974), which is:

$M = (1+r)\ \gamma_0 V_0 + \gamma_1 \{V_1 \text{ If } V_1 \geq F, \text{ or } V_1 - L \text{ if } V_1 < F\}$

where M denotes the compensation for managers, V_0 and V_1 are the values of the firm at time 0 and at time 1 respectively, L stands for a penalty for the manager when the firm is bankrupt at time 1, and F is the par value of the debt issued at time 0. $V_1 \geq F$ means the value can cover the repayment of debt. γ_0 and γ_1 are constants that stand for fixed non-negative weights. It is expected that the managers have

insider information, which allows them to maximize their incentive compensation (M). It also assumes that the incentive compensation for managers is positively related to the firm value. But once the firm goes into bankruptcy, the manager will lose their job, salary, reputation, etc. Therefore, in order to maximize their own benefit, managers need to balance between the incentive compensation and possible benefits from informative signaling when making the choice of capital structure (Ross, 1977). It implies that the informative signaling does have a significant effect on the corporate leverage ratio. However, it is difficult to undertake empirical testing on Ross's incentive signaling model in continuous time. For instance, the model should consider problems in financing of private and small companies as well as large companies; and for empirical studies, the impact of real bankruptcy costs and taxation should also be taken into account.

Leland and Pyle (1977) emphasize the importance of financial intermediation; suggesting that financial intermediaries can be regarded as an automatic response to asymmetric information. As moral hazard prevents the information transferring among market participants directly, the market may perform poorly and result in adverse selection. These results indicate that the market takes higher entrepreneur ownership as an indication of a more favourable project. The projects with higher specific risk signal their values to the market relatively more easily, which results in lower signaling costs in equilibrium. Besides, if the transaction costs are sufficiently high, firms' debt levels can serve as a signal of firms' market values. But if transaction costs are minimal, the debt level cannot serve as a signal of firm value.

2.2.5 Market timing theory:

The equity market timing theory of capital structure was introduced by Baker and Wurgler (2002), regarding how companies make decisions about financing investments. It is often contrasted with the pecking order theory and the trade-off theory. Baker and Wurgler (2002) claim that market timing is the most significant determinant of companies' capital structure, as companies do not generally care

whether to finance with debt or equity; on some occasions they prefer to raise equity and on other occasions they prefer debt. It is the issue of getting the right timing of finance that matters. They find that the historical market-to-book ratio is negatively related to leverage based on a sample of all COMPUSTAT countries. Their results imply that when firms achieve their certain levels of earnings growth, the stock prices will become overvalued, then firms will finance projects through debts. Otherwise, the firms will be undervalued and rely on equity financing. Mahajan and Tartaroglu's (2008) study is based on the findings of Baker and Wurgler. They investigate the market timing hypothesis of capital structure in a sample of G-7 countries, concluding that historical market-to-book ratio has a short-term negative effect on firm leverage. However, they argue that this negative relationship cannot be attributed to equity market timing because, when examining the Japanese firms, market timing was insignificant for capital structure. Their findings are not consistent with the prediction of the equity market timing hypothesis but are in line with the trade-off theory. Lumby and Jones (2011) also claim that when a firm's managers make capital structure decisions, the consideration of market timing may be a more important factor in practice than any of the other usual determinants of capital structure. Chen and Zhao (2006) point out that, in the case of China, equity market timing is a significant factor for capital structure decisions. Most Chinese listed companies prefer equity financing, and the market timing of equity financing seems to be the main form of financing behaviour of the listed companies.

Following the design of Baker and Wurgler (2002), Chen et al. (2013) tested the pecking order theory and market timing theory of publicly- traded firms in Taiwan utilizing panel data analysis from 1990 to 2005. It is estimated that the main difference between the market timing theory and the pecking order theory is whether the assumption of semi-strong form market efficiency is maintained. Furthermore, Chen et al. (2013) argue that the pecking order theory cannot be applied on the financing behaviour of Taiwanese firms, which is consistent with the research of Frank and Goyal (2003). The market timing theory is favourable for the stock market in Taiwan for the period 1990-2001, while it does not apply

to the period 2002-2005. This might be due to the bullish stock market during 1990-2001, and the bearish stock market during 2002-2005 which resulted in the low market performance. Thus, firms in Taiwan prefer issuing debt rather than equity under low market performance. Celik and Akarim (2013) analysed how equity market timing influenced capital structure in the emerging market from the perspective of Initial Public Offering (IPO) event. They first tested the impact of market timing on the amount of equity issued by IPO companies. Second, they examined the effect of market timing on capital structure. Their results show that there is no significant effect of market timing on capital structure. Then they concluded that the market timing theory is not valid for their sample; whether the firms go public in a hot or cold market in the short-term has no effect on firms' capital structure.

2.3 Review of Dynamic Trade-off Theory of Capital Structure

The static trade-off theory that has been stated above considers the trade-off between the benefits and costs of debt and equity financing. It predicts that companies pursue a target capital structure, where the marginal costs of bankruptcy are equal to the marginal benefits from tax shields. However, empirical tests show that the actual leverage ratios are very likely to drift away considerably from the target ratios. The static trade-off theories neither explain the reason for this significant deviation nor state how large a deviation should be tolerated. Accordingly, a new theory emerged, which is more persuasive than either the trade-off or the pecking order theory, called the dynamic trade-off theory. The dynamic trade-off theory states that, even though numerous firms allow their capital structure to deviate from their targets for a while, managers ultimately would adjust gradually back to their target leverage, which suggests that the traditional trade-off theory explains the long-run deviations, whereas the pecking order theory holds in the short-run deviations (Hovakimian, Opler and Titman, 2002). The dynamic trade-off theory assumes that the costs of adjusting capital constantly are high, and thereby firms would change capital structure only when the benefits surmount the costs. Accordingly, there will be an optimal range that motivates the firms to adjust

their leverage ratios when the boundary of the optimal range is reached. The dynamic trade-off theory of capital structure incorporates asymmetric information costs and agency costs, suggesting that firms should adjust their leverage ratios to the point where marginal costs of debt equal marginal costs of equity (Fischer, Heinkel and Zechner, 1989). The speed of adjustment at which the companies adjust towards their optimal leverage could determine whether they follow the trade-off theory or packing order theory. A detailed analysis of empirical studies on dynamic capital structure models is given in the following paragraphs.

The first dynamic examination of optimal leverage was provided by Brennan and Schwartz (1978). They proposed their model following the findings of Black and Scholes (1973) and the Black-Scholes partial differential equation. Brennan and Schwartz's model assumes that the value of the asset underlying the contingent claim follows a geometric Brownian motion and is driven by debt tax incentive and agency costs. Brennan and Schwartz (1978) have built significant ground for the study of dynamic capital structure models. However, some limitations exist in their model. Firstly, their study assumes that the firm will be bankrupt when the firm value is lower than the debt value, but this case is not common. Thus, their statistical result cannot stand for general cases. Secondly, Brennan and Schwartz's model considers the changes in financial structure, which last only until the bonds expiry. An expiration date is required for their numerical algorithm; in other words, they have not explicitly analysed the permanent capital structure changes (Leland, 1994). Subsequently, Fischer et al. (1989) developed a model along with the existence of recapitalization costs that takes the companies' optimal debt ratio range as a function of firm-specific characteristics. Based on an exogenous cash flow process, this model is able to endogenously determine the asset values and the claim values of derivative securities of the company under optimal leverage. Their results robustly support the dynamic setting of theoretical capital structure models and imply that even the slight costs of recapitalization would result in wide swings in firms' leverage over time.

Later on, an increasing body of literature has considered adjustment costs as an explanation of the relatively slow movement towards a target debt ratio. Since the 1990s, the models of dynamic capital structure have been developed by incorporating diverse factors into the models and by breaking away the restrictive assumptions in prior models. In addition to adjustment costs of rebalancing capital structure, estimating the speed of adjustment towards the target capital structure is essential as well. Capital structure adjustment speed refers to the speed at which firms move towards their target debt ratios. Banerjee et al. (2004) find that companies typically have leverage ratios that are not at their targets and they adjust very slowly towards their target leverage; therefore it is very important to identify the determinants of adjustment speed towards the optimal leverage. Their results show that the speed of adjustment is positively related to firm size and negatively related to the firm's growth opportunities. Flannery and Rangan (2006) use the conventional econometric specification to test firms' adjustment towards target leverage in the long-run, which takes the form of a partial adjustment process. Their model recognizes that firms have specific optimal leverage ratio, but their optimal leverage would change over time and firms differ in their speed of capital structure adjustment. The model of Flannery and Rangan (2006) allows us to estimate firms' speed of adjustment, and the results support the prediction of dynamic trade-off theory that firms do have active target adjustment behaviour. Strebulaev (2007) find that firms will trade-off between the frequency of rebalancing their capital structure and the amount of borrowing. If the costs of adjustment rise, the firms will decrease the frequency of refinancing. This is supported by the results of Byoun (2008) which suggest that firms move towards their target leverage when they face a financial deficit or surplus. He argues that firms with high adjustment costs or financial constraints tend to absorb cash flow internally without resorting to external capital, and the adjustment speed of capital structure varies with firm characteristics.

According to the preceding review of dynamic capital structure, the dynamic partial adjustment model is outlined as below:

$$\Delta d_{it} = \lambda (d_{it}^{*} - d_{it-1}) + e_{it}$$

where d_{it} is the observed leverage ratio, d_{it}^{*} is the target leverage ratio, λ is the speed of adjustment that should change between 1 and 0 with the presence of adjustment costs, and e_{it} is the error term. The model implies that the magnitude of the speed of adjustment is vitally important in empirical studies on capital structure, due to the fact that firms are not at their target leverage ratios constantly (Flannery and Rangan, 2006). It demonstrates that capital structure is dynamic for corporate, thereby it is significant for companies to balance the costs and benefits of choosing capital structure. If the adjustments of moving towards their target debt level are costly, the firms would adjust partially and slowly towards their targets. A more detailed discussion about the framework for the dynamic capital structure model and the adjustment speed of capital structure is given in Chapter 4.

2.4 Conclusion

This chapter has reviewed literature on capital structure theories, including Miller and Modigliani theory, agency cost theory, signaling effect theory, pecking order theory, static and dynamic trade-off theory. The Miller and Modigliani theory is generally viewed as a cornerstone in corporate finance that lead to the development of the subsequent capital structure theories. It assumes that a firm's capital structure is irrelevant to its market value in a perfect market which is different from the real world in which corporations operate. Over the last five decades, the restrictive assumptions of Modigliani-Miller irrelevance propositions have been relaxed in the subsequent work, and the capital structure frictions such as asymmetric information, taxes, bankruptcy costs and transaction costs have been introduced into the capital structure models (Frank and Goyal, 2005). The new emerged theory, dynamic trade-off theory of capital structure, incorporates asymmetric information costs and agency costs and suggests that firms would adjust their leverage ratios to the optimum by the trade-off between the benefits and costs of using debt. The dynamic setting of theoretical capital structure models provides a basis for the quantitative data analysis in Chapter 4 and 5.

In the following chapter, institutional background of Chinese listed companies is reviewed. An overview of the Chinese stock markets and information related to corporate governance and ownership structure of Chinese listed firms are presented.

CHAPTER 3. INSTITUTIONAL BACKGROUND OF CHINESE LISTED COMPANIES

3.1 Introduction

This chapter illustrates the institutional background and capital structure patterns of Chinese listed firms. The history of Chinese stock markets development and the series of economic reforms implemented especially the split-share structure reform, are summarised as well. The information related to corporate governance and ownership structure of Chinese listed companies is also presented.

3.2 Institutional Context

Before the economic reforms of 1978, China was a highly centralized planned economic system in where most companies were state-owned and financed from the state-owned banks attached to government bureau. All loans were authorised and approved by the government authorities (CSRC, 2008). After a series of reforms implemented in the financial sector and banking sector, China has transformed towards a market-oriented financial system. Approximately 26 listed non-bank financial intermediaries have been established to encourage various sources and channels of raising funds for companies more than just financing through the bank loans. There was also a reallocation of bank credit from state-owned enterprises (SOEs) to private enterprises, allowing the privates to have more financing opportunities and in turn encouraging the privates' development (Chen et al., 2013). In 2004, the government removed the ceiling on bank lending rates and the floor on bank deposit rates for all lenders and increased the bank credit for small companies and technology companies (CSRC, 2008). This series of evolutions has also included an incorporation process of Chinese companies, with changes in their ownership structure and ownership concentration. In the late 1980s, with some SOEs transformed into joint-share companies, the joint-share companies with limited liability were trialed. The typical public corporations' ownership structures were broken into several share classes: state shares, floating common shares and legal-person shares (Chen, 2013). In 1992, the establishment of the Securities Committee and the China Securities Regulatory Commission (CSRC) marked a new beginning that propelled the Chinese capital market into a new stage of development. The securities market further opened up, leading to an increasing

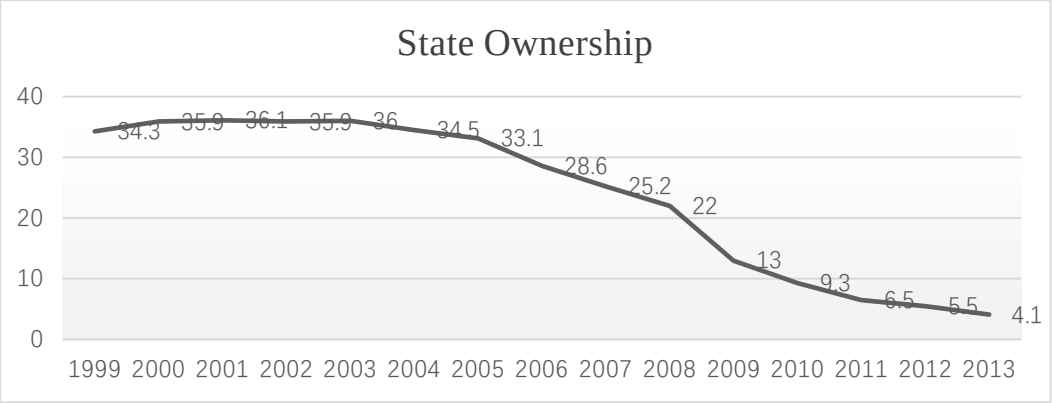
level of foreign capital flowing into Chinese capital markets. Restrictions on the listing of private companies decreased and were then removed in 2000. The CSRC also formulated a number of laws and rules for regulating the securities market and issued a series of regulations over the organization and operations of listed companies, laying the legal foundation for the development of Chinese listed companies (CSRC, 2008).

Before 1990, the bonds issued were part of the national credit plan and were non-tradable in the secondary market. Since the Chinese bond markets were established on Shanghai and Shenzhen stock exchange in 1990 and 1991 respectively, the government started to sell bond on a voluntary basis through these exchanges (Chen et al., 2011). Then after the Central Securities Depository (CSD) established in 1996, China's bond market entered a period of rapid development. Over the last several decades, China's bond market becomes the third largest bond market all over the world with approximately 5.4 trillion dollars in total amount outstanding by the end of 2015 (GSAM, 2015). While the relative share of the corporate debt is quite small, even though the size of the Chinese bond market is growing dramatically. For the smaller-sized firms, their access to public debt markets remains limited, because SOEs dominate much of the corporate bond market (Chen et al., 2011). Moreover, SOEs have advantages in the Chinese bond market with higher bond ratings and lower yield spreads, in comparison with the non-SOEs. Besides, the Chinese bond market is mainly dominated by the government's intervention and is greatly influenced by the government policies and macroeconomic situation (Livingston, Poon and Zhou, 2018).

Despite the rapid development of Chinese financial markets, numerous problems still remain in the Chinese financial system after several decades of reforms. The first problem is the highly concentration of state ownership. Approximately two thirds of firms listed in the Shanghai Stock Exchange (SHSE) were dominated by the state or local governments, leading to serious inefficiency in capital allocation (Kang et al., 2008). Although many state-owned enterprises (SOEs) transformed

into joint-share companies after a series of reforms implemented in the Chinese financial sector, the concentration of state ownership is very high. Table 3-1 shows that the average percentage of state-owned shares to total shares has decreased from 36.4 percent in 2003 to 3.9 percent in 2013. Even though the state control over listed companies has decreased considerably recently, the state still owns large shareholdings in some companies. For instance, by the end of 2013, the state still owns more than 30 percent stakes in about 150 listed firms and owns more than 50 percent of ownership in nearly 80 listed firms.

Table 3-1: State ownership of Chinese listed firms (%), 1999-2013



Source: Author's work using CSMAR database

Second, informal financing activities have been very common among Chinese companies over the last three decades. Until now, China's financial markets are relatively ineffective for businesses to raise capital, and bank loans still stand for the main source of debt financing for Chinese listed companies (Chen et al., 2011). Due to the weakness of the banks, firms raise most of their capital through an informal and nonstandard financial sector consisting of largely underground businesses and private banks (Newman, Gunessee and Hilton, 2010). Other problems such as the inefficient enforcement of regulations and laws, the lack of independence among board directors and the lack of well-defined fiduciary duty are significant and could seriously impact the development of Chinese financial system (Allen et al., 2012).

Besides, before analysing the capital structure decisions of listed firms, it is also essential to know the recent overall condition of the Chinese listed firms. From 1990 to 2013, the number of Chinese domestically-listed companies increased rapidly from 10 to 2489. The number of listed companies and A-shares companies each year is listed in Table A-1 in Appendices. In 2013, about 1500 listed companies made profit compared with last year, while about 200 listed companies made losses in revenue. The average debt ratio of all listed companies has gradually decreased by approximately two percent from 47.1 percent in 2012 to 45.3 percent in 2013 (China Statistical Bureau, 2014).

3.3 Chinese Capital Structure Patterns

Companies can raise capital from debt and/or equity, and it seems there is a "pecking order" of issuing debt and equity for the companies. The pecking order theory refers to a situation whereby, as the announcement of issuing debt has slighter downward impact on stock price than the declaration of an equity issue, firms would like to issue debt rather than equity and prefer internal to external finance. Equity issues will be announced only when issuing debt is costly. For example, managers and investors would foresee the costs of financial distress that caused by high debt when the company is at dangerously high leverage ratios, then equity would be financed by the company. However, it seems that the choices of capital structure of Chinese firms do not follow the pecking order theory. Chen (2004) finds that the Chinese companies are following a "new pecking order" which is retained profit first, then equity, and lastly debt. This finding is supported by the subsequent research of Hovey (2006). Hovey (2006) claims that, of all firms listed in China during 1999-2005, the most significant finding in his study is that pecking order theory does not appear to hold in China. Some empirical studies also show that the financing practice of Chinese listed companies is opposite to the pecking order theory. Chen (2004) further concludes that Chinese large firms use more short-term finance and contain substantially smaller amounts of long-term debt. It is estimated that Chinese firms generally use less than 10 percent of long-

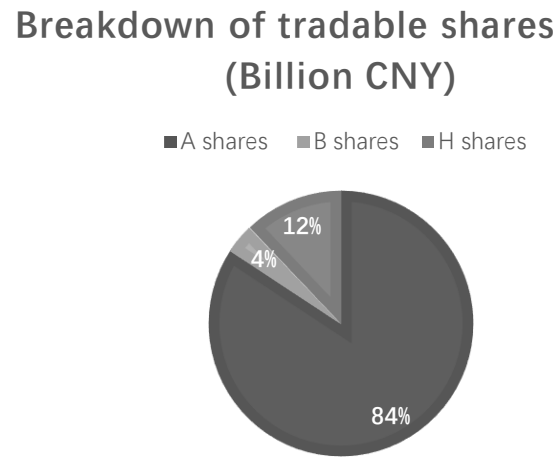
term debt, while the average debt level of G7 countries is approximately 40 percent and 20 percent in other developing countries (Bhabra, Liu and Tirtiroglu, 2008).

3.4 Stock Markets in China

3.4.1 An overview of Chinese stock markets

The stock markets in China adopted a fairly complicated share structure. There are two major categories: tradable and non-tradable shares. By the end of 2013, tradable shares accounted for about one third of total shares. Tradable shares include A-shares, B-shares and overseas-listed shares such as H-shares. The trading markets for A-, B- and H-shares are distinct and separate. A-shares refer to the shares of firms founded in mainland of China, and the shares are traded in the mainland A-shares markets. B-shares are subscribed and traded in foreign currencies mainly for domestically listed foreign investment shares. B-shares were designated only for overseas investors in the past; since February 2001, domestic citizens have been allowed to trade B-shares in foreign currencies. H-shares are the shares of firms incorporated in mainland China that are traded in the Hong Kong Stock Exchange (Kang et al., 2008). Chen and Shih (2002) observe several main differences between A-shares and B-shares. The external and institutional environment, investors' attitudes and accounting systems are different for A-and B-shares. Because this study is targeted at domestic companies listed in the Shanghai Stock Exchange (SHSE) and the Shenzhen Stock Exchange (SZSE), the involvement of B- and H-shares will disturb the accuracy of the results. Thus, only A-shares are kept in the sample of this thesis. The situation of A-share markets is analysed in detail in the following section.

Figure 3-1

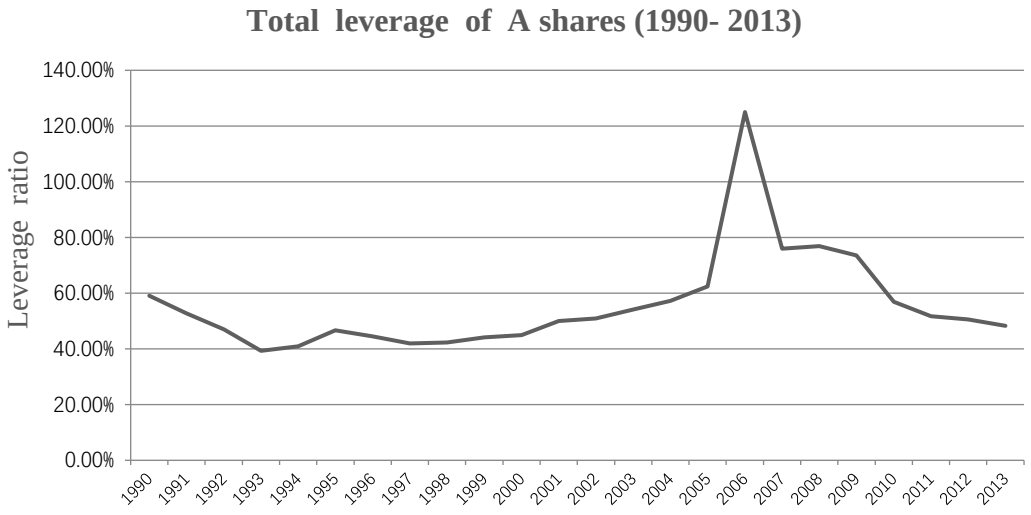


Source: Author's work using CSRC data

3.4.2 A-share markets

As shown in Figure 3-1, A-shares takes 84 percent of total tradable shares by the end of 2013. B- and H-shares take 4 percent and 12 percent of tradable shares respectively. A-share markets are the major components of the Chinese stock markets. Figure 3-2 shows the trend of overall debt ratios for A-shares. It is notable that in 2006, the leverage ratio reached the highest point at 125 percent, and then declined sharply to 76 percent in 2007. Since 2008, the leverage ratios of A-shares kept decreasing constantly from 76 percent to 50.6 percent in 2012 and then levelling off at 48.2 percent in 2013. Furthermore, it can be seen from Figure 3-3 that the market value of A-shares increased by 7.25 percent from 2010 to 2011. During 2006-2008, there were great fluctuations in A-share markets; its market value increased rapidly from 88,114 (100 million CNY) in 2005 to 324,588 (100 million CNY) in 2006 and decreased hugely by 62.9 percent in 2007, and then it raised again to 242,127 (100 million CNY) in 2008. The large fluctuations might be caused by the instability of macroeconomic conditions during that period.

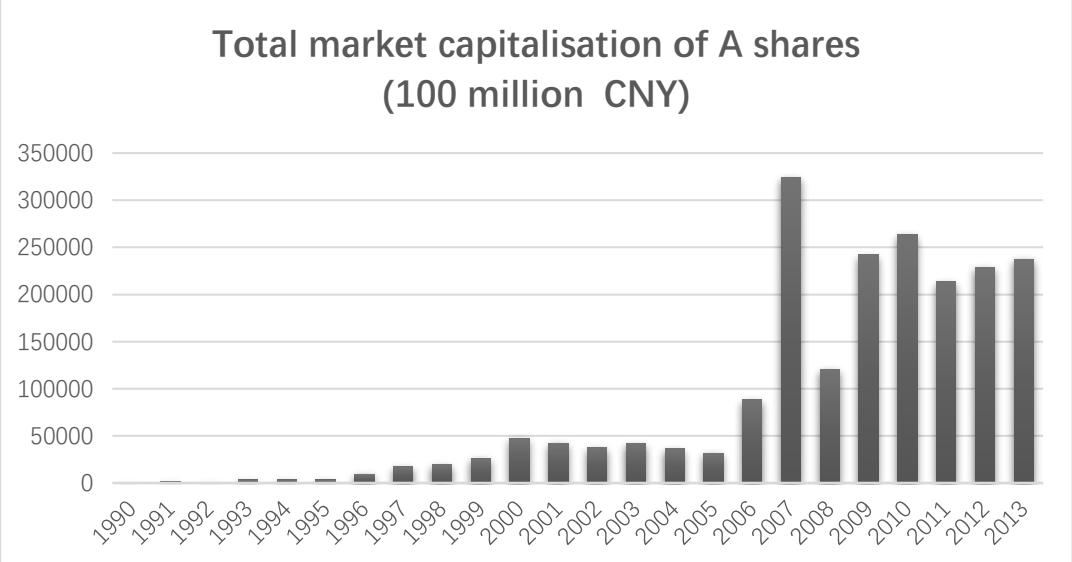
Figure 3-2



Source: Author's work using CSMAR database

Note: Total leverage of A shares is measured by the average book total leverage ratio which is equal to total liabilities divided by total assets.

Figure 3-3



Source: National Bureau of Statistics of China (2015)

3.4.3 Tradable versus non-tradable shares

In China, only recently, majority of listed firms' shares have become negotiable on the stock exchange. About two-thirds of each firm's shares were non-tradable before the split-share structure reform. The non-tradable shares which is also named as restricted shares were composed of 1) state shares; 2) state-owned legal person shares; 3) domestic legal person shares; and 5) other non-tradable shares including shares allocated for strategic investors, etc (CSRC, 2008). Approximately 75 percent of the restricted shares were state-owned shares before 2005 (Huang and Zhu, 2015). In April 2005, the Chinese government initiated a split-share structure reform to transform all non-tradable shares into tradable shares. The split share reform remarkably improved the quality of corporate governance of the Chinese listed firms by alleviating the agency problems between non-tradable controlling shareholders and tradable minority shareholders (Ma et al., 2016).

Table 3-2 shows the percentage of shares that are tradable and non-tradable from 2003 to 2013. In 2003, the mean (median) percentage of shares that are tradable, by firm, is only 39.71% (37.9%). By 2007, more than half the firms had more tradable shares than non-tradable shares. Specifically, in 2007, the mean (median) percentage of shares that are tradable, by firm, is 53.35% (53.42%). By 2013, the majority of shares are tradable in more than half of the firms. Specifically, the mean (median) percentage of shares that are negotiable is 78.61% (91.64%), which means that almost all the shares of the Chinese listed firms are now tradable on the stock exchange.

Table 3-2: Percentage of tradable and non-tradable (restricted) shares, 2003-2013.

year	No. of observations	% of tradable shares		% of non-tradable shares	
		mean	median	mean	median
2003	1237	39.71	37.90	60.29	62.10
2004	1334	39.57	37.72	60.43	62.28

2005	1348	41.60	39.66	58.40	60.34
2006	1427	47.95	47.36	52.05	52.64
2007	1532	53.35	53.42	46.65	46.58
2008	1587	59.07	58.86	40.93	41.14
2009	1733	68.61	72.37	31.39	27.63
2010	2084	66.92	73.64	33.08	26.36
2011	2315	68.55	78.01	31.45	21.99
2012	2313	73.16	85.98	26.84	14.02
2013	2307	78.61	91.64	21.39	8.36

Source: Author's work using CSMAR database

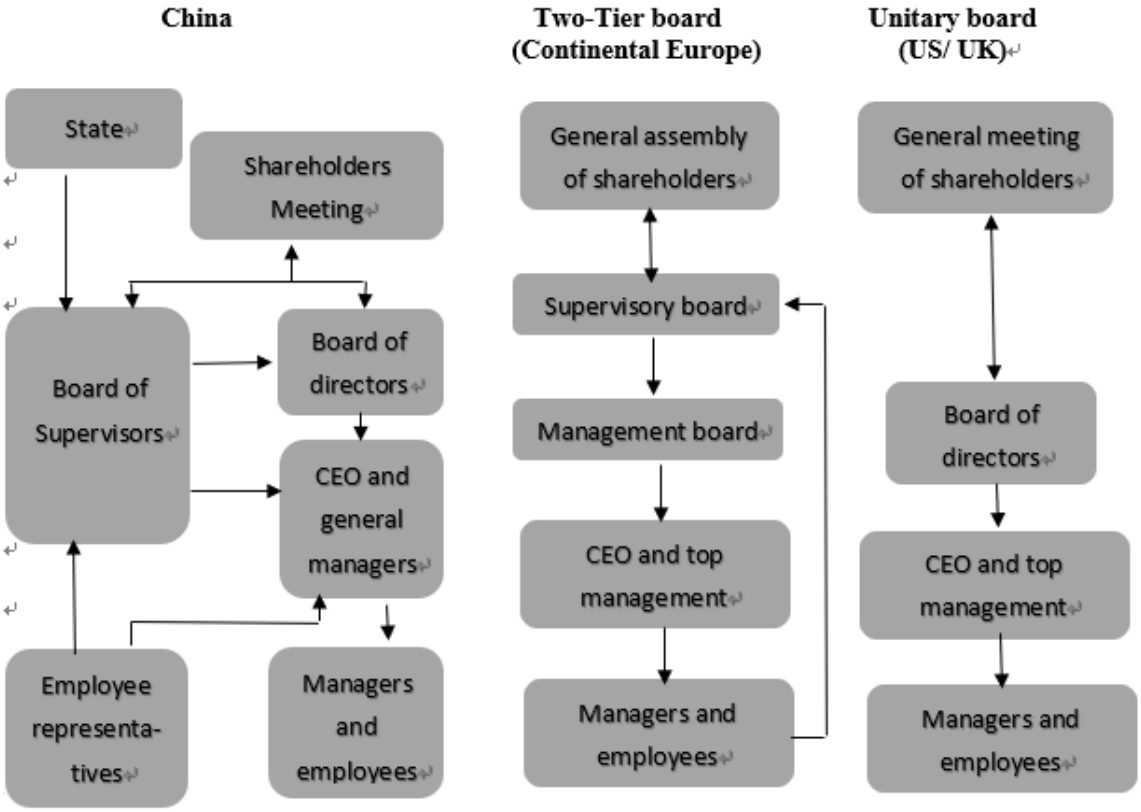
3.5 Corporate Governance and Ownership Structure in China

3.5.1 Corporate governance model:

The China Securities Regulatory Commission (CSRC) is the corporate and securities regulator. It performs the functions of issuing corporate governance code, regulations and rules, and publishes regular reports on corporate governance reform and performance. With the regulations presented by the CSRC and the introduce of Company Law and Securities Law, the level of corporate governance has been constantly improving since the early 1990s (OECD, 2011). The Company Law and Securities Law provide the foundation for drawing up the framework of corporate governance for Chinese firms. After joining the World Trade Organisation (WTO) in 2001, China adopt the OECD Principles of Corporate Governance to regulate the listed companies (OECD, 2011). In comparison with the developed economies, China has adopted a unique form of corporate governance structure; the state still typically plays a significant role in the governance of enterprises. As can be seen from Figure 3-4, the corporate governance model of China is different from that of the United Kingdom, the United States and Continental Europe. The unitary board system is used in the U.K. and U.S. to adjust to the objective of rapid economic growth, as the nation's economic development depends on the efficiency of the corporations

(Kusumaningtias et al., 2016). The board of directors monitors managers to ensure they work in the interests of shareholders (Monks and Minow, 1995), and they also have the rights to hire and fire the CEO and senior managers (Johnson, Daily and Ellstrand, 1996). The use of unitary board system enables the CEO to have freedom in running their companies effectively, while it also gives a tremendous authority to the CEO leads to corporate scandals such as Enron and WorldCom (Kusumaningtias et al., 2016). The countries located in Continental Europe including Austria, Germany, Sweden and the Netherlands adopt the two-tier board system (Daniri, 2014). The two-tier board system separates the functions and duties of supervisors and managers in the companies. The supervisory board has no authority to control the firms but to oversee and supervise the managers. In China, the board structure of corporate governance is more complicated with the government plays a significant role in it. The revised Securities Law, introduced in 2006 in China, improved the supervision of listed companies and also improved the system governing the issuance, trading, registration and settlement of securities (OECD, 2011). The state supervises the board of supervisors, and the board of supervisors responsible for supervising the board of directors, CEO, senior managers as well as employee representatives. The supervisory board and independent directors both act as the internal supervision mechanisms of the listed firms. While, unlike the European model, the supervisory board in China has no responsibility for the shareholders and has no power to hire or fire managers.

Figure 3-4: Board structure of governance



Source: Tricker (2009)

3.5.2 Ownership concentration:

Ownership concentration refers to the relative amounts of shares owned by large shareholders or institutional investors. It is a key corporate governance mechanism that can mitigate agency problem and interest conflicts between managers and owners (Jensen and Meckling, 1976; Shleifer and Vishny, 1986). There are several measurements for ownership concentration such as the fraction of shares held by the largest shareholder or the five largest or the ten largest shareholders, or the sum of shareholdings held by the second to the tenth largest shareholder (Jensen and Meckling, 1976; Leland and Pyle, 1977; Diamond, 1984). In China, largest shareholder is in a dominant position in comparison with the second largest shareholder. The minority shareholders have very small influence over the corporate financing decisions. For most Chinese listed firms, the shareholdings

held by the largest shareholders are overwhelmingly large which can be seen from Table 3-3.

Table 3-3: Ownership concentration of Chinese listed companies, 2003-2013

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
a) Top 1 (%)	0.43	0.42	0.41	0.36	0.36	0.37	0.36	0.36	0.36	0.36	0.36
b) Top 2-10 (%)	0.18	0.20	0.20	0.20	0.20	0.19	0.19	0.22	0.23	0.22	0.21

Source: Author's work using CSMAR database

Note: Top 1 (%) represents the largest shareholding which equals to annual average percentage of shares held by the largest shareholder; Top 2-10 (%) equals to annual average percentage of shares held by the sum of the second to the tenth largest shareholder.

Table 3-3 shows the average percentage of shares held by the largest shareholder (row a) and by the sum of the second to the tenth largest shareholder (row b) for the Chinese listed firms from 2003-2013. It shows that on average, a firm's largest shareholder owns about 38 percent of the firm, while the sum of the second to the tenth largest shareholder together own only about 20 percent of the firm. This situation seems to be neglected by many previous studies on Chinese firms. Thus, the impact of largest shareholdings on capital structure decisions will be investigated later in Chapter 5 in this thesis.

To sum up, this chapter has summarised the background information on Chinese listed companies. It reviewed the development and the unique features of Chinese stock markets. The capital structure patterns and trends in debt ratios of Chinese listed firms since 1990 are analysed. The board structure of corporate governance and ownership concentration of Chinese listed firms are also examined. The relationship between corporate governance mechanisms and capital structure will be analysed based on dynamic panel data models in Chapter 5. In the following chapter the effects of firm-specific factors on corporate financing decisions are examined using an unbalanced panel of 2048 Chinese listed companies from 1990 to 2014.

CHAPTER 4. CAPITAL STRUCTURE DYNAMICS OF CHINESE LISTED COMPANIES: EMPIRICAL ANALYSIS

4.1 Introduction

This chapter demonstrates an empirical analysis of capital structure of listed companies in China during the period 1990-2014, controlling for the dynamic nature of the relationship between firm characteristics and financing choices. This study applies a well-developed dynamic panel Generalised Method of Moments (GMM) estimator, accounting for sources of endogeneity in finance research. The adjustment speed of leverage based on the dynamic partial adjustment models is estimated and analysed. It examines the effects of firm-specific factors from the dynamic perspective to capture the dynamic adjustments in firms' leverage ratios. The empirical results are based on an unbalanced panel of 2048 Chinese listed companies by the end of 2014. It also investigates the role of industry in determining capital structure for each company during the period. There is also a comparative analysis across different industries. The sample is divided into five industries based on industry classifying guideline of listed companies released by the China Securities Regulatory Commission (CSRC), which includes public utility, real estate, conglomerates, manufacturing and retail trade industry. This comparative analysis helps to clarify how the industry associated factors affect the relative importance of core determinants.

The remainder of this chapter is organised as follows. Firstly, hypotheses of dynamics of capital structure and the determinants of the speed of capital structure adjustment are developed based on the existing literature. In section 4.3, the methodology is presented in detail. The empirical results are presented and analysed in section 4.4, an empirical analysis of each industry is also included. Section 4.5 presents a discussion and some implications of the empirical results. Section 4.6 concludes this chapter and states the limitations of this study.

4.2 Hypotheses Development

4.2.1 Tangibility

The trade-off theory and agency theory suggest that firms with more tangible assets should rely on debt financing. A firm's tangibility of assets has an important effect on the costs of financial distress because the tangible assets are easy to collateralise for debt and suffer a small loss of value when the firm goes into distress (Frank and Goyal, 2009). In other words, the firms with more collateralizable assets can provide an improved guarantee of repayment. Thus, agency costs of debt are lower for firms with higher tangibility of assets (Jensen and Meckling, 1976). Most previous empirical studies confirm the above theoretical implication in both developing and developed countries (Long and Malitz, 1985; Titman and Wessels, 1988; Friend and Lang, 1988; Rajan and Zingables, 1995; Walsh and Ryan, 1997; Frank and Goyal, 2003; Chen, 2004; Zou and Xiao, 2006; Qian, Tian and Wirjanto, 2007). Chen (2004) proves that tangibility is positively related to total leverage and long-term leverage of Chinese listed companies for the period 1995-2000. Most of the listed companies that are in the manufacturing and heavy industry sectors commonly have low technology levels in China. These companies control a large amount of tangible assets and a small amount of intangible assets (Chen, 2004). However, the prediction of pecking order theory on the relation between tangibility and leverage is averse to the implication of the trade-off theory and agency theory. The pecking order theory implies that firms with more tangible assets are likely to have less information asymmetry which will decrease the costs of issuing equity, and thereby a greater propensity to issue equity is expected (Harris and Raviv, 1991). Cornelli et al. (1996), Joeveer (2006) and Delcoure (2007) who investigate the determinants of capital structure in transition economies confirm the implication of the pecking order theory.

In numerous empirical studies such as Long and Malitz (1985), Chung (1993), Walsh and Ryan (1997), Chen (2004), tangibility is measured as the ratio of tangible assets to total assets. Following prior literature, this study measures tangibility as tangible assets to total assets and assumes that tangibility is positively

related to leverage. In accordance with the implication of trade-off theory and agency theory, this chapter hypothesises that firms with more tangible assets adjust faster towards their target leverage.

Hypothesis 1: tangibility is positively related to firm leverage

4.2.2 Firm Size

On the relationship between firm size and capital structure, capital structure theories generally predict that firm size is positively related to leverage. The trade-off theory implies that larger corporations are more diversified and are expected to have larger debt capacity than the smaller ones. Thus, large companies tend to have higher debt levels than small-sized firms. Empirical studies of Marsh (1982), Fama and Jensen (1983), Rajan and Zingales (1995), Booth et al. (2001) and Chen (2004) support this suggestion of the trade-off theory. Fama and Jensen (1983) and Berger and Udell (2006) use asymmetric information problems to explain this positive relationship. They point out that larger firms tend to disclose more information to the public than the small-and medium-sized enterprises (SMEs). As it is more acute for smaller firms to resolve information asymmetries with their lenders, the cost of financing is higher for smaller firms. Ortqvist et al., (2006) argue that this positive relationship between firm size and debt ratio is caused by operating risks; small firms are more likely to face operating risks, thereby they have more strict access to external financing. Kurshev and Strebulaev (2006) further explain that it is the fixed costs of financing caused this positive relationship, and a firm's stage and timing of refinancing and restructuring cycles also matter. Besides, the findings of Gregory, Tenev and Wagle (2000) indicate that larger enterprises in China have fewer restrictions on accessing external sources of finance than smaller enterprises. This is because the large firms in China usually refer to state-owned enterprises, which have higher bargaining power and easy access to credits especially in state-owned banks (Harris and Raviv, 1991).

For the measurement of firm size, Firth, Lin and Wong. (2008) and Zheng et al. (2012) measure firm size as the natural logarithm of total assets, while Chen et al. (2014), Chung and Wang (2014) measure firm size as the natural logarithm of net sales. Kurshev and Strebulaev (2006) use the natural logarithm of the sum of book debt and market equity to proxy firm size. In this study, firm size is measured as the natural logarithm of total assets and a positive relationship between firm size and leverage is assumed.

Hypothesis 2: firm size is positively related to firm leverage

4.2.3 Technological innovation

Following the Industrial Revolution, technological innovation has contributed greatly to companies' growth, especially for those high-technology and knowledge-based companies. It's essential to ascertain whether financing decisions differ with research and development (R&D) intensity, as technological innovation is playing an increasingly important role in companies' valuations and competitions. Lev (2001) argues that intangible assets which refer to technological knowledge (Dosi, 1988) are a major source of technological upgrading and innovation-driven development. The majority of prior studies use the ratio of net intangible assets to total assets to measure technological innovation. Firms' intangible assets include goodwill, copyright, R&D and knowledge activities (Rajan and Zingales, 1995). Goodwill is excluded from net intangible assets. The trade-off theory implies that intangibility is negatively related to leverage. On the contrary, the pecking order theory suggests a positive relationship between intangibility and debt ratio. Earlier empirical studies including Titman and Wessels (1988), Rajan and Zingales (1995), Graham (2000), Hovakimian et al. (2002) show a negative correlation between R&D expenditure and capital structure. Subsequently, Aghion et al (2004) find that there is a nonlinear relationship between firms' technological innovation and leverage. Firms with positive R&D are more likely to have higher leverage ratios than firms with zero R&D, but the firms with the highest R&D intensities tend to be the least likely to use debt. The

ratio of R&D expenditure over total sales is used to measure R&D intensity. One advancement in Aghion et al (2004)'s paper is that they use a R&D firm dummy variable as an alternative technological indicator. The R&D dummy variable equal to 1 if expenditure of R&D is positive in at least one year, and equal to 0 otherwise. This measurement for technological innovation has not been applied in the previous studies. One limitation of Aghion et al (2004)'s study is that they only focus on large and mature UK firms which are traded in developed economies, where technological differences between firms may not be that significant in their sample. Liu and Wong (2011) develop a real options model to estimate the association between intellectual capital and capital structure and show a positive relationship between them. And the positive relationship tends to be stronger for the biotechnology corporations. Following the implications of trade-off theory and the empirical studies of Titman and Wessels (1988), Rajan and Zingales (1995), Graham (2000), Hovakimian et al. (2002), this chapter hypothesises a negative relation between technological innovation and leverage and uses the ratio of net intangible assets (excluding goodwill) over total assets as a measurement of technological innovation. According to the calculation of net intangible assets in CSMAR (the China Stock Market and Accounting Research database), this item includes a firm's patent, non-patent technology, trademark, copyright, etc, and excludes its goodwill.

Hypothesis 3: Technological innovation is negatively related to firm leverage

4.2.4 Profitability

Most empirical studies prove a negative relationship between firm leverage and profitability (Myers and Majluf, 1984; Long and Malitz, 1985; Barton et al., 1989; Rajan and Zingales, 1995; Michaelas, Chittenden and Poutziouris, 1999; Booth et al., 2001; Fama and French, 2002). This is in contrast with the implication of the trade-off theory of capital structure. The trade-off theory predicts that firms can acquire high income by exempting from taxes (Kraus and Litzenberger, 1973). Thus, profitable firms with more interest tax shields tend to borrow more. However,

the pecking order theory predicts that a firm's profitability is negatively related to its leverage, as the profitable firms prefer internal financing rather than external debt because of asymmetric information. Fama and French (2002) find that, in the pecking order model, more profitable firms tend to have lower leverage ratios, which confirms the evidence of Rajan and Zingales (1995), Titman and Wessels (1988) Booth et al. (2001). The findings of Chen (2004) also support this negative relation between profitability and capital structure for Chinese firms. He uses total and long-term leverage ratios to measure capital structure and uses annual earnings before interest and tax (EBIT) divided by total assets to measure profitability, based on the data of 88 large firms listed in China during the period 1995-2000. Kayhan and Titman (2007) suggest that, in dynamic trade-off models, profitability also appears to have a negative effect on leverage as companies accumulate profits passively.

This chapter attempts to validate Chen's (2004) findings on the relationship between profitability and leverage in both static and dynamic models of capital structure by using a larger panel-data sample that covers more recent periods, and hypothesises that profitability is negatively related to capital structure for Chinese listed companies.

Hypothesis 4: profitability is negatively related to firm leverage

4.2.5 Growth opportunities

According to the pecking order theory, firms with higher growth opportunities will have relatively higher debt levels, because higher growth rate implies a higher demand for external financing (Marsh, 1982). However, agency theory and trade-off theory predict a negative relation between firms' growth opportunities and leverage. This implication is supported numerous empirical studies (Myers, 1977; Rajan and Zingales, 1995; Wald, 1999; Al-Sakran, 2001; Booth et al., 2001; Qian et al., 2009). Myers (1977) argues that growth opportunities can be viewed as call

options, firms with high growth opportunities tend to hold more real options for future investment than low-growth firms. A high-growth firm with outstanding debt may forgo the investment opportunity when it needs extra equity financing to exercise such options in the future, because such an investment would effectively transfer wealth from shareholders to debtholders. Firms with high growth opportunities may not issue debt in the first place (Huang and Song, 2006). Thus, firm's debt level is expected to be negatively related with growth opportunities. Rajan and Zingales (1995) argue that firms with higher growth opportunities have lower levels of debt because of the interest conflicts between debt holders and equity holders. Rajan and Zingales (1995) use market-to-book ratio as a proxy of growth opportunities and give two main reasons for this negative relationship. Firstly, firms with high growth opportunities suffer higher costs of financial distress. Secondly, it is driven by the firms which issue large amount of equity; considering the situation that stocks are over-valued, firms would issue stock instead of issue debt. Qian et al. (2009) investigate the dynamic capital structure of Chinese listed firms from 1990 to 2004 by formulating a dynamic panel data model. They also find that a firm's growth opportunities are negatively related to its leverage ratios. Titman and Wessels (1988) estimate the growth opportunities as R&D expenses and find a negative relationship between R&D expenses and firm leverage. Since firms generally engage in R&D to generate future investments, and growth opportunities are capital assets that add value to a firm but cannot be collateralized (Titman and Wessels,1988), intangibility is frequently treated as a proxy for growth opportunities (Booth et al., 2001). For this reason, a negative relationship between firm leverage and growth opportunities is expected.

There are different proxies for growth opportunities in previous empirical studies (Huang and Song, 2006). Qian et al. (2009) argue that Tobin's *Q* seems to be a reliable measurement for growth which is defined as the ratio of a firm's market value to its book value. Wald (1999) uses the average value of sales growth to proxy growth opportunities. Booth et al. (2001) use market-to-book ratio of equity to measure growth opportunities. Titman and Wessels (1988) adopt capital investment scaled by total assets and research and development expenses to proxy

growth opportunities. According to the previous findings of Marsh (1982), Kester (1986), Titman and Wessels (1988), Simith and Watts (1992), Berens and Cuny (1995), Wald (1999) and Booth et al. (2001), I hypothesise a negative relationship between growth opportunities and firm leverage and use the sales growth rate as a proxy for growth opportunities.

Hypothesis 5: growth is negatively related to firm leverage

4.2.6 Earnings volatility

Earnings volatility refers to how stable or how smooth the earnings of a firm are, which is generally used as a proxy for business risk or a measure of costs of financial distress in empirical literature (Bradley et al., 1984; Titman and Wessels, 1988; Kale, Noe and Ramirez, 1991; Chen, 2004). Both the trade-off theory and pecking order theory predict that there is a negative relationship between firms' earnings volatility and leverage ratios. According to trade-off theory, firms with higher earnings volatility means higher possibility of bankruptcy, which are more likely to have higher expected bankruptcy costs (Bradley et al., 1984). As the firms' expected bankruptcy costs increase, a new equilibrium between bankruptcy costs and tax advantages of debt will settle at a lower debt level (Altman, 1984). The empirical results of Bradley et al. (1984), Friend and Lang (1988), Huang and Song (2006) support the implications of the trade-off theory. Bradley et al (1984) demonstrate that if the costs of financial distress are significant for a firm, the variability of earnings is negatively related to firm leverage ratios. It is because the costs of financial distress tend to be higher for firms with higher earnings volatility, which motivates these firms to decrease debt levels (Fama and French, 2002). On the contrary, Hsia (1981) observes a positive relationship between firm's earnings volatility and leverage by combining the capital assets pricing model, the option pricing model and Modigliani-Miller theorems. His finding is subsequently supported by Qian et al. (2009) whose study is based on a database of 650 Chinese publicly listed corporations. However, Titman and Wessels (1988) who use earnings volatility to proxy business risk argue that there is no significant relationship between earnings volatility and firm leverage ratios.

This study follows the implication of trade-off theory and assumes that earnings volatility has a negative effect on debt ratios. Following prior literature, in this study, the volatility of earnings is measured as the absolute difference between the annual percentage change in earnings before interest and taxes (EBIT) and the average of this change over the sample period (Chen, 2004).

Hypothesis 6: earnings volatility is negatively related to firm leverage

4.2.7 Industry conditions

Frank and Goyal (2009) point out that industry median leverage is the most reliable determinant of capital structure in the U.S. In practice, the firms' capital structure shows significant variation among different industries. Lemmon et al., (2008) illustrate that one reason for the industry differences in leverage ratios is that management may take the industry average leverage as a benchmark while making financing decisions. Accordingly, the industry average can be interpreted as a target capital structure for most firms (Hull, 1999). It is proven by Hovakimian et al., (2001) that firms do adjust leverage ratios actively towards the industry median leverage. They argue that another interpretation for the industry effects is that it reflects omitted factors affecting financing decisions, such as competition, regulation, prospects and potential of one industry. Thus, industry leverage should be included to control for omitted industry factors. Under the trade-off theory perspective, industry average leverage is positively related to firm leverage. While the pecking order theory predicts that there is an indirect link between industry average and firm leverage. In this chapter, industry average leverage is used as a control variable.

4.2.8 Macroeconomic conditions

The pecking order theory suggests that firms' debt ratios should decrease when GDP is growing quickly because internal capital goes up during expansions. If

there is an increase in firms' earnings, agency problems between shareholders and managers will be less severe, then firms would issue less debt accordingly (Frank and Goyal, 2009). However, in practice, firms seem to borrow more during expansions since, the stock prices, taxable earnings and expected bankruptcy costs increase during economic expansion. Additionally, it is evident that macroeconomic factors influence firms' target leverage through the aggregated distribution of wealth between the shareholders and management (Kiyotaki and Moore, 1997). A majority of empirical studies also indicate that there is a positive effect of GDP growth on capital structure such as Jong, Kabir and Nguyen (2008), Faulkender et al. (2008), Frank and Goyal (2009). Jong et al. (2008) further illustrate that the macro factors have an indirect impact on leverage through influencing the firm-specific determinants as well as a direct impact on leverage. Furthermore, recent studies have begun to emphasize the macro factors' effect on the speed of adjustment towards the target leverage. Drobetza and Wanzenried (2006) demonstrate that the speed of adjustment towards targets dependents on the stage of business cycle; the adjustment speed is faster for firms under good economic prospects. A contingent claim model is then developed by Hackbarth et al. (2005), predicting that the speed and size of adjustment are positively related to countries' macroeconomic conditions. One explanation for the positive relationships is that the firms in more developed economies are faced with less severe financial constraints. Cook and Tang (2010) analyse the effect of macro conditions on firms' leverage by measuring GDP growth rate, default spread and dividend yield across states. They provide a supplementary condition for Drobetza and Wanzenried's (2006) hypotheses that if regardless of firms' access to external capital markets, the speed of adjustment is faster in the states with a good economic situation than in the bad states. As variations in macroeconomic conditions are expected to have effect on firms' financing decisions, macroeconomic factor is used as a control variable in this chapter. The macroeconomic condition is proxied by GDP growth rate which refers to differences in the log of real Gross Domestic Product aggregates at the current price in this paper.

4.2.9 The adjustment speed of capital structure

A significant number of the previous studies estimate the capital structure in a static model. However, a firm may adjust its capital structure frequently towards the optimal level; the decisions on capital structure are inherently dynamic (Fischer, Heinkel and Zechner, 1989; Flannery and Rangan, 2006; Qian, Tian and Wirjanto, 2009). Recent studies have begun to emphasize the adjustment process of capital structure and to pay attention to the relationship between firm characteristics and the speed of adjustment towards target capital structure. The adjustment speed of capital structure can be defined as the rate at which a firm adjusts its leverage towards the optimal leverage (Flannery and Rangan, 2006). The study of Banerjee, Heshmati and Wihlborg (2004) is one of the first studies that simultaneously endogenize the adjustment factors and the target leverage ratio. Banerjee et al. (2004) find that growth opportunities and firm size have significant effects on the speed of adjustment. They argue that larger-sized firms have higher adjustment speed than the small firms. Since firm size can be regarded as a proxy for information asymmetry between insiders and outside investors, larger firms generally experience lower asymmetric information costs because more publicly information is available about larger firms. Thus, larger firms are expected to have relatively lower transaction costs of rebalancing leverage, and they can vary their leverage ratios more easily than the smaller firms. Accordingly, firm size is expected to be positively related to the speed of adjustment. Banerjee et al. (2004) also find that firms with higher growth opportunities adjust more slowly towards the target leverage. To the contrary, Drobetz and Wanzenried (2006) find a positive relationship between firms' growth opportunities and adjustment speed. They use a dynamic adjustment model and panel methodology to investigate the determinants of the adjustment speed of 90 Swiss firms and document that faster growing firms adjust more readily to their target leverage. They estimate the dynamic panel model in first differences using Generalised Method of Moments (GMM) estimator as suggested by Arellano and Bond (1991). However, as the sample size in Drobetz and Wanzenried's (2006) study is very small (90 firms) and the length of the time series is short (1991-2001), their study may suffer from small sample bias or the problem caused by short panel data model which will lead to

biased and inconsistent estimates (Hayakawa, 2007). Hence, I intend to use a greater sample and repeat the test for the hypothesis that larger firms and firms with higher growth opportunities adjust faster towards their target leverage.

In the studies of Banerjee et al. (2004), Drobetz and Wanzenried (2006), Qian et al. (2009), Cook and Tang (2010), the distance between observed and target leverage ratios is estimated to be an important factor that can influence the speed of adjustment. Banerjee et al. (2004) argue that if fixed costs constitute a major portion of cost of changing capital structure, sub-optimal firms will alter their capital structure only if their capital structure sufficiently deviates from their target leverage. If the fixed costs of adjustment are prohibitively high, then most adjustment may occur without transactions in external capital markets. The costs of adjustment are expected to be increasing in the distance from optimal leverage, because there are costs associated with capital structure adjustment. Thus, I hypothesise that firms with smaller deviation from their targets adjust faster towards target leverage.

As suggested by Byoun (2008), the speed of adjustment of capital structure varies with firm characteristics. Other firms-specific factors that can influence the speed of adjustment must relate to the costs and benefits of reaching the target leverage. In other words, the factors that can increase the benefits of being closer to target leverage should cause the firms to adjust more quickly (Oztekin and Flannery, 2012). Given that a firm's profitability does have a vital impact on firm value and the financing decisions of its managers, it is likely that profitability can influence the speed of capital structure adjustment. According to the trade-off theory, a more profitable firm is more able to cover the adjustment costs, thereby I hypothesise that there is a positive relationship between a firm's profitability and the speed of adjustment. Since it is found in the literature that other firm characteristics, such as tangibility, technological innovation and earnings volatility, have played significant roles in the determination of capital structure, it will be of interest to examine whether these firm characteristics also affect the speed of adjustment. As

there has not been any significant findings to give empirical support to this argument, to fill the gap in the literature on the rate of adjustment towards the optimal capital structure, this study will test whether a firm' tangibility, technological innovation and earnings volatility can influence the adjustment speed or not. In sum, based on the capital structure theories and empirical studies, the relationship between firm characteristics and the speed of adjustment towards target capital structure are hypothesised as following:

Hypothesis 7: larger firms adjust faster towards their target leverage
Hypothesis 8: firms with higher growth opportunities adjust faster towards target leverage
Hypothesis 9: more profitable firms adjust faster towards target leverage
Hypothesis 10: firms with smaller deviation from their targets adjust faster towards target leverage

4.3 Research Methodology

4.3.1 Sample and Data collection

The sample of data is mainly retrieved from CSMAR which is a database providing China's economic and financial data, and from the Chinese publicly listed companies' annual reports that complied by the Shanghai Stock Exchange (SHSE) and Shenzhen Stock Exchange (SZSE). The data of macroeconomic conditions and industry conditions is downloaded from the China Statistical Bureau which can be accessed through the website: www.stats.gov.cn. The detailed measurements for these factors are stated later in section 4.3.2. The period of time for investigation is from 1990 to 2014. The reason for using data since 1990 is because reliable corporation data has only been available since the early 1990s. SHSE was established in 1990 and SZSE was established in 1991, representing the start of a mixture of debt and equity financing in Chinese corporate sector. As this study is targeted at domestic companies listed in SHSE and SZSE, the involvement of B

shares and H shares will disturb the accuracy of the results. Thus, B and H shares are dropped from the sample. The firms belong to financial industry are excluded from the sample. The firms listed on the exchange for shorter than three years are also dropped. To deal with outliers and most extremely mis-recorded data, firm-specific variables are winsorized at 1% level in both tails of the distribution. The final sample is an unbalanced panel, consisting of 2048 firms over 24 years.

4.3.2 Variables

4.3.2.1 Dependent variable:

The dependent variable is firm's leverage which has various measures in the previous literature. However, what measure of leverage should be used in empirical research remains an unsettled issue. As there is no consensus on whether to use book leverage or market leverage, this section engages in discussion of book and market value-based measures of leverage.

Book ratios versus market ratios

Frank and Goyal (2009) report that the main capital structure factors are not always robust to the choice of book or market leverage. Evidence shows that major differences exist between market ratios and book ratios of capital structure and they should not be treated as equivalent (Barclay and Smith, 2001). Book value-based measures of leverage are calculated based on historic values while market value-based measures are calculated as current values. In other words, book values are believed to be backward looking measures while market values are generally assumed to be forward looking measures (Frank and Goyal, 2003). Myers (1977) states that management focuses on book values because debt is better supported by assets in place than by growth opportunities. Book leverage is also preferred because financial markets fluctuate a great deal and managers are said to believe that market leverage numbers are unreliable as a guide to corporate financial policy. Furthermore, Fama and French (2002) claim that book values better reflect a firm's

target debt ratio because the market value of equity strongly fluctuates and is dependent on a number of factors that are out of a firm's direct control. The survey results of Graham and Harvey (2001) also support the notion that market values may not reflect the underlying alterations initiated by managers, and hence market leverage numbers may be an unreliable guide to corporate financial policy. Brealey et al., (2017) argue that market leverage is not appropriate because the market value of a firm includes the value of intangible assets generated by research and development, advertising, staff training and so on. These assets are not readily salable and, if the company falls on hard times, their value may disappear altogether.

On the contrary, some experts argue that market value of leverage should be more appropriate to proxy capital structure. For example, Booth et al. (2001) and Fama and French (2002) adopt total market-debt ratio (total liabilities to the market value of a firm) or long-term market-debt ratio (long-term liabilities divided by the market value of a firm). According to previous literature, it seems there are several disadvantages of using book values. First, book value of leverage is less volatile than market value of leverage and tends to overstate the importance of corporate issuing activities. After all, new securities are issued at market values and not at book values. Second, the book value of equity is determined through the difference between the left-hand and the right-hand side of the balance sheet and cannot represent a firm's economic conditions appropriately (Barclay and Smith, 2005). Furthermore, Shyam-Sunder and Myers (1999) point out that firms' tangibility and profitability are strong predictors of book value-based debt ratios should not be surprising. The international accounting rules imply that book values of equity grow with cash flow and shrink with depreciation. Some previous studies on capital structure only use one measure of capital structure such as Fama and French (2002) and Huang and Song (2006) who only use book value-based measurement. However, it is very likely that their results are not robust. Until today, the choice between book or market value measures of leverage remains an unsettled issue. Thus, this study uses both book value-based and market value-based measures of leverage to proxy capital structure.

Measures of capital structure

The dependent variable, capital structure, is measured by 1) book total leverage ratio (Total_lev: total liabilities to total assets), 2) book long-term leverage (Long_lev: long-term liabilities to total assets), 3) market total debt ratio (MT_debt: total debt/ (total debt + market value of equity), 4) market long-term debt ratio (ML_debt: long-term debt/ (long-term debt + market value of equity). The market value of equity refers to the total market value of all the outstanding shares. It is calculated by share price multiplied by number of shares outstanding. Total debt is equal to the sum of long-term debt and short-term debt.

4.3.2.2 Independent variables:

The firm-specific variables include firm size, tangibility, technological innovation, growth rate, profitability and earnings volatility. According to prior literature, tangibility (Tang) is measured as tangible assets divided by total assets. Tangible assets are equal to the sum of fixed assets and inventories. Firm size (Size) is measured as the log of total assets. Technological innovation (Tech) is measured as the ratio of net intangible assets to total assets. Here the net intangible assets after deducting amortization and impairment includes patent, non-patent technology, trademark, copyright, etc, and excludes goodwill. Profitability refers to operating profit divided by total assets. Growth opportunities (Grow) is measured as $(Turnover_n - Turnover_{n-1}) / Turnover_{n-1}$. Earnings volatility (EVOL) is defined as the absolute difference between the annual percentage change in earnings before interest and taxes and the average of this change over the sample period. The distance variable (DIS) refers to the distance between observed and target leverage and is only included in the dynamic capital structure models estimating the determinants of speed of adjustment in section 4.4.5.

4.3.2.3 Control variables:

The control variables are GDP growth rate and industry mean leverage. GDP growth rate can be collected directly from the database of the World Bank. The market is classified into 5 industries according to the industry classifying guideline of listed companies released by CSRC. The detailed information about industry classification is shown in Table A-2 in Appendices. Industry conditions (Indus) is measured as the mean value of total leverage of each industry. The definition and measurement of all variables are summarised below in Table 4-1.

Table 4-1: Variable definition and measurement

Variable	Indicator	Measurement	Data Items from annual reports
Capital Structure	Book total leverage ratio	Ratio of total liabilities to total assets	Total Liability/ Total Assets
	Book long-term leverage ratio	Ratio of long-term liabilities to total assets	Long-term liabilities / Total assets
	Market total debt ratio	Ratio of market value of total debt to market value of total debt plus market value of equity	Total debt/ (total debt + market value of equity)
	Market long-term debt ratio	Ratio of market value of long-term debt to market value of long-term debt plus market value of equity	Long-term debt/ (long-term debt + market value of equity)
Explanatory Variables	Firm size	Natural log of total assets	Ln (total assets)
	Tangibility	Ratio of tangible assets to total assets	Fixed Assets / Total Assets
	Profitability	Ratio of operating profit to total assets	Operation Profit / Total Assets
	Growth opportunities	Growth rate of turnover annually	(Turnover $_{t}$ - Turnover $_{t-1}$) / Turnover $_{t-1}$
	Technological innovation	Ratio of net intangible assets to total assets	Net Intangible Assets / Total Assets

	Earnings volatility	The absolute value of the first difference of percentage change of EBIT	The absolute difference between the annual percentage change in EBIT and the average of this change over the sample period
Control Variables	Industry leverage	Average leverage of the five industries respectively	Mean of (Total Liability/ Total Assets) of each industry
	GDP growth	GDP growth rate annually	$(GDP_t - GDP_{t-1}) / GDP_{t-1}$

4.3.3 Deal with outliers

Normally, it is not acceptable to drop an observation just because it is an outlier. It is important to investigate the nature of the outlier before deciding how to deal with it (Gujarati and Porter, 2009). The outliers in this sample have not been dropped, because it is impossible to identify whether the outlier is due to incorrectly entered or measured data. To avoid outlier messes up the analysis, the variables are winsorized at 1% level in both tails of the distribution. There might be something wrong with the extreme values, but they are probably still extreme and dropping them is problematic.

4.3.4 Methodological issues

In previous empirical studies, some researchers use cross-sectional analysis, while some of them use time-series or panel-data analysis approaches. This chapter adopts panel data analysis methodology and the static and dynamic panel data models. Using panel data analysis would be more helpful and practical for this research as panel data are more capable of studying the dynamics of adjustment with more informative data, more variability, less co-linearity among variables and more efficiency (Baltagi, 2002). First, using panel data is a more appropriate approach to tackle the endogeneity problem than cross sectional data. A model is said to have an endogeneity problem if any regressor variable is correlated with the error term. Because panel data can provide lagged variables which are unavailable in cross sectional data, the endogeneity problem can be better addressed by using panel data (Borsh-Supan and Koke, 2002). Second, I can use panel data to control for individual heterogeneity. Some variables contained in the empirical model vary with time and firms, while some are time-invariant or firm-invariant. Cross-section and time-series studies are not able to control for this individual heterogeneity that would lead to biased results, but panel data can control for these time-invariant and firm-invariant variables. Most importantly, the panel data approach allows us to set and test more complex models than purely time-series or cross-sectional data models (Baltagi, 2002).

Generally, the pooled ordinary least squares (OLS), random effects (RE) and fixed effects (FE) estimation are used for static panel data models. The pooled OLS regression is simple to perform but it does not make full use of the richness of the panel data (Cameron and Trividi, 2009). In other words, the pooled OLS regression omits time effects and the differences between firms. Thus, pooling is not appropriate for this study as firm and time heterogeneity may lead to biased estimation. Moreover, the choice between the fixed and random effects models is also an important issue. The Hausman test is employed to choose between random and fixed effects models. If the regressors and the individual effects are correlated, the fixed effects model is appropriate (Greene, 2011). According to the Hausman test for each regression which is shown in Table 4-3 in section 4.4.2, the random effects model is inappropriate. Thus, this study uses fixed effects regression for the static panel data models.

In dynamic panel data models, the fixed effects are always correlated with lagged dependent variable (Cameron and Trividi, 2009). Thus, fixed effects and random effects estimators cannot be used for dynamic panel data models, which will lead to biased and inconsistent results. Here, Generalized Method of Moments (GMM) estimator can be used to deliver consistent results of the model parameters, namely, Arellano and Bond's (1991) difference GMM and Blundell and Bond's (1998) system GMM. Difference and system GMM flexibly accommodate unbalanced panels and allow for a lagged dependent variable, endogenous regressors and fixed individual effects while avoiding dynamic panel bias (Roodman, 2009). Difference GMM adopts the set of available lags as instruments while system GMM extends the set of instruments with lagged differences (Arellano and Bond, 1991; Blundell and Bond, 1998).

In the empirical analysis shown later, Equation 5 (see section 4.3.6 below) is estimated in first differences using GMM. The first-differenced GMM uses all lags of leverage ratio from the second lag as instruments. However, the time length of the sample is 24 years; this long-time span would result in large number of

instruments if it is not restricted. A large instrument collection can over-fit endogenous variables which would increase bias in the estimate on lagged leverage ratio (Roodman, 2009). To address this concern, this chapter restricts the number of instruments from (t-2) to (t-3) periods in the dynamic models.

4.3.5 The static capital structure model

The static model of capital structure is shown as below:

$$Y_{it} = \alpha + \sum \beta_i X_{it} + u_i + \varepsilon_{it} \qquad (1)$$

where Y_{it} is the dependent variable of company i at time t. X_{it} is the independent variables of company i at time t. α represents the constant. β_i is the regression coefficient associated with each X_{it}. u_i is the unobserved individual impact of firm i. ε_{it} is the standard error term. When the static models contain lagged dependent variables, they are called dynamic models (Flannery and Rangan, 2006). In the dynamic panel data models, the past influences the present; its detailed development and utilization are presented in the next section.

4.3.6 The dynamic framework

The dynamic partial adjustment model will be used to capture the dynamic adjustment towards the optimum, following work by Hovakimian, Opler and Titman (2001), Flannery and Rangan (2006), Huang and Ritter (2009). The dynamic panel data model is estimated by controlling for fixed-effects by applying a first-difference transformation (Verbeek, 2004). Under Ideal condition, the observed leverage ratio of firm *i* at time *t* (Y_{it}) is equal to the optimal leverage (Y_{it}^*): $Y_{it} = Y_{it}^*$, and in a dynamic setting, the deviation in actual leverage from the previous to the current period should be equal to the change required to reach the optimal leverage: $Y_{it} - Y_{i,t-1} = Y_{it}^* - Y_{i,t-1}$. However, in practice, a firm's actual leverage ratio normally deviates from its optimal leverage ratio because of adjustment costs (Banerjee et al., 2004; Huang and Ritter, 2009). The firm would adjust partially towards its target, which can be represented as:

$$Y_{it} - Y_{i,t-1} = \delta_{jt} (Y_{it}^{*} - Y_{i,t-1}) + e_{it} \qquad (2)$$

which can be re-written as:

$$Y_{it} = (1- \delta_{jt}) Y_{i,t-1} + \delta_{jt} Y_{it}^{*} + e_{it} \qquad (3)$$

where δ_{jt} is the speed of adjustment to the target leverage ratio. Y_{it} is the observed leverage ratio of company *i* at time *t* and $Y_{i,t-1}$ is the lagged one period leverage ratio. Y_{it}^{*} is the target leverage ratio of company *i* at time *t*. e_{it} is the error term. The model implies that the change in the observed capital structure from the prior to the current period is equal to the change required for the company to reach the target capital structure at time t. If δ_{jt} = 1, the company makes a full adjustment and reaches its target ratio at time t. If δ_{jt} = 0, there is no adjustment occurring. While δ_{jt} > 1 means over-adjustment; the firm makes unnecessary adjustment and is still not at its target leverage. If the cost of adjustment to the target leverage is high, then the company may find that it is not optimal to adjust fully. Thus, a partial adjustment would be taken instead.

The regression model estimating the variables that determine the target capital structure is expressed as follows:

$$Y_{it}^{*} = \alpha + \sum r_i X_{it} + u_i + \varepsilon_{it} \qquad (4)$$

Y_{it}^{*}: The dependent variable, represents the target leverage ratio of firm i at time t.

X_{it}: The independent variables

α: A constant, the value of Y when all X values are zero

r_i: The regression coefficient associated with each X_{it}, represents each X_{it}'s relative importance to the model

u_i: The unobserved individual impact of firm i

ε_{it}: The standard error term

As the target leverage Y_{it}^{*} is unobservable, the target leverage from equation (4) is substituted into the partial adjustment model in equation (3), to achieve the following reduced-form partial adjustment model in one step:

$$Y_{it} = (1 - \delta_{jt})\, Y_{i,t-1} + \delta_{jt} \sum r_i X_{it} + u_i + \varepsilon_{it} \qquad (5)$$

In this model, the speed of adjustment and target leverage relationships are estimated jointly. Equation (5) is the dynamic partial adjustment model which will be used to test the dynamic adjustment mechanism of capital structure of Chinese listed companies.

The model obtained above (Equation 5) is the dynamic partial adjustment model, by using the Arellano-Bond difference GMM estimation and the Blundell-Bond's system GMM estimators, all coefficients are adjusted for heteroscedasticity (Arellano and Bond, 1991; Blundell and Bond, 1998; Hovakimian and Li, 2010). The left-hand variable, Y_{it}, is dynamic that depends on its own past realisations, and the right-hand side variables are not strictly exogenous which can be correlated with past or current realisations of the error (Roodman, 2009). The GMM estimation flexibly accommodates unbalanced panels and multiple endogenous variables to avoid dynamic panel bias (Nickell 1981; Roodman, 2009). In the following analysis, I extend this class of models and endogenize the speed of adjustment to the target leverage ratio. I assume that the model to explain the speed of capital structure adjustment (δ_{jt}) is a linear function of a constant term and some explanatory variables, and the adjustment speed varies over time. Z_{jt} is the firm-specific variables of δ_{jt}, which is:

$$\delta_{jt} = \beta_0 + \beta_j Z_{jt} \qquad (6)$$

Z_{jt}: Explanatory variables of δ_{jt}

β_0: A constant, the value of δ_{jt} when all Z_{jt} values are zero

β_j: The regression coefficient associated with each Z_{jt}, represents each $Z_{jt}'s$ relative importance to the model.

Then I substitute the linear specification for adjustment speed (Equation 6) into Equation 5, rewriting Equation 5 and we get the following expression for the leverage at time *t*:

$$Y_{it} = (1 - \beta_0 - \beta_j z_{jt}) Y_{i,t-1} + (\beta_0 + \beta_j z_{jt}) \sum r_i X_{it} + u_i + \varepsilon_{it} \quad (7)$$

Multiplying Equation 7 out and then we get Equation 8:

$$Y_{it} = (1 - \beta_0) Y_{i,t-1} - \beta_j z_{jt} Y_{i,t-1} + \beta_0 \sum r_i X_{it} + \beta_j z_{jt} \sum r_i X_{it} + d_t + u_i + \varepsilon_{it} \quad (8)$$

where d_t is a time-specific effect, and u_i is an unobserved individual impact of firm *i*. I model the time effects through the year dummy variables, then both year and firm fixed effects are controlled (Zhou et al., 2016). The Arellano-Bond difference GMM (Arellano and Bond, 1991) and Blundell-Bond system GMM estimators (Blundell and Bond, 1998) are used to estimate the dynamic panel data models in this chapter.

4.4 Empirical Results

4.4.1 Descriptive statistics

Table 4-2: Summary Statistics of the variables used in the analysis, 1990-2014

Variable	Mean	Std. Dev.	Min	Max
Panel A: capital structure variables				
Book total leverage	0.4756	0.2133	0.0593	1.2083
Market total debt	0.1514	0.1532	0.0000	0.9313
Book long-term leverage	0.0550	0.0855	0.0000	0.4125
Market long-term debt	0.0549	0.1038	0.0000	0.9085
Panel B: firm-specific variables				
Tangibility	0.2666	0.1770	0.0013	0.7567
Firm size	21.457	1.2381	18.8778	25.267
Technological innovation	0.0413	0.0524	0.0000	0.3015
Profitability	0.0397	0.0727	-0.2722	0.2601
Growth	0.7257	1.8783	-0.7955	10.455

Earnings volatility	0.0674	0.0784	0.0013	0.5503
Panel C: control variables				
Industrial leverage	0.5109	0.0867	0.2867	0.8367
GDP growth	0.0894	0.0186	0.0239	0.1364

Note: This table reports the descriptive statistics of the variables used in this chapter. All of the data is gathered from CSMAR database, except for GDP growth rate which is obtained from the World Bank's website.

Table 4-2 provides descriptive statistics of the variables used in this chapter. In Panel A, with respect to capital structure variables, the listed companies have an average book total leverage ratio of 47.56 percent, a minimum book value of 5.93 percent, and a maximum book value of 120.83 percent for the period 1990-2014. The average value of market total debt ratio is 15.14, and its standard deviation (0.1532) is much lower than that of the book total leverage (0.2133) indicating that the data of market-value-based leverage are closely distributed around the mean value while the data of book-value-based leverage are spread out over a wider range. There are 171 firms used to have higher than 100 percent book total leverage ratios in this sample and most of these firms belong to conglomerates and manufacturing industry. These extremely high total leverage ratios almost occurred during the period of 2008-2010 which are just after the world financial crisis in 2007. The mean value of industry average leverage is 51.1 percent which is a bit higher than the mean value of total leverage. The mean of book value and market value of long-term leverage are very small which are approximately 5.5 percent. The reason for such a low long-term debt level is that Chinese firms prefer equity financing over debt financing once they go public, as most firms enjoy a favorable high stock price (Huang and Song, 2006). The validity of this argument is examined in Chapter 6 through survey evidence.

The correlation matrix between regressors can be found in Table A-3 in Appendices. It indicates that the correlation coefficients between dependent and explanatory variables are not large enough to flag any collinearity problem. There

is a low degree of correlation between factors, thus the model has not violated the perfect multicollinearity assumption. It is interesting that the correlation between growth opportunities and other variables are very small, and the correlation between profitability and earnings volatility is high. The detailed analysis and tests for the relationship and magnitude would be given in the following sections.

The regression results for both the static and dynamic models of capital structure are given in the following sections. The relation between firm characteristics and adjustment speed of capital structure is also investigated. Table 4-3 presents the estimates and test results for the static panel data model, which is estimated by the fixed effects estimators (FE). Table 4-4 shows the estimates of the dynamic panel data model, given by Equation (5). The dynamic model is estimated by the one-step and two-step difference and system GMM estimation. Table 4-5 presents the regression results of determinants of adjustment speed, given by Equation (8).

4.4.2 Regression results of static model of capital structure

The regression results of static regression model for capital structure are presented in the following paragraphs. The Hausman test is used to choose between random and fixed effects models, which indicates that the random effects model is inappropriate. The fixed effects (FE) estimators of book and market value of total, long-term and short-term leverage are presented for the overall sample in Table 4-3.

Table 4-3: Static Panel Model of Capital Structure: fixed effects estimate of book and market value of total and long-term leverage

	Total leverage		Long-term leverage	
	(i) Book ratio	(ii) Market ratio	(iii) Book ratio	(iv) Market ratio
Tang	0.0220**	0.1013***	0.0404***	0.0450***
	(0.0078)	(0.0064)	(0.0041)	(0.0045)
Size	0.0623***	0.0590***	0.0239***	0.0414***
	(0.0012)	(0.0010)	(0.0006)	(0.0007)
Tech	0.0172	-0.0719***	-0.0030	-0.0227
	(0.0208)	(0.0169)	(0.0108)	(0.0120)
Prof	-0.8648***	-0.5870***	-0.0690***	-0.1622***
	(0.0150)	(0.0122)	(0.0078)	(0.0087)
Grow	-0.0011*	-0.0126***	-0.0000	-0.0044***
	(0.0005)	(0.0004)	(0.0002)	(0.0003)
Evol	0.2727***	-0.0832***	-0.0453***	-0.0668***
	(0.0140)	(0.0114)	(0.0073)	(0.0081)
Indus	0.1116***	0.1284***	0.0153	0.1075***
	(0.0169)	(0.0138)	(0.0088)	(0.0098)
GDP	0.8165***	0.6544***	0.0572	-0.1354**
	(0.0744)	(0.0607)	(0.0386)	(0.0430)
Constant	-0.9774***	-1.2254***	-0.4774***	-0.8748***
	(0.0265)	(0.0215)	(0.0137)	(0.0153)

R-square:				
within	0.3023	0.2915	0.0806	0.1986
between	0.3526	0.4366	0.2067	0.3355
overall	0.2803	0.3554	0.1433	0.2733
Prob > F	0.0000	0.0000	0.0000	0.0000
Hausman chi2(9)	190.16	795.63	370.36	456.44
(Prob>chi2)	(0.000)	(0.000)	(0.000)	(0.000)

Source: Author's work using CSMAR database

Note: This table reports the results of estimating the regression model for static capital structure. The regression model is expressed as follows:
$LEV_{it} = \alpha + \beta_1 Tang_{it} + \beta_2 Size_{it} + \beta_3 Tech_{it} + \beta_4 Prof_{it} + \beta_5 Grow_{it} + \beta_6 Evol_{it} + ɦ_1 Indus_{it} + ɦ_2 GDP_t + u_i + \varepsilon_{it}$
The robust standard error is reported below the coefficient estimates in brackets
R-square statistics and F tests for the overall significance are also reported in the table
Results of Hausman test for fixed effects are shown in the last row

* statistical significance at the 10% level
** statistical significance at the 5% level
*** statistical significance at the 1% level

In column (i) and (ii) of Table 4-3, the estimates of FE indicate that tangibility is positively related to the book value and market value of total leverage. In column (iii) - (vi), tangibility is also positively related to both book and market ratios of long-term and short-term leverage. The table also shows that firm size is positively related to total leverage and long-term leverage. The negative signs on the coefficients of growth opportunities, indicating growth opportunities have negative effects on total, long-term and short-term leverage ratios. Although the p-value indicates that the coefficients of growth opportunities are statistically significant, their magnitudes are negligibly small. Profitability is the most critical core determinant for total, long-term and short-term leverage ratios. Earning volatility is the second most crucial firm-specific factor that exhibits a coefficient of 0.2727 for the book ratio of total leverage. However, the coefficients of earning volatility are negative for the market-based value of total, short-term and long-term leverage. The industry mean leverage and GDP growth rates are positively related to capital structure. The above assertions are based on static capital structure models, detailed analysis and discussion of the relationship between capital structure and its determinants based on dynamic frameworks are presented in the following paragraphs.

4.4.3 Regression results of dynamic model of capital structure

As it has been stated above that the fixed effects estimates would lead to biased results for this sample, GMM estimation seems to be the most appropriate method for estimating the capital structure issues in dynamic models (Blundell and Bond, 1998). Table 4-4 presents the estimation and test results for the dynamic panel models of leverage given by Equation (5), which is estimated by the one- and two-step difference and system GMM estimators. The two-step GMM estimation is better for the investigation of this issue than one-step GMM estimation. Here, the one-step and two-step estimators have different estimated coefficients, and most of the standard errors are decreased in two-step GMM (Roodman, 2009). Thus, the two-step GMM seems more favorable than one-step GMM as there is efficiency gain in two-step estimation. The two-step difference GMM estimators of long-term

leverage are also shown in Table A-4 in Appendices as a robustness check. The following analysis and discussion mainly rely on the estimates of two-step difference GMM because problems of over-identification and serial correlation exist within the system GMM estimation.

Table 4-4: Dynamic panel data model of capital structure: one-step and two-step difference and system GMM estimations

	Total leverage book ratio				Total market debt ratio			
	(i) One-step difference GMM	(ii) Two-step difference GMM	(iii) One-step system GMM	(iv) Two-step system GMM	(v) One-step difference GMM	(vi) Two-step difference GMM	(vii) One-step system GMM	(viii) Two-step system GMM
$LEV_{(t-1)}$	0.3683**	0.4366***	0.5654***	0.6213***	0.1265	0.2161	-0.0792	0.0647
	(0.1804)	(0.1543)	(0.1596)	(0.1158)	(0.1864)	(0.1597)	(0.1608)	(0.1433)
Tang	-0.3608	-0.3717	-0.1814	-0.2195	-0.6448	-0.4325	0.0610	0.1255
	(0.2229)	(0.2058)	(0.1901)	(0.2010)	(0.3001)	(0.2972)	(0.3665)	(0.3023)
Size	0.1701**	0.1907**	0.0459	0.0453	0.2286***	0.2270***	0.2426***	0.2186***
	(0.0759)	(0.0779)	(0.0624)	(0.0677)	(0.0540)	(0.0529)	(0.0542)	(0.0487)
Tech	0.6005	0.7982	-1.1003*	-0.8727	1.6181	1.5688	-1.8281	-0.8236
	(0.7302)	(0.6885)	(0.5065)	(0.4800)	(1.4768)	(1.1890)	(1.3237)	(1.3265)
Prof	-1.4553***	-1.3438***	-1.0648*	-0.9064	-0.9985**	-0.6992*	-1.5090**	-0.9402
	(0.4930)	(0.4508)	(0.5055)	(0.5325)	(0.4825)	(0.3604)	(0.5395)	(0.5635)
Grow	-0.0068	-0.0033	-0.0034	-0.0035	-0.0306**	-0.0190	-0.0166	-0.0176
	(0.0085)	(0.0075)	(0.0102)	(0.0078)	(0.0147)	(0.0119)	(0.0154)	(0.0186)
Evol	0.4217*	0.3798*	0.7506*	0.6026*	0.3795	0.4727	-0.7746	-0.2859
	(0.7741)	(0.6559)	(0.7599)	(0.6507)	(0.3487)	(0.3121)	(0.3806)	(0.4564)
Indus	-0.0257	-0.0347	-0.1517	-0.0926	1.1973*	1.2398*	-1.0745*	-0.8776
	(0.5626)	(0.5470)	(0.5870)	(0.5397)	(0.6918)	(0.6566)	(0.4709)	(0.5146)
GDP	0.4040***	0.0864	0.5037***	0.5064***	-0.0117	-0.0536	0.5587	0.3427

	(0.0548)	(0.0677)	(0.0887)	(0.0887)	(0.0340)	(0.0355)	(0.1042)	(0.1408)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AR (1)	-6.48	-4.16	-20.56	-19.75	-4.59	-4.37	-4.17	-2.84
(Pr > z)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.004)
AR (2)	-1.12	-0.68	0.15	0.08	-2.35	-1.69	-2.65	-0.97
(Pr > z)	(0.263)	(0.494)	(0.879)	(0.936)	(0.019)	(0.006)	(0.008)	(0.334)
Sargan test	8.1	8.1	19.27	19.27	24.92	24.92	70.14	70.14
(Prob > chi2)	(0.619)	(0.619)	(0.082)	(0.082)	(0.006)	(0.006)	(0.000)	(0.000)
Hansen test	6.32	6.32	196.52	186.52	28.38	28.38	51.3	51.3
(Prob > chi2)	(0.787)	(0.787)	(0.000)	(0.000)	(0.002)	(0.002)	(0.000)	(0.000)
No. of instruments	43	43	83	83	43	43	83	83

Source: Author's work using CSMAR database

Note: This table reports the results from estimating the dynamic panel data model:

$LEV_{it} = \gamma LEV_{i,t-1+} \beta_1 Tang_{it} + \beta_2 Size_{it} + \beta_3 Tech_{it} + \beta_4 Prof_{it} + \beta_5 Grow_{it} + \beta_6 Evol_{it} + ħ_1 Indus_{it} + ħ_2 GDP_t + u_i + \varepsilon_{it}$

The robust standard error is reported below the coefficient estimates in brackets

AR (1) and AR (2) are the test results for first and second order autocorrelations of the residuals.

The p-values for the AR (1) and AR (2) are distributed below the test results in brackets

Sargan test and Hansen test are shown in the table to indicate whether the over-identifying restrictions are valid

The p-values for Sargan test and Hansen test are distributed below the test results in brackets

Number of instruments is shown in the last column in this table

GMM-type: L (2/3) leverage, instruments are restricted from (t-2) to (t-3) periods

* statistical significance at the 10% level

** statistical significance at the 5% level

*** statistical significance at the 1% level

In Table 4-4, the two-step difference GMM estimation shows that firm size is positively related to capital structure, profitability is negatively related capital structure. The lagged leverage ($LEV_{i,t-1}$), which stands for the influence of past leverage ratios, has positive effect on the current leverage ratios and is highly significant. From Table 4-4, we can see that after taking the past influences into account, tangibility, technological innovation and growth opportunities which are statistically significant in static model (Table 4-3) become insignificant in dynamic model under system GMM method. One possible reason for the insignificance of these variables might because in the static model, the variables take up the effect of the omitted variable which is the past effect of leverage. It causes misspecification due to omission of the relevant variable. Therefore, when we include variable $LEV_{i,t-1}$ in the dynamic model, the variables that take up the effect of $LEV_{i,t-1}$ show insignificant effect. The dynamic model is better for the investigation of the issue because the static model has omitted the past influences.

In column (i), γ = 0.3683 for book ratio of total leverage. If the adjustment speed is estimated based on one-step difference GMM in column (i), as γ =1- δ, we can get that the adjustment speed estimates, δ=1- γ = 1- 0.3683 = 0.6317. The result suggests that, for any given year of the sample period, the speed of adjustment towards target leverage is 0.6317. Here, the adjustment speed is between one and zero ($0<\delta<1$), which means the firms take partial adjustment towards target capital structure annually. If the adjustment speed is estimated based on two-step difference GMM in column (ii), we can get that the adjustment speed estimates, δ=1- γ = 1- 0.4366 = 0.5634. The result suggests that the speed of adjustment towards target leverage based on book value is 56.34% for the sample firms during the sample period. Here, the adjustment speed is also between one and zero ($0<\delta<1$). The results that provided by difference GMM estimation (63.17% and 56.34%) proving that the firms take partial adjustment towards target capital structure and are consistent with prior studies. It is closer to the result reported by Ozkan (2002) which is 57% for the U.K. firms, and it is much higher than the adjustment speed of the U.S. firms which is 34.1% reported by Flannery and Rangan (2006) and 25%

reported by Lemmon et al. (2008). Qian et al. (2009) who employ a database of Chinese listed companies during 1999-2004 also find a partial adjustment speed between one and zero (18.5%), but it is considerably lower than the estimation of this study.

One weakness of the two-step difference GMM is that the standard errors it produces tend to be biased downward in finite samples (Blundell and Bond, 1998). To deal with this issue, the procedure advocated by Windmeijer (2005) is adopted to correct the standard errors of the two-step GMM estimates (Qian et al., 2009). Besides, the number of instruments is restricted from (t-2) to (t-3) periods in the dynamic model, which means that only lag 2 and lag 3 of the dependent variables (L (2/3)) are used as GMM instruments in the equation in first differences. If the set of lags is not restricted, there will be a huge number of 288 instruments in this sample, which will lead to biased estimate on lagged leverage ratios. The reason is that, in finite samples, a large collection of instruments over-fits endogenous variables and also weakens the Hansen test of over-identifying restrictions (Roodman, 2008). Accordingly, the number of instruments is restricted from 288 to 43 in two-step difference GMM and from 311 to 83 in two-step system GMM.

Diagnostic checking:

Arellano-Bond test:

In dynamic panel data models, the fixed effects (α) are always correlated with lagged dependent variables. Therefore, the lagged dependent variables are used as instruments for the endogenous regressor (Arellano and Bond, 1991; Arellano and Bover 1995). Arellano and Bond (1991) point out that:

> "An estimator that uses lags as instruments under the assumption of white noise errors would lose its consistency if in fact the errors were serially correlated. It is therefore essential to satisfy oneself that this is not the case by

reporting test statistics of the validity of the instrumental variables (i.e. tests of lack of serial correlation) together with the parameter estimates."

(p. 278)

To ascertain the validity of the instruments, testing for serial correlation is needed. However, standard test for serial correlation such as Durbin-Watson and Breusch-Godfrey are not appropriate in dynamic panel data models (Arellano and Bond, 1991). Thus, the Arellano-Bond test is used for testing second order serial correlation. The Arellano-Bond test result of the two-step difference GMM estimation of total leverage book ratio is shown in Table 4-5 below:

Table 4- 5: Arellano-Bond test

Order	z	Prob > z
1	-4.16	0.000
2	-0.68	0.494

H_0 : no autocorrelation

The null hypothesis of Arellano-Bond test is that there is no second order serial correlation. The test results show that the null hypothesis cannot be rejected. Therefore, I conclude that there is no problem of serial correlation in this model at order 2 (p-value>0.05).

Sargan test and Hansen test of over-identifying restrictions:

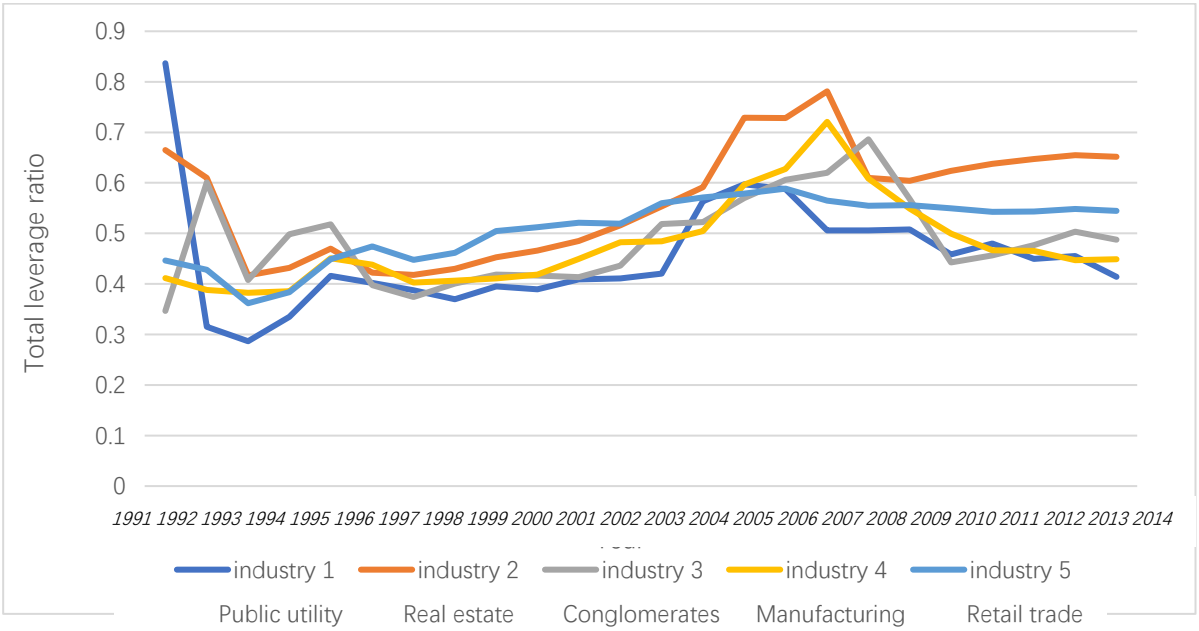
In the difference GMM estimation above, it is assumed that all regressors are exogenous. However, the GMM estimator is very likely to accommodate endogenous regressors. Thus, Sargan test and Hansen test for the validity of over-identifying restrictions need to be applied. Sargan test shows that chi2 (10) = 8.1, Prob>chi2 = 0.619. Therefore, we reject the null hypothesis and conclude that overidentifying restrictions are invalid. As Sargan test is not powerful when there

are many instruments, then Hansen test is applied as well. Hansen shows that chi2 (10) = 6.32, Prob>chi2 = 0.787, the null hypothesis that over-identifying restrictions are valid is rejected. The Hansen test coincides with the Sargan test. Thus, at least one of the instruments is invalid; some regressors are endogenous.

4.4.4 Further analysis: comparison among different industries:

This section conducts a comparative analysis of capital structure in the five industries including public utility, real estate, conglomerates, manufacturing and retail trade industry. The companies belonging to financial industry are excluded from this sample. The industry is divided according to the guidance on the industry classification of listed companies by CSRC (China Securities Regulatory Commission) which is downloaded through CSMAR database. More detailed information on industry classification is shown in Table A-2 in Appendices. This section aims to explore whether firm-specific determinants have varied effects on firm's financing choices in different industries.

Figure 4-1: Corporate debt levels by industry, 1990-2014 (mean value of total liabilities to total assets)



Source: Author's work using CSMAR database

Figure 4-1 represents the annual mean leverage ratios of the five industries during 1990-2014. It shows that the trend of debt levels of each industry is quite similar. There was a sharp increase in average leverage ratios of conglomerates industry from 1991 to 1992 and then it experienced a dramatic decline from 60 percent to 40 percent during 1992-1994. The debt levels of public utility and real estate industry also decreased sharply in 1992-1994. Furthermore, we can see a remarkable increase in leverage since 2002, and then it reached the highest level during 2007 and 2008 which was caused by the 2007 financial crisis. The trend of debt levels of manufacturing and retail trade industry is more stable in comparison with the other industries. MacKay and Phillips (2005) argue that the intra-industry differences in debt levels can be taken as measure of difference risk levels in industries. According to the theory of agency costs, a high-risk industry has less debt than the industries with lower risk. Data revealed by CSMAR indicates that the average risk levels of firms belonging to real estate industry are very high (approximately 15 percent) and the average debt ratio reached 78 percent in 2007 which is the highest among the five industries.

Table 4-6 shows the regression results of the static and dynamic panel data models of total book leverage ratios of the five industries respectively. The static capital structure models are estimated based on fixed effects estimation (column i, iii, v, vii, ix) and the dynamic capital structure models use two-step difference GMM estimation (column ii, iv, vi, viii, x). In Table 4-6, it is inevitable to notice the remarkable differences across the five industries. Firms belonging to different industries have different adjustment speed of capital structure. Firms which belong to conglomerates have the relatively higher speed of capital structure adjustment (44.9 percent). Firms of real estate and manufacturing industry adjust slowly towards their target leverage at the speed of 29.46 percent and 25.95 percent respectively. Firms belong to public utility industry have the lowest adjustment speed (15.37 percent) among the five industries. Table 4-6 also shows that profitability is the most crucial firm-specific variable for the five industries. It has significant negative effect on capital structure in both static and dynamic models. Firm size is positively related to leverage for all industries, which is consistent with

the above assertions. Technological innovation is significant and positively related to leverage for firms in manufacturing industry under FE estimation (0.147). It is obvious that the development of manufacturing firms needs to heavily rely on intangible assets including technological innovation, goodwill, R&D activities, etc. In contrast, for the firms in real estate and retail trade industry, technological innovation causes negative impact on firms' leverage ratios.

Table 4-6: FE and GMM estimate of capital structure of each industry

	Industry 1 Public utility		**Industry 2** Real estate		**Industry 3** Conglomerates		**Industry 4** Manufacturing		**Industry 5** Retail trade	
	(i) FE	(ii) GMM	(iii) FE	(iv) GMM	(v) FE	(vi) GMM	(vii) FE	(viii) GMM	(ix) FE	(x) GMM
$LEV_{(t-1)}$	--	0.8463***	--	0.7054***	--	0.5510***	--	0.7405***	--	0.5864***
Tang	-0.0106	-0.1447	-0.0153	0.1735	-0.0947	0.2376	0.0748***	0.0581	0.0176	-0.2498**
Size	0.0474***	-0.0094	0.0815***	0.0346*	0.0591***	0.0326	0.0548***	-0.0105	0.0794***	-0.0130
Tech	0.0649	-0.3563*	-0.1471*	-0.3038	-0.0486	-0.0298	0.1470***	-0.0285	-0.3147***	-0.2498
Prof	-1.0736***	-0.7707***	-0.7765***	-0.4609**	-0.7888***	-0.4866**	-0.8510***	-0.5905***	-0.7884***	-0.9944***
Grow	-0.0006	-0.0017	-0.0032*	-0.005***	-0.0025	-0.0012	-0.0005	-0.0017*	-0.0010	-0.0026
Evol	0.2855***	-0.3652	0.4344***	-0.0571	0.2224**	-0.1487	0.2419***	0.2078	0.2842***	-0.2425
Indus	0.1520**	0.1113**	0.1111**	-0.0431	0.1700*	0.0094	0.0283	-0.1046***	-0.0885	0.2615
GDP	0.6658**	0.1779	1.0537***	0.7716**	0.8070*	0.5087*	0.9870***	0.6222***	1.3706***	0.4284**
Constant	-0.6909***	--	-1.3488***	--	-0.9072***	--	-0.8223***	--	-1.2096***	--
Overall R-squared	0.3236	--	0.3451	--	0.2281	--	0.3046	--	0.2007	--
No. of observations	2700	2700	2662	2662	842	842	15012	15012	2283	2283
No. of firms	230	230	182	182	72	72	1409	1409	155	155
No. of instruments	--	43	--	42	--	42	--	42	--	43

Source: Author's work using CSMAR database

Note: This table reports the fixed effects (FE) estimate of the static model of capital structure:

$$LEV_{it} = \alpha + \beta_1 Tang_{it} + \beta_2 Size_{it} + \beta_3 Tech_{it} + \beta_4 Prof_{it} + \beta_5 Grow_{it} + \beta_6 Evol_{it} + ħ_1 Indus_{it} + ħ_2 GDP_t + u_i + \varepsilon_{it}$$

and the Generalised Method of Moments (GMM) estimate of the dynamic model of capital structure:

$LEV_{it} = \gamma LEV_{i,t-1} + \beta_1 Tang_{it} + \beta_2 Size_{it} + \beta_3 Tech_{it} + \beta_4 Prof_{it} + \beta_5 Grow_{it} + \beta_6 Evol_{it} + \hbar_1 Indus_{it} + \hbar_2 GDP_t + u_i + \varepsilon_{it}$

The robust standard error is reported below the coefficient estimates in brackets

Overall R-square statistics for the static model are reported in the table

Number of instruments for the dynamic model are reported in the last column in the table

GMM-type: L (2/3) leverage, instruments are restricted from (t-2) to (t-3) periods

* statistical significance at the 10% level

** statistical significance at the 5% level

*** statistical significance at the 1% level

4.4.5 Speed of adjustment and firm specific adjustment factors

Table 4-7 reports the results of estimating Equation 8 with the General Methods of Moments (GMM) dynamic panel data estimator proposed by Arellano and Bond (1991). It shows the effects of firm-specific factors on the adjustment speed of capital structure. Following the suggestions of Drobetz and Wanzenried (2007), the firm-specific determinants of the adjustment speed are applied separately one at a time when estimating Equation 8, in order to avoid the problem of multicollinearity. The main focus lies on the estimate for β_j, which is the coefficient on the interaction term between a firm-specific determinant of adjustment speed, Z_{jt}, and lagged leverage, $Y_{i,t-1}$. It is suggested to take a careful consideration when checking possible interactions, therefore I statistically examine each of interaction term of the adjustment factors. A Wald test is used to test the significance of the interaction terms. As shown in Table 4-7 below, the tests of the interaction terms have P-values equal to 0,000, which rejects the hypothesis that both coefficients are simultaneously equal to zero. Thus, there is a statistically significant interaction between the two variables. If both coefficients would be zero, then the term falls out of the equation, there would be no interaction and you could omit the term from the model. It should be noted that Equation 8 specifies a negative sign on β_j, the signs of the estimated coefficients on the respective interaction terms must be interpreted accordingly; thus, a negative sign implies a faster adjustment and a positive sign implies a slower adjustment (Qian et al., 2009).

In column (ii) in Table 4-7, the estimated coefficient on the interaction term with firm size indicates that firm size is positively related to adjustment speed of capital structure. This result confirms the hypothesis that larger firms adjust more quickly towards targets than smaller firms. It is in line with the findings of Qian et al (2009) who argue that as changing the capital structure involves substantial fixed costs, the adjustment costs may be relatively lower for large firms than small firms. Column (vii) shows that there is a negative relationship between the distance variable (DIST) and the speed of adjustment. Inconsistent with the studies of

Banerjee et al. (2004) and Drobetza and Wanzenried (2006) that find a significant and positive relationship between firms' growth opportunities and speed of capital structure adjustment, this chapter find that growth opportunities have no significant effect on adjustment speed for Chinese listed firms (column v). In column (i), (iii), (iv) and (vi), the coefficients on the interaction terms indicates that tangibility, technological innovation, profitability and earnings volatility have no significant effect on the speed of adjustment.

Table 4-7: Firm-specific factors and adjustment speed of capital structure

	(i) Tang	(ii) Size	(iii) Tech	(iv) Prof	(v) Growth	(vi) Evol	(vii) Dist
$LEV_{i,t-1}$	0.5763*** (0.3219)	5.5907*** (1.6617)	0.8861*** (0.1267)	0.5489*** (0.1155)	0.9223*** (0.0738)	0.8015*** (0.1696)	0.4659*** (0.0442)
Interaction $z_{jt} * LEV_{i,t-1}$	-0.7155 (1.0844)	-0.2390** (0.1188)	0.0881 (3.1305)	0.9294 (1.4390)	-0.0136 (0.0385)	-0.2847 (0.5958)	0.6412*** (0.2495)
AR (1) (Pr > z)	-19.79 (0.000)	-3.45 (0.001)	-11.7 (0.000)	-11.59 (0.000)	-18.79 (0.000)	-13.76 (0.000)	-7.42 (0.000)
AR (2) (Pr > z)	-1.19 (0.235)	-0.98 (0.328)	-1.00 (0.315)	-0.60 (0.551)	-1.01 (0.312)	-1.13 (0.259)	-3.00 (0.003)
Sargan test (Prob > chi2)	23.09 (0.284)	26.69 (0.144)	25.75 (0.174)	19.2 (0.509)	22.75 (0.301)	22.38 (0.098)	26.84 (0.03)
Hansen test (Prob > chi2)	18.61 (0.547)	20.69 (0.416)	21.18 (0.386)	13.06 (0.875)	19.26 (0.505)	15.89 (0.39)	19.27 (0.202)
Wald test (Prob > chi2)	4835.43 (0.000)	3547.87 (0.000)	5449.43 (0.000)	3066.18 (0.000)	5266.47 (0.000)	4706.99 (0.000)	5555.98 (0.000)
No. of instruments	43	43	43	43	43	43	43

Source: Author's work using CSMAR database

Note: This table reports the results from estimating Equation 8: $Y_{it} = (1-\beta_0)\, Y_{i,t-1} - \beta_j\, z_{jt}\, Y_{i,t-1} + \beta_0 \sum r_i X_{it} + \beta_j\, z_{jt} \sum r_i X_{it} + d_t + u_i + \varepsilon_{it}$, with the two-step difference GMM estimator advocated by Arellano and Bond (1998)

The robust standard error is reported below the coefficient estimates in brackets

AR (1) and AR (2) are the test results for first and second order autocorrelations of the residuals.

The p-values for the AR (1) and AR (2) are distributed below the test results in brackets

Sargan test and Hansen test are shown in the table to indicate whether the over-identifying restrictions are valid
The p-values for Sargan test and Hansen test are distributed below the test results in brackets
Number of instruments is shown in the last row in this table

* statistical significance at the 10% level
** statistical significance at the 5% level
*** statistical significance at the 1% level

4.5 Discussion and Implications

This chapter proves that the Chinese listed firms do partially adjust towards their target capital structure. The speed of capital structure adjustment is 56.34 percent on average based on two-step difference GMM estimate for book total leverage ratios during 1990-2014. Corporate debt level is positively related to tangibility, firm size and earnings volatility while negatively related to profitability and growth opportunities. Regarding the relationship between tangibility and leverage, FE estimation show positive signs on tangibility. This positive correlation between tangibility and leverage for our sample is expected by implication of trade-off theory, agency cost theory and hypothesis of pecking order theory in terms of assets mispricing. It suggests that firms with more tangible assets tend to have more debt financing. It is consistent with a majority of previous empirical studies such as Long and Malitz, (1985), Chung (1984), Rajan and Zingales (1995), Walsh and Ryan (1997) and Jong et al. (2008) which are all based on static model of capital structure. However, GMM estimation indicates that tangibility has an insignificant effect for capital structure. One reason for the insignificance of tangibility in dynamic panel data model is because in the static model, the variable takes up the effect of the omitted variable which is the past effects of leverage. It causes misspecification due to omission of the relevant variable. Accordingly, after introducing variable $LEV_{i,t-1}$ in the dynamic model, the variable tangibility that takes up the effects of $LEV_{i,t-1}$ shows insignificant coefficient estimation.

The hypothesised positive relationship between firm size and leverage is supported by the results of FE and GMM estimation. The results are in line with the prediction of trade-off theory and empirical studies of Marsh (1982), Rajan and Zingales (1995), and Booth et al. (2001). This positive effect of firm size on leverage might be caused by the fact that larger-sized corporations have better access to capital markets for equity finance than the small companies. As large companies have good reputations and can attract more capital gains in the secondary markets. Titman and Wessels (1988) argue that large companies have more diversified activities and thereby face less risk of bankruptcy, which allows them to maintain

a higher level of debt. Furthermore, outsides investors may take firm size as a signal of firm value due to the information asymmetry. The outsiders prefer to invest in large-scale listed firms because most large listed firms in China are transformed from or are still state-owned enterprises; in other words, the outside investors have trust in the large firms. Additionally, larger firms can finance debt with smaller costs as generally they can provide more information to outside investors (Fama and Jensen, 1983), thereby larger firms tend to have higher debt levels than smaller firms. This significantly positive relationship between firm size and capital structure has been commonly agreed by most empirical studies in either developed or developing economies (Marsh, 1982; Titman and Wessels, 1988; Rajan and Zingales, 1995; Booth et al., 2001; Chen, 2004; Huang and Song, 2006).

Regarding the variable profitability, it shows that profitability is highly negatively related to total leverage. It is the most critical core factor for firms' capital structure in this sample. The results seem demonstrate that pecking order theory is more relevant in the case of China than trade-off theory. In practice, tax effects that predicted by the trade-off model are not common in China. It is because the state still controls listed corporations and banks as well as the beneficiary of tax to some extent, although China is transferring from a centrally planned economy to a market-oriented economy. Accordingly, companies tend to use equity financing as much as possible. That's why the trade-off theory is incapable to explain the relation between profitability and leverage of Chinese companies. This finding is consistent with most previous studies. The empirical studies in developed economies of Titman and Wessels (1988), Rajan and Zingales (1995), Michaelas et al. (1999), Booth et al. (2001), existing Chinese research of Chen (2004), Chen and Strange (2005), Chen et al. (2014) and theoretical study of Wong (2015) all indicate a negative relation between profitability and debt ratios. As the firms with high profitability have large retained profits, their retained profits are generally sufficient for providing capital for the firms' development and investment next year. Retained profit is taken as the easiest and fastest financing source by most firms, because issuing equity or debt induce transaction costs and are quite time-consuming. Firms would prefer to use internal funds rather than borrowing from

the external (Myers and Majluf, 1984). Thus, more profitable firms tend to issue less debt and thereby have low leverage ratios.

Contrary to my hypothesis, the results show that earnings volatility is positively related to total leverage in both static and dynamic models. The main reason of why the trade-off theory is not useful in explaining the relation between earnings volatility and leverage might because that the bankruptcy costs are not significant for Chinese listed firms. The results support the findings reported by Hsia (1981) and Qian et al. (2009). Qian et al. (2009) employ the two-step difference GMM estimation for the dynamic capital structure model that based on a database of 650 Chinese publicly listed firms and show very similar results to the estimation results of my study. Earnings volatility is statistically significant at the 5% level with the same predicted sign, except for that the magnitude of earnings volatility in this study is larger than that in Qian et al. (2009)'s study.

The FE estimation indicates that growth opportunities are negatively related to firms' leverage. This finding is inconsistent with the main prediction of pecking order theory and signaling theory. It does not support the findings of Marsh (1982), Michaelas et al. (1999) and Chen (2004) who have propounded a positive relationship between the two variables. The result obtained with this specification supports trade-off theory. Trade-off theory suggests that firms prefer equity rather than debt because the firms with more growth opportunities suffer higher costs of financial distress (Rajan and Zingales, 1995). It is in line with the findings of Rajan and Zingales (1995), Al-Sakran (2001). Besides, it is noted that growth opportunities are insignificant under the two-step difference and system GMM estimation. Although its coefficient is significant under the FE estimation, the magnitude of its coefficient is so small that can be taken as zero. The evidence supports the implication of Qian et al. (2009) who get a very weak relationship between growth opportunities and total leverage ratios. One possible reason might be derived from its measurement, the methods of calculation maybe not accuracy or not appropriate. This study uses the sales growth rate as a proxy for growth

opportunities, however, most prior literature use Tobin's Q to measure growth opportunities. Another explanation is that growth opportunities are indeed has very small or no effect on the capital structure just as the results shown above.

Another significant finding of this study is that firm size has a significant effect on the speed of capital structure adjustment. I find that larger firms adjust more quickly to their target leverage ratios than the smaller firms. There are three possible explanations for this positive relationship. Firstly, as firm size can be regarded as a proxy for information asymmetry between insiders of the firms and the outside investors, large firms with more information disclosure will have better access to both debt and equity financing. Accordingly, large firms should be more readily to correct deviations from their optimal capital structure. Secondly, the large-sized firms are generally believed to have greater capability to alleviate the conflicts between bondholders and shareholders as the creditors would have an improved guarantee of repayment (Jensen and Meckling, 1976; Drobetz and Wanzenried, 2006). Thirdly, the bondholders' monitoring costs normally will be lower for large firms that with more collateralizable assets. It is the costs of changing capital structure that determine a firm's frequency of adjustment towards the optimal leverage. If the costs of adjustment are larger than the benefits of reaching the optimal capital structure, the firms would prefer to deviate considerably from their targets. Inconsistent with the previous studies (e.g., Banerjee et al., 2004; Drobetz and Wanzenried, 2006), this chapter did not find a significant relationship between growth opportunities and adjustment speed of capital structure. In addition, this chapter proves that technological innovation, profitability and earnings volatility have no effect on the speed of adjustment towards optimal capital structure for the Chinese listed firms during the sample period.

4.6 Conclusion and Limitations

This study investigates the firm-specific determinants and adjustment speed of capital structure of Chinese listed companies. The unbalanced panel data set, covering the period from 1990 to 2014, contains 25,751 observations of 2048 firms. It is analysed based on both static and dynamic framework. There is an advantage of the estimation method used in this study. For dynamic panel adjustment models, the GMM estimation can correct for the biases of other commonly used alternative estimations such as OLS and FE. By using one-step and two-step difference GMM estimation for the dynamic panel data model, this paper suggests that the firm leverage is positively related to firm size and earnings volatility and is negatively related to profitability. In comparison with other variables in this sample, profitability is the most critical core determinant for firms' capital structure decisions, and earnings volatility is the second most important factor. This study finds that the firms do partially adjust towards their target leverage ratios. The adjustment of speed towards target leverage is 56.34 percent on average for this sample during the 1990-2014. Most importantly, through empirical evidence, I find that larger firms tend to adapt more quickly towards their targets. Firms with larger distance from the targets tend to adjust faster to the target leverage. Furthermore, firms belong to different industries have different adjustment speed of capital structure. Firms belong to conglomerates have the relatively higher speed of adjustment than other industries in this sample.

This study has several limitations. Firstly, it is based on a sample of companies listed on SHSE and SZSE, which may not be generalized to all Chinese firms, listed and unlisted. Secondly, most of the listed firms in China are large companies. As the private SMEs have not been taken into consideration, this sample might not be representative of the population. Furthermore, the financial data of companies used in this study might be inapplicable. Although the data from CSMAR was collected from the annual reports of Chinese firms listed in the SHSE and SZSE, an inherent possibility of inaccuracy still exists in reporting; some listed companies would decorate their reporting information to attract investors. Misreporting financial reports to the authorities is common in most nations, which seems to be greater in

Chinese companies. Another limitation is that this chapter does not analyse why the signs of some coefficients on book and market value of leverage ratios would be opposite, which will be investigated in my future research. Moreover, the analysis of dynamic capital structure is mainly based on the measure as total leverage ratios, without identifying the different results obtained from long-term and short-term leverage ratios. Bevan and Danbolt (2002) argue that significant differences have been found in the determinants of short-term and long-term debt. Thus, the analysis of capital structure in this chapter may be incomplete without a detailed examination of short-term and long-term debt. In addition, some variables that have significant effects on firms' financing decisions might be omitted in this chapter. For example, non-debt tax shields, which is generally considered as one of the important factors influence corporate capital structure, is not included in this study, because non-debt tax shields are also proxies for the tangibility of assets (Bradley et al., 1984). It will cause the problem of multicollinearity if both tangibility and non-debt tax shields are estimated in one model.

CHAPTER 5. CORPORATE GOVERNANCE AND FINANCING DECISIONS: NEW EVIDENCE FROM DYNAMIC CAPITAL STRUCTURE MODELS

5.1 Introduction

In the previous chapter the static and dynamic panel data analysis were used to analyse the dynamics of capital structure. The firm-specific factors which have been proved to be significant for dynamic capital structure in the previous chapter are used as control variables in this chapter. This chapter investigates the role of corporate governance in financing decisions of Chinese listed companies. Corporate governance is a set of mechanisms that affect how a corporation is operated (Sami, Wang and Zhou, 2011). It specifies the distribution of rights and responsibilities among different participants in the corporation, such as the board, managers, shareholders and other stakeholders (Shleifer and Vishny, 1997). Narrowly speaking, it generally applies to issues from the composition and function of boards of directors to the rights and prerogatives of shareholders in corporate decision-making (Blair, 1995). In the specialized literature, earlier research about capital structure only focuses on the firm-specific factors such as firm size, tangibility, profitability, liquidity, etc. Following the argument of Jensen and Meckling (1976) about owner-manager agency conflicts, an increasing body of research stresses the importance of corporate governance for capital structure decisions. However, most prior literature just refines the static trade-off theories that omitting the dynamic adjustments in firms' leverage ratios; how a firm's corporate governance determines its capital structure is still mysterious. To fill the gap in the literature specific to China, this chapter uses dynamic trade-off models to examine the importance of corporate governance mechanisms for capital structure decisions and to capture the speed of capital structure adjustment. In this study, managerial shareholding represents the incentive mechanism of corporate governance, and the monitoring mechanisms are captured by board size, board independence and CEOs' duplicate positions. Ownership structure which determines the allocation of corporate control, is the foundation of corporate governance (Tirole, 2006). As a corporate governance mechanism, it is essential to find out how ownership structure affects firms' capital structure and the intensity of the impact. Different from the prior empirical studies, this chapter classifies the firms according to the nature of ultimate controlling shareholders instead of the nature of the firms. This study aims at answering the following questions:

- ✧ Which characteristic of ownership structure affects firms' decisions about capital structure adjustment?
    - ➢ Does the fraction of shares held by the largest shareholder have any effect on firms' debt levels?
    - ➢ Does managerial shareholding have any effect on firms' capital structure decisions?
    - ➢ Does the nature of ultimate controlling shareholder have any effect on firms' financing decisions?
    - ➢ Does the state ownership have any effect on the speed of adjustment of capital structure?
- ✧ Does the structure of board of directors have any influence on firms' decisions about capital structure adjustment?
- ✧ To what extent do corporate governance mechanisms influence capital structure?

To investigate the above questions, this chapter applies a dynamic-panel-data Generalized Method of Moments (DPD-GMM) estimator to a data set of 1695 firms over a period from 2003 to 2013. The Arellano-Bond difference GMM (Arellano and Bond, 1991) and the Blundell-Bond's system GMM (Blundell and Bond, 1998) are used to estimate the time-varying adjustment speed of capital structure and to analyse the relationship between corporate governance mechanisms and leverage in a dynamic framework. The remainder of this paper is organised as follows. Section 5.2 reviews the empirical literature on corporate governance, ownership and capital structure and the hypotheses are developed. In section 5.3, the methodology of this research is presented. Section 5.4 presents the empirical results and discusses the main findings. Section 5.5 concludes this chapter and states the limitations of this study.

5.2 Literature Review and Hypothesis Development

The agency cost theory provides vital contributions to a holistic framework addressing the association between corporate governance mechanisms and

corporate financing decisions. Shleifer and Vishny (1997) argue that agency problems can be mitigated by good corporate governance mechanisms. The corporate governance mechanisms that including ownership structure and concentration and the structure of board of directors, proved to have significant impact on firms' leverage ratios (Jensen and Meckling, 1976; Jensen, 1986; Friend and Lang, 1988; Lipton and Lorsch, 1992; Graham and Harvey, 2001; Margaritis and Psillaki, 2010; Morellec et al., 2012; Paligorova and Xu, 2012). This section reviews the theoretical and empirical literature related to corporate governance, ownership and capital structure. Hypotheses of relationship between corporate governance mechanisms and capital structure are developed based on the existing literature.

5.2.1 Controlling shareholders and ownership concentration

The role of controlling shareholders in firms' financing choices has been emphasized by recent research (Liu and Sun, 2005; Paligorova and Xu, 2012). Paligorova and Xu (2012) argue that the firms with highly concentrated ownership may have high debt levels because their ultimate controlling shareholders have strong control-enhancing motivations. Ultimate controlling shareholder refers to the one with the maximum shareholding in the shareholder list that generally holds over 30 percent of shares of a listed company (Shleifer and Vishny, 1986). Furthermore, the ultimate controlling shareholders have high effective voting power without commensurate cash flow rights. They can gain private benefits by ruling subsidiary business groups, and they do not bear the full costs of the financial distress of distant affiliates (Paligorova and Xu, 2012). Liu and Sun (2005) classify the ownership of Chinese companies according to the nature of ultimate shareholders, finding that the State is often the ultimate shareholder in a total of more than 80% of Chinese companies. Chen, Firth and Xu (2009) argue that the monitoring efficiency of Chinese listed firms varies across the types of controlling shareholders because different types of shareholders have different motivations which will affect how they exercise the control rights over the listed firms. They prove that the relationship between large controlling shareholders and firm

performance depends on the type of large shareholders. To test whether different types of ownership of listed companies has any effect on corporate financing decisions, this chapter classifies the dominant shareholders into those that are state-owned and those that are privates and hypothesises that the type of ultimate controlling shareholders has a significant effect on capital structure.

Agency theory suggests that ownership concentration is a key corporate governance mechanism that can mitigate conflicts of interest between managers and owners (Shleifer and Vishny, 1986). It is because the separation between ownership and control give rise to the monitoring costs and cause the agency problem between managers and owners (Jensen, 1986). With more concentrated ownership of the firm, managers and directors are more likely to take into account the interests of large shareholders. Jensen and Meckling (1976) predict that a firm with higher ownership concentration may tend to issue less debt if it brings more monitoring, as a higher level of ownership concentration permits more effective monitoring of management by the shareholders. The studies of Chen et al., (2009) and Margaritis and Psillaki (2010) take both the impact of ownership concentration and ownership type into consideration. Chen et al., (2009) argue that a distinct characteristic of Chinese listed firms is that the largest shareholder's ownership concentration far exceeds that of the second largest shareholder. They use the shareholdings held by the largest and the second largest shareholders to measure ownership concentration of Chinese listed firms. Margaritis and Psillaki (2010) measure ownership concentration by the percentage of shares owned by the large shareholders; referring to three ranges of ownership holding: OWN1--there is no shareholder holding more than 25 percent of shares; OWN2--the largest shareholders own from 25 percent to 50 percent of stake; OWN3--there are more than 50 percent of equity holdings. Their results show that more concentrated ownership is normally associated with higher leverage ratio, while ownership type does not have significant effect on capital structure choices which is different from their hypotheses. There are several other ways to measure a firm's ownership concentration. In the studies of Jensen and Meckling (1976), Leland and Pyle (1977), and Diamond (1984), shareholding percentage of the largest shareholder or

the five largest or the ten largest shareholders are used to proxy ownership concentration. Cepedes et al. (2010) use the Herfindal index (the sum of the squares of the fractions of equity held by each individual shareholder) to measure ownership concentration. This chapter uses the fraction of shares held by the largest shareholder to proxy ownership concentration. A detailed discussion about the measurements of ownership concentration is illustrated in section 5.3.2 later. According to the agency theory of Jensen and Meckling (1976), this study hypothesises that ownership concentration is negatively related to capital structure.

Hypothesis 1: the nature of ultimate controlling shareholders has a significant effect on capital structure decisions

Hypothesis 2: ownership concentration is negatively related to capital structure

5.2.2 Board structure

A board of directors is defined as a recognized group of people who jointly oversee the activities of an organization, which can be either a for-profit business, non-profit organization, or a government agency (Johnson, Daily and Ellstrand, 1996). Board of directors is apex body in the corporate set-up that is generally considered as the most significant factor in monitoring a firm's management and strategic decisions (Hermalin and Weisbach, 1991). It appoints the chief executive officer (CEO) of the corporation and sets out the overall strategic direction. The board of directors also has the authority to determine executive pay and the responsibility to monitor managers to ensure that they work in the interests of shareholders (Monks and Minow, 1995; Johnson et al., 1996). Measures of board structure employed in this chapter include board size, board independence and chair/manager duality.

5.2.2.1 Board Size

Historically, non-profit boards sometimes had large boards with up to twenty-four members, but a modern trend is to have smaller boards with as few as six or seven people (Chaganti, Mahajan and Sharma, 1985). Lipton and Lorsh (1992) and Jensen (1993) identify that board size is an important determinant of corporate governance effectiveness. Lipton and Lorsh (1992) point out that a company's board should be composed of a small number of directors with ideally eight or a maximum of ten, in order for the board to actively monitor and evaluate CEO and company performance. White (2016) provide support for Lipton and Lorsh (1992)' findings and suggest that after seven people, each additional person reduces the effectiveness of group-decision-making. Pfeffer and Slancik (1978), Lipton and Lorsch (1992) and Jensen (1986) also prove that there is a significant relationship between board size and leverage. Jensen (1986) finds that leverage is lower when the board of directors is smaller. He suggests that larger boards tend to have weakening corporate governance because, with more board members, it is more difficulty to reach a consensus in decision making; the weakening corporate governance could result in high debt levels. On the contrary, Berger et al (1997) indicate that firms with higher leverage have smaller boards of directors. One possible explanation for this negative relation is that larger boards generally put more pressure on managers to maintain relatively low levels of debt in order to signal a good impression to the public. However, Wen et al (2002) who investigate the relationship between corporate governance and capital structure for 60 Chinese listed firms during 1996 and 1998, find that board size is statistically insignificant for capital structure decisions. In this chapter, the impact of board size on capital structure for Chinese listed firms is estimated by using a larger panel-data set of 1695 firms, and the sample period is extended from 2003 to 2013. In adherence to Jensen (1986), I assume there is a positive relationship between board size and capital structure. According to the above empirical literature, board size is measured as the natural logarithm of total number of members on the board of directors.

Hypothesis 3: board size is positively related to capital structure

5.2.2.2 Board independence

There is a growing consensus on the importance of board independence as a monitoring mechanism of corporate governance for influencing firm performance and determining the structure of financing sources (Rosenstein and Wyatt, 1990; Alves, Couto and Francisco, 2015; Liu et al., 2015). A more independent board can protect the interests of shareholders and enhance the quality of information provided by insiders to the public (Rosenstein and Wyatt, 1990). Then information asymmetries and adverse selection costs are decreased accordingly. Thus, retained earnings as internal financing sources are declined because of less information asymmetry (Myers, 1984). Empirically, Harford, Li and Zhao (2008) find that firms with more independent boards are more likely to have higher debt levels. This positive relation is due to a reduction in the agency cost of debt financing. However, Field et al. (2012) point out that board of directors' independence is beneficial to equity-holders as well as bondholders, as the increase of board independence will decrease information asymmetries for both equity- and debt-holders. Alves et al. (2015) further explained that a more independent and diversified board of directors is expected to decrease information asymmetries between managers and investors and therefore should make it easier to issue external securities and risky securities. The risky securities normally include long-term debt and new equity. According to pecking order theory, information asymmetry between managers and investors increases the cost of issuing securities. Managers would prefer to use internal financing first, and then less risky securities, because the risky securities are more sensitive to information asymmetries than the low risk ones (Myers and Majluf, 1984). For the firms with more independent directors, the forecast earnings are issued more frequently and are more accurate, and the quality of information provided in the financial reports is higher, which lowers information asymmetry accordingly (Ajinkya et al., 2005).

In sum, firms with more independent board of directors will have more external financing and less use of retained earnings; more short-term debt when compared with retained earnings; and more equity than long-term debt. In this paper, board

independence is measured by the ratio between the number of independent directors and the total number of directors on the firm's board. Following Harford et al. (2008), this study hypothesises a positive relationship between board of directors' independence and capital structure of Chinese listed firms.

Hypothesis 4: board independence is positively related to capital structure

5.2.2.3 Duality

Less attention has been given to the influence of chair duality on the mix of financing sources. The duality governance structure refers to a dual leadership role of the board chairman who is also a top manager or the CEO of the firm. CEO duality is generally viewed as a legal but discouraged governance structure in previous studies, and it is widely used as a dummy variable in corporate governance research (Gove et al., 2017). An expanding body of literature has demonstrated the significance of duality leadership for capital structure decisions (Fosberg, 2004; Abor, 2007; Kempf et al., 2013; Alves et al, 2015). Alves et al. (2015) argue that board independence can be improved if the chairman of the board does not perform a dual-role in the firm. Kempf et al. (2013) argue that duality managers take more risky decisions than non-duality managers. Fosberg (2004) states that the firms with CEO duality tend to have higher leverage ratios than the firms with no CEO duality. Abor's (2007) results support the findings of Fosberg (2004). They argue that as a CEO's or a manager's duplicate positions decrease problems associated with separation of ownership and control, the firms with duality leadership have high accessibility to external financing. CEO duality is frequently operationalized dichotomously as a dummy variable in corporate governance research (Gove et al., 2017).

There is scant literature investigating the association between capital structure and manager duality of Chinese corporations. For that reason, the analysis of its influence and relationship with firms' leverage must not be overlooked. In this chapter, Chair/Manager duality is adopted as a dummy, and I hypothesise that the

dual-roles of a manager can cause significant impact on his decisions about capital structure.

Hypothesis 5: manager's duplicate positions in the board can increase a firm's leverage ratio

5.2.3 Management ownership

The institutional environment in China is lacking in efficient monitoring compared with other developed economies. Accordingly, the agency problem between shareholders and management is severe for Chinese companies and should not be omitted when analysing capital structure. Interest conflicts exist between managers and shareholders based on agency theory (Jensen and Meckling, 1976). In general, shareholders prefer equity to debt while managers prefer debt to equity due to signaling effects of managerial actions; potential investors believe that an increased amount of debt use would effectively signal that the company's prospects have improved. In order to attract more investors, managers would be more likely to use debt (Ross, 1977). However, if the managers have more shareholdings, they are more aligned with shareholders, thereby decreasing debt financing to eliminate agency problems. Therefore, managerial shareholdings can be viewed as a corporate governance mechanism to incentivise managers. Agency theory implies that the ratio of shares held by management is expected to be negatively related to debt ratios (Chang et al, 2014).

Friend and Lang (1988) find a negative relation between managerial ownership and firms' leverage ratios. Their findings are supported by Mehran (1992), Graham and Harvey (2001), Kayhan (2008) and Morellec et al. (2012). Graham and Harvey (2001) use a survey-based approach to analyse the characteristics of managers and emphasise the significance of management ownership in analysing firms' financing decisions. Morellec et al. (2012) emphasize the importance of agency conflicts in financing choices. They build a dynamic capital structure model and

prove the internal governance mechanisms are significant for firms' capital structure.

In the case of China, Friend and Lang's (1988) argument is also supported by the subsequent study of Huang and Song (2006). They show that managerial shareholdings have a significant and negative effect on Chinese firms' leverage. As debt financing has higher risk than equity financing, managers would lower debt level if they have more shareholdings at hand. However, the findings of Chang et al., (2014) do not fully support Huang and Song (2006). Results from Chang et al., (2014) show that although management shareholdings are negatively related to capital structure, its coefficient is only significant in the overall sample regression of book leverage, while insignificant in the regional samples of market leverage.

Morck et al. (1988) investigate the influence of management ownership on market valuation of the firms. The methods they used to measure management ownership were insightful for the subsequent studies. They construct three piecewise variables for board ownership, allowing for slopes to change at different points. This methodology is also implemented by Hubbard and Palia (1995) to estimate the relationship between management ownership and the stock returns. Hubbard and Palia (1995) divide the managerial shareholdings into three ranges: smaller than 5%, between 5% and 25%, and larger than 25%. Their findings in the 0 – 5% and 5% - 25% range are similar to that of Morck et al. (1988). Even though they didn't take firms' debt ratios into consideration, the methodology used in their papers is implicational.

Although managerial ownership is believed to have an effect on capital structure, there is no clear predication about its relationship with leverage for Chinese corporations. To fill the gap in the literature, this chapter estimates management ownership as a dummy variable to test whether a firm having or not having managerial shareholding would cause significant impact on leverage. The reason

why management ownership is constructed as a dummy is illustrated later in section 5.4.1.

Hypothesis 6: management ownership has a significant effect on firm leverage

5.2.4 State ownership

Regarding the relationship between state ownership and capital structure, it is normally considered that firms with large state shares have easy access to external financing sources in China. Although access to both equity and debt finance is considered to be easier for corporations that are owned by the state, they would still prefer to have low debt levels because the risks of bankruptcy increase when leverage ratios are high (Jensen and Meckling, 1976). Firth et al. (2008) and Chang et al. (2014) construct a state-control dummy variable to measure state ownership and report that the SOE is negatively and significantly related with firm leverage, and state-controlled firms tend to have lower leverage ratios than the privately-controlled firms. On the other hand, Anderson and Reeb (2003) find that family-owned companies face lower agency costs when carrying debt financing. The private companies have stronger incentives to alleviate agency conflicts with debt claimants, which result in lower costs of debt financing. Therefore, family-owned companies are more likely to have high debt levels than the SOEs.

Li et al. (2009) study non-listed Chinese companies and find that state ownership is positively related to capital structure and companies' access to long-term debt, while foreign ownership is negatively related to both short-term and long-term leverage ratios. The non-state-owned companies are more likely to have lower total and short-term debt than their state-owned counterparts in developing and less-developed countries. In Li et al. (2009)'s model, the ownership and institutional structures together explain up to six percent of total variation in companies' capital structure decisions, while the firm characteristics explain no more than eight percent of the variation. Their results provide several implications for subsequent

studies. Firstly, it is evident that non-listed Chinese companies introduce too much short-term debt. Secondly, state ownership plays a significant role in capital structure, while better institutional development limits the importance of state ownership in companies' financing decisions in China. Accordingly, effective policies are needed to extend the debt maturities for both listed and non-listed companies and to encourage the development of Chinese stock markets. Specifically, in the case of Chinese family businesses, Zhang et al. (2012) empirically examine the influence of non-state ownership on business expansion using data collected from 200 Chinese family firms in Henan Province. Their findings suggest a complex relationship; an inverted U-shaped relationship between family ownership and firm's annual expansion rate. Additionally, family ownership has a positive effect on firm's internal financing preference and a negative effect on firm's total expansion level. However, limitations exist in the research of Zhang et al. (2012). First, the sample size is small and only limited to one province; it would be more valid if the investigation is conducted across different places in China. Furthermore, the method of measuring business expansion seems to be inappropriate; it would be more convincing if measuring not only the number of employees but also the annual revenues of the firms. Pessarossi and Weill (2013) undertake further investigation about firms' preference for debt. They find evidence that, comparing to other nations, central government ownership of Chinese corporations is a key determinant of preference for the bond markets. In other words, SOEs are more likely to issue bonds and borrow uniquely on the bond markets, rather than tapping both debt markets.

Besides, it is also important to consider the impact of state ownership on the speed of capital structure adjustment. As it has been discussed in the previous chapter of this thesis, the factors that have an effect on adjustment costs of capital structure are expected to influence financial executives' decisions about the distance between actual and optimal leverage ratios and the frequency of rebalancing capital structure. According to the dynamic trade-off theory, firms' actual debt levels always deviate from the optimal levels, they would partially adjust towards their target leverage due to the existence of adjustment costs (Byoun, 2008). If the costs

of adjustment substantially offset the benefits of reaching optimal leverage, then the firms will have no incentive to adjust their capital structure. Qian et al. (2009) indicate that state ownership is important for firms' decisions about adjusting leverage. They find that state ownership is significantly and negatively related to the adjustment speed of capital structure during 1999 to 2004 based on a sample of 650 Chinese listed companies. To further test the above assertions, this study uses a larger sample of 1695 firms with newly released data to estimate the effects of state ownership on the adjustment speed of capital structure.

Hypothesis 7: state ownership is negatively related to adjustment speed of capital structure

5.3 Research Methodology

5.3.1 Sample and Data collection

5.3.1.1 Full sample:

Data are retrieved from CSMAR, a database providing China's economic and financial data. The firms that are listed on the Shanghai Stock Exchange (SHSE) and Shenzhen Stock Exchange (SZSE) for shorter than three years are dropped from the sample. All firms in any industry other than financials are included in the sample. To deal with outliers and most extremely mis-recorded data, firm-specific variables are winsorized at 0.5% level in both tails of the distribution. The final sample is an unbalanced panel which includes 1695 listed firms from 2003 to 2013. The reason for using data since 2003 is due to the fact that reliable data about shareholders has been available since 2003 in the CSMAR database. Furthermore, since the China Securities Regulatory Commission (CSRC) required that board members of listed firms should include at least one-third independent directors by the end of June 2003, this sample period allows us to control for relatively stable independent director ratios. The choice of 2013 as the end of this sample period is because this is the latest year for which data on corporate governance were available when this study was carried out.

5.3.1.2 Subsamples:

According to the nature of ultimate controlling shareholders, the sample of this chapter is further classified into two groups whose dominant shareholders are state-owned and privately-owned firms respectively (referring to Classification Standard for Related Party Nature which is released by CSMAR database). There is a comparison among the two portfolios in section 5.4.2.

5.3.2 Variables:

5.3.2.1 Dependent variable:

The dependent variable, capital structure, is measured by book total leverage ratio (Total_lev: total liabilities to total assets). As mentioned earlier in chapter 4, difference exists between market ratios and book ratios of capital structure; they should not be treated as equivalent because book value-based measures of leverage are calculated based on historic values while market value-based measures are calculated as current values (Barclay and Smith, 2001; Frank and Goyal, 2003). However, in this chapter only book ratios are used to measure leverage because in the context of the Chinese listed firms, there is a relatively high fraction of restricted shares which is non-tradable in the Chinese stock market as shown in Table 3-3 in chapter 3. This will result in an excessively high market value of debt ratio, as the market ratio of leverage is calculated as the ratio of total debt divided by market value of equity, and the market value of equity is equal to share price multiplied by number of shares outstanding. Second, the aim of this chapter is to estimate the effects of corporate governance on capital structure, here, the market leverage seems to be an unreliable guide to financing decisions because market value of equity strongly fluctuates which in turn may not reflect the underlying alterations initiated by CFOs (Graham and Harvey, 2001). Thus, this chapter uses book value-based measures of total leverage to proxy capital structure. The dependent variables are winsorized at 0.5% level in both tails of the distribution to avoid outlier messes up the analysis.

5.3.2.2 Independent variables:

The explanatory variables include ownership concentration, board structure, management ownership and state ownership. Board structure is proxied by three variables: board size, board independence and chair/manager duality. Board size (BS) refers to the natural logarithm of total number of directors on the firm's board. Board independence is measured by the fraction of independent directors on the board (BI). Chair/manager duality (Dua) is employed as a dummy variable that takes the value of 1 when a manager is also the board chairman of the firm and takes the value of 0 when a chairman has no other identities at the same time. Ownership concentration is measured by the percentage of shares held by the largest shareholder (LS). State ownership (SO) is measured as the ratio of state-owned shares to total shares. The state-owned shares include state shares and state-owned legal person shares. Management ownership is measured as a dummy variable (MSD) that takes the value of 1 when a firm has managerial shareholdings and takes the value 0 when a firm has no managerial shareholdings. The reason why management ownership is constructed as a dummy is illustrated later in section 5.4.1.

5.3.2.3 Control variables:

The determinants of capital structure which are proved to have significant and relatively bigger effects on leverage in the previous chapter are selected as control variables in this chapter, including firm size (Size), profitability (Prof) and earnings volatility (Evol). The measures of these control variables are consistent with the previous chapter of this thesis. Detailed definition and measurement of the variables used in this chapter are presented below in Table 5-1.

Table 5-1: Variable definition and measurement

Variable	Indicator	Measurement
Capital Structure	Book total leverage ratio	Ratio of total liabilities to total assets
	Book long-term leverage ratio	Ratio of long-term liabilities to total assets
Explanatory Variables	State ownership	Ratio of state-owned shares to total shares
	Ownership concentration	Shareholding percentage of the largest shareholder
	Board size	Natural logarithm of total number of members on the board of directors
	Board independence	Ratio of the number of independent directors to the total number of directors on the board
	CEO duality	Dummy; takes the value of 1 when a manager is also the board chairman of the firm and takes the value of 0 when a chairman has no other identities at the same time
	Management ownership	Dummy; takes the value of 1 when a firm has managerial shareholdings and takes the value 0 when a firm has no managerial shareholdings
Control Variables	Firm size	Natural log of total assets
	Profitability	Ratio of operating profit to total assets
	Earnings volatility	The absolute difference between the annual percentage change in EBIT and the average of this change over the sample period

5.3.3 Methodology

This chapter uses dynamic-panel-data Generalized Method of Moments (DPD-GMM) analysis methodology to analyse the dynamic capital structure models. The regression model estimating the dynamics of capital structure is expressed as follows:

$$Y_{it} = (1 - \delta_{jt})Y_{i,t-1} + \delta_{jt} \sum r_i X_{it} + u_i + \varepsilon_{it} \qquad (1)$$

where δ_{jt} is the speed of adjustment to the target leverage ratio. Y_{it} is the observed leverage ratio of company *i* at time *t* and $Y_{i,t-1}$ is the lagged one period leverage ratio. X_{it} is the explanatory variables of company *i* at time *t*. u_i is an unobserved individual impact of firm *i*. ε_{it} is the standard error term. Both year and firm fixed effects are included to control for omitted firm-and year-specific factors (Zhou et al., 2016). If δ_{jt} = 1, the company makes a full adjustment and reaches its target ratio at time t. If δ_{jt} = 0, there is no adjustment occurring. While δ_{jt} > 1 means over-adjustment; the firm makes unnecessary adjustment and is still not at its target leverage. If the cost of adjustment to the target leverage is high, then the company may find that it is not optimal to adjust fully, then a partial adjustment would be taken instead.

The difference and system GMM estimators, developed by Holtz-Eakin et al., (1988), Arellano and Bond (1991), Arellano and Bover (1995) and Blundell and Bond (1998), are proved to be the most efficient estimator for dynamic panel data model. Because the fixed effects (u_i) are correlated with the lagged variable ($Y_{i,t-1}$), OLS, fixed effects and random effects cannot be used for the first-differenced model which will lead to biased and inconsistent results. Thus, in this chapter, the two-step difference and system GMM estimations are used to control for individual heterogeneity and multiple endogenous variables, in order to avoid dynamic panel bias (Roodman, 2009). The detailed procedure of how the dynamic partial adjustment model (Equation 1) is generated and the relevant methodological issues about DPD-GMM have been presented in section 4.3 in chapter 4. This chapter uses the same dynamic models and methodologies as chapter 4.

5.4 Empirical Results and Discussions:

5.4.1 Preliminary analysis:

Table 5-2: Summary statistics of the variables used in this chapter, 2003-2013

Variable	Mean	Std. Dev.	Median	Min	Max
Panel A: capital structure variable					
Total leverage	0.5411	0.2262	0.5382	0.0466	1.7526
Panel B: control variables					
Firm size	21.836	1.241	21.705	18.768	25.317
Profitability	0.0316	0.0733	0.0332	-0.3315	0.2325
Earnings volatility	0.0676	0.1036	0.0428	0.0011	0.8885
Panel C: explanatory variables					
State ownership	0.1982	0.2450	0.0240	0.0000	0.9712
Largest shareholding	0.3814	0.1625	0.3607	0.0220	0.8941
Board size	2.2192	0.2059	2.1972	1.0986	2.9444
Board independence	0.3590	0.0541	0.3333	0.0000	0.8000
CEO Duality	0.8494	0.3577	1	0	1
MSD	0.7051	0.4560	1	0	1
MS	0.0709	0.1693	0.0001	0.0000	0.9945

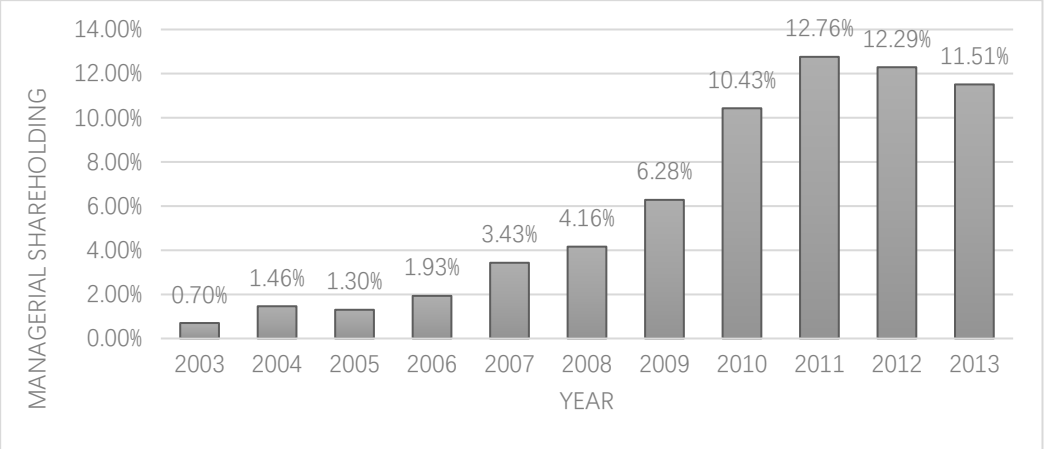
Note: This table reports the descriptive statistics of the variables used in this chapter. All of the data is gathered from CSMAR database. Firm size, profitability and earnings volatility are control variables which have been proved to have significant effects on capital structure in Chapter 4. CEO duality (or named as Chair/Manager duality) and management ownership (MSD) are dummy variables.

Table 5-2 reports the summary statistics for the variables of the full sample from 2003 to 2013. Panel C of Table 5-2 shows that the degrees of control by the state vary greatly among the firms in the sample, consistently ranging from 0 to 0.9712, given that the means of state tend to be closer to the lower limit, the distribution of SO is fairly skewed. It also shows that the largest single shareholders hold an average of 37.45 percent of the total shares over the sample period, supporting the finding that Chinese listed companies are dominated by a single shareholder (Chen et al., 2009; Conyon and He, 2011). As mentioned earlier in section 3.5.3 in Chapter 3, one distinct characteristic of Chinese listed firms is that they have a single dominant shareholder whose ownership goes far beyond that of the second

largest shareholder (Chen et al., 2009). Its low standard deviation (0.1591) means the values of largest shareholding are highly concentrated around the mean; there is relatively small variability in the ownership concentration. The mean value of board size is 2.2192 which is measured as natural logarithm of total number of directors on the board. As expected, the average ratio of independent directors on the director board is approximately 36 percent during 2003-2013, given that the authorities stipulate that the boards must contain about one-third independent directors by the end of June 2003 (CSRC, 2004). Moreover, 84.94 percent of the firms in this sample have a CEO or a senior financial manager that is also the chairman of the board simultaneously at year *t* during the sample period, and 70.51 percent of the firms/years have managerial shareholdings.

Managerial shareholding (MS) is generally measured by the ratio of shares held by the managers to total shares in the previous studies. In the last column of Table 5-2, it is notable that the average ratio of MS is about 7.09 percent. Such a minor fraction of shares might not be able to incentivize managers to act in the best interests of shareholders. The median MS (0.0001) is considerably lower than the mean MS (0.0709), indicating that firms with lower management ownership dominate the Chinese market. According to the practical situation that few firms in China have managerial shareholding, it seems that it is meaningless to use management ownership as a determinant for capital structure decisions. Figure 5-1 shows the annual average fraction of managerial shareholding for Chinese listed firms during 2003-2013. We can see that the percentage of managerial shareholding had increased from 0.7 percent in 2003 to 12.8 percent in 2011 and leveled off since then. The low fraction of managerial shareholding indicates that managerial shareholding has not been widely adopted as an incentive mechanism yet and it is much less of a force in China. Thus, managerial ownership is constructed as a dummy variable (MSD) in the models.

Figure 5-1: Annual average value of MS (managerial shareholdings) (%), 2003-2013



Source: Author's work using CSMAR database

Table A-5 reports the correlation matrix of all the variables employed in the subsequent regression analyses. In this chapter, largest shareholdings and state ownership are tested in different models due to the fact that almost 50% of Chinese listed firms have the state as their ultimate controlling shareholder by the end of 2013. To avoid the problem of multicollinearity, state ownership is excluded from the models that including largest shareholdings as explanatory variable, and it is tested separately in section 5.4.3. The relationship between corporate governance mechanisms and leverage is estimated in the following sections.

5.4.2 Regression results of corporate governance and capital structure

In Table 5-3, column (i) - (ii) present the estimation and test results of two-step system and difference GMM estimates for the dynamic panel data models of the full sample. Column (iii) - (vi) present the two-step system and difference GMM estimates of firms whose ultimate controlling shareholders are state-owned enterprises (SOEs) and privates; this comparison is useful for investigating whether the effects of corporate governance mechanisms vary between different ultimate controlling shareholders.

One potential weakness of two-step difference GMM estimation is that the standard errors it produces tend to be biased downward in finite samples (Blundell and Bond, 1998). To deal with this issue, the procedure advocated by Windmeijer (2005) is adopted to correct the standard errors of two-step difference GMM (Qian et al., 2009). The system GMM that proposed by Blundell and Bond (1998) has been proven to be more efficient than difference GMM and have superior finite sample properties. In order to improve estimation accuracy, this chapter mainly rely on the estimates of two-step system GMM. The two-step difference GMM estimation is presented in column (ii), (iv) and (vi) in Table 5-3 as a robustness check. The results of difference GMM estimation are consistent with the results of system GMM estimation, indicating that ownership concentration (LS) is positively related to total leverage and board size (BS) and board independence (BI) are negatively related to total leverage ratios. It is interesting that chair/manager duality (Dua) has no significant effect on capital structure for the full sample, and whether a firm has or has no managerial shareholdings would cause no impact on corporate financing decisions.

In column (i) in Table 5-3, Arellano-Bond test AR (1) and AR (2) as well as Hansen test statistics all suggest that the dynamic panel-data regression of total leverage ratio is well specified. There is no serial correlation or over-identifying restrictions problems. In column (i), the coefficient on lagged total leverage ratio (1-δ) is 0.6208 and is highly significant which implies that the speed of adjustment towards target leverage is only 0.3792 (δ=1- γ =1- 0.6208=0.3792) on average during 2003-2013. The adjustment speed of leverage estimated in this chapter is much closer to that reported by Flannery and Rangan (2006) which is 0.341 for the U.S. firms, and is much slower than that of the U.K. firms (0.57) as reported by Ozkan (2002). Through empirical evidence, this chapter finds that largest shareholding (LS) has a weak but positive effect on capital structure of Chinese listed firms during the sample period. In column (ii), we can see that largest shareholdings (LS) is significantly and positively related to total leverage ratios. It indicates that with highly concentrated ownership, firms prefer to have high debt levels. This result is consistent with the results of Paligorova and Xu (2012) and Margaritis and

Psillaki's (2010). It does not support the implication of agency theory. It is opposite to the findings of Jensen and Meckling (1976) who argue that a rise in insider ownership would incentivise them to decrease debt levels.

The coefficient on board size is statistically significant at 1% level in column (i) and significant as well at 10% level in column (iii), showing that board size is positively related to total leverage ratio. It is consistent with the findings of Jensen (1986). This result supports my hypothesis that a firm's debt level is expected to be higher when the size of board of directors is larger. Larger boards tend to have weakening corporate governance because, with more board members, it is more difficulty to reach a consensus in decision making; the weakening corporate governance could result in high debt levels (Jensen, 1986). Board size is widely used as an indicator of board control over the CEO in numerous previous studies (e.g., Chaganti et al., 1985; Zahra and Pearce, 1989; Lipton and Lorsch, 1992; Pearce and Zahra, 1992; Ocasio. 1994). The result of this study is in line with these prior empirical studies and proves the significance of board size.

In comparison with other explanatory variables in this sample, board independence has the strongest effect on total leverage. In column (i), it shows that total leverage will decrease by 0.5978 with one percent increase in board independence, holding other variables constant. Board independence has a significant negative effect on total leverage for the sample firms. This result proves the theoretical implication that board independence is one of the most important corporate governance mechanisms for decisions on capital structure. It is inconsistent with my hypothesis and opposite to the findings of Harford et al. (2008). It is in line with the implication of pecking order theory. As suggested by Alves et al. (2015), the increase of board independence will decrease information asymmetries for both equity-holders and debt-holders. As the information asymmetries between managers and investors are reduced, the costs of issuing more risky securities will decline accordingly because the risky securities are more sensitive to information asymmetries than the low risk

ones (Myers and Majluf, 1984). As a result, firms will have lower debt levels as more securities are issued by the firms.

It is interesting to find that the coefficients on CEO duality is insignificant in column (i)-(vi) in Table 5-3. It implies that whether a firm's CEO or senior manager has a duplicate position as a chairman of the board or not, it would not cause any effect on this firm's capital structure decisions. This result does not support the findings of Fosberg (2004) and Abor (2007). Another important finding of this chapter is that management ownership is insignificant for corporate financing decisions. One possible explanation for this result is that the fraction of shareholdings held by managers is too small to cause any incentive effects for the managers. As stated above in section 5.4.1, firms with lower management ownership dominates the Chinese market. The average ratio of managerial shareholdings for the sample firms is about 7.09 percent during 2003-2013 as shown in Table 5-2. Such a minor fraction of shares is incapable to incentivize managers to act in the best interests of shareholders.

To examine whether the effects of corporate governance mechanisms vary among firms with different types of ultimate controlling shareholders, test results and estimates for firms whose ultimate controlling shareholders are SOEs (group b) and privates (group c) are given in column (iii – vi) in Table 5-3 as well. We can see that the speed of adjusting capital structure for group b (δ=1- γ =1- 0.7301=0.2699) is slower than that for group c (δ=1- γ =1- 0.6794=0.3206), suggesting that firms whose ultimate controlling shareholders are SOEs rebalance their capital structure less frequently than those that are privates. Evidence that adjustment speed of capital structure varies plausibly with ownership type provides support for the findings of Paligorova and Xu (2012). The coefficients on board size (BS) are insignificant in column (iii) and (iv), indicating that board size is insignificant for the financing decisions of firms whose dominant shareholders are SOEs. For the private controlled listed firms (column v-vi), board independence has no significant effect on their decisions about capital structure adjustments. The

stronger effect of board independence on capital structure is driven by the SOEs controlled firms (group b). Moreover, the magnitude of coefficients on ownership concentration (LS) for SOEs owned (0.0298) and privates owned firms (0.2807) also varies considerably. The results indicate that the effects of ownership concentration and board structure on capital structure vary among firms with different types of controlling shareholders. It supports my prediction that the type of controlling shareholders plays a significant role in the listed firms' decisions about debt or equity financing.

Table 5-3: System and difference GMM estimates for the regression models of firms' corporate governance mechanisms and capital structure, 2003-2013

	a) Full sample		b) State-owned		c) Privates	
	(i) System GMM	(ii) Difference GMM	(iii) System GMM	(iv) Difference GMM	(v) System GMM	(vi) Difference GMM
$Lev_{(t-1)}$	0.6208***	0.3549***	0.7301***	0.3064**	0.6794***	0.4777***
	(0.0839)	(0.0793)	(0.0663)	(0.1113)	(0.0833)	(0.1152)
LS	0.2232*	0.1208*	0.0298*	0.4250	0.2807*	0.3411
	(0.1365)	(0.2980)	(0.1531)	(0.3942)	(0.1140)	(0.3167)
BS	-0.5300***	-0.5672**	0.0854	0.1429	-0.0693*	-0.1610*
	(0.1796)	(0.2430)	(0.1322)	(0.1823)	(0.1423)	(0.1732)
BI	-0.5978*	-0.6873*	-0.3257*	-0.7048*	0.0716	0.0439
	(0.3924)	(0.4033)	(0.4565)	(0.4368)	(0.4144)	(0.4797)
Dua	0.0538	0.0263	0.0066	-0.0742	0.0704	0.0507
	(0.0499)	(0.0588)	(0.0653)	(0.0955)	(0.0475)	(0.0610)
MSD	-0.0548	-0.0353	-0.0205	-0.0243	0.0337	-0.0300
	(0.0453)	(0.0506)	(0.0276)	(0.0412)	(0.0520)	(0.0641)
Size	0.0498*	0.1381**	0.0283	0.2590***	0.0596**	0.1064**
	(0.0309)	(0.0586)	(0.0287)	(0.0775)	(0.0299)	(0.0535)
Prof	-1.2183***	-1.3754***	-0.8988***	-0.3241*	-0.8792***	-0.9790***
	(0.2520)	(0.2978)	(0.2353)	(0.2103)	(0.2212)	(0.3127)
Evol	-0.5142**	-0.3662*	-0.1519	0.2923	-0.5014**	-0.7328***
	(0.2187)	(0.2179)	(0.1716)	(0.2841)	(0.2255)	(0.2557)
Year Dummy	Yes	Yes	Yes	Yes	Yes	Yes
AR (1)	-10.09	-7.24	-10.86	-2.45	-7.47	-4.91
(Pr > z)	(0.000)	(0.000)	(0.000)	(0.014)	(0.000)	(0.000)

AR (2) (Pr > z)	-0.42 (0.674)	-0.90 (0.369)	-0.13 (0.893)	1.56 (0.119)	0.09 (0.928)	0.06 (0.952)
Sargan test (Prob > chi2)	62.88 (0.400)	50.09 (0.060)	94.23 (0.000)	52.19 (0.400)	46.76 (0.400)	36.87 (0.428)
Hansen test (Prob > chi2)	47.33 (0.378)	39.24 (0.327)	71.24 (0.008)	39.94 (0.299)	45.30 (0.459)	40.43 (0.281)
No. of firms	1689	1689	1120	1120	719	719
No. of instruments	64	54	64	54	64	54

Source: Author's work using CSMAR database

Note: This table reports the results from estimating Equation 1: $Y_{it} = (1 - \delta_{jt})\, Y_{i,t-1} + \delta_{jt} \sum r_i X_{it} + u_i + \varepsilon_{it}$

The dynamic panel data model is: $Lev_{it} = \gamma Lev_{i,t-1} + \beta_1 LS_{it} + \beta_2 BS_{it} + \beta_3 BI_{it} + \beta_4 Dua_{it} + \beta_5 MSD_{it} + \sum Z_i (control\ variables_j)_{it} + u_i + \varepsilon_{it}$

where *i* denotes a firm, *t* denotes a year, u_i refers to the unobserved constant individual impact of firm *i*, and ε stands for the error term. As there is a high collinearity between state ownership and largest shareholdings, state ownership is excluded from the regression models in Table 5-3 to avoid the problem of multicollinearity. The state ownership is investigated later in section 5.4.3.

To test the effects of corporate governance on capital structure, GMM estimation for the dynamic panel data model are employed.

The robust standard error is reported below the coefficient estimates in brackets.

AR (1) and AR (2) are the test results for first and second order autocorrelations of the residuals.

The p-values for the AR (1) and AR (2) are distributed below the test results in brackets

Sargan test and Hansen test are shown in the table to indicate whether the over-identifying restrictions are valid

The p-values for Sargan test and Hansen test are distributed below the test results in brackets

Number of instruments is shown in the last column in this table.

* statistical significance at the 10% level

** statistical significance at the 5% level
*** statistical significance at the 1% level

5.4.3 Regression results of state ownership and adjustment speed of capital structure:

This section examines the relationship between state ownership and adjustment speed of capital structure for the listed Chinese firms during 2003-2013. In the following analysis, I extend Equation 1, $Y_{it} = (1 - \delta_{jt}) Y_{i,t-1} + \delta_{jt} \sum r_i X_{it} + u_i + \varepsilon_{it}$, and endogenize the speed of adjustment to the target leverage ratio. I assume that the model to explain the speed of capital structure adjustment (δ_{jt}) is a linear function of a constant term and some explanatory variables, and the adjustment speed varies over time. δ_{jt} is the speed of adjustment to the target leverage ratio. z_{jt} is the firm-specific variables of δ_{jt}. The model is shown as:

$$\delta_{jt} = \beta_0 + \beta_j z_{jt} \qquad (2)$$

Then I substitute the linear specification for adjustment speed (Equation 2) into Equation 1, rewriting Equation 1 and we get the following expression for the leverage at time *t*:

$$Y_{it} = (1 - \beta_0 - \beta_j z_{jt}) Y_{i,t-1} + (\beta_0 + \beta_j z_{jt}) \sum r_i X_{it} + u_i + \varepsilon_{it} \qquad (3)$$

Multiplying Equation 3 out and then we get Equation 4:

$$Y_{it} = (1 - \beta_0) Y_{i,t-1} - \beta_j z_{jt} Y_{i,t-1} + \beta_0 \sum r_i X_{it} + \beta_j z_{jt} \sum r_i X_{it} + d_t + u_i + \varepsilon_{it} \qquad (4)$$

where d_t is a time-specific effect, and u_i is an unobserved individual impact of firm i. The time effects are included to control for omitted year-specific factors through the year dummy variables (Zhou et al., 2016). This equation can be estimated consistently and efficiently by the DPD-GMM estimation.

Table 5-4 shows the one-step and two-step difference GMM estimates for the dynamic panel data model (Equation 4) testing the effect of state ownership on the speed of capital structure adjustment. The system GMM estimation is not used in this section because the test results of Arellano-Bond test and Hansen test show that problems of over-identification and serial correlation exist within the system

GMM estimation. The analysis mainly focuses on the coefficient on the interaction term between state ownership, SO_{it}, and lagged leverage, $LEV_{i,t-1}$. Note that Equation 4 specifies a negative sign on β_j, therefore the sign of the respective estimate for the coefficient of the interaction term should be interpreted accordingly. A negative sign on β_j implies a positive effect while a positive sign on β_j implies a negative effect on the speed of adjustment. The results reported in Table 5-4 show that state ownership is significant for the adjustment speed of capital structure of Chinese listed firms during the sample period at the 10% level. It supports the findings of Qian et al. (2009). With higher concentrated state ownership, the firms tend to adjust slower or less frequently towards the target leverage ratios if their actual leverage ratios deviate considerably from their targets. One possible explanation for this result is that the adjustment costs of rebalancing capital structure are higher for firms with more state shareholdings. According to the dynamic trade-off model of capital structure, if the costs of adjustment are larger than the benefits of reaching the optimal capital structure, the firms will have no incentive to adjust their capital structure, and thereby they will reduce the frequency of adjusting towards their target leverage (Byoun, 2008).

Table 5-4: One- and two-step difference GMM estimates for the regression models estimating the relationship between state ownership and speed of capital structure adjustment, 2003-2013

	(i) One-step difference GMM	(ii) Two-step difference GMM
$LEV_{i,t-1}$	0.4517***	0.4458**
	(0.1204)	(0.1548)
SO_{it}	-0.4315**	-0.3925*
	(0.1567)	(0.1750)
Interaction	0.3970*	0.4012*
$SO_{it} * LEV_{i,t-1}$	(0.2058)	(0.2483)
Wald test	502.93	415.38
(Prob > chi2)	(0.000)	(0.000)
AR (1)	-6.78	-5.16
(Pr > z)	(0.000)	(0.000)
AR (2)	-0.39	-0.32
(Pr > z)	(0.698)	(0.750)

Sargan test (Prob > chi2)	109.34 (0.000)	109.34 (0.000)
Hansen test (Prob > chi2)	85.97 (0.000)	85.97 (0.000)
No. of instruments	54	54

Source: Author's work using CSMAR database

Note: This table reports the results from estimating Equation:
$Y_{it} = (1-\beta_0)\, Y_{i,t-1} - \beta_j\, z_{jt}\, Y_{i,t-1} + \beta_0 \sum r_i X_{it} + \beta_j\, z_{jt} \sum r_i X_{it} + d_t + u_i + \varepsilon_{it}$, with the two-step difference GMM estimator advocated by Arellano and Bond (1998)
The robust standard error is reported below the coefficient estimates in brackets
The results of AR test, Sargan test, Hansen test and Wald test are also shown in this table
The p-values for AR test, Sargan test, Hansen test and Wald test are distributed below the test results in brackets
Number of instruments is shown in the last row in this table

* statistical significance at the 10% level
** statistical significance at the 5% level
*** statistical significance at the 1% level

5.5 Conclusion

This chapter examines the effects of corporate governance on capital structure of Chinese listed companies during 2003-2013 by using dynamic panel data models. The results indicate that the shareholdings held by the largest shareholders are overwhelmingly large that largest shareholders are in a dominant position in most Chinese listed firms. The firms with more concentrated ownership will have higher debt levels. On the issue of board structure, board size and board independence have significant effects on firms' capital structure decisions. Firms' debt levels decrease with the increase of board size during the sample period. Board independence has the strongest impact on leverage ratios in comparison with other corporate governance mechanisms in this study. However, whether a firm's CEO or senior manager is also a board chairman at the same time does not influence this firm's financing decisions. This chapter also finds that management ownership has no significant effect on total leverage, indicating that managerial shareholdings have not been widely adopted as an incentive mechanism in China by the end of 2013. Furthermore, I find that the effects of corporate governance mechanisms on

capital structure and the speed of adjusting leverage vary plausibly with different types of ultimate controlling shareholders. Another important contribution that distinguished my analysis from previous empirical studies on capital structure is the finding of state ownership's impact on adjustment speed of capital structure. The empirical evidence in this chapter proves that the speed of leverage adjustment can be significantly affected by state ownership. The firms with lower concentrated state ownership tend to adjust faster towards their target leverage.

This study has several limitations that should be stressed. First, there might be a mismatch between the current conceptualization of CEO duality, actual patterns of data and the measurement of duality as suggested by Gove et al. (2017). This study uses the common approach to measure Chair/Manager duality as a dummy variable, which takes the value of 1 when a manager is also the board chairman of the firm and takes the value of 0 when a chairman has no other identities at year *t*. However, duality is highly unstable within firms across time periods. As all cases are classified as either non-duality (0) or duality (1) at a single point in time, it is insufficiently sensitive to control for the high levels of instability in CEO duality (Gove et al., 2017). Another limitation of this chapter pertains to the classification of privately-owned firms. I noted that the CSMAR database fails to identify the ultimate owner of "domestic legal person shares". There is a possibility that the ultimate owners of "the legal person shares" are institutions controlled by the central or a local government. If so, classifying the legal person shares into the group of privately-owned firms would be improper. As the state controls the legal person who in turn controls the firm, thereby the ultimate owner of the firm is the state, not the legal person itself (Liu and Sun, 2005). Unfortunately, this classification due to unclear interpretation of legal person shares is very common in prior literature. For instance, the studies of Xu and Wang (1999), Qi et al. (2000), Sun et al. (2002) and Liu and Sun (2005) are all based on such an ad hoc classification. This problem is expected to be solved in my future studies. Moreover, limitations also arise from the quality of data used; although the data was collected from CSMAR, it is quite possible that there are inaccuracies in firms' annual reporting.

CHAPTER 6. A QUALITATIVE STUDY OF CORPORATE FINANCING DECISIONS

6.1 Introduction

This chapter presents interviews with financial executives from some Chinese listed firms and provides a discussion of the financing choices by these decision makers. As opposed to the quantitative analysis of the secondary data in the previous two chapters, in this chapter, I carry out a qualitative analysis of first-hand observations from the interviews. Findings obtained in this chapter can complement the previous two chapters and help us better understand the issues related to capital structure. This chapter intends to investigate the hidden motivations behind the financing choices and to find out the stories behind the figures. This research also aims to verify which of the capital structure theories are consistent with the financial executives' views; to identify whether there are other factors specific to the Chinese firms, such as a firm's network resources and the relationships with banks or local governments that have not been discussed in the previous chapter. Any barriers that faced by the listed firms to finance in China are also examined. Overall, this research examines the sensitivity of capital structure dynamics to China's unique institutional environment. The semi-structured interviews with firms' CFOs, financial managers and secretaries of the board are utilised to explore their decision-making process in practice. Apart from the managers of listed companies, market participants also include the government, investors, securities firms and stock exchanges. In order to have a more comprehensive understanding of corporate financing behaviour, I also interviewed two government officials and three bank managers to analyse the process of corporate financing from their views.

The qualitative method used in this chapter has several unique advantages in comparison with the quantitative methods. Firstly, it allows me to ask direct questions of the managers' attitudes toward the assumptions of capital structure theories. This approach permits the observation of how managers engage with theoretical formulations in the field, hopefully contributing to the development of existing theories and motivating new ones. Moreover, surveys can provide valuable information which enables me to better deal with the situations in practice. Thirdly,

corporate managers may find the surveys useful in learning about the managerial policies of their peers. However, the qualitative method has several limitations. For example, the interviewees may misunderstand the interview questions so that their answers may not be useful, or when being asked sensitive questions, the managers may not express their real thoughts or just give a stock response. In addition, fieldwork researchers also face the risk that the respondents may not be representative enough of the population which could bias the results. Despite these limitations, qualitative data analysis is a useful complementary method to empirical studies by quantitative analysis.

The volume of qualitative research about corporate financing and corporate governance of enterprises in developed economies has grown recently, such as the studies of Moore and Reichert (1983), Harris and Raviv (1991), Shleifer and Vishny (1997), Zingales (2000), Graham and Harvey (2001), Graham (2003), Bancel and Mittoo (2004), Brounen, de Jong and Koedijk (2006), Belloc (2011), Graham, Harvey and Puri (2013). These surveys, described and critiqued in section 6.2, have brought about a new set of knowledge and increased understanding of financial practices and rationales across countries. However, the number of surveys conducted on Chinese firms is quite limited. It is imperative to conduct fieldwork in China to survey financial executives in the Chinese firms. This chapter provides important policy implications on the basis of the findings about financing choices of Chinese listed firms in practice, which suggests that existing views about capital structure theories should potentially be modified. New theories may be expected to be developed based on this survey's results; through discovering the contexts in which existing academic theories present limitations to being fully implemented in the practical situation in China. This survey is one of the first of several studies that reports the results of an investigation on the thoughts of financial executives, government officials and bank managers in China. This field research will provide greater insights into the findings and shed light on which current capital structure theory is closer to reality in China, from the perspectives of financial executives' perceptions.

The remainder of this chapter consists of the following sections. Section 6.2 concerns the literature review of previous surveys about corporate financing. Section 6.3 presents the methodology in detail. The survey results are presented, and interview data is analysed is section 6.4. Section 6.5 gives some implications of the survey results. Section 6.6 states the limitations of this study and section 6.7 concludes this chapter.

6.2 Literature Review

Although qualitative studies about corporate finance are less common than their quantitative counterpart, surveys can provide valuable insights into the link between theory and practice of finance (Baker, Singleton and Veit, 2010). This section discusses the most important contributions and limitations of the surveys and summarizes where the literature stands today.

Stonhill et al. (1975) find that managing financial risk is cited as the most important component of capital structure policy by the respondents in the U.S., the Netherlands and Norway. Their findings from the survey supports the static trade-off theory of capital structure, in which managers issue high debt level due to the tax advantage of debt. Another relatively early survey about firms' financing policy from financial managers' perspective is Allen's (1991) research, who investigates the broad determinants of capital structure through using semi-structured interviews with financial executives and company secretaries of 48 Australian listed companies. He finds that the managers do not appear to consciously trade-off between the tax shields of debt and the bankruptcy costs when setting leverage ratios, as suggested by the static trade-off theory of capital structure. They are more concerned with the long-term survival and sufficient funding availability for their companies when making financing decisions. Allen's (1991) survey results foreshadow the findings of Graham and Harvey (2001) on the importance of credit ratings and financial flexibility for financing decisions. The research of Graham and Harvey (2001) is a landmark survey that provided valuable insights into the

theory and practice of corporate finance covering cost of capital, capital budgeting and capital structure. In comparison with the previous qualitative studies about corporate finance, the scope of Graham and Harvey (2001)'s survey is broader. They selected respondents from 392 financial managers in the U.S and Canada, which is a large cross-section sample. They find that the most important item affecting corporate debt decisions is management's desire for "financial flexibility". Their survey results show that their findings are consistent with the pecking order theory.

Later, Bancel and Mittoo (2004) surveyed firms in sixteen European countries to investigate the dynamics that affect firms' capital structure decisions. Their questionnaire was extremely similar to that of Graham and Harvey (2001). Bancel and Mittoo (2004) find that about 75 percent of surveyed firms have a target leverage ratio. The collected responses to their question: "Have your firm seriously considered issuing common stock? If yes, what factors affect your firm's decisions about issuing common stock?" showing that "maintaining a target debt ratio" is the second most important factor for issuing stock. "Earnings per share dilution" ranks first, which is consistent with the static trade-off theory. Moreover, Bancel and Mittoo (2004) use the responses to the question: "what factors affect how you choose the appropriate amount of debt for your firms?" to point out that financial flexibility is the most important factor affecting firms' decisions about issuing debt. This is consistent with the survey results of Graham and Harvey (2001). Bancel and Mittoo (2004) conclude that their evidence provides some support for the trade-off theory but less support for the pecking order, signaling and agency theories. In accordance with Graham and Harvey (2001) and Bancel and Mittoo (2004), the questions "what factors affect your decisions about issuing common stock for your firms?" and "what factors affect your decisions about issuing debt for your firms?" are included in my survey questionnaire.

Brounen et al. (2006) replicated the study of Graham and Harvey (2001) in the countries including the United Kingdom, France, Germany and the Netherlands.

Their survey questionnaire about capital structure exactly matches those of Graham and Harvey (2001). They also modified and added questions about capital budgeting and cost of capital to take a further step from Bancel and Mittoo's (2004) survey. Armitage and Marson (2008) surveyed sixteen financial managers of large firms listed in the United Kingdom. Their research relates to capital structure decisions in that it examines how executives perceive their role in affecting the cost of capital. One important finding of their research is that the survey results do not support the signaling theory; managers do not view signaling as a motive for disclosure thereby signaling does not influence firms' decisions about capital structure. Graham et al. (2013) subsequently conducted another wide-ranging survey mainly focusing on CEOs, finding that U.S. CEOs differ significantly from non-U.S. CEOs in terms of their underlying attitudes. They find evidence that links CEOs' personality traits and attitudes such as risk-aversion and optimism to corporate financial policies. For instance, more risk-tolerant CEOs tend to make more acquisitions and more optimistic CEOs prefer to have more short-term debt. Their findings also suggest that managerial impatience and time preference affect compensation structure, which is consistent with standard agency theory.

6.3 Methodology

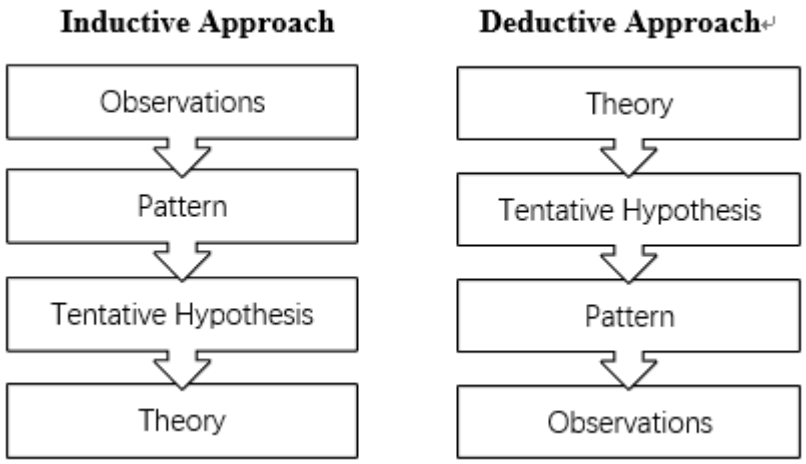
6.3.1 Method:

As described by Burgess (1984), the methods of field research contain direct observation, participant observation, interview and document collection. The qualitative interview can be seen as a conversation with a purpose; aiming to collect data through questioning a group of people or the individuals respectively. It is probably the most popular method of data collection in organisation studies (Thorpe and Holt, 2008, p. 118). Based on the degree of structuring, there are three types of qualitative interviews including un-structured, semi-structured and structured interview. The structured interview format requires that each interview is presented with exactly the same questions in the same order, and it also standardizes the order in which questions are asked of survey respondents. Oakley

(1981) and Wakeford (1981) argue that the structured interview drives the interviewer towards an unnatural relationship with the informants, therefore few researchers have followed the structured approach (Burgess, 1984). The semi-structured and unstructured style of interviewing gives those who are interviewed an opportunity to develop their responses outside a structured format. Hence the method of semi-structured interviews is adopted in this research. I use the method of semi-structured interview because it can help me gain reliable and comparable qualitative data. The information obtained from semi-structured interviews provided not just answers but also the reasons for the answers. I conducted face-to-face interviews with some financial managers and CFOs to collect detailed information about managers' motivations, considerations and decisions of financing. The semi-structured interviews enable my discussions with the managers to have greater flexibility and depth, because a majority of questions can be created during the pilot study and the interview. Moreover, with the open-ended questions, the interviewees can express their opinions more freely. After each interview, a transcript of the conversation was taken by myself daily, based on my notes and the recordings if permitted by the interviewees.

The semi-structured interviews are thematically analysed using a combination of inductive and deductive approaches. The inductive approach is widely used for less-structured interviews while the combination deductive/inductive approach is more frequently adopted for semi-structured and structured interviews (Miles et al., 2014). The stages of inductive and deductive approach are shown in Figure 6-1. The combination deductive/inductive approach included creation of thematic categories derived from previous literature (Schulz, 2012). The process involves both forward and backward linkages. In other words, the steps in the survey process are not necessarily sequential. Through using a combination of inductive and deductive approach, this allowed me to confirm whether the observations can support the capital structure theory and the hypothesis. It can help compliment empirical research by exploring why the theory either does or does not match practice. It also allows new ideas and themes to emerge.

Figure 6-1: Stages of inductive and deductive approach



Source: Schulz (2012)

6.3.2 Questionnaire design:

I constructed a list of questions based on a careful review of the existing literature. The questions served as a starting point of this project. To provide the best analysis of the information collected, the interview questions were developed into four types which are 1) categorical question, 2) ordinal question, 3) multiple choice question, and 4) open-ended question (Bennekom, 2002). Categorical data assigns numbers to represent different categories of answers. The best way to summarize categorical data is with frequencies. Frequencies report how many people gave a particular answer to a question. In ordinal questions, the number assigned to the answer category has meaning. One typical example of ordinal question is those that ask about attitudes ranked on a scale from lowest to highest. The lower number represents a lower quantity or quality than higher numbers. For example, for responses to the questions: "how important is retained profits as a financing source for your company?", the interview data is converted into a five-point rating scale: 1= not important, 2 = limited importance, 3 = somewhat importance, 4 = important, 5 = very important. Multiple choice question allows interviewees to select single or multiple answers. The open-ended question seeks to explore the qualitative, in-depth aspects of a particular topic or issue. It gives a person the chance to respond in detail. The list of questions is presented in Table A-6 in Appendices.

6.3.3 Validity and reliability of the research:

Several strategies were used to ensure the findings from semi-structured interviews were as valid and reliable as possible. Validity refers to the accuracy of the findings and the credibility of the researcher's interpretations (Silverman, 2013). As Perakyla (2011) states:

> "the validity of research concerns the interpretation of observations: whether or not the inferences that researcher makes are supported by the data, and sensible in relation to earlier research"
>
> (p. 365)

Baker, Singleton and Veit (2010) point out that a key to conducting a credible survey is to develop and execute an effective plan. At the early stage of research, a pilot pre-test should be used to improve the internal validity of this research. A pilot study is defined as a small study conducted in advance of the planned project, specifically to test aspects of the research design and to allow necessary adjustment before the main research is done (Kasunic, 2005). I conducted a pilot study with a senior director working at the stock exchange, a local entrepreneur and a bank manager who were excluded from the research sample. I then revised the draft survey based on their feedback and suggestions. Some questions were further developed, and some were deleted after conducting the pilot pre-test. The order of the questions was adjusted, and the wording of some questions was also changed. In order to enhance the face validity of the questions, feedback was also sought from academic colleagues and from industry respondents in the drafting of the initial interview script. As a result, the clarity, consistency and comprehensiveness of the questionnaire has been improved. The internal validity of the research was also improved by getting feedback from the key respondents during the interview process and after the transcription had been completed. Care was taken to ensure that the interviews were recorded, and the interview transcripts consistently and thoroughly analysed. The reliability of this research is also enhanced by repeatedly listening and analysing the recording of each interview, and through careful translation and transcription of every conversation. Additionally, in order to conduct a reliable survey, this research follows the seven-stage process proposed

by Kasunic (2005) which suggests that the survey process should 1) first, identify the research objectives; 2) identify and characterise the target audience; 3) design and plan the sample; 4) design and write the questionnaire; 5) pilot test the questionnaire; 6) distribute the questionnaire; and 7) analyse the results and write a report.

This research project has been reviewed according to the ethical review processes in place in the University of Nottingham. The process was governed by the University's Code of Research Conduct and Research Ethics. Before interviewing, the potential respondents were informed that any information they provided would be confidential. The interview data would be only used for academic purposes. The identities of interviewees and their companies would not be disclosed through any use of the information they had supplied during the survey. Such guarantees of maintaining confidentiality ensured that respondents would be full and frank in providing sensitive information during the research process.

6.3.4 Sample and Data Collection:

Interview participants were selected from publicly listed companies in a province located in the central area of China. All firms are included in the dataset of enterprises used in Chapter 4 and Chapter 5. The reasons for conducting the survey mainly in the central area of China is due to time limitation, fund shortage and personal networks. Burgess (1984) indicates that generally field researchers are not concerned about whether a research site is representative or not. He also claims that:

> "research sites may be selected where individuals are willing to cooperate, where the situation is convenient for the researcher and where the researcher has some contacts already established."
>
> (p. 59)

My aim for the fieldwork was not to get a representative sample of the various categories, but to gather a substantial body of information from the informants. The persons who are likely to give me most information on the topic were contacted beforehand. Due to the difficulties in approaching the research participants directly, three main intermediaries, namely a bank branch manager, a senior director working in Central China Securities, and a government official, were used to contact potential participants. Invitations were sent through emails to the potential respondents or they were contacted by telephone before setting times and dates for the interviews. To conduct further interviews, a snowball sampling technique was used. Some experts argue that the use of intermediaries may result in the use of non-probability sampling. However, prior surveys conducted in China have highlighted the challenges faced in using representative sampling techniques (Zheng, Morrison and O'Neill, 2009). It would be extremely difficult to gain access to the financial managers and CFOs without going through the intermediaries in China. Moreover, it would have been difficult to gain the trust of the potential respondents if there is no introducer. In other words, without an introducer, it would have been highly likely that the participants would not consider the interviews seriously or could provide less or meaningless information to me. The aim of my research is to get the most information on financing choice through stimulating an in-depth discussion with the decision-makers of the companies. Thus, the chosen sampling method is appropriate under such circumstances (Zheng et al., 2009).

This research focused on the listed companies of the traditional manufacturing sector. At the research design stage, it was intended that the interviewed companies in the sample should belong to different industries. However, due to time and access limitations, it became more beneficial to analyse one industry in detail and in-depth rather than to introduce a broad view of several industries on a superficial level. Accordingly, all the interviewed companies in this sample belong to manufacturing industry. A more detailed industry classification of the sample firms is shown in Table A-2 in Appendices.

As I use semi-structured interview approach, a list of key questions was prepared ahead of time. But the order of the questions varied depending on the flow of the discussion. The open-ended questions enable me to discuss with the managers with greater flexibility and depth. Conducting semi-structured interviews is a labour-intensive process and required me to spend over one month on the fieldwork to collect data during February and March 2015. The interviews were held formally in an office or a conference room. The interviews with firm B and firm C were of an unsatisfactory quality. These unsuccessful cases made me realise the importance of location for interviewing. The interview with firm B was in a teahouse and the interview with firm C was in a restaurant. As the surrounding environment was informal and quite noisy, the respondents were too easily distracted by other things and became impatient. I needed to try hard to bring the interviewees' attention back to the questions I wanted to discuss about. As a result, the interviews with firm B and C took much longer than the planned time schedule. In order to avoid this situation, subsequent interviews were all arranged in offices or conference rooms, which were quiet and formal venues. Each interview lasted between one and two hours. The total time spent in interviewing respondents is approximately 36 hours. In total, 27 interviews were conducted with participants involving seven CFOs, nine financial managers, six secretaries of the board, two government official and three bank branch managers, as shown in Table 6-1. Among these interviewees, five of them hold concurrent posts and play multiple roles in their firms. For example, they might hold the position of both deputy general manager and secretary of the board or financial manager. Apart from CFOs and managers of the companies, secretaries of the board also participated in the process of decision-making about financing. It is also necessary to gather information from the secretaries of the board. In addition to the potential interviewees from enterprises, the alternative viewpoints held by bank managers and government officials are important as well, as they have many years of experience dealing with issues regarding corporate financing. The information gathered from them is helpful for further understanding of regulations and policies regarding corporate finance.

Table 6-1: Position of the respondents

Position	Number
CFO	7
Financial manager	9
Secretary of the Board	6
Government official	2
Bank official (Branch Manager)	3

Before each interview, I fully investigated the participating firms to have a deep understanding of their background and development history, including conducting an analysis of their annual reports. I designed some information forms on the participating firms by myself, and I would fill in the forms after confirming the date with the interviewees. The forms include some essential information such as ownership, firm age, years of listing, number of employees, total leverage, long-term leverage, sales revenue, board independence, etc, as shown in Table A-7 and Table A-8 in appendices. Table A-7 shows information on firm age, industry of the firms and the job titles of the respondents. Table A-8 presents the summary information about the sample firms. Other data is omitted to be shown in the tables to avoid exposing the identities of the sample firms. This form was only used by myself for analysing the firms being interviewed. The data can be found in the companies' annual reports which are published for the public online. It was helpful for me to be well-prepared for the interviews and improve the accuracy of questions created during the interviews.

The interviews were conducted in Mandarin because all the respondents are Chinese. Notes for the interviews were taken by myself. The interviews were recorded if permitted by the interviewees to ensure accuracy of the information noted during the interview process. After each interview, I transcribed the conversation based on my notes and the recording. The process of transcription was very time-consuming, normally taking many hours for each individual interview. I made a promise to the participants during the interview process to maintain their confidentiality. Neither the interviewees' names nor their

organizations' names would be identified at any stage of the analysis. According to the requirements of the interviewees, the recording is to be kept confidential and can only be used by myself for academic purposes. Guaranteeing the protection of research participants' identity was extremely significant for this research as participants only agreed to provide sensitive information on condition of their anonymity being preserved.

6.3.5 Coding and data analysis

This section explains how the analysis of the interview data was undertaken. Coding was the main form of analysis used on the interview data. According to Silverman (2013):

> "coding your data according to some theoretical schemes should only be the first stage of your data analysis. Then you will need to go on to examine how these elements are linked together. At this second stage, lateral thinking can help. …One way of achieving better data analysis is by a steadily narrower focus."
>
> (p.247)

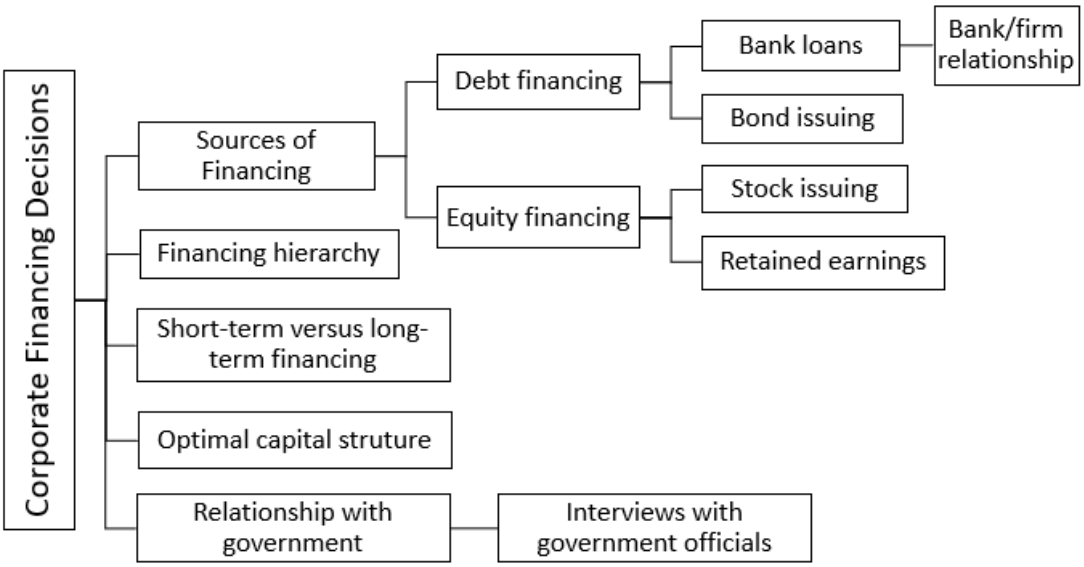
As suggested by Miles, Huberman and Saldana (2014):

> "questionnaire data can be pre-coded (process of assigning codes to expected answers on designed questionnaire), field-coded (process of assigning codes as soon as data is available, usually during fieldwork), post-coded (coding of open questions on completed questionnaires) or office-coded (done after fieldwork)."
>
> (p. 156)

This study uses the pre-coded, field-coded, and office-coded strategy to code the interview data. As all the 27 interviews were conducted by myself, I decided to use the method of manually coding the interview data rather than coding through computer programmes or software. First, the number of interviews is limited permitting coding by hand and making it relatively easier than coding through

software. Moreover, the process of coding by hand makes me re-think and reflect upon the interview transcripts, which allows me to have a better understanding about the interview data. As mentioned above in section 6.3.1, a thematic analysis strategy using a combination of deductive and inductive approaches was used for coding of the semi-structured interview. A new coding category was developed once a new theme had been identified during the analysis process. Even though the process of coding by hand is labour-intensive, it ensures the analysis of interview data is as reliable and credible as possible. Accordingly, six broad coding categories and a group of more detailed coding categories were developed. A summary of the themes and sub-themes of the interview data is provided in Figure 6-2 below.

Figure 6-2: Themes and sub-themes of the interview data



6.4. Presentation and Discussion of Findings

In this section, the main findings from interviews with respondents are presented and discussed. The findings are classified into categories that were developed based on the research questions and uncovered during the interview process.

6.4.1. Sources of Financing:

The respondents were asked to state the main financing sources used by their firms and to indicate the importance of each financing source. Among the 22 respondents, all confirmed that bank financing is the most important source of financing, five of them indicated retained earnings as one of the major financing sources, four of them have issued equity after IPO, and 13 of them have issued debt. Then I asked them the questions: 1) what are the managers' main considerations when making the choice between debt and equity financing; 2) how much debt or equity was issued, and what are the reasons behind the managers' decisions. I posed a fill-in-the-blank question:

> *"generally, the approximate percentage of total financing provided by each of the following sources of finance is ____, (except the period of financial crisis)"*

followed by nine prescribed choices including both equity and debt financing and an open response. The survey results are shown in Table A-9 in Appendices. From Table A-9, we can see that most firms mainly use four types of financing, namely retained profits, bank loans, equity issuing and debt issuing. Only a few firms can receive financial support from the government, and the amount of government funding is very limited. Among these respondents, only one firm (firm S) acknowledged that informal financing has been used. But the interviewee did not reveal which kind of informal financing it is. Column (1) of Table A-9 indicates that 31.8 percent (7 out of 22 companies) of the sample firms do not consider retained profits as financing source. Column (2) of Table A-9 shows that these firms rely heavily on bank financing. Except for firm V, all other firms have more than 30 percent of bank loans to total financing. Specifically, about 90 percent of Firm G's financing sources is bank financing. It seems that the Chinese listed firms in this sample have an over-reliance on bank loans. The detailed interview analysis of each financing source is stated below.

6.4.1.1 Debt financing:

Companies can have different types of debt, such as bonds, bank loans, commercial paper and medium-term notes, etc. They need to consider which type of debt to use and how much they should borrow. According to Table A-9, we can see that the sample firms mainly rely on two types of debt which are bond issuing and bank loans. Over 95 percent of these firms have more than 30 percent of bank loans, and 50 percent of them have bond issuing as a financing source. In accordance with Bancel and Mittoo (2004), the question "what factors affect your decisions about choosing the appropriate amount of debt for your firms?" is included in my questionnaire. Table 6-2 displays the results of this question; the ranking of the factors and mean scores are shown. Mean scores are based on a rating scale of 0 (not important) to 5 (very important).

Table 6-2: Respondent's ranking of factors affecting their decisions about issuing debt

Factor	Mean score	Rank
Level of interest rates	4.17	1
Credit rating	4.08	2
Insufficient internal funds	3.75	3
Financial flexibility	3.54	4
Transaction costs and fees for issuing debt	3.42	5
Volatility of cash flows	3.25	6
Overvaluation or undervaluation of equity	2.67	7
Potential costs of bankruptcy / distress costs	2.67	7

Table 6-2 summarizes the collected responses pertaining to the factors that affect firms' decisions about choosing the appropriate amount of debt. Almost 90 percent of the sample firms considered the level of interest rates as "important" and "very important" factor. They indicated that they prefer to issue debt when interest rates are low. This is because the costs of debt issuing are low when the level of interest rates is low. The collected responses show that level of interest rates is the most important item affecting managers' debt decisions (rating of 4.17 in Table 6-2). Firm's credit rating ranks as the second most important factor for debt financing (rating of 4.08). Financial executives are very concerned about credit ratings of

their firms, which is consistent with the findings of Allen (1991), Graham and Harvey (2001) and Bancel and Mittoo (2004). A deeper investigation about the impact of credit rating is presented in the section on bond issuing below. Insufficient internal funds rank as the third most critical factor encouraging firms to issue debt (rating of 3.75). When the internal funds are insufficient, over 70 percent of managers indicated that they would use external debt financing to enable their firms' daily operation and long-term survivability. A more detailed analysis about firms' financing hierarchy when internal financing is insufficient is presented in section 6.4.2. The Chinese financial managers do not take financial flexibility as the most important factor (rating of 3.54), which demonstrates a difference from the previous U.S. and Europe-based surveys (e.g. Allen, 1991; Graham and Harvey, 2001; Bancel and Mittoo, 2004). A comparison about the importance of the factor "financial flexibility" among surveys conducted in different countries is given in the following section. Graham and Harvey (2001) find that over half of the CFOs cited equity undervaluation as a major reason to use convertible debt instead of issue equity. In contrast, the findings of this research show that over 58.3 percent of executives do not take equity undervaluation as a major issue when issue convertible debt (rating of 2.67). As static trade-off theory of capital structure suggests that there is a trade-off between tax benefits of increasing debt levels and costs of financial distress that caused by higher debt (Modigliani and Miller, 1963), I asked the managers directly about whether financial distress costs cause any influence on their decisions about debt financing. The financial executives said that they are almost unconcerned about financial distress or the potential cost of bankruptcy (rating of 2.67). Their responses indicate that costs of financial distress and over- or under-valuation of equity are the least important factors for managers' debt decisions. The survey results do not provide moderate support for trade-off theory of capital structure.

The face-to-face in-depth conversations with the financial managers reveal some interesting findings behind the figures. About 40 percent of the respondents pointed out that they would like to raise capital when their companies are in a good situation.

Respondent A said that the amount of money his company borrowed this year is used for company's development of the next few years. He further explained that:

> "because our company is profitable and has been developed very well recently, the potential investors would like to invest in our company, and it is quite easy for us to borrow from the banks. On the contrary, if our firm's internal funds are insufficient to support firm's activities, it would be very difficult for us to access to debt financing. No investors or banks would like to lend money to firms facing deficit. That's why we raise capital more than the amount of we actually need right now. The extra amount of debt can be used to resist potential risks in the future."

The collected responses from other interviewees of firm D, E, K and L also support A's statements above. According to their statements, Chinese listed firms tend to borrow more money than actual demands require. It explains why the debt levels of the listed Chinese companies are high, especially for those firms belong to conglomerates and manufacturing industry. This finding is consistent with the results of Chapter 4.

Comparison with the previous surveys:

Table 6-3: Ranking of factors affecting firms' debt issuance decisions: comparison among surveys conducted by different researchers in different countries

Factor	U.K.	Europe	U.S.	China
Financial flexibility	1	1	1	4
Credit rating	7	2	2	2
Volatility of cash flows	2	3	3	6
Insufficient internal funds	6	12	4	3
Level of interest rate	8	6	5	1

Source: survey results of China is based on my own research, the U.S. results adapted from Graham and Harvey (2001), European results adapted from Bancel and Mittoo (2004) and other individual European country results adapted from Brounen et al. (2006).

Table 6-3 compares the results of my research with the survey results of Graham and Harvey (2001), Bancel and Mittoo (2004) and Brounen et al. (2006) regarding the question "what factors affect your decisions about choosing the appropriate amount of debt for your firms?" One of the most important findings from this comparison is that there is large international variation among the developed economies and China. Financial flexibility which is recognized as the primary indicator of a rule-of-thumb approach, ranks first in the United Kingdom, the United States and the Europe, but not in China. My survey results show that financial flexibility ranks fourth according to the responses from the Chinese financial executives. The most dominant factor considered by Chinese managers is the level of interest rates which is acknowledged as less important in other countries in Table 6-3. Volatility of cash flow ranks top-three in the United Kingdom, the United States and Europe, which is neglected to some extent by the Chinese managers. Table 6-3 also shows that credit rating is viewed as the second most important factor of debt policy in China, the United States and the Europe. Insufficient internal funds are also considered as a very important reason for debt issuing in China, while it ranks almost the least important one in Europe.

Bond issuing:

When I asked the financial managers whether they would like to consider issuing bond to raise capital, 90 percent of the respondents answered "Yes" to this question. Eleven of the sample firms have not issued bonds before, but most respondents mentioned that their companies were thinking about issuing bonds in the near future. When I asked them further why they did not issue bonds as a financing source before, the interviewees told me that there are numerous limitations on issuing bonds for listed companies in China. A company needs to carry a rating from a credit rating agency before issuing bonds. Credit ratings represent the likelihood of default; in other words, credit ratings are assessments of creditworthiness that are arranged on an ordinal scale; the scale is just a rank ordering of credit risk (Baker and Martin, 2011, p.300). Table 6-4 lists the major Chinese credit rating agencies. In China, the Chinese credit rating agencies (CRAs) are a direct product of Chinese regulators' mandate (Livingston et al., 2018, p. 216).

There are eight major CRAs in China including five domestic CRAs and three global-partnered CRAs. The CRAs will give a credit rating of the company based on its asset value, profitability, reputation, loan repayment capacity and growth characteristics, etc. Figure 6-3 shows the main scale used by the credit rating agencies in China. An "AA" rating represents higher credit risk than an "AAA" rating. Credit ratings are connected to the cost of debt; the higher the credit rating, the less the costs of bond issuing (Kisgen, 2006). For instance, a firm with an "AAA" rating" will pay less for issuing bonds than a firm with an "AA" rating. The respondent from firm N pointed out that the bond market is accessible to firms with good credit ratings. A firm's credit rating is the most significant factor in determining the cost at which a firm can borrow. Respondents from firm C, E and F told me that the reason why their companies did not issue bonds is that their companies' credit ratings are lower than competitors in their field, which result in higher costs of issuing bonds. Several managers indicated that when firm fundamentals were close to causing a change in rating, they would take action to improve their firms' credit ratings and they would not use bond issuing for financing until their credit ratings were increased. This finding is consistent with the results of Kisgen (2006).

Table 6-4: List of major Chinese credit rating agencies (CRAs)

	Company Name	Global Partner	Website
Global-partnered CRAs	Chengxin_Moody (CCXI)	Moody's	www.ccxi.com.cn
	China Lianhe Credit Rating Co., Ltd.	Fitch	www.lhratings.com
	Shanghai Brilliance Credit Rating &Investors Service Co., Ltd.	S&P	www.shxsj.com
Domestic CRAs	Chengxin Credit Rating Group (CCXR)	None	www.ccxr.com.cn
	Dagong Global Credit Rating Co., Ltd	None	www.dagongcredit.com
	Dongfang Jincheng Credit Rating Co., Ltd	None	www.dfratings.com
	Lianhe Credit Rating Co., Ltd.	None	www.lianhecreditrating.com.cn

	CSCI Pengyuan Credit Rating Co., Ltd.	None	www.pyrating.cn

Source: www.chinabond.com.cn; CSRC

Figure 6-3: Agency rating scales

Category	Scale
Investment grade	AAA, AA+, AA, AA-, A+, A, A-, BBB+, BBB, BBB-
Speculative or "junk"	BB+, BB, BB-, B+, B, B-, CCC+, CCC, CCC-, CC
Nonperforming	C, D

Source: www.chinabond.com.cn

Bank loans:

As shown in column (2) of Table A-9 in Appendices, five of the firms have over 70 percent of their financing as bank loans. Only one respondent (firm V) in the sample revealed that his firm does not rely on bank financing. The remaining companies have more than 30 percent of financing as bank loans. It shows that most firms tend to be over-reliant on bank financing. During the interview, an overwhelming majority of interviewees confirmed the critical importance of bank loans, and their comments are summarized below:

A: when our firm has the plan to expand or invest in new projects, we would like to mainly rely on bank financing.

B: for the large state-owned companies like our company, the banks would like to lend money to our company.

C: our firm has very good relationships with banks. We discuss our financial position with banks monthly. Bank financing is the first choice of our company.

F: we have a banking relationship with 15 banks. The flexibility to negotiate contracts with banks is valuable for us. Having a banking relationship with more than one banks gives us more choices.

Most firms confirmed that bank loans are their primary source of financing. They expressed their strong willingness to keep good business relationships with banks for the purpose of having easy access to bank loans. Then I designed several questions to explore their interactions with the banks, which are summarized below.

Relationship between firms and banks:

Table 6-5 displays a summary of responses to the questions "how many banks does your company maintain a strong connection with?" Table 6-6 displays a summary of responses to the question "how often do you report your financial position to the banks which have a banking relationship with you?"

Table 6-5: The number of banks have a banking relationship with the firms

	0	**1-2**	**3-5**	**More than 5**
No. of firms	1	3	8	10
% of total firms	4.5%	13.6%	36.4%	45.5%

Table 6-6: Frequency of discussing financial position with bank

	Weekly	**Monthly**	**Quarterly**	**Yearly**	**Only when a loan is needed**
No. of firms	3	5	7	3	4
% of total firms	13.6%	22.7%	31.8%	13.6%	18.2%

From Table A-9 and Table 6-5, we see that the majority of companies are over-reliant on bank-based financing. They tend to have a banking relationship with more than one bank. Ten companies (45.5 percent of total sample) have more than five banks with which they have a banking relationship. Among the firms in the sample, only one firm (Firm V) has no banking relationship with any bank. This firm is a well-developed large company with high profitability and low growth rate. The respondent from this firm said that his company has vast internal funding thereby bank loan is unnecessary for his company. Table 6-6 shows that a majority of the firms in this sample reported their financial positions to the banks with high

frequency (weekly, monthly and quarterly). Only four firms will not report their financial positions to the banks regularly, but rather only when they need bank loans. Such firms have one thing in common – they are all large profitable firms with good reputations, which means that they do not need to spend time on building connection with banks. The respondents from these four firms told me that banks show great initiative in lending money to their firms.

To summarize, the results indicate that the sample firms would like to make great efforts to keep a close relationship with banks and to devote a great deal of time to networking. When I further asked the managers how their firms interact with banks and how effective those activities are, the answers of the respondents all seemed very evasive, or corresponded to official rhetoric. Most of them did not give a clear answer to this question, but some of them did confirm that they need to develop their network ties with the bank officials; maintaining a strong connection with banks is very important for their companies' long-term survival. Their responses reveal that, first, their interactions with banks are considered to be very sensitive information that they are unwilling to disclose. Second, maintaining a strong connection with banks is very helpful for accessing bank loans for the Chinese firms. These are in line with the findings of Nguyen and Ramachandran (2000) showing that there is a positive relationship between the bank/firm relationship and firms' leverage ratios in the developing countries.

6.4.1.2 Equity financing

Issue stocks:

Stock issuing is also considered as a very important financing source by the respondents. As the 22 firms in this sample are listed firms, they all have issued initial public offerings (IPO) which is the first time that the stocks of the firms are offered to the public. 17 out of 22 firms in this sample have conducted seasoned equity offerings (SEOs) after going public. Echoing Bancel and Mittoo's (2004) survey, responses to the question "what factors affect your decisions about issuing

common stock for your firms?" are also reported in this research. Table 6-7 displays the results of this question; the ranking of the factors and mean scores are shown below. Mean scores are based on a rating scale of 0 (not important) to 5 (very important).

Table 6-7: Respondent's ranking of factors affecting their decisions about issuing common stock

Factor	Mean score	Rank
Costs for issuing stock (issuing stock is your cheapest source of funds currently)	4.42	1
Favourable investor impression (issuing stock gives a better impression of your firm's prospects than using debt)	4.08	2
Maintaining a target leverage ratio	3.67	3
Risk (stock is less risky than other financing sources)	3.5	4
Stock price (stock is undervalued or overvalued by the market)	3.08	5

This survey finds that costs of issuing stock is the most important factor considered by the interviewees (rating of 4.42 in Table 6-7). A majority of managers replied that they tend to issue common stock when it is the cheapest source of financing at some stage. The second most important factor incentives the firms to issue stock is that issuing equity can send a positive signal to the market (rating of 4.08). It provides a support for the signaling theory. The firm can give the potential investors a better impression of its prospects by equity financing than debt financing. Moreover, it also supports the empirical studies of Ross (1977) and Leland and Pyle (1977) who argue that firms use capital structure to signal their future prospects to the public. However, this finding is contrary to the survey results of Graham and Harvey (2001) and Bancel and Mittoo (2004) which indicate that very few firms' financing decisions are influenced by signaling effect. Maintaining a target leverage ratio ranks as the third most important factor (3.67); about 50 percent of the managers consider this factor plays an important or very important role in their decisions to issue equity. A summary of managers' comments about the target capital structure is presented later in section 6.4.4.

Another important finding is that stock price is the least important factor when managers think about issuing common stocks (rating of 3.08); whether the stock price is over- or under-valued by the market does not exert much influence on corporate financing decisions. It is inconsistent with the findings of Graham and Harvey (2001). In Graham and Harvey's (2001) survey, stock under- or overvaluation is considered to be the second most important factor for the issuance of common stock, with around 67 percent of the respondents marking it as important or very important.

Several managers also emphasized the importance of stock market development and the relevant regulations for stock issuing. In comparison with developed countries, Chinese stock markets adopted a fairly complicated share structure, which includes tradable and non-tradable shares. The tradable shares only accounted for one third of total shares by the end of 2013 (Chang, Chen and Liao, 2014). This means that about two thirds of shares in the stock markets are non-negotiable. The regulations about stock issuing are quite strict and are based on an approval system. Unlike the registration system that characterizes the IPO process in most developed countries, the CSRC (China Securities Regulatory Commission) tightly controls the process of initial public offering (IPO) and stock issuing in China. For instance, as of year-end 2013, many hundreds of firms have applied for a listing, but during a 14-month stretch in 2012 and 2013, no firm was granted an IPO (Chang et al., 2014). However, as the CSRC has recently confirmed plans to move the IPO process into more of a registration-based system, this system may change in the near future. But currently, according to the collected respondents from the interviewees, this approval system has obstructed most firms' willingness to issue stocks (over 60%).

Retained earnings:

Analysis of the interview data indicated that retained earnings is one of the main sources of capital for firms in the sample. Its importance for the firms' operations can be illustrated by the following comments from a number of respondents:

S: of course, retained profits are important for our firms' operation. The original capital and profits take about 20% of total capital used for our firm's development and investments.

However, there are a number of respondents who consider retained earnings as a relatively unimportant source for firms' business and investments.

K: as this is a very large listed firm, we need plenty of capital which mainly comes from external finance. Accumulation of profits is insufficient for the firm's development.

J: internal financing only accounts for a very small part of our total financing. It takes about 5% of the total capital.

Table 6-8 displays a summary of responses to the question "how important is retained profits as a financing source for your company?", through using a five-point scale, where not important = 1, limited importance = 2, somewhat importance = 3, important = 4, very important = 5.

Table 6-8: Respondent's ranking of importance of retained profits as a financing source

Level of importance	**1. not important**	**2. limited importance**	**3. somewhat important**	**4. important**	**5. very important**
Number of firms	2	3	7	6	4
% of the sample (totally 22 firms)	9.1%	13.6%	31.8%	27.3%	18.2%

Table 6-8 shows that 9.1 percent of the sample companies considered retained profits as "not important", and 18.2 percent of companies considered retained profits as "very important". Among the sample firms, the weighted average importance of retained profits is about 3.3, indicating that most firms consider retained profits as "somewhat important" for firms' financing. When I asked whether the firm chose retained earnings as their first financing choice, the collected responses indicated that about 15 percent of sample companies chose

retained earnings as their first financing choice. There are two companies in the sample do not use retained earnings for their further development or future investment. This indicates that the pecking order hypothesis of Myers and Majluf (1984) cannot alone explain capital structure choices of the sample firms in this study.

6.4.2 Financing hierarchy

According to the pecking order theory, firms prefer funding internal equity first, and then issue debt, the last is external equity financing (Myers, 2001). As internal financing has minor asymmetric information problems and low transactions costs, firms prefer internal financing when available. Additionally, if external financing is required, debt is preferred over equity. Graham and Harvey (2001) designed a survey to explore the extent to which the pecking-order model is reflected in corporate decision-making. They asked whether firms would issue shares when retained profits were not sufficient, and whether the company would issue equity if debt, convertibles or other sources of financing were not available. Their survey results show that their findings are consistent with the implication of pecking-order theory. I also asked the same question to Chinese CFOs but got different responses. The survey results about financial executives' attitudes toward financing hierarchy are summarized below.

To investigate whether the pecking order theory holds in the case of China, the first important thing to do is to clarify the definition of internal financing. During the interviews with Chinese managers, I found that when I mentioned *nei bu rong zi* (*内部融资*, internal financing), several respondents thought I was talking about employee share ownership. The conceptualization of what was meant by *nei bu rong zi* appeared to be different from my expectations. In the theory of capital structure, internal financing can be defined as a firm using its retained earnings and/or depreciation as a source of capital, rather than from outside sources. The intention was to inquire about internal financing; however, responses elicited from

managers seem to indicate that some managers understood this to be *nei bu yuan gong rong zi* (*内部员工融资*, capital raising by setting up an employee share scheme). I suspect that this may be owing to a lack of theoretical knowledge pertaining to finance, as it is my belief that practitioners in China are more likely to be led by examples from working practice. Therefore, when asking Chinese financial managers about financing hierarchy, as to whether they would choose internal financing as their first choice, it would be better to ask directly whether they would choose retained earnings as their first choice. This is very easily overlooked, which then causes unnecessary misunderstandings during interviews.

According to the collected responses from managers, Chinese firms (over 70 percent) have more debt than equity financing in practice because, first, the process of equity issuing is very time-consuming, and second, the China Securities Regulatory Commission (CSRC) have strict regulations that restrict firms' access to the equity market. Many firms' applications to make initial public offers (IPOs) and seasoned equity offers (SEOs) have been turned down because they cannot get permission from the CSRC (Firth et al., 2010). In recent years, the state has set numerical quotas for IPOs that are far below the number of eligible applicants. Furthermore, the existing shareholders would not like their companies to issue new shares as their value held in hand will be diluted. Moreover, the announcement of a new equity issue is usually bad news for the investors. They may take it as a signal of lower future profits or higher risk. Thus, if issues of shares are costly and send a negative signal to investors, companies would avoid issuing new shares.

However, respondents state that they would prefer external equity financing rather than debt financing in an ideal situation where there is no strict regulations and permission system. This is because the risk of equity financing is much lower than debt financing. A firm needs to pay back a loan by the maturity date if it issues debt, which will exert a huge pressure on the financial executives. The respondents stated that as there is no maturity date for issuing equity, they would prefer equity financing. The collected responses about the pecking order are consistent with the

findings of Chen (2004), implying that Chinese listed firms prefer retained earnings first, then external equity finance and lastly debt. However, the managers who are also shareholders in their firms prefer external debt financing to external equity financing, because new equity issuing has a dilutive effect on the ownership percentage of existing shareholders (Asquith and Mullins, 1986). Besides, some managers also pointed out that their preference for debt or equity is seriously affected by the macroeconomic factors. In practice, firms tend to have high debt levels during economic expansions because the stock prices, taxable earnings and expected bankruptcy costs increase during expansion. The pecking order theory suggests that firms' debt ratios should decrease when GDP is growing quickly because internal capital goes up during expansions.

Table 6- 9: Financing preference

	In practice	Under ideal situation
Equity financing		✓
Debt financing	✓	

The comparison table of the pecking order under the ideal situation and in practice is shown in Table 6-9. The survey results indicate that firms tend to follow a financial hierarchy in their financing patters; ideally, they prefer external equity, while in practice, they use external debt in most situation. The managers who are holding shares of their firms prefer debt financing because issuing new stocks increases the total shares outstanding which will result in equity dilution. It seems that the pecking order model cannot alone explain capital structure of Chinese firms.

6.4.3 Preference for short-term versus long-term financing

When I asked the managers whether they have preference for short-term and long-term debt, most interviewees (60 percent of total sample) replied that they prefer long-term debt. Ten percent of the respondents said that they do not particularly

favour long-term or short-term debt. The rest (30 percent) indicates that they tend to use short-term debt. This section summarizes the responses on factors that drive the financial executives' choices between short-term and long-term debt.

Almost 90 percent of respondents who prefer long-term debt said that the interest rates of debt are their first consideration as lower interest rates induce lower costs. They prefer long-term debt because the interest rates of long-term contracts are lower than the short-term contracts. The following comments underline the reasons for choosing long-term debt:

D: we use long-term debt because the interest rates of long-term contracts are lower. The costs of financing must be considered when we are making financing decisions. The long-term contracts can cause smaller costs than the short-term contracts.

A: it is because long-term contracts cause smaller amount of workload than that of the short-term contracts for us. In other words, we do not have to renew our firms' contracts very frequently.

B: Long-term debt causes less pressure on us. We can repay the bank by instalment before the due date which decreases the burden on our enterprise.

Respondent G's statement is very similar to respondent B's view:

G: generally, if the banks are willing to provide long-term debt for our company, we definitely favour long-term debt. If we borrow in the short-term, we have to pay back the principal loan every year which increases the burden on our company.

E: as our company is a large state-owned firm with good reputation, it is easy for us to get long-term debt approval from banks.

P: we use long-term debt to minimize the risk of refinancing in bad times.

Some interviewees said that they do not have special favour for long-term or short-term debt. It dependents on the purpose the capital is used for. The following comments reveal that the long-term and short-term financing are used in different ways:

F: we use the short-term debt as liquid capital for daily operation of our business. When our company made the decision to expand the factory, to increase the number of production lines or to introduce new equipment and technology, we used long-term loans.

N: generally, we use long-term debt for investment in fixed assets.

O: our firm's long-term contracts normally last for three years or more than five years, and the short-term contracts are between six months to one year. We mainly use long-term debt as project debt and use short-term debt for daily operation and production.

The managers (L and K) who prefer short-term debt replied that the most important reason is because the long-term contracts normally take a long time to get approved by the banks. Interviewee L and K stated that:

L: our firm prefer short-term debt because the approval of short-term debt is easier than long-term debt.

K: the approval of long-term contracts is more time-consuming than short-term contracts.

This argument was in line with my interviews with the bank manager:

Bank manager A: the approval of long-term contracts involves an evaluation process of the investment project and a market investigation. It might take several months or even half a year to complete the investigation.

Nevertheless, the managers who are also shareholders or firm owners prefer short-term debt:

I: as an owner of this firm, risk is the first thing I would consider when making decisions. I would choose short-term debt because long-term debt would cause higher risks for our firms.

J: our company has high profits; we do not need to borrow so much money. We would like to keep our firm's leverage at a low level to give a good impression for the investors.

According to their comments above, we can see that the managers prefer long-term debt mainly because first, long-term contracts cause smaller amount of workload and less pressure for the managers. Furthermore, the interest rates of long-term debt are normally lower than that of the short-term debt; accordingly, the costs of long-term debt are lower. However, the managers who are also shareholders or owners of their firms prefer short-term debt because the risk of long-term debt is higher than that of the short-term debt. This is consistent with the implications of agency theory. Besides, theoretically, a firm's choice between short- and long-term debt is associated with its credit rating. If a firm is currently assigned a low credit rating but it privately knows that its fundamentals are close to inducing an increase in credit rating, the firm will use short-term debt because its credit rating is expected to be improved (Flannery, 1986; Graham and Harvey, 2001). However, in practice, most respondents told me that they would not reflect over whether to choose short-term or long-term debt, but instead would use equity financing instead if their firms' credit ratings are low.

6.4.4 Optimal capital structure

In response to the question of "whether the managers believe their companies have an optimal capital structure and pursuing a target capital structure", Graham and Harvey (2001) point out that 71 percent of the CFOs responded to having a target

range for the leverage ratio, and 10% of them indicated having a strict target debt-equity ratio. Bancel and Mittoo (2004) find that about 75 percent of the European firms in their survey sample would like to make target debt ratios and adjusting debt levels towards their targets. Brounen et al. (2006) confirm that over two-thirds of the survey firms report a target leverage ratio. In my research, I also asked the financial executives whether they believe their companies have optimal capital structure and whether they are pursuing a target leverage ratio. Ten percent of respondents replied that they do not believe their firms have optimal capital structure, yet they did not have a target debt ratio. Baker et al. (2010) argue that there are two possible scenarios to explain this situation; either firms do not have optimal capital structures owing to possible flaws in the theory, or firms do have optimal capital structure, but practice lags behind theory and financial executives have not accepted capital structure theory as valid (p. 227). Over 60 percent of the firms replied that they have flexible target ratios or would allow the debt ratios to fluctuate within a range. About 30 percent of the firms revealed that they would keep their debt ratios just below 75 percent. This is because the banks have a de facto rule that they will not lend money to companies whose debt level is above 75 percent. Besides, most respondents also mentioned that they would take industry average leverage as a benchmark while making financing decisions. Industry average leverage can be used as a target capital structure for most firms (Hull, 1999). This is in line with the findings of Hovakimian et al., (2001) who prove that firms do adjust leverage ratios actively toward the industry median leverage.

The results of this survey do not fully support trade-off theory's implication about optimal capital structure. If a firm thinks that pursuing an optimal capital structure is worthless, it will not put effort on calculating the optimal leverage ratio. The results revealed above in section 6.4.1.1 about the managers' overlook of financial distress and bankruptcy costs also support this finding.

6.4.5 Relationship with government

When asked about managers' attitudes toward relationship with government authorities or the local government that is their primary market, all the interviewed managers are keen on acknowledging the value of the relationship. They would like to make great efforts to maintain good relationships with the authorities and the local government. Among these interviews, the response from interviewee R sparked my interest, so we had a deeper discussion about this issue. The conversation with him is summarized below:

R: maintaining a good relationship with government can help us avoid some troubles when dealing with the regulatory department.

Then I asked interviewee R what kind of trouble this might be:

R: for example, when you develop a new project and need to get approval of this new project. The person working in the examination and approval office may cause troubles for you to some extent in order to get benefits from you. If you have good relationships with his leaders or colleagues (*shang mian you ren, 上面有人*), he will not make it too tough for you (*ji dan li mian tiao gu tou, 鸡蛋里面挑骨头*). It can help you save time and avoid a lot of trouble. This is embodied through the Chinese proverb *bu kan seng mian kan fo mian* (不看僧面看佛面, to do something for a person or out of deference to a person because of his relationship with another person).

According to interviewee R's statement, it seems that the local government officials are less governed by laws and regulations. It is *guanxi* (关系) that matters when doing business in the Chinese market. The concept of social and personal networks, known in China as *guanxi*, has been proven to be of vital importance as a means of facilitating business dealings (Tsang, 1998; Todeva, 2007; Parnell et al., 2012). Chinese entrepreneurs would like to do business with familiar people rather than cooperating with strangers. Sometimes, an intermediary or an

introducer plays a very important role for doing business in China. The network of friends and acquaintances seems to be one of the most significant assets for Chinese companies. Chinese corporations use social networks to access information to forecast external changes (Tsang, 1998) and to access financing resources (Zhou, 2009).

Interviews with government officials:

For the purpose of maintaining a comprehensive analysis about firm/government relationship, I also had a deep conversation with two government officials. I asked them the following question:

> "During my interviews with the firms' financial managers, I found that most of them made great efforts to keep good relationships with the local government. How do you view this behaviour?"

The government officials WA and WB cited mainly four advantages for the companies if they maintain strong ties with the local government:

> "First, the companies who have a good relationship with government can access to the new policy information sooner than other companies. Moreover, it can help the companies maintain competitive advantage in their industry. The government actions may cause a significant effect on companies' economic value, thereby if one company can get the policy information earlier than others, they can figure out strategies in order to have an advantage over their competitors. Third, it might be easier for them to get financial support from the government if they have connections with the local government. Furthermore, the strong ties between government and the companies can help the companies signal a good reputation to their potential investors."

However, government official WB also mentioned that although keeping a good relationship with government is important for a company, what's more important

is its daily operation. The firm's earning capacity is the most important factor for its survival in the market.

6.5 Do Theory and Practice Actually Meet?

The survey responses indicate that gap existing between theory and practice. Some plausible explanations for this gap could be as follows. First, most financial theories are based on long-term time horizons whereas financial managers may focus on short-term financial activities. Furthermore, as has been indicated above, many practicing managers do not consistently follow any specific academic theory; they tend to rely upon their own experience rather than upon formulaic models. Survey evidence from Scott and Johnson (1982), Stonehill et al. (1986), Pinegar and Wilbricht (1989) and Norton (1991) suggests that no matter how positive an academic theory is, it is unlikely to capture how managers make financial decisions in practice. Graham and Harvey (2001) demonstrate that, contrary to theory, respondents appear to be favouring financial planning rules-of-thumb, like financial flexibility, over theoretical considerations, like the costs of bankruptcy. Baker et al. (2010) suggest that

> "…In the normative economic tradition, theories are designed to suggest how managers should behave and not to describe how they actually behave. When researchers empirically test these theories, their inability to accurately model what is occurring in practice in not surprising."
>
> (p. 233)

According to the trade-off theory of capital structure, firms would pursue an optimal capital structure. However, this research indicates that 10 percent of the sample firms do not have a target debt ratio. Over 60 percent of the firms have flexible target ratios or allowing the debt ratios to fluctuate within a range. About 30% of the firms revealed that they would keep their debt ratios just below 75%. This is because the banks have a de facto rule that they will not lend money to companies whose debt level is above 75%. The pecking order model of Myers and

Majluf (1984) hypothesises that firms first prefer internal financing, then external debt and lastly external equity. External debt financing is preferred over external equity. According to my survey results, in practice, 70 percent of the Chinese listed companies in this sample follow the pecking order. As indicated above in section 6.4.2, this is caused by the unique approval system of equity issuing in China. The process of equity issuing is highly costly and very time-consuming, and the China Securities Regulatory Commission (CSRC) have strict regulations that restrict firms' access to the equity market. CSRC strictly controls the process of IPOs and SEOs, which has obstructed most firms' willingness to issue stocks. This result supports the presumption of the pecking order that the costs of issuing external equity (costs arising from asymmetric information problems) are high. However, most respondents stated that they prefer external equity financing rather than debt financing under ideal situations. In other words, if the authorities had not strictly controlled the process of issuing equity, most financial executives would issue equity instead of issuing debt. The survey responses about pecking order under the ideal situation are consistent with the findings of Chen (2004), implying that Chinese listed firms prefer retained earnings first, then external equity finance and lastly debt.

6.6 Limitations

This section illustrates some limitations of the study and possible improvements that can be made in addition to the follow-up studies. One limitation of this research is that this survey was only conducted in the central area of China due to time and access limitations, while the survey results might be different for the firms located in other areas. Gregory et al. (2000) argue that there is large variation among provinces in the ways in which firms are financed. Future work might also be extended to the firms located in the coastal area in China. Furthermore, all the sample firms included in this chapter are large firms. With more informative datasets collected in the near future, survey results about small-sized or small-and medium-sized enterprises (SMEs) will be included, and a comparison between the financing behaviour of large firms and SMEs can be expected.

Another limitation of this research is that I assumed that all financial managers have sufficiently developed understanding of financial theories. However, during the interviews, I found that some of them did not have sound financial knowledge but rather relied on practical experience in firms' daily operations. Some financial executives are more likely to be led by examples from working practice rather than by theories. That is why I spent much time confirming every financial terminology with the respondents to ensure there was no misunderstanding between us. Although this process is time-consuming, I would suggest that it should not be neglected by researchers who intend to conduct surveys about corporate financing in China.

Nevertheless, I cannot guarantee that all the respondents' comments are honest and exactly reflect what they do in practice. Graham (2003) notes that sceptics view survey research as "unscientific":

> "The common attitude is that managers and investors can do very different things than what they say they do, and even if they do what they say, their real reasons for doing things can be different from the ones they cite."
>
> (p. 40)

6.7 Conclusion

This chapter discusses the factors influencing the capital structure decisions of Chinese listed firms through semi-structured interviews with 27 respondents including firms' CFOs, financial managers, secretaries of the board, government officials and bank branch managers. As semi-structured interview has been rarely used in previous financial research about Chinese companies, this study can provide unique information that complements the quantitative studies about financing decisions. It helps further understanding about how managers make decisions and how companies choose financing sources. This chapter finds that firstly, most Chinese listed firms only use external financing and do not consider retained earnings as financing source. The majority of them are heavily reliant on

bank loans. Such findings do not support the assertions of the pecking order theory. Moreover, the large listed firms do not have the tendency to decrease their debt levels even if they have an increase in their internal funds, contrary to the findings of Graham and Harvey (2001). It suggests that the large listed Chinese companies tend to be over-financing. Sometimes, they tend to have excessive debt financing even if they have enough capital for their daily operation and development. As a result, the small-sized or non-listed companies who urgently need financing for their growth are unable to approach financing sources in the markets, because considerable amounts of capital resources have been taken by the large listed companies.

Furthermore, when firms are thinking about issuing external debt, the level of interest rates is the most important factor considered by the respondents. This is different from the results of previous surveys (Graham and Harvey, 2001; Bancel and Mittoo, 2004) which indicate that financial flexibility is the top-ranked factor affecting firms' decisions about issuing debt. In addition, this research finds that the Chinese financial executives rely on their experiences rather than formulaic models or theories when making financing decisions. They tend to make the same financing decisions as they did in the past, even though past circumstances may no longer be relevant.

Another important finding of this research is that the survey results of financing hierarchy in this chapter are contrary to the empirical results of the previous two chapters. This is caused by the strict approval system of issuing stocks under the control by CSRC in Chinese stock markets. In practice, firms finance more through external debt than external equity. But firms would prefer external equity financing to external debt under an ideal situation where there is no strict approval system. Besides, most listed Chinese firms are risk-averse rather than risk-taking. A majority of them would try their best to keep their leverage ratios below 75 percent which is the default ceiling required by the banks. This is because the firms will bear the risk of no lending from the banks and no investment from their potential

investors if their debt levels are over 75 percent. This finding may shed lights on the need of addressing the misallocation of capital in the China markets.

CHAPTER 7. CONCLUSION

7.1 Introduction

This final chapter reviews the findings of this study, presents the empirical and methodological contributions made to the existing literature. Following this, the implications of this study which are helpful for the corporate entrepreneurs and policy makers are highlighted. This chapter concludes by discussing the limitations of the present research and providing suggestions for possible future research based on the results of this study.

7.2 Research Findings, Contributions and Implications

This study investigates the association between firm-specific factors, corporate governance mechanisms and corporate financing decisions through the estimation of dynamic panel data models. The speed of capital structure adjustment is estimated and the possible determinants for the adjustment speed are examined as well. This study suggests that attention should be given to explore the changing pattern and dynamic adjustment process of capital structure and the diversity of firms' financing decisions rather than just simply describing the relationship between firm characteristics and capital structure.

One significant empirical contribution of this study is made in through the testing of a dynamic partial adjustment model for capital structure of Chinese listed firms. The results of Chapter 4 support the findings of Leary and Roberts (2005) that the motivations behind corporate financing decisions are consistent with a dynamic rebalancing of capital structure. By analysing the process of making financing decisions as a dynamic process, it empirically proves that the listed firms partially adjust their leverage ratios towards the optimal levels. Empirical evidence of Chapter 4 also proves that larger firms tend to have higher debt levels and tend to adjust faster towards their target leverage than the small firms. Firms' profitability and growth opportunities have significant negative effects on capital structure. Profitability is the most critical core determinant for firms' capital structure decisions, while the effects of growth opportunities are very weak. According to

dynamic trade-off theory of capital structure, variation in adjustment speed of capital structure reflect the trade-off between costs and benefits of moving towards target leverage (Oztekin and Flannery, 2012). The results of this study find that speed of leverage adjustment varies among difference industries because of different business risk levels in industries. The industries with relatively higher risk in this sample have less debt and adjust more quickly towards their target leverage, such as conglomerates, retail trade and real estate industry, which is consistent with the implication of dynamic trade-off theory of capital structure.

Another distinct contribution of this study is made through the investigation of relationship between the speed of leverage adjustment and firm characteristics. Empirical evidence in Chapter 4 indicates that, among the firm-specific factors which are expected to affect costs of adjusting capital structure, only firm size has a significant effect on the adjustment speed of capital structure. The results show that larger firms adjust faster towards their target leverage ratios than the smaller ones. This study also gives some possible explanations for this positive relationship between firm size and adjustment speed of leverage. According to the theory of information asymmetry, larger companies with more information disclosure are expected to have better access to debt and equity financing, and thereby they should be more readily to correct deviations from the target leverage than the smaller companies. Secondly, according to the implication of agency theory, the large firms tend to have an improved guarantee of repayment, therefore they are generally believed to have greater capability to alleviate the conflicts between bondholders and shareholders (Jenson and Meckling, 1976). The agency costs for large firms adjusting their capital structure would be lower than the small firms accordingly (Drobetz and Wanzenried, 2006). In sum, it is the costs of adjusting leverage that determine a firm's speed of adjustment towards the optimal leverage. If the costs of adjustment are larger than the benefits of reaching the optimal capital structure, the firms would adjust at a slow speed or rebalancing less frequently towards their targets.

I have also documented some evidence of corporate governance mechanisms' effects on firms' financing decisions. The results of Chapter 5 indicate that largest shareholding has a weak but significantly positive effect on capital structure of Chinese listed firms. Firms' board size and board independence can also influence their financing decisions; firms tend to have lower debt levels with larger board size or with more independent directors in the boards. However, inconsistent with the previous studies (Friend and Lang, 1988; Mehran, 1992; Graham and Harvey, 2001), this study finds that management ownership has no significant effect on firms' leverage. The results indicate that managerial shareholding has not been widely adopted as an incentive mechanism in China during 2003-2013; management ownership is much less of a force in most Chinese listed firms. This study also finds that state ownership is significant for the adjustment speed of capital structure of Chinese listed firms. As evidenced in Table 5-4, with higher concentrated state ownership, the firms tend to adjust slower towards the target leverage ratios if their actual leverage ratios deviate considerably from their targets, which supports the findings of Qian et al. (2009).

In Chapter 6, semi-structured interviews were undertaken with 22 financial executives, two government official and three bank branch managers. The responses collected during the interviews in Chapter 6 indicating that the financial executives do not consciously trade-off between the tax shields of debt with the bankruptcy costs when setting leverage ratios as suggested by the static trade-off theory of capital structure. They are more concerned with the long-term survival and sufficient funding availability for their companies when making financing decisions in practice. The underinvestment problem theory of Myers (1977) finds less support in my survey perhaps because the managers are governed by practical rules such as transaction costs, financial flexibility and credit rating rather than by formulaic models or theories. Furthermore, when the financial managers making decisions about whether to issue equity or debt, they tend to rely on their experiences and make the same financing choice as they did in the past, even though past circumstances may no longer be relevant. The views expressed in this survey are not broadly similar to those reported for the U.S., U.K. or other

European countries. For example, a notable difference exists in the ranking of factors affecting firms' debt issuance decisions. Financial flexibility, being recognized as the primary indicator of a rule-of-thumb approach in the developed countries, only ranks fourth according to the responses from Chinese CFOs. Moreover, insufficient internal funds which ranks almost as the least important one in Europe, are considered as a very important reason for debt issuing in China. One further difference is that most Chinese firms would try their best to keep their leverage ratios below 75 percent. This is because 75 percent is the default ceiling required by the banks in China; the banks have a de facto rule that they will not lend money to companies whose debt level is above 75%. The firms face the risk of no lending from the banks and no investment from their potential investors if their debt levels exceed the default ceiling. In contrast with the survey results of Graham and Harvey (2001) about firms' financing hierarchy, evidence in Chapter 6 shows that the large listed firms in this sample do not have the tendency to decrease their debt levels even if they have an increase in their internal funds. It does not support the implication of pecking order theory. This research also finds that the costs of issuing stock is the most important factor considered by the financial managers as evidenced in Table 6-6, which provides a support for the signaling theory. This result is contrary to the survey results of Graham and Harvey (2001) and Bancel and Mittoo (2004) which indicate that very few firms' financing decisions are influenced by signaling effect. Survey results of Chapter 6 also indicate that the government still play a significant role in the financing of Chinese listed firms, which is different from that of the developed economies. Over 90 percent of respondents highlighted the importance of maintaining good relationships with local government officials. The concept of social networks (known in China as *Guanxi*) has been proven to be of vital importance as a means of facilitating business dealings, which are used by the Chinese entrepreneurs to access information to forecast external changes (Tsang, 1998) and to access financing resources (Zhou, 2009).

This study also makes methodological contributions to the existing body of research. The dynamic partial adjustment model is used in Chapter 4 and 5 to

capture the dynamic adjustment towards the optimum (Flannery and Rangan, 2006; Huang and Ritter, 2009). The dynamic model of capital structure is better for the investigation of the issue because the static model has omitted the past effects of leverage. In the static model, the variables take up the effects of the omitted variable will cause misspecification. Thus, using lagged leverage as instruments can alleviate the simultaneity problem and may therefore cleanse the other variables from the noise of omitted factors. Nevertheless, there is also an advantage of the estimation method used in this study. Arellano and Bond's (1991) difference GMM and Blundell and Bond's (1998) system GMM are used in this study, which can correct for the biases of other commonly used alternative estimations such as the pooled ordinary least squares (OLS), random effects (RE) and fixed effects (FE) estimation (Roodman, 2009).

Another methodological contribution of this study is made in through the using of mixed method of quantitative and qualitative data analysis. The mixed method provides valuable insights into the link between theory and practice of corporate finance by exploring why the theory either does or does not match practice. It also allows new ideas and themes to emerge. The usage of qualitative analysis in Chapter 6 is an important step forward, which can provide unique information that complements the quantitative studies about financing decisions. The method of semi-structured interview is helpful for communicating with the financial managers in-depth with great flexibility. It helps me overcome difficulties with collecting detailed information about managers' motivations, as so to find out the reasons behind their debt-equity mix choices. Moreover, the sensitivity of capital structure dynamics to China's unique institutional environment can be examined.

7.3 Limitations and Suggestions for Future Research

One limitation of this paper pertains to an inherent possibility of reporting inaccuracy. Although the data from CSMAR database was collected from the annual reports of Chinese firms listed in the SHSE and SZSE, listed firms may decorate their reporting information to the public which is common in most nations.

Secondly, this sample might not be representative of the population, as the sample firms are those that listed on SHSE and SZSE, which may not be generalized to all Chinese firms, listed and unlisted. Further work can be done on the unlisted Chinese firms. A comparative analysis between the two groups of firms, listed and unlisted, is expected to be conducted in the future. Although both market- and book-value-based leverage are used as measurements of capital structure, this study does not report why the signs of some coefficients on book and market value of leverage ratios would be opposite, which will be investigated in my future research. A more detailed analysis of the measurements of variables included in Chapter 4 and 5 would provide a fruitful source of further work. For the variable Chair/Manager duality, which is measured as a dummy variable in Chapter 5, there might be a mismatch between the actual patterns of data and conceptualization of manager duality. As duality is highly unstable within firms across time periods in practice, classifying it as either non-duality (0) or duality (1) at a single point in time might be insufficiently sensitive to control for the high levels of instability.

The survey results of Chapter 6 are limited to the listed firms located in the central area of China due to time and access limitations, which might be different from that of the firms located in the coastal area. Further work might be extended to the coastal cities in China to facilitate comparisons of firms' financing behaviour between different regions. Additionally, all the firms investigated in my survey are large firms. Survey results about small-and medium-sized enterprises (SMEs) can be expected with more interviews conducted in my future research. Another limitation of the qualitative data analysis is that I cannot guarantee that all the interviewees' comments are honest and exactly reflect what they do in practice; their real reasons for doing things might be different from the ones they cite.

Appendices

Table A- 1: Summary for Chinese listed firms

Year	No. of listed companies	No. of listed A-shares	Total market capitalisation of A shares (100m)
1990	10	6	208
1991	14	13	1,523
1992	53	54	978
1993	183	177	3,319
1994	291	287	3,516
1995	323	311	3,311
1996	530	514	9,449
1997	745	720	17,154
1998	851	825	19,299
1999	949	922	26,168
2000	1088	1060	47,456
2001	1160	1136	42,246
2002	1224	1200	37,527
2003	1287	1263	41,520
2004	1377	1353	36,309
2005	1381	1358	31,811
2006	1434	1411	88,114
2007	1550	1527	324,588
2008	1625	1602	120,567
2009	1718	1696	242,127
2010	2063	2041	263,221
2011	2342	2320	213,310
2012	2494	2472	228,775
2013	2489	2468	237,500
2014	2613	2592	372,547

Source: National Bureau of Statistics of China (2015)

Table A-2: Industry classification of Chinese listed companies

Industry name	Industry information
Industry 1. Public utility	Transportation; mining; communication service; public facility services; speciality & scientific research services; information service;
Industry 2. Real estate	Real estate development and operation; real estate management; real estate intermediary service; real estate brokerage; real estate appraisal; real estate consulting; other real estate intermediary services
Industry 3. Conglomerates	Agriculture; forestry; livestock farming; fishery; Agriculture, forestry, livestock farm and fishery service;
Industry 4. Manufacturing	Food and beverage manufacturing; biological medicines manufacturing; textile, clothes and fur; timber and furniture; paper making and printing; petroleum, chemistry, rubber and plastic; electronic; metal and non-metal; machinery, equipment and instrument; other manufacturing
Industry 5. Retail trade	Retail of food, beverage, tobacco and household products; retail of daily consumer goods and sundry articles; retail of hardware, transport, electric and chemical products; retail of medicine and medical appliances; retail of books, newspapers and magazines; other retail trades; commercial brokerage and agency service; wholesale of food, beverage, tobacco and household products; wholesale of energy, materials, machinery and electronic equipment; other wholesale trades

Source: Author's work using CSRC and CSMAR database

Table A-3: Correlation between capital structure and determinants for Chinese listed firms, 1990-2014, Chapter 4

	Total_lev	MT_debt	Long_lev	ML_debt	Tang	Size	Tech	Prof	Grow	Evol	Indus	GDP
Total_lev	1.0000											
MT_debt	0.6145	1.0000										
Long_lev	0.3360	0.5266	1.0000									
ML_debt	0.3767	0.7247	0.8434	1.0000								
Tang	0.0084	0.1804	0.2273	0.1947	1.0000							
Size	0.2111	0.4025	0.3195	0.4592	0.0440	1.0000						
Tech	0.0044	-0.0379	-0.0145	-0.0378	0.0287	-0.0507	1.0000					
Prof	-0.4518	-0.3120	-0.0631	-0.0992	-0.0715	0.1690	-0.0849	1.0000				
Grow	0.0074	-0.1124	0.0079	-0.0620	-0.0160	-0.0012	0.0055	0.0715	1.0000			
Evol	0.1632	-0.0438	-0.0671	-0.0868	0.0126	-0.1725	0.0830	-0.2980	-0.0423	1.0000		
Indus	0.2157	0.1758	0.0869	0.1294	-0.0590	0.0700	-0.0364	-0.0663	0.2864	0.0041	1.0000	
GDP	0.1193	0.0785	0.0348	0.0082	0.0888	-0.0725	-0.0122	-0.0162	0.3754	0.0125	0.7124	1.0000

Source: Author's work using CSMAR database

Note: This table reports the correlation matrix between the variables used in chapter 4. All of the data is gathered from CSMAR database, except for GDP growth rate which is obtained from the World Bank's website.

Table A-4: Two-step difference GMM estimates of long-term leverage for dynamic panel models of capital structure

	(i) Long-term leverage	
	Book ratio	Market ratio
$LEV_{(t-1)}$	0.7533***	0.7727***
	(0.0227)	(0.0171)
Tang	0.0348***	0.0033
	(0.0058)	(0.0081)
Size	0.0079***	-0.0033***
	(0.0006)	(0.0006)
Tech	0.0022	-0.0497**
	(0.0110)	(0.0159)
Prof	-0.0512***	-0.1999***
	(0.0093)	(0.0175)
Grow	0.0001	-0.0014***
	(0.0003)	(0.0003)
Evol	0.0122	-0.0250
	(0.0074)	(0.0148)
Indus	0.0225**	-0.0548***
	(0.0077)	(0.0097)
GDP	-0.0117	0.1972***
	(0.0340)	(0.0434)
No. of instruments	76	76

Source: Author's work using CSMAR database

Note: This table reports the two-step difference GMM estimates of long-term leverage for the dynamic panel data models in chapter as a robust check. The regression model is expressed as follows:

$$LEV_{it} = \gamma LEV_{i,t-1} + \beta_1 Tang_{it} + \beta_2 Size_{it} + \beta_3 Tech_{it} + \beta_4 Prof_{it} + \beta_5 Grow_{it} + \beta_6 Evol_{it} + \eth_1 Indus_{it} + \eth_2 GDP_t + u_i + \varepsilon_{it}$$

The robust standard error is reported below the coefficient estimates in brackets

The number of instruments is shown in the last row in this table

* statistical significance at the 10% level

** statistical significance at the 5% level

*** statistical significance at the 1% level

Table A-5: Correlation between leverage and determinants for Chinese listed firms, 2003-2013, Chapter 5

	Total_lev	Size	Prof	Evol	SO	LS	BS	BI	Dua	MSD
Total_lev	1.0000									
Size	0.0967	1.0000								
Prof	-0.4891	0.2309	1.0000							
Evol	0.3130	-0.1835	-0.3116	1.0000						
SO	-0.0414	0.0178	0.0529	-0.0400	1.0000					
LS	-0.0483	0.2588	0.1600	-0.0515	0.4359	1.0000				
BS	-0.0115	0.2025	0.0751	-0.0731	0.1621	0.0290	1.0000			
BI	0.0199	0.1332	0.0102	-0.0076	-0.1223	0.0021	-0.3056	1.0000		
Dua	0.0128	0.0999	0.0236	-0.0599	0.1063	0.0852	0.1137	-0.0592	1.0000	
MSD	-0.0095	0.0797	0.0161	-0.0130	-0.1046	-0.1666	-0.0032	-0.0036	-0.0406	1.0000

Source: Author's work using CSMAR database

Note: This table reports the correlation matrix between the variables used in chapter 5. All of the data is obtained from CSMAR database.

Table A-6: List of questions

QUESTIONS:
1. What sources of financing does your firm mainly use? And how important are the financing sources for your firm.
2. What factors affect your financing choices?
3. How important are internal financing to your company?
4. How important are external financing to your company?
5. What factors affect your decision about issuing external equity?
6. What factors affect your decision about issuing external debt?
7. Does your company maintain a good/close relationship with the banks? How many banks does your company have a relationship with? How often do you report your financial position to the banks which have a banking relationship with you?
8. Is there a financing preference for debt or equity? Will your firm issue shares when retained profits are insufficient, and do your firm issue equity if debt, convertibles or other sources of financing are unavailable?
9. Is there a preference for short-term or long-term financing?
10. Do you believe your firm has an optimal capital structure and pursuing a target capital structure?
11. How's your firm's relationship with the local government?

Table A-7: Information on interviewees and interviewed firms

Firm	Position of respondent	Industry	Firm age (Years)
A	CFO	Chemical fibre manufacturing	25
B	Financial manager	Solar photovoltaic industry	20
C	CFO	Non-Ferrous Metal Smelting, Rolling, Drawing, And Extruding	17
D	CFO	Electrical machinery and equipment manufacturing	24
E	Financial manager	Food Processing	19
F	Financial manager	Paper and Allied Products	24
G	CFO	Gas Production and Supply	19
H	Secretary of the Board	Non-Ferrous Metal Smelting, Rolling, Drawing, And Extruding	19
I	Secretary of the Board	Coal Mining and Quarrying	17
J	Financial manager	Coal Mining and Quarrying	19
K	CFO	General Machinery Manufacturing	8
L	Secretary of the Board	Estate Development and Operation	24
M	CFO	Chemical Fibre Manufacturing	15
N	Financial manager	Non-metallic Mineral Products	23
O	Financial manager	General Machinery Manufacturing	16
P	CFO	Electrical Machinery and Equipment Manufacturing	19
Q	Secretary of the Board	Medicine Manufacturing	20
R	Secretary of the Board	Civil Engineering Construction	16
S	Secretary of the Board	Other Wholesale	21
T	Financial manager	Non-metallic Mineral Products	9
U	Financial manager	Electrical Machinery and Equipment Manufacturing	18
V	Financial manager	Electrical Machinery and Equipment Manufacturing	18
WA	Government official	--	--
WB	Government official	--	--
XA	Bank branch manager	--	--
XB	Bank branch manager	--	--
XC	Bank branch manager	--	--

Note: This table presents the basic information on respondents and interviewed companies in chapter 6. It reports the respondents' job titles in their companies and presents the industry and firm age of the sample firms. Neither the interviewees' names nor their organizations' names would be identified at any stage of the analysis.

Table A- 8: Sample characteristics based on the interviewed firms

	Sales (CNY millions)	Number of employees	Number of directors	Number of independent directors	Total leverage ratio	Long-term leverage ratio
1	8359.193	5990	9	3	0.422	0.000
2	243.7402	231	7	3	0.094	0.000
3	45695.73	68159	6	3	0.256	0.000
4	23967.12	30999	9	4	0.796	0.123
5	512.626	1758	9	3	0.398	0.057
6	9532.878	1894	7	3	0.679	0.003
7	2259.035	1668	9	3	0.418	0.004
8	1759.152	409	9	3	0.787	0.108
9	17857.37	6869	9	3	0.614	0.000
10	3005.243	3710	9	4	0.841	0.047
11	1912.732	2323	7	3	0.706	0.155
12	1749.032	1803	9	3	0.566	0.000
13	4605.827	5537	9	3	0.386	0.000
14	7480.841	43726	11	4	0.373	0.059
15	1932.26	9643	9	3	0.470	0.082
16	8879.175	3343	9	3	0.836	0.105
17	1164.932	1180	9	3	0.337	0.019
18	9542.724	6999	9	3	0.674	0.042
19	612.541	1912	10	4	1.037	0.435
20	1702.395	2142	7	3	0.559	0.068
21	3005.243	3343	9	3	0.566	0.047
22	16119.45	92170	15	5	0.615	0.061
Mean	8042.571	13927	8.905	3.286	0.065	0.223
Min	243.74	231	6	3	0	-0.84
Max	45695.73	92170	15	5	0.435	1.836

Note: This table summarises the information about the interviewed companies in chapter 6. It reports the sales, number of employees, number of directors and independent directors, total and long-term leverage of the 22 sample firms, and presents their mean, min and max value in the last three columns. To protect the privacy of the interviewees, more detailed information is to be kept confidential.

Table A-9: The approximate proportion of one financing source to total financing

	(1) Retained profits	(2) Bank loans	(3) Government loans	(4) Trade credit	(5) Loans from owners	(6) leasing	(7) Issue equity	(8) Issue debt	(9) Loans from NBFIs[1]	(10) Other
A	20%	30%	0	0	0	0.5%	20%	5%	0	--
B	0	70%	0	0	0	0	0	30%	0	--
C	5%	85%	0	6%	0	4%	0	0	0	--
D	30%	60%	0	0	0	0	0	10%	0	--
E	10%	30%	5%	35%	15%	0	5%	0	0	--
F	0	40%	5%	10%	10%	15%	0	20%	0	--
G	1%	90%	0.1%	0	0	0	8.9%	0	0	--
H	0	72%	0	0	15%	13%	0	0	0	--
I	20%	70%	1%	0	0	5%	4%	0	0	--
J	0	33%	0	0	0	0	33%	33%	0	--
K	40%	37%	3%	0	0	0	20%	0	0	--
L	10%	45%	1%	2%	2%	5%	3%	0	30%	--
M	0	40%	1%	0	0	0	59%	0	0	--
N	0	50%	0	0	0	0	10%	40%	0	--
O	0	55%	0	0	0	0	15%	30%	0	--
P	5%	50%	1%	0	0	2%	30%	17%	0	--
Q	20%	50%	10%	0	0	0	20%	0	0	--
R	30%	50%	2%	0	0	0	18%	0	0	--
S	10%	50%	5%	5%	10%	20%	10%	5%	10%	5%[2]
T	10%	50%	5%	0	0	10%	5%	10%	20%	--
U	30%	60%	0	3%	3%	0	3%	0	0	--

V	40%	0	0	0	0	0	10%	50%	0	--

Source: Data in this table is collected from my own interviews with the CFOs, financial managers and secretaries of board of Chinese listed companies.

Note: (1) NBFIs refers to non-bank financial institutions.

(2) 5% is the approximate proportion of informal financing to total financing.

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